INFINITI®

I30

MODEL A32 SERIES

QUICK REFERENCE INDEX

INFINITI®

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Service Notice or Precautions

FAIL-SAFE

The A/T control unit has an electronic Fail-Safe (limp home mode). This allows the vehicle to be driven even if a major electrical input/output device circuit is damaged.
Under Fail-Safe, the vehicle always runs in third gear even with a shift lever position of "1", "2" or "D". The customer may complain of sluggish or poor acceleration.
When the ignition key is turned ON following Fail-Safe operation, O/D OFF indicator lamp blinks for about 8 seconds. (For diagnosis, refer to AT-40.)
Fail-Safe may occur without electrical circuit damage if the vehicle is driven under extreme conditions (such as excessive wheel spin followed by sudden braking). To recover normal shift pattern, turn the ignition key OFF for 5 seconds, then ON.
The blinking of the O/D OFF indicator lamp for about 8 seconds will appear only once and be cleared. The customer may resume normal driving conditions.
Always follow the "WORK FLOW" (Refer to AT-38).
The SELF-DIAGNOSIS results will be as follows:
The first SELF-DIAGNOSIS will indicate damage to the vehicle speed sensor or the revolution sensor.
During the next SELF-DIAGNOSIS, performed after checking the sensor, no damages will be indicated.

ATF COOLER SERVICE

Replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer.
VQ30DE engine (with RE4F04A/V) ... fin type cooler
Replace radiator lower tank (which includes ATF cooler) with a new one and flush cooler line using cleaning solvent and compressed air.

OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the A/T control unit in combination with the ECM. The results can be read through the blinking pattern of the O/D OFF indicator or the malfunction indicator lamp (MIL). Refer to the table on AT-26 for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and A/T control unit memories.

  Always perform the procedure "HOW TO ERASE DTC" on AT-24 to complete the repair and avoid unnecessary blinking of the MIL.
- The following self-diagnostic items can be detected using ECM self-diagnostic results mode* only when the O/D OFF indicator lamp does not indicate any malfunctions.
  –Improper shifting to 1st, 2nd, 3rd, or 4th gear position
  –Improper torque converter clutch operation
  –Improper lock-up operation.

*: For details of OBD-II, refer to EC section ("ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION").

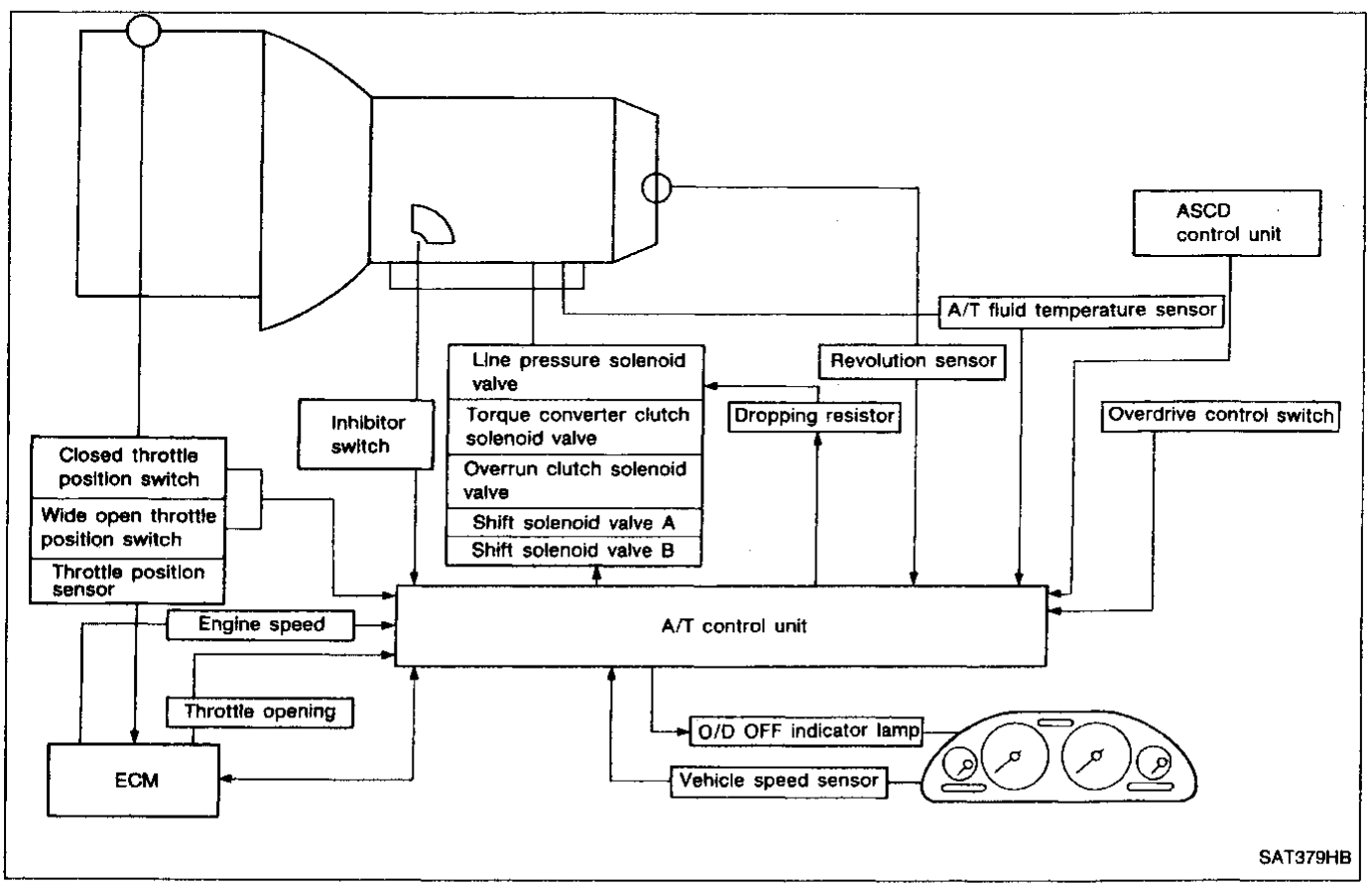
Control System

OUTLINE

The RE4F04A(V) automatic transmission senses vehicle operating conditions through various sensors. It always controls the optimum shaft position and reduces shifting and lock-up shocks.

SENSORS	CONTROL UNIT	ACTUATORS
Inhibitor switch Throttle position sensor Closed throttle position switch Wide open throttle position switch Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed sensor Overdrive control switch	Shift control Line pressure control Lock-up control Overrun clutch control Timing control Fail-safe control Self-diagnosis	Shift solenoid valve A Shift solenoid valve B Overrun clutch solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve O/D OFF indicator lamp

CONTROL SYSTEM



Diagnostic Worksheet (Cont'd)

DIAGNOSTIC WORKSHEET

1.	☐ Read the Fail-safe and listen to customer complaints.	AT-8
2.	☐ CHECK A/T FLUID ☐ Leakage (Follow specified procedure) ☐ Fluid condition ☐ Fluid level	AT-39
3.	☐ Perform all ROAD TEST and mark required procedures.	AT-39
	3-1 Check before engine is started. ☐ SELF-DIAGNOSTIC PROCEDURE — Mark detected items. ☐ Inhibitor, overdrive control and throttle position switches, AT-59. ☐ A/T fluid temperature sensor and A/T control unit power source, AT-65. ☐ Vehicle speed sensor·A/T (Revolution sensor), AT-68. ☐ Engine speed signal, AT-70. ☐ Torque converter clutch solenoid valve, AT-86. ☐ Line pressure solenoid valve, AT-94. ☐ Shift solenoid valve A, AT-97. ☐ Shift solenoid valve B, AT-100. ☐ Throttle position sensor, AT-103. ☐ Overrun clutch solenoid valve, AT-105. ☐ Vehicle speed sensor·MTR, AT-108. ☐ Battery ☐ Others	AT-40
	3-2. Check at idle ☐ 1. O/D OFF Indicator Lamp Does Not Come On, AT-110. ☐ 2. Engine Cannot Be Started In "P" And "N" Position, AT-111. ☐ 3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed, AT-111. ☐ 4. In "N" Position, Vehicle Moves, AT-112. ☐ 5. Large Shock. "N" → "R" Position, AT-113. ☐ 6. Vehicle Does Not Creep Backward In "R" Position, AT-114. ☐ 7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position, AT-115.	AT-41
	3-3. Cruise test Part-1 ☐ 8. Vehicle Cannot Be Started From D_1, AT-116. ☐ 9. A/T Does Not Shift: $D_1 \rightarrow D_2$ Or Does Not Kickdown: $D_4 \rightarrow D_2$, AT-117. ☐ 10. A/T Does Not Shift: $D_2 \rightarrow D_3$, AT-118. ☐ 11. A/T Does Not Shift: $D_3 \rightarrow D_4$, AT-119. ☐ 12. A/T Does Not Perform Lock-up, AT-120. ☐ 13. A/T Does Not Hold Lock-up Condition, AT-121. ☐ 14. Lock-up Is Not Released, AT-121. ☐ 15. Engine Speed Does Not Return To Idle (Light Braking $D_4 \rightarrow D_3$), AT-122.	AT-42, AT-45

Diagnostic Trouble Code (DTC) Chart

A/T RELATED ITEMS

Diagnostic trouble code No.*4		Detected items (Screen terms for CONSULT, "SELF-DIAG RESULTS" mode)	Malfunction is detected when ...
CONSULT GST	ECM*3		
P0705	1101	Inhibitor switch circuit (INHIBITOR SWITCH)	• A/T control unit does not receive the correct voltage signal from the switch based on the gear position.
P0710	1208	A/T fluid temperature sensor (FLUID TEMP SENSOR)	• A/T control unit receives an excessively low or high voltage from the sensor.
P0720	1102	Revolution sensor (VHCL SPEED SEN·A/T)	• A/T control unit does not receive the proper voltage signal from the sensor.
P0725	1207	Engine speed signal (ENGINE SPEED SIG)	• A/T control unit does not receive the proper voltage signal from the ECM.
P0731	1103	Improper shifting to 1st gear position (A/T 1ST SIGNAL)	• A/T cannot be shifted to the 1st gear position even if electrical circuit is good.
P0732	1104	Improper shifting to 2nd gear position (A/T 2ND SIGNAL)	• A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.
P0733	1105	Improper shifting to 3rd gear position (A/T 3RD SIGNAL)	• A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.
P0734	1106	Improper shifting to 4th gear position (A/T 4TH SIGNAL OR TCC*5)	• A/T cannot be shifted to the 4th gear position even if electrical circuit is good.
P0740	1204	T/C clutch solenoid valve (TOR CONV CLUTCH SV)	• A/T control unit detects an improper voltage drop when it tries to operate the solenoid valve.
P0744	1107	Improper lock-up operation (A/T TCC SIGNAL)	• A/T cannot perform lock-up even if electrical circuit is good.
P0745	1205	Line pressure solenoid valve (LINE PRESSURE S/V)	• A/T control unit detects an improper voltage drop when it tries to operate the solenoid valve.
P0750	1108	Shift solenoid valve A (SHIFT SOLENOID/V A)	• A/T control unit detects an improper voltage drop when it tries to operate the solenoid valve.
P0755	1201	Shift solenoid valve B (SHIFT SOLENOID/V B)	• A/T control unit detects an improper voltage drop when it tries to operate the solenoid valve.
P1705	1206	Throttle position sensor Throttle position switch (THRTL POSI SEN·A/T)	• A/T control unit receives an excessively low or high voltage from the sensor.
P1760	1203	Overrun clutch solenoid valve (OVERRUN CLUTCH S/V)	• A/T control unit detects an improper voltage drop when it tries to operate the solenoid valve.

*1: DRIVING pattern 1-6 means as follows:
Pattern 1 should meet b and c.
Pattern 2 should meet a and c.
Pattern 3 should meet a through e.
Pattern 4 should meet a and b.
Pattern 5 should meet a through c.
Pattern 6 should meet a through d.

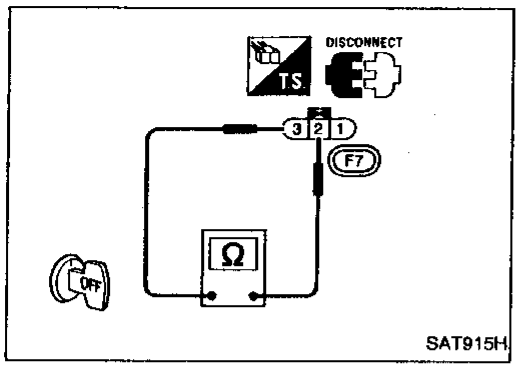
*3: In Diagnostic Test Mode II (Self-diagnostic results)

*4: 1st trip DTC No. is the same as DTC No.

*5: Although "A/T 4TH SIGNAL OR TCC" is shown as a self-diagnostic result for P0734 with CONSULT, malfunction is present at 4th speed only.

a: Selector lever is in "D" position.
b: Vehicle speed is over 10 km/h (6 MPH).
c: Throttle opening is over 1/8.
d: Engine speed is over 450 rpm.
e: A/T fluid temperature is 20 - 120°C (68 - 248°F).

Inhibitor, Overdrive Control and Throttle Position Switches (Cont'd)



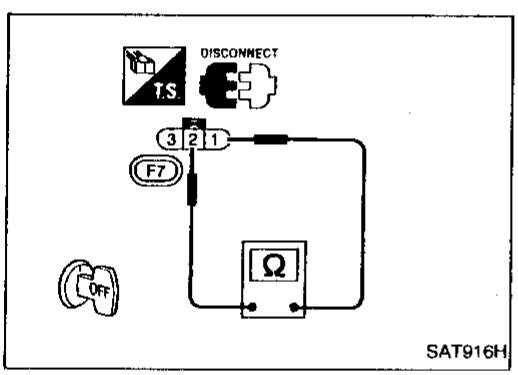
Throttle position switch

Closed throttle position switch (idle position)

- Check continuity between terminals ② and ③.

Accelerator pedal condition	Continuity
Released	Yes
Depressed	No

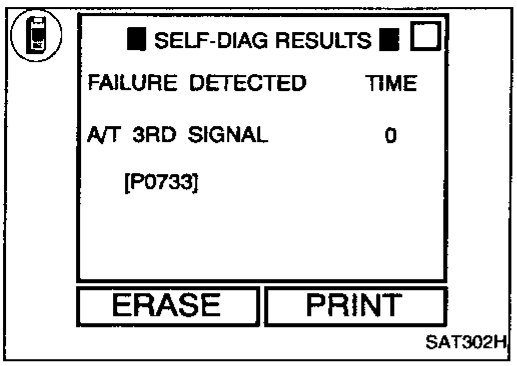
- To adjust closed throttle position switch, refer to EC section ("Basic Inspection", "TROUBLE DIAGNOSIS — Basic Inspection").

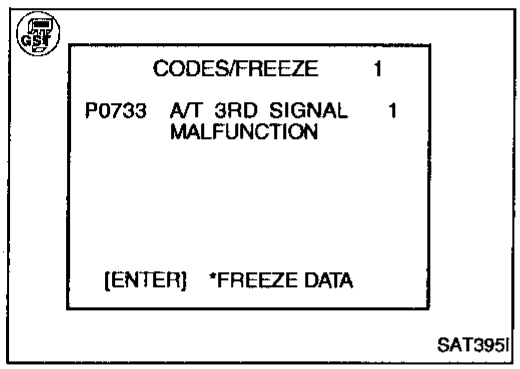


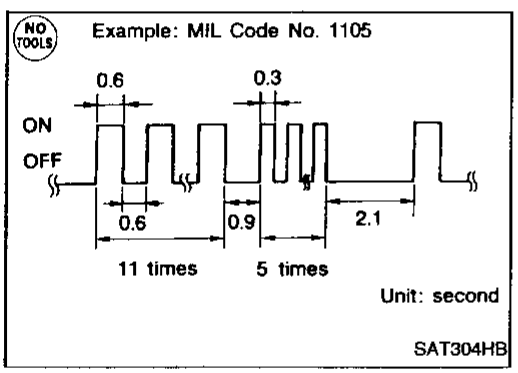
Wide open throttle position switch

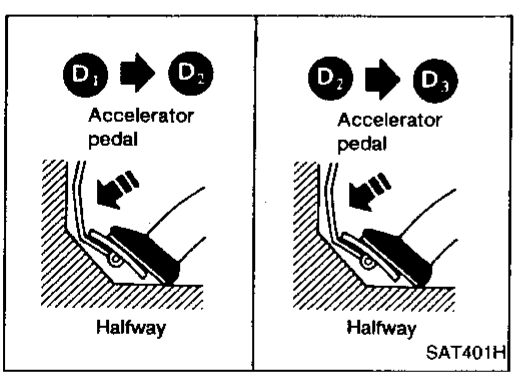
- Check continuity between terminals ① and ②.

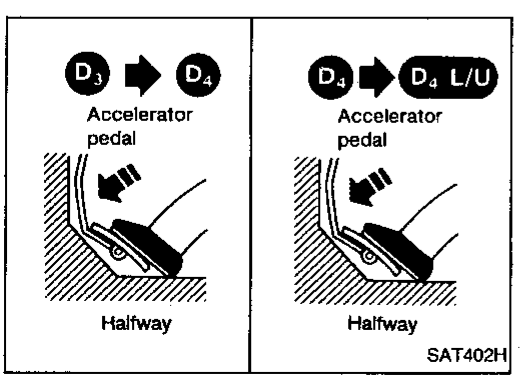
Accelerator pedal condition	Continuity
Released	No
Depressed	Yes











Improper Shifting to 3rd Gear Position

DESCRIPTION

- This is one of the items indicated by the MIL.
- This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into third gear position as instructed by the A/T control unit. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning servo piston or brake band, etc.

Diagnostic trouble code	Malfunction is detected when ...	Check item (Possible cause)
: A/T 3RD SIGNAL : P0733 : MIL Code No. 1105	A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.	• Shift solenoid valve A • Each clutch • Hydraulic control circuit

Diagnostic Trouble Code (DTC) confirmation procedure

After the repair, perform the following procedure to confirm the malfunction is eliminated.

1) Start engine and warm up ATF.
2) Select "SELF-DIAG RESULTS" mode for ECM with CONSULT.
3) Start vehicle with selector lever in "D" and throttle opening halfway. Check that vehicle runs through gear shift of $D_1 \rightarrow D_2 \rightarrow D_3 \rightarrow D_4$, in accordance with shift schedule. Refer to shift schedule, AT-49.

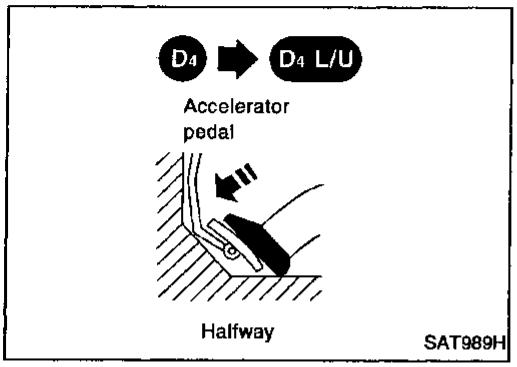
OR

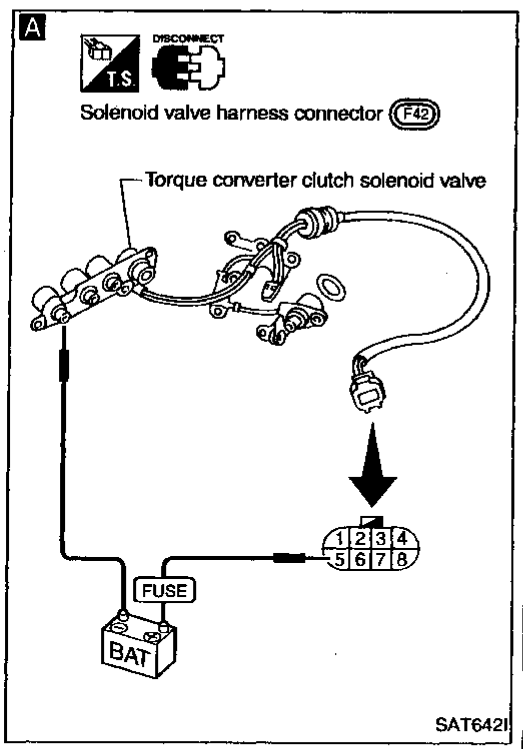
1) Start engine and warm up ATF.
2) Start vehicle with selector lever in "D" and throttle opening halfway. Check that vehicle runs through gear shift of $D_1 \rightarrow D_2 \rightarrow D_3 \rightarrow D_4$, in accordance with shift schedule. Refer to shift schedule, AT-49.
3) Select "MODE 7" with GST.

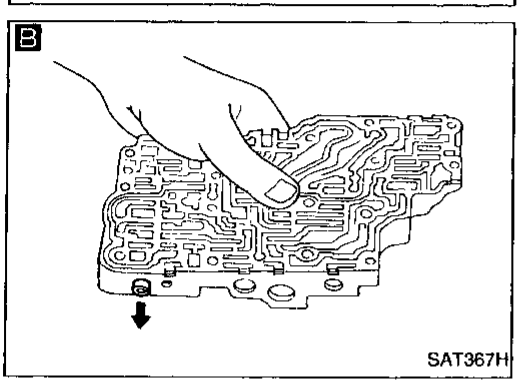
OR

1) Start engine and warm up ATF.
2) Start vehicle with selector lever in "D" and throttle opening halfway. Check that vehicle runs through gear shift of $D_1 \rightarrow D_2 \rightarrow D_3 \rightarrow D_4$, in accordance with shift schedule. Refer to shift schedule, AT-49.
3) Perform self-diagnosis for ECM.
Refer to EC section ["Malfunction Indicator Lamp (MIL)", "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"].

Improper Lock-up Operation (Cont'd)







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During "Cruise test – Part 1" (AT-45), does A/T perform lock-up at the specified speed?

Yes → Perform "Cruise test – Part 1" again and return to the start point of this flow chart.

No

A

CHECK TORQUE CONVERTER CLUTCH SOLENOID VALVE.
1. Remove control valve assembly. Refer to AT-138.
2. Check torque converter clutch solenoid valve operation. Refer to AT-168.

NG → Replace solenoid valve assembly.

OK

B

CHECK CONTROL VALVE.
1. Disassemble control valve assembly. Refer to AT-168.
2. Check control valves for sticking.
- Torque converter clutch control valve
- Torque converter clutch relief valve

NG → Repair control valve

OK

Does A/T perform lock-up at the specified speed?

No → Check control valve again. Repair or replace control valve assembly.

Yes

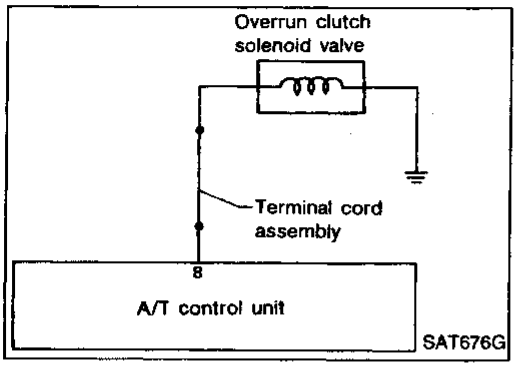
Perform Diagnostic Trouble Code (DTC) confirmation procedure, AT-89.

NG → Perform "Cruise test — Part 1" again and return to the start point of this flow chart.

OK

INSPECTION END

Overrun Clutch Solenoid Valve (Cont'd)

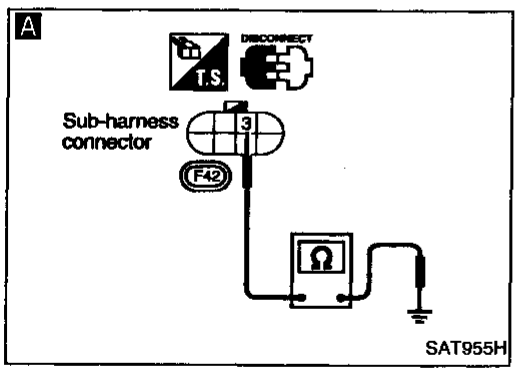


A

CHECK GROUND CIRCUIT.
1. Turn ignition switch to "OFF" position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal ③ and ground.
   Resistance: 20 - 40Ω

NG →
1. Remove control valve assembly. Refer to AT-138.
2. Check the following items:
- Overrun clutch solenoid valve
  Refer to "Component Inspection" on next page.
- Harness of terminal cord assembly for short or open

OK ↓

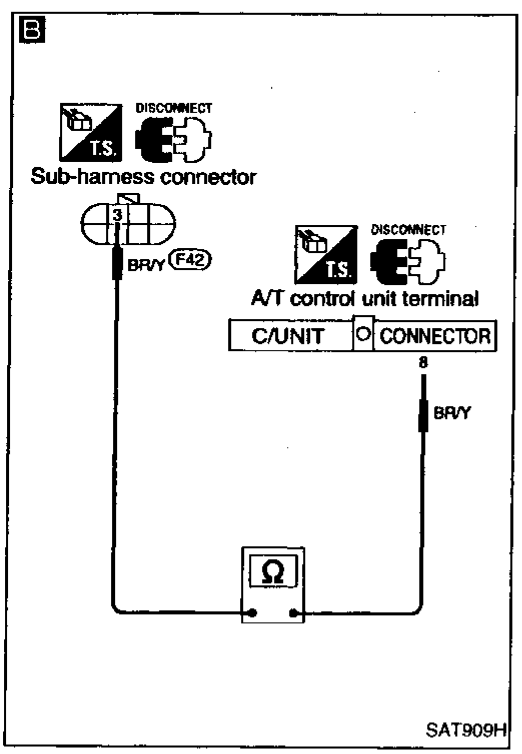


B

CHECK POWER SOURCE CIRCUIT.
1. Turn ignition switch to "OFF" position.
2. Disconnect A/T control unit harness connector.
3. Check resistance between terminal ③ and A/T control unit harness connector terminal ⑧.
   Resistance:
   Approximately 0Ω
4. Reinstall any part removed.

NG →
Repair or replace harness between A/T control unit and terminal cord assembly. (Main harness)

OK ↓

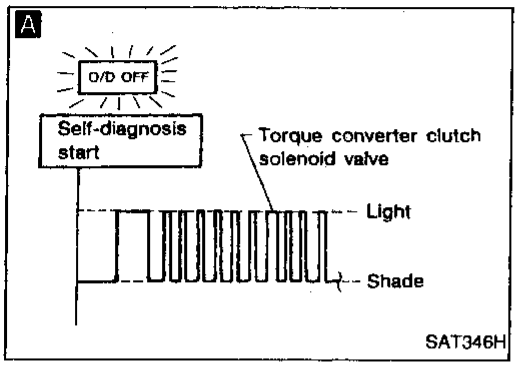


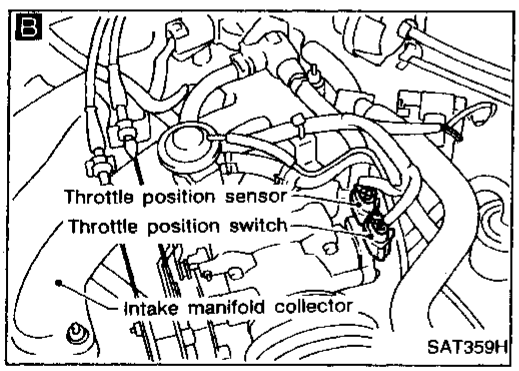
Perform Diagnostic Trouble Code (DTC) confirmation procedure, AT-105.

NG →
1. Perform A/T control unit input/output signal inspection.
2. If NG, recheck A/T control unit pin terminals for damage or loose connection with harness connector.

OK ↓

INSPECTION END





12. A/T Does Not Perform Lock-up

SYMPTOM:

A/T does not perform lock-up at the specified speed.

A

Does self-diagnosis show damage to torque converter clutch solenoid valve circuit after cruise test?

Yes → Check torque converter clutch solenoid valve circuit. Refer to "TROUBLE DIAGNOSIS FOR DTC P0740", AT-86.

No

B

Check throttle position sensor. Refer to EC section ["Throttle Position Sensor (DTC: 0403)", "TROUBLE DIAGNOSIS FOR DTC P0120"].

NG → Repair or replace throttle position sensor.

OK

1. Remove control valve. Refer to AT-138.
2. Check following items:
   - Torque converter clutch control valve
   - Torque converter relief valve
   - Torque converter clutch solenoid valve
   - Pilot valve
   - Pilot filter

NG → Repair or replace damaged parts.

OK

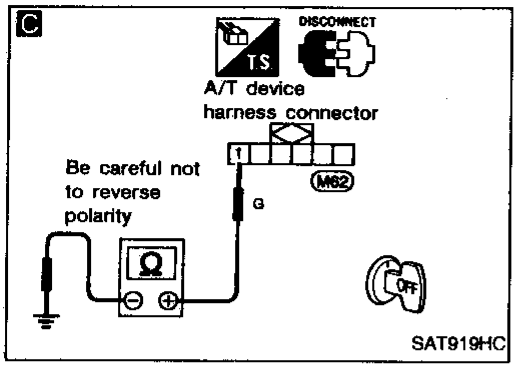
Check again.

NG → 1. Perform A/T control unit input/output signal inspection.
2. If NG, recheck A/T control unit pin terminals for damage or loose connection with harness connector.

OK

INSPECTION END

Diagnostic Procedure (Cont'd)



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C

CHECK GROUND CIRCUIT.
1. Turn ignition switch to "OFF" position.
2. Disconnect A/T device harness connector.
3. Check continuity between A/T device harness terminal ① and ground.

Polarity	Continuity
① (+)	NO
① (–)	YES

NG → 1. Repair harness or connector. 2. Diode

OK ↓

CHECK PARK POSITION SWITCH.
(Refer to "Component Check", AT-136.)

NG → Replace park position switch.

OK ↓

CHECK SHIFT LOCK SOLENOID.
(Refer to "Component Check", AT-136.)

NG → Replace shift lock solenoid.

OK ↓

Reconnect shift lock harness connector.

↓

Turn ignition switch from "OFF" to "ON" position. (Do not start engine.)

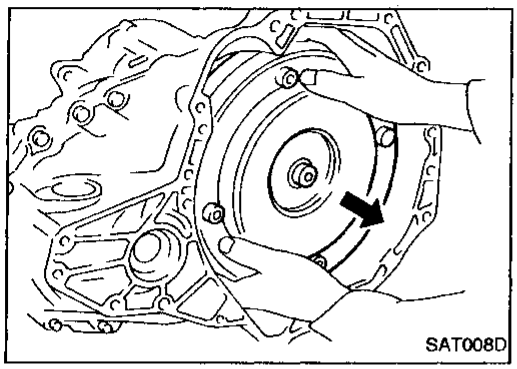
↓

Recheck shift lock operation.

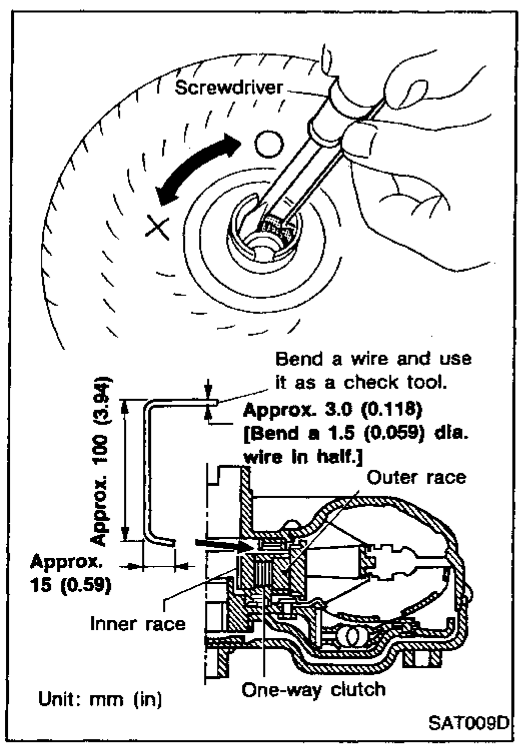
NG → 1. Perform A/T device input/output signal inspection test. 2. If NG, recheck harness connector connection.

OK ↓

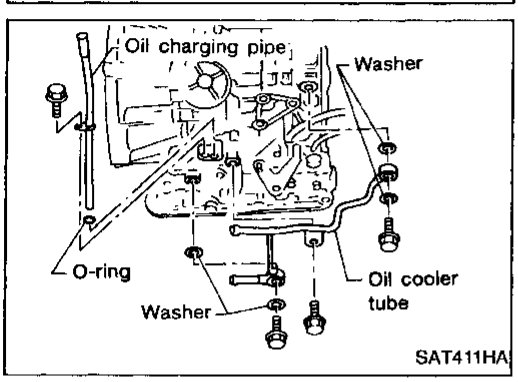
INSPECTION END



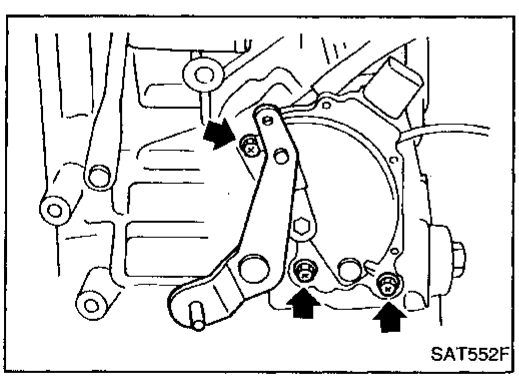
1. Drain ATF through drain plug.
2. Remove torque converter.



3. Check torque converter one-way clutch using check tool as shown at left.
a. Insert check tool into the groove of bearing support built into one-way clutch outer race.
b. When fixing bearing support with check tool, rotate one- way clutch spline using screwdriver.
c. Check that inner race rotates clockwise only. If not, replace torque converter assembly.

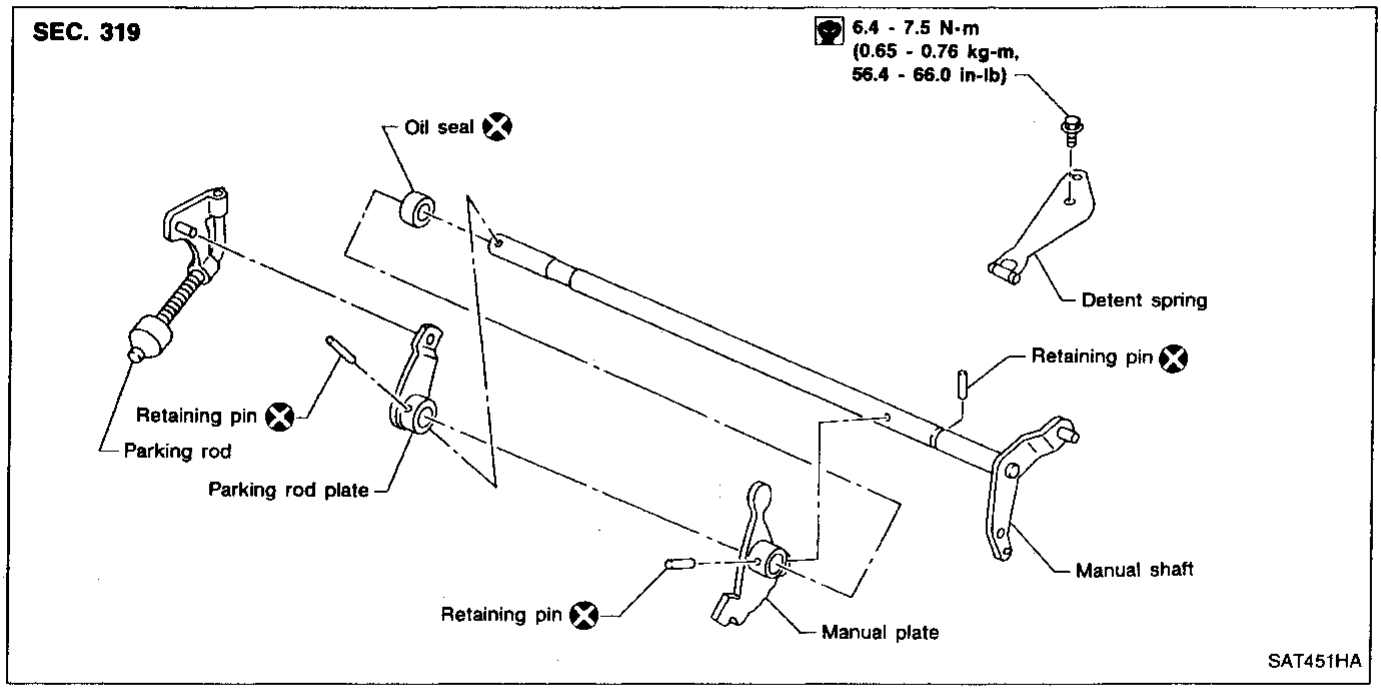


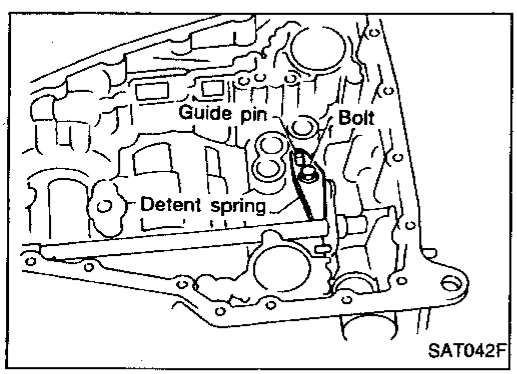
4. Remove oil charging pipe and oil cooler tube.



5. Set manual shaft to position "P".
6. Remove inhibitor switch.

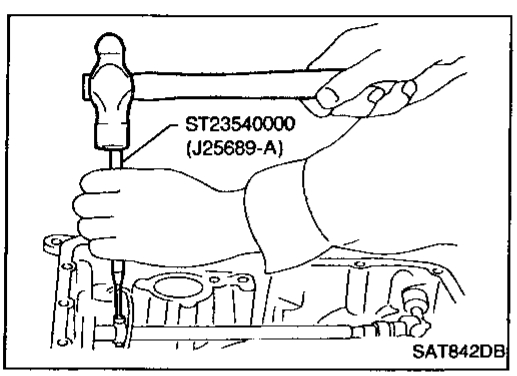
Manual Shaft



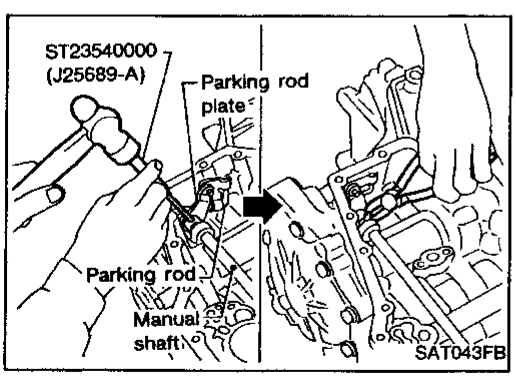


REMOVAL

1. Remove detent spring from transmission case.



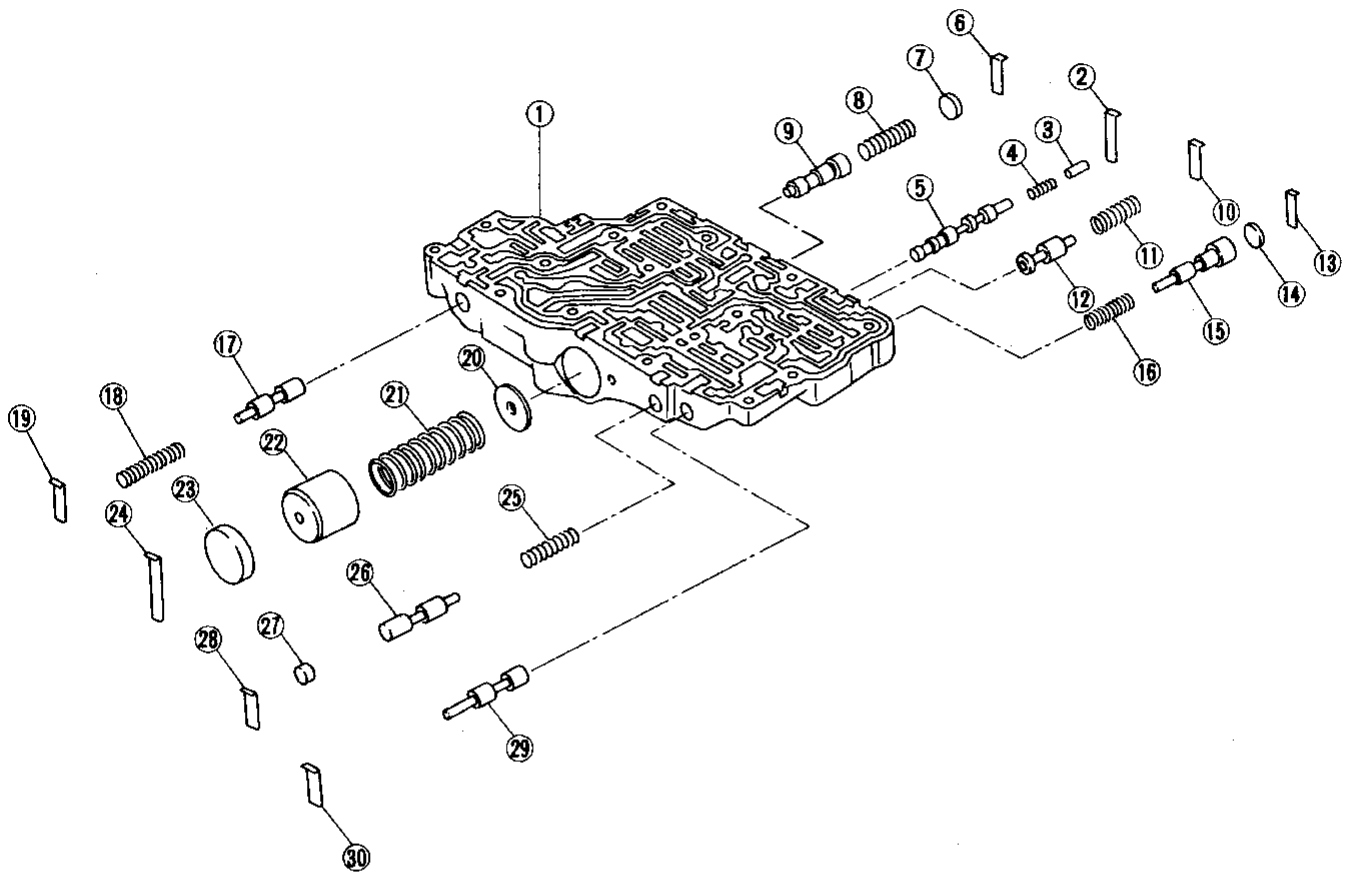
2. Drive out manual plate retaining pin.



3. Drive and pull out parking rod plate retaining pin.
4. Remove parking rod plate from manual shaft.
5. Draw out parking rod from transmission case.

Control Valve Upper Body

SEC. 317



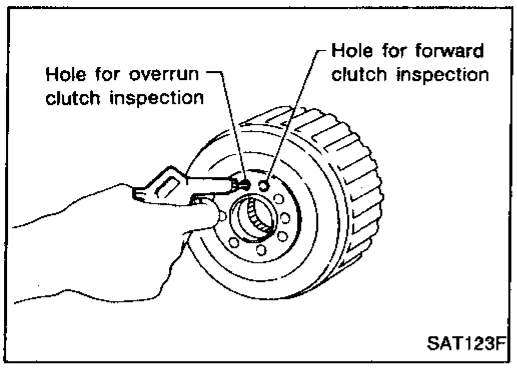
SAT859H

Apply ATF to all components before installation.

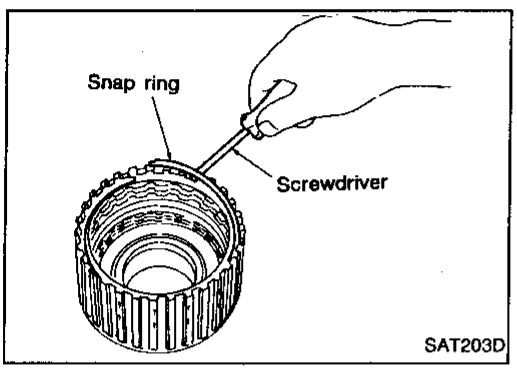
① Upper body
② Retainer plate
③ Plug
④ Return spring
⑤ Torque converter clutch control valve
⑥ Retainer plate
⑦ Plug
⑧ Return spring
⑨ 1-2 accumulator valve
⑩ Retainer plate
⑪ Return spring
⑫ Torque converter relief valve
⑬ Retainer plate
⑭ Plug
⑮ Overrun clutch reducing valve
⑯ Return spring
⑰ Pilot valve
⑱ Return spring
⑲ Retainer plate
⑳ 1-2 accumulator retainer plate
㉑ Return spring
㉒ 1-2 accumulator piston
㉓ Plug
㉔ Retainer plate
㉕ Return spring
㉖ 1st reducing valve
㉗ Plug
㉘ Retainer plate
㉙ 2-3 timing valve
㉚ Retainer plate

Forward Clutch and Overrun Clutch (Cont'd)

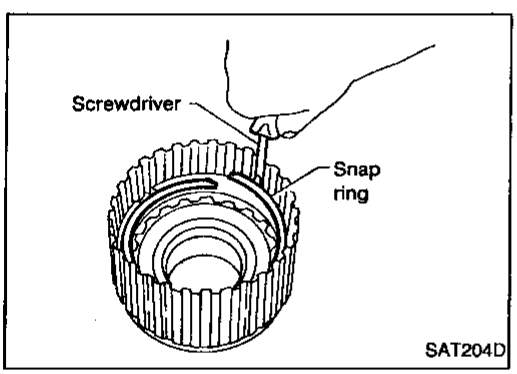
DISASSEMBLY



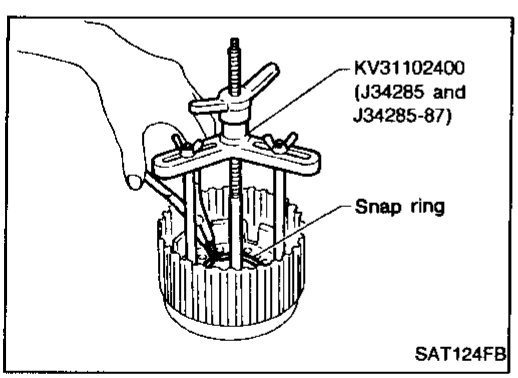
1. Check operation of forward clutch and overrun clutch.
a. Install bearing retainer on forward clutch drum.
b. Apply compressed air to oil hole of forward clutch drum.
c. Check to see that retaining plate moves to snap ring.
d. If retaining plate does not contact snap ring:
- D-ring might be damaged.
- Oil seal might be damaged.
- Fluid might be leaking past piston check ball.



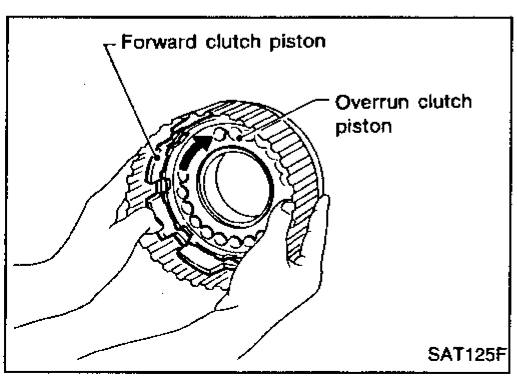
2. Remove snap ring for forward clutch.
3. Remove drive plates, driven plates, retaining plate and dish plate for forward clutch.



4. Remove snap ring for overrun clutch.
5. Remove drive plates, driven plates, retaining plate and dish plate for overrun clutch.



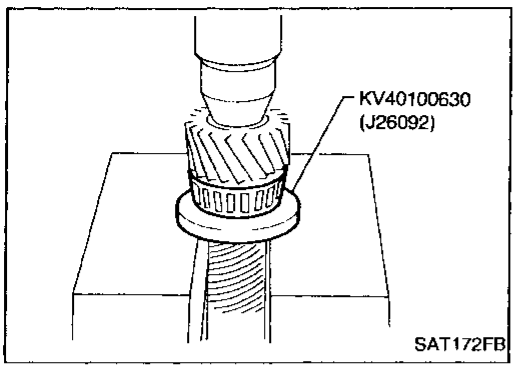
6. Set Tool on spring retainer and remove snap ring from forward clutch drum while compressing return springs.
- **Set Tool directly over return springs.**
- **Do not expand snap ring excessively.**
7. Remove spring retainer and return springs.
- **Do not remove return springs from spring retainer.**



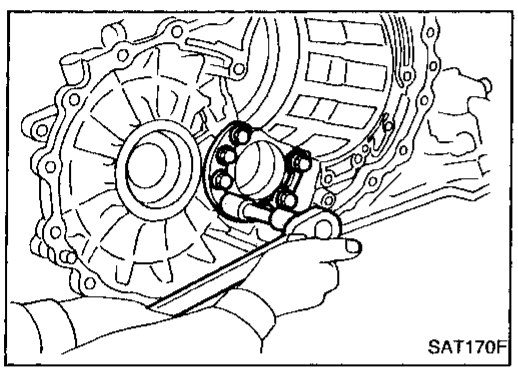
8. Remove forward clutch piston with overrun clutch piston from forward clutch drum by turning it.

Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer (Cont'd)

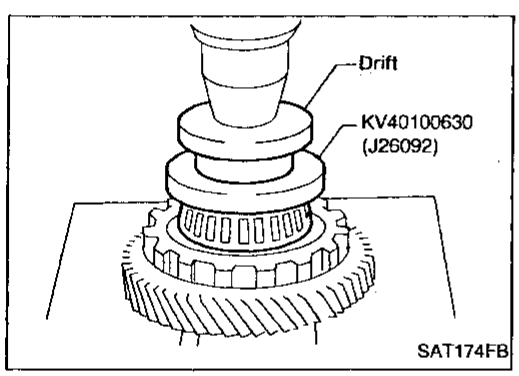
ASSEMBLY



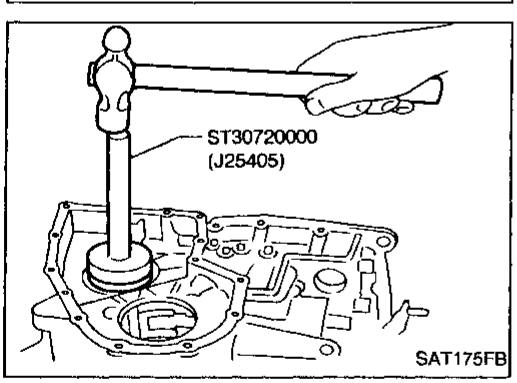
1. Press reduction pinion gear bearing inner race on reduction pinion gear.



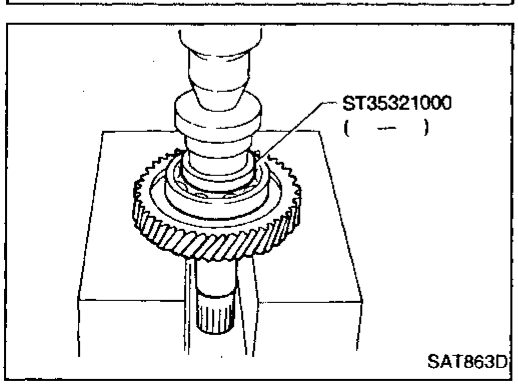
2. Install reduction pinion gear bearing outer race on transmission case.



3. Press idler gear bearing inner race on idler gear.

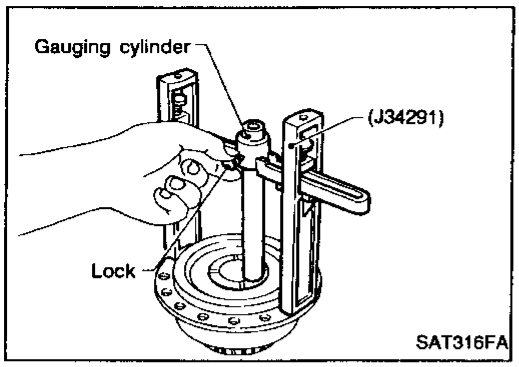


4. Install idler gear bearing outer race on transmission case.



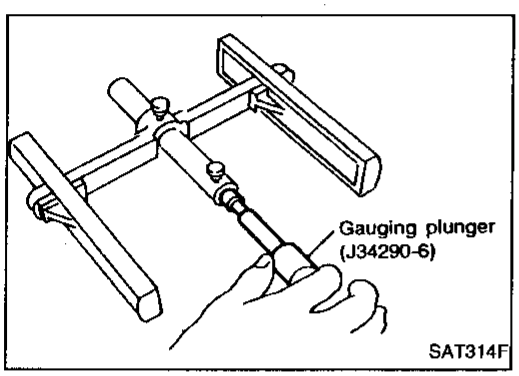
5. Press output shaft bearing on output shaft.

Final Drive — RE4F04V (Cont'd)

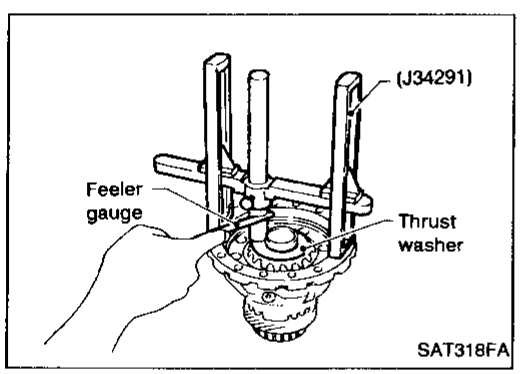


Viscous coupling side

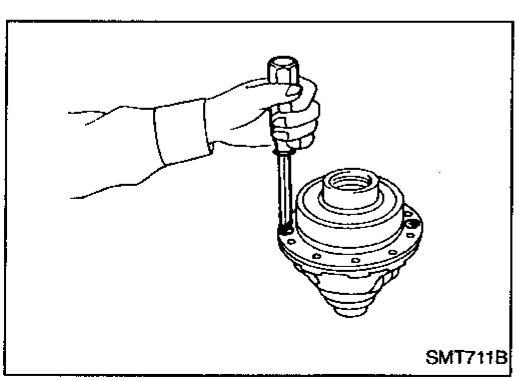
a. Set tool on viscous coupling and lock gauging cylinder in place with set screw.



b. Install gauging plunger into cylinder.

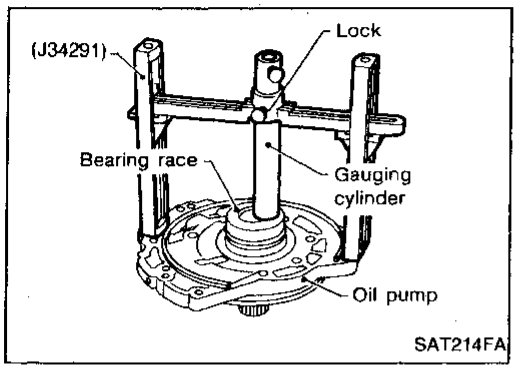


c. Install pinion mate gears and side gears with original washers on differential cases.
   Align paint marks.
d. Tighten differential case bolts.
e. Set tool and allow plunger to rest on side gear thrust washer.
f. Measure gap between plunger and cylinder.
   This measurement should give exact clearance between side gear and differential case with washers.
   Standard clearance:
   0.1 - 0.2 mm (0.004 - 0.008 in)
g. If not within specification, adjust clearance by changing thickness of side gear thrust washer.
   Side gear thrust washers for viscous coupling side:
   Refer to SDS, AT-242.

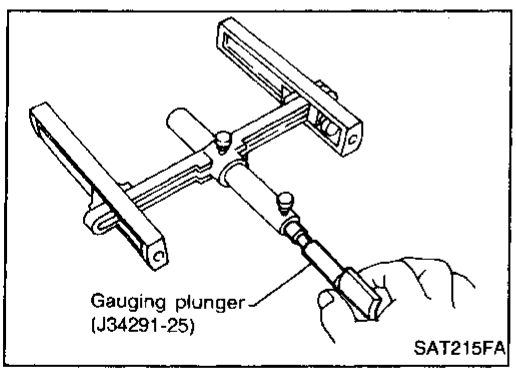


2. Install viscous coupling.

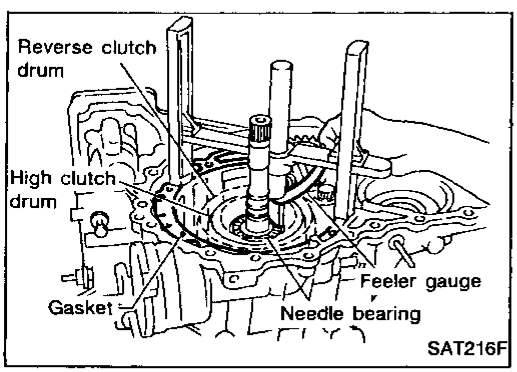
Adjustment 2 (Cont'd)



a. With original bearing race installed, place Tool onto oil pump. The long ends of legs should be placed firmly on machined surface of oil pump assembly. The gauging cylinder should rest on top of bearing race. Lock gauging cylinder in place with set screw.



b. Install gauging plunger into cylinder.



c. With needle bearing installed on high clutch drum, place Tool legs on machined surface of transmission case (with gasket). Then allow plunger to rest on needle bearing.

d. Measure gap between cylinder and plunger. This measurement should give exact total end play.

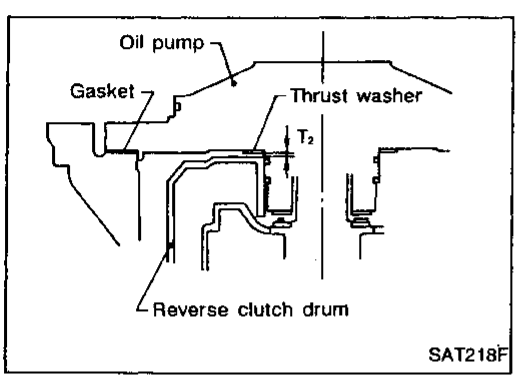
Total end play "T_1":

0.25 - 0.55 mm (0.0098 - 0.0217 in)

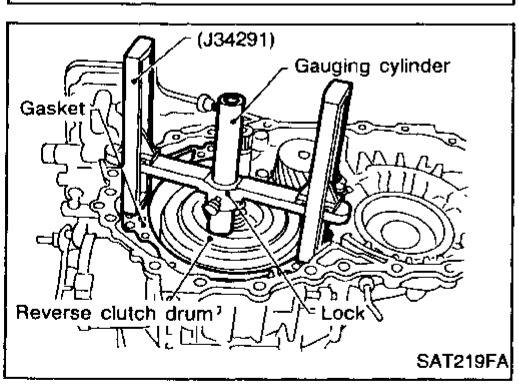
- If end play is out of specification, decrease or increase thickness of bearing race as necessary.

Available bearing race:

Refer to SDS, AT-245.



2. Adjust reverse clutch drum end play "T_2".



a. Place Tool on machined surface of transmission case (with gasket). Then allow gauging cylinder to rest on reverse clutch drum. Lock cylinder in place with set screw.

BRAKE SYSTEM

SECTION BR

CONTENTS

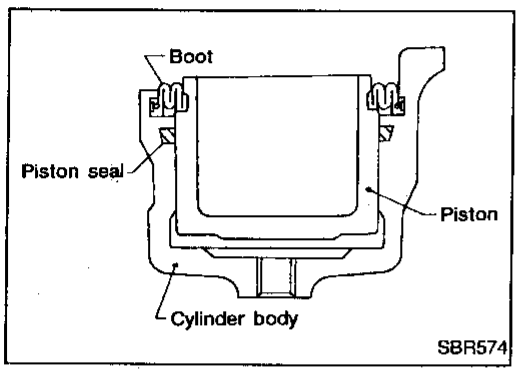
Inspection — Rotor (Cont'd)

THICKNESS

Thickness variation (At least 8 positions):
Maximum 0.01 mm (0.0004 in)

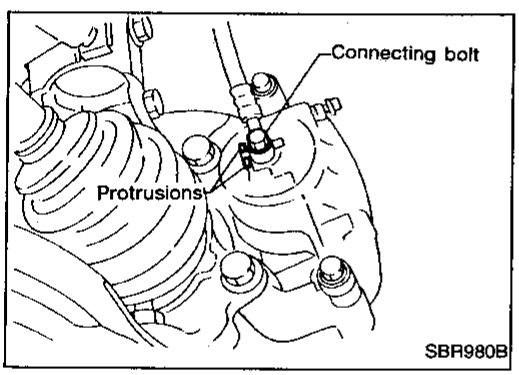
If thickness variation exceeds the specification, turn rotor with on-car brake lathe.

Rotor repair limit:
20.0 mm (0.787 in)



Assembly

1. Insert piston seal into groove on cylinder body.
2. With piston boot fitted to piston, insert piston boot into groove on cylinder body and install piston.
3. Properly secure piston boot.

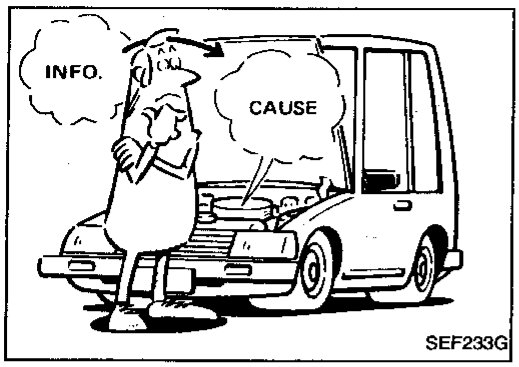


Installation

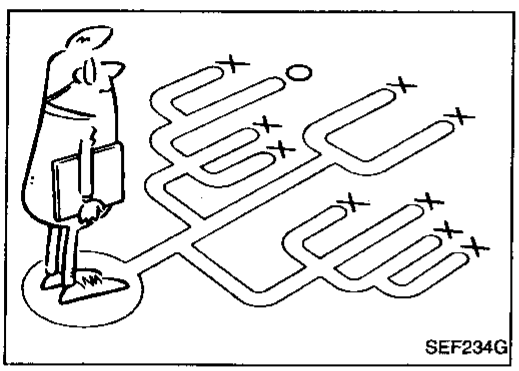
CAUTION:

- **Refill with new brake fluid "DOT 3".**
- **Never reuse drained brake fluid.**

1. Install brake hose to caliper securely.
2. Install all parts and secure all bolts.
3. Bleed air. Refer to "Bleeding Brake System" (BR-5).



SEF233G


SEF234G

How to Perform Trouble Diagnoses for Quick and Accurate Repair

INTRODUCTION

The ABS system has an electronic control unit to control major functions. The control unit accepts input signals from sensors and instantly drives actuator. It is essential that both kinds of signals are proper and stable. It is also important to check for conventional problems: such as air leaks in the booster or lines, lack of brake fluid, or other problems with the brake system.

It is much more difficult to diagnose a problem that occurs intermittently rather than continuously. Most intermittent problems are caused by poor electric connections or faulty wiring. In this case, careful checking of suspicious circuits may help prevent the replacement of good parts.

A visual check only may not find the cause of the problems, so a road test should be performed.

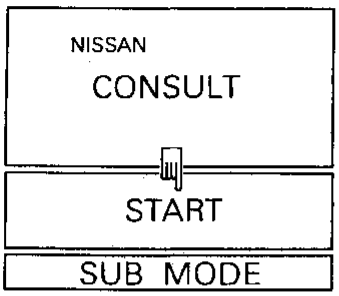
Before undertaking actual checks, take just a few minutes to talk with a customer who approaches with a ABS complaint. The customer is a very good source of information on such problems; especially intermittent ones. Through the talks with the customer, find out what symptoms are present and under what conditions they occur.

Start your diagnosis by looking for "conventional" problems first. This is one of the best ways to troubleshoot brake problems on an ABS controlled vehicle.

CONSULT Inspection Procedure (Cont'd)

DATA MONITOR PROCEDURE

A

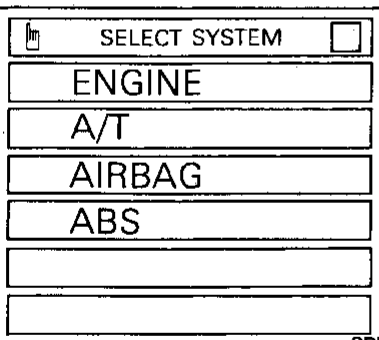


SEF392I

1) Turn ignition switch OFF.
2) Connect CONSULT to Data link connector for CONSULT.
3) Turn ignition switch ON.

A 1) Touch "START" on CONSULT screen.
B 2) Touch "ABS".
C 3) Touch "DATA MONITOR".

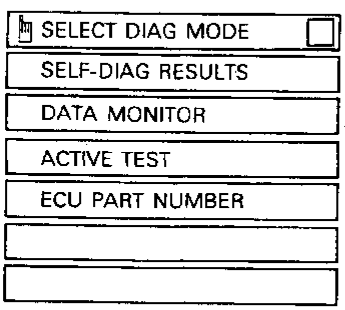
B



SBR385C

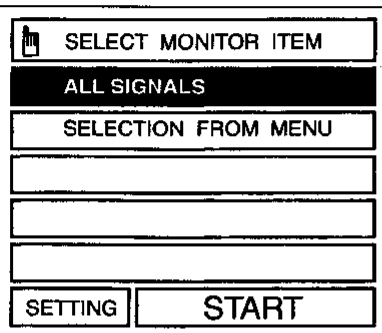
D 1) Touch "SETTING" on "SELECT MONITOR ITEM" screen.
E 2) Touch "LONG TIME" on "SET RECORDING COND" screen.
D 3) Touch "START" on "SELECT MONITOR ITEM".

C



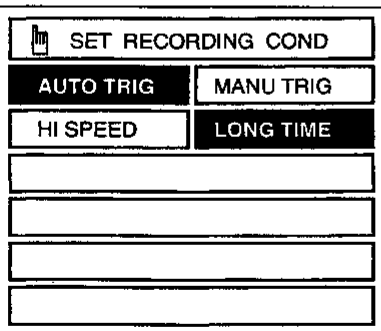
SST412B

D

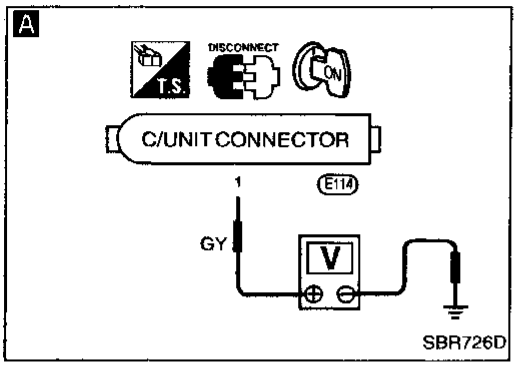


SBR936C

E



SBR937C



Diagnostic Procedure 5 (Low voltage)

Malfunction code No. 57

- Disconnect control unit connectors. Check terminals for damage or connection. Then reconnect connectors.
- Carry out self-diagnosis again.
  Does warning lamp activate again?

No → Inspection end

Yes ↓

A

CONTROL UNIT POWER SUPPLY CHECK

- Disconnect control unit connector.
- Check voltage between control unit connector terminal ① and ground.
  Battery voltage should exist when ignition switch is turned ON.

NG → Ⓐ (See below.)

OK ↓

CONTROL UNIT GROUND CHECK

- Refer to CONTROL UNIT GROUND in Ground Circuit Check (BR-45).

NG → Repair harness and connectors.

OK ↓

Replace control unit.

Ⓐ ↓

Check 10A fuse [15]. Refer to POWER SUPPLY ROUTING in EL section.

NG → Replace fuse.

OK ↓

Check continuity between battery and control unit connector terminal ①.

NG → Repair harness and connectors.

OK ↓

Check battery. Refer to BATTERY in EL section.

Diagnostic Procedure 6 (Control unit)

Malfunction code No. 71

Carry out self-diagnosis after erasing self-diagnostic results (BR-36, 40).

↓

Does warning lamp indicate code No. 71 again?

Yes → Replace control unit.

No ↓

Inspect the system according to the code No.

Body Front End (Cont'd)

SEC. 260•261•262•620•630•650

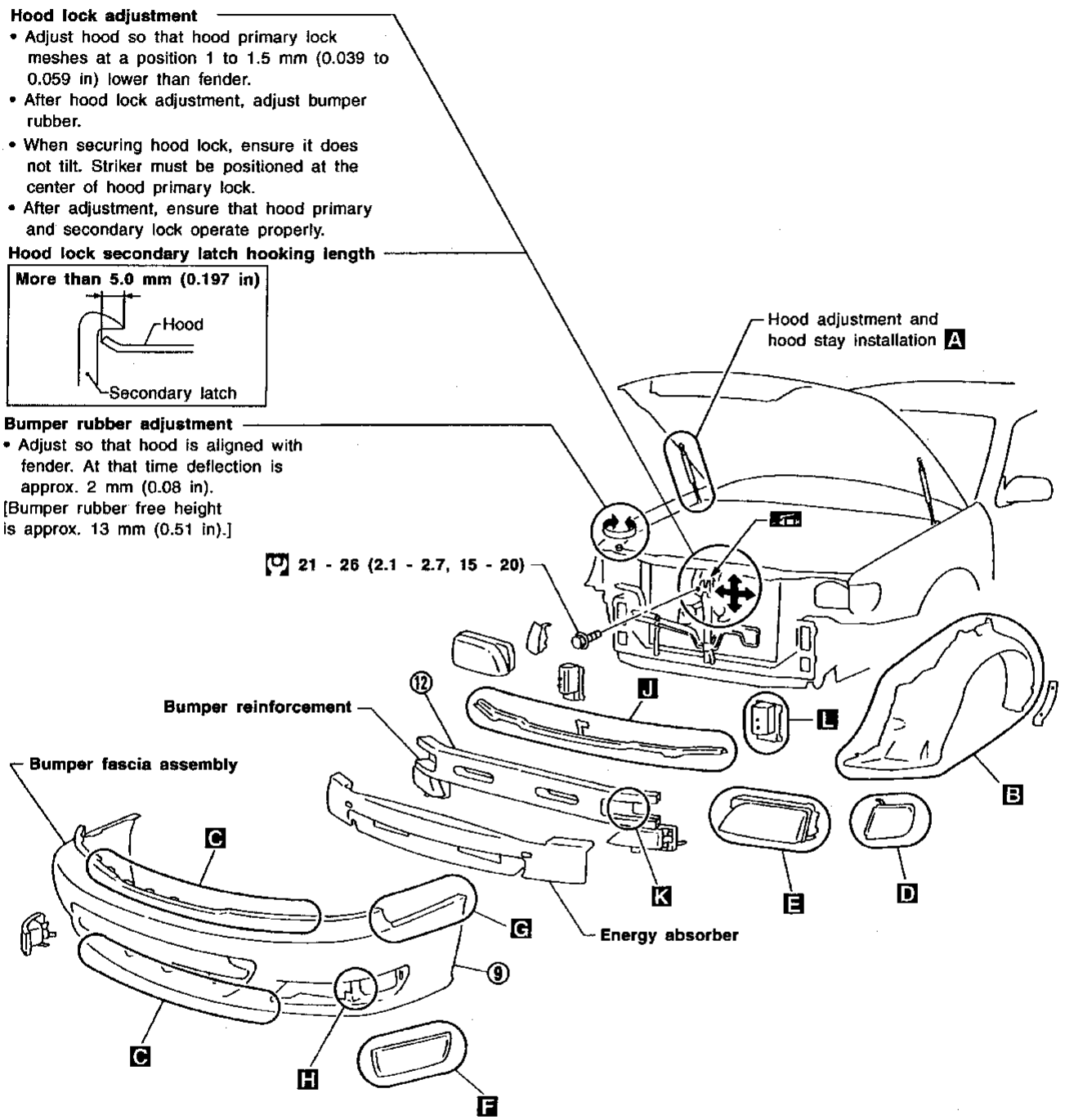
Hood lock adjustment
- Adjust hood so that hood primary lock meshes at a position 1 to 1.5 mm (0.039 to 0.059 in) lower than fender.
- After hood lock adjustment, adjust bumper rubber.
- When securing hood lock, ensure it does not tilt. Striker must be positioned at the center of hood primary lock.
- After adjustment, ensure that hood primary and secondary lock operate properly.

Hood lock secondary latch hooking length

More than 5.0 mm (0.197 in)

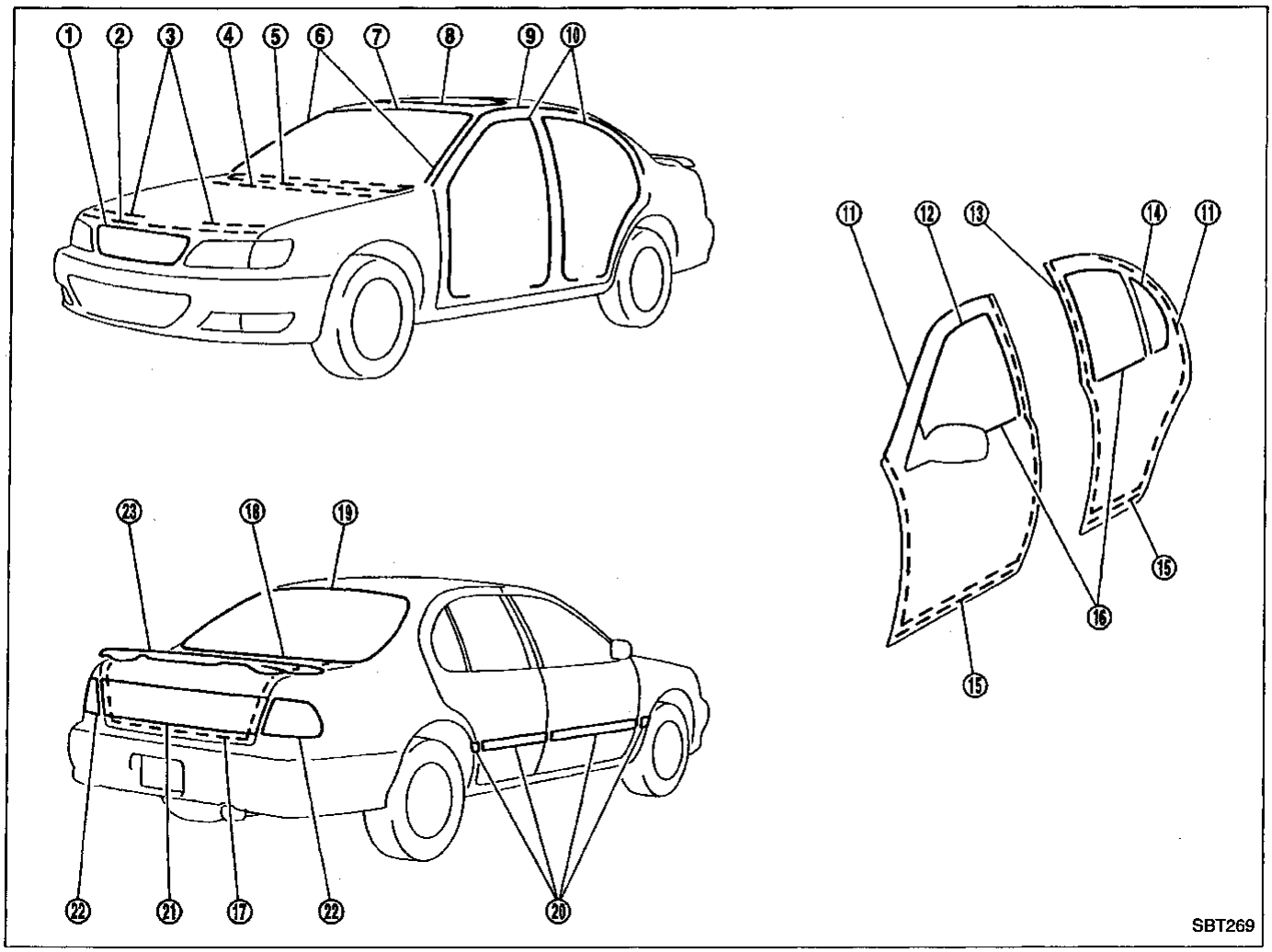
Bumper rubber adjustment
- Adjust so that hood is aligned with fender. At that time deflection is approx. 2 mm (0.08 in).

[Bumper rubber free height is approx. 13 mm (0.51 in).]

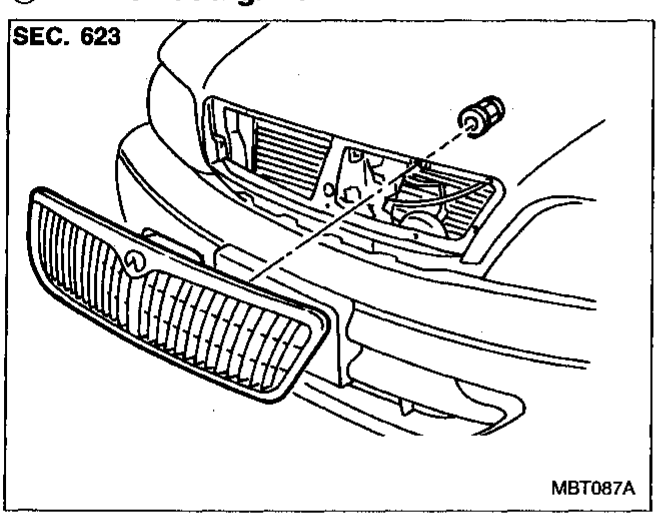


: N•m (kg-m, ft-lb)

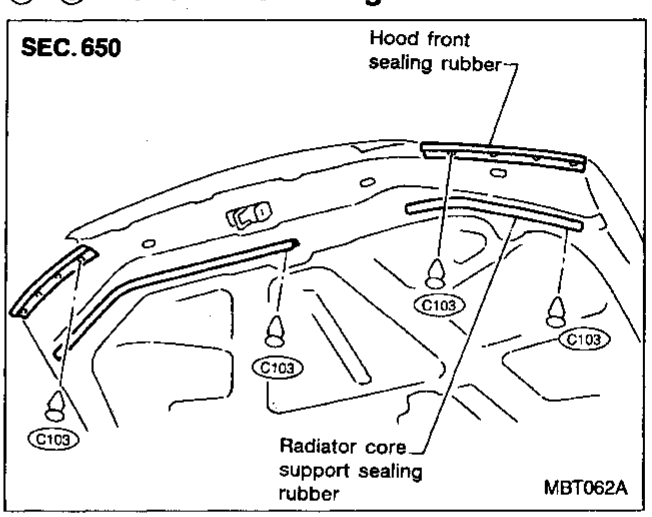
SBT270



① Front hood grille



② ③ Hood front sealing rubber



Door Mirror

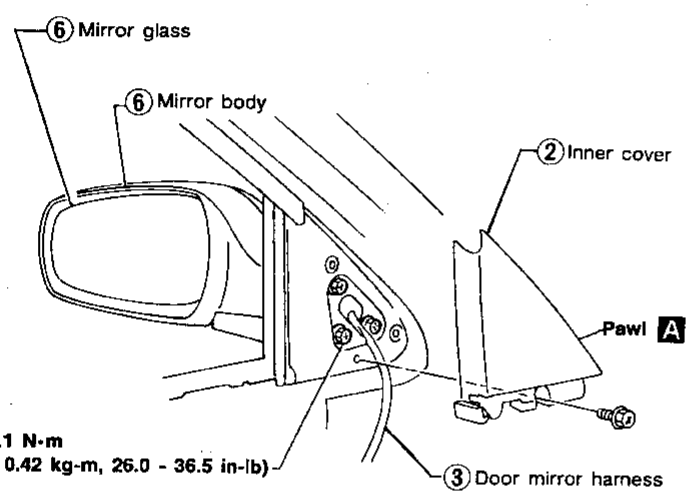
CAUTION:
Be careful not to scratch door rearview mirror body.

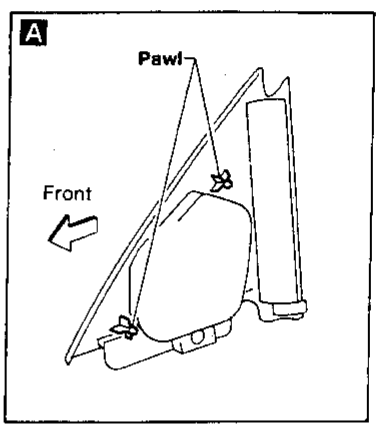
★ **For Wiring Diagram, refer to "POWER DOOR MIRROR" in EL section.**

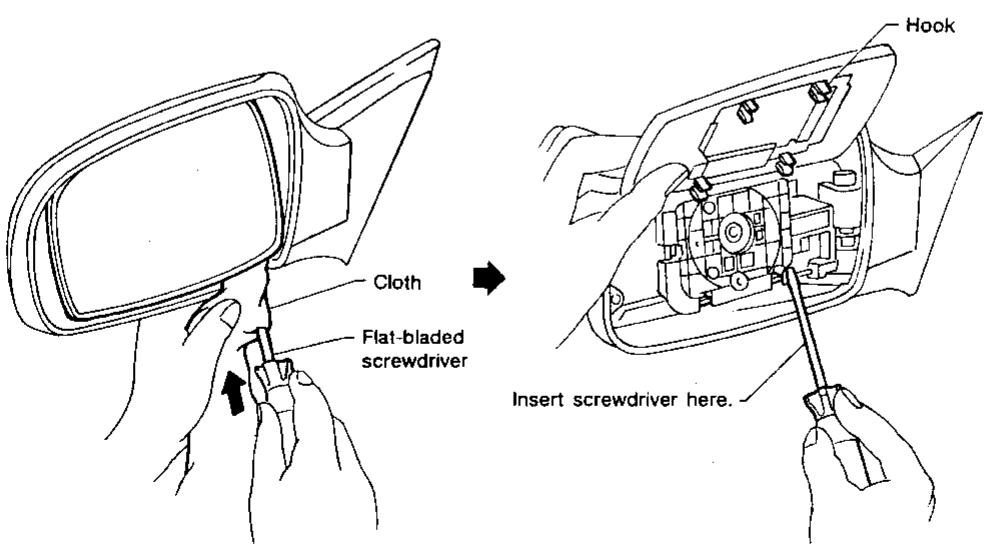
REMOVAL — Door mirror

① Remove door trim. Refer to "Door Trim" in "INTERIOR TRIM" for details, BT-17.
② Remove inner cover front corner of door.
③ Disconnect door mirror harness connector.
④ Remove door mirror harness clips.
⑤ Remove three bolts securing door mirror assembly.
⑥ Remove the mirror glass from mirror body. Do not insert screwdriver too far.

SEC. 963







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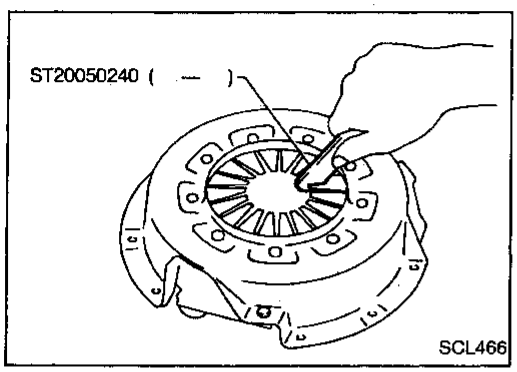
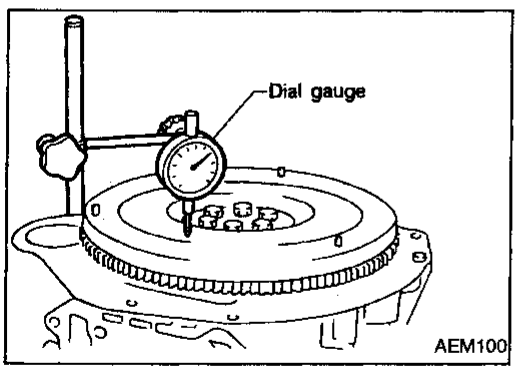


Clutch Cover and Flywheel

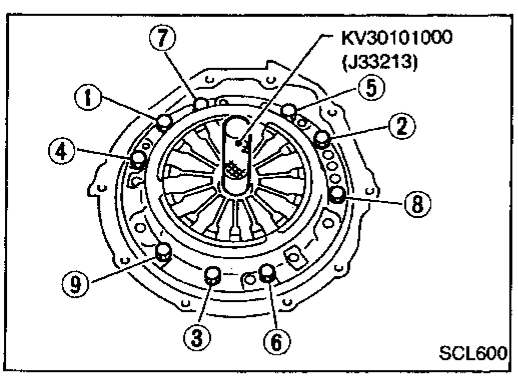
INSPECTION AND ADJUSTMENT

- Check clutch cover installed on vehicle for unevenness of diaphragm spring toe height.
  Uneven limit:
  0.5 mm (0.020 in)
- If out of limit, adjust the height with Tool.



FLYWHEEL INSPECTION

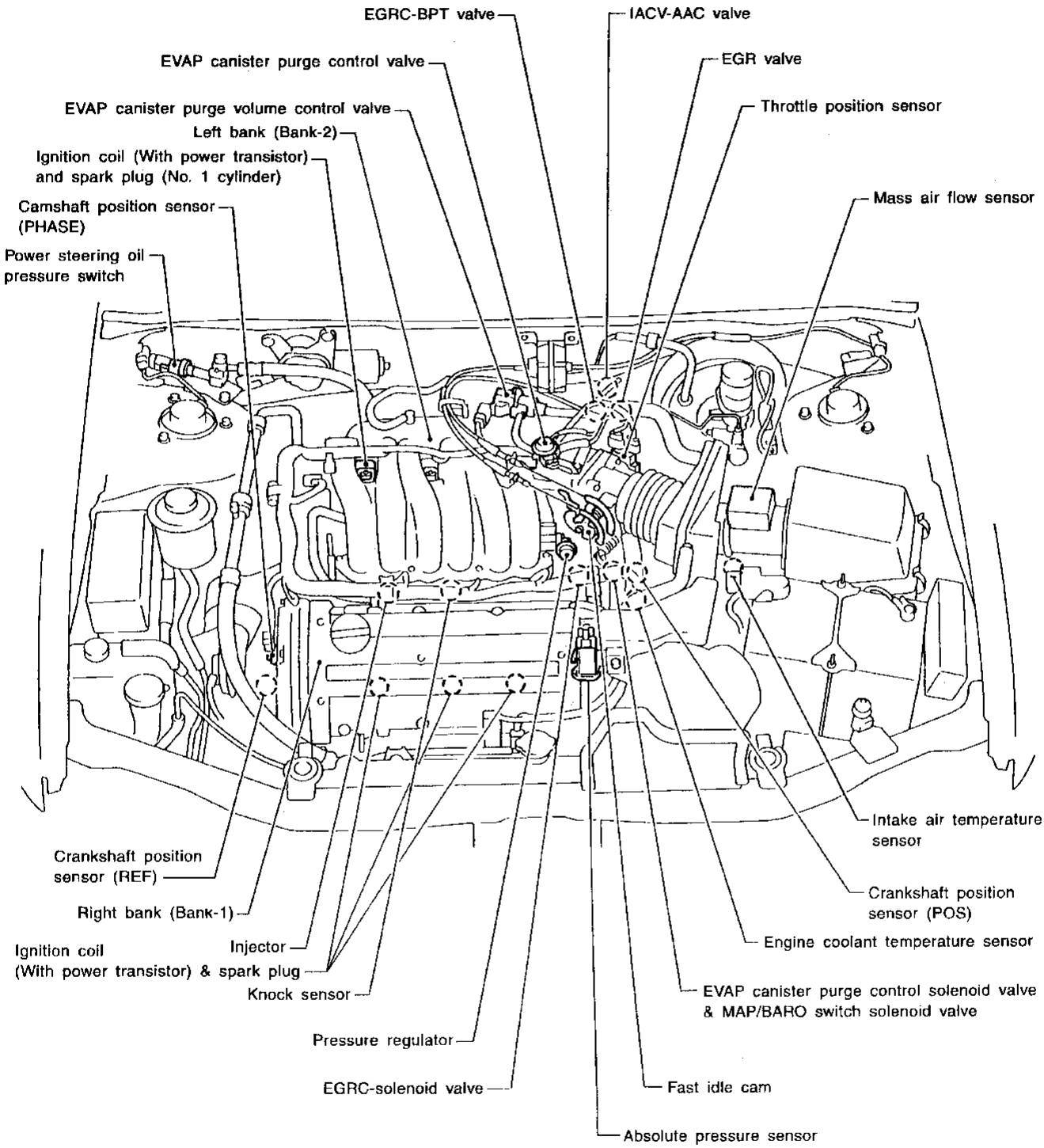
- Check contact surface of flywheel for slight burns or discoloration. Repair flywheel with emery paper.
- Check flywheel runout.
  Maximum allowable runout:
  Refer to EM section ("Inspection", "CYLINDER BLOCK").



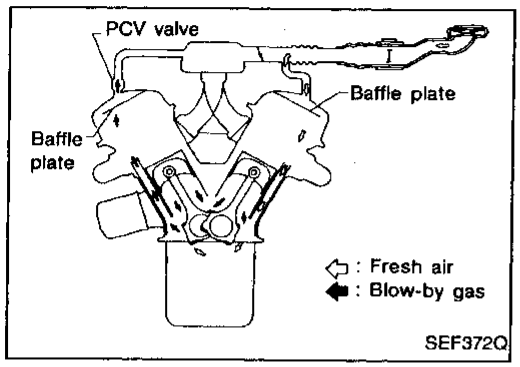
INSTALLATION

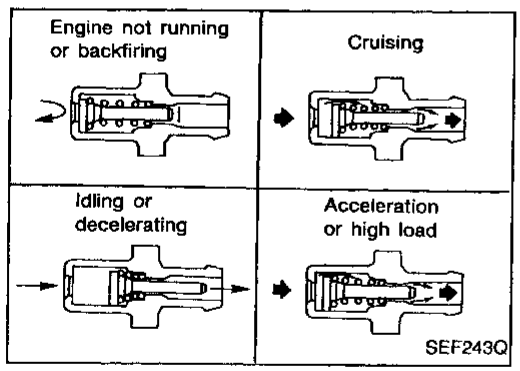
- Insert Tool into clutch disc hub when installing clutch cover and disc.
- Tighten bolts in numerical order.
- **Be careful not to allow grease to contaminate clutch facing.**
  First step:
  : 10 - 20 N·m (1 - 2 kg-m, 7 - 14 ft-lb)
  Final step:
  : 34 - 44 N·m (3.5 - 4.5 kg-m, 25 - 33 ft-lb)

ECCS Component Parts Location



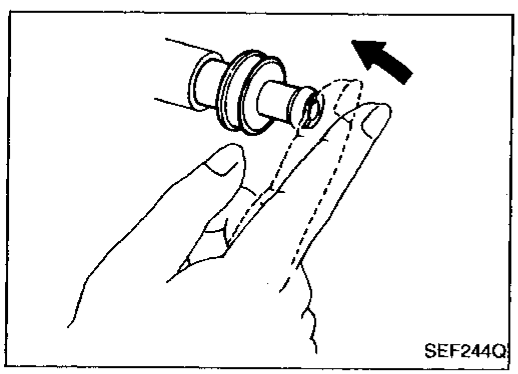
SEF389T





Description

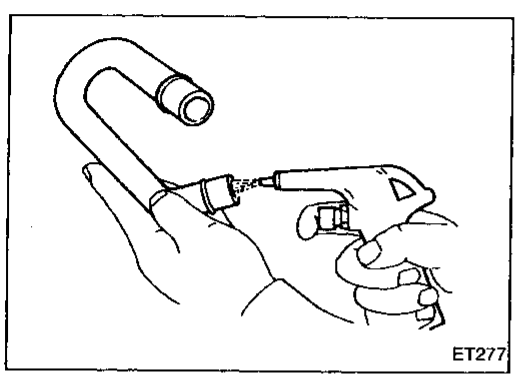
This system returns blow-by gas to both the intake manifold and air cleaner.
The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold.
During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve.
Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air.
The ventilating air is then drawn from the air cleaner, through the hose connecting air cleaner to rocker cover, into the crankcase.
Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve, and its flow goes through the hose connection in the reverse direction.
On vehicles with an excessively high blow-by some of the flow will go through the hose connection to the air cleaner under all conditions.



Inspection

PCV (Positive Crankcase Ventilation)

With engine running at idle, remove ventilation hose from PCV valve; if valve is working properly, a hissing noise will be heard as air passes through it and a strong vacuum should be felt immediately when a finger is placed over valve inlet.



VENTILATION HOSE

1. Check hoses and hose connections for leaks.
2. Disconnect all hoses and clean with compressed air. If any hose cannot be freed of obstructions, replace.

Emission-related Diagnostic Information

DTC AND 1ST TRIP DTC

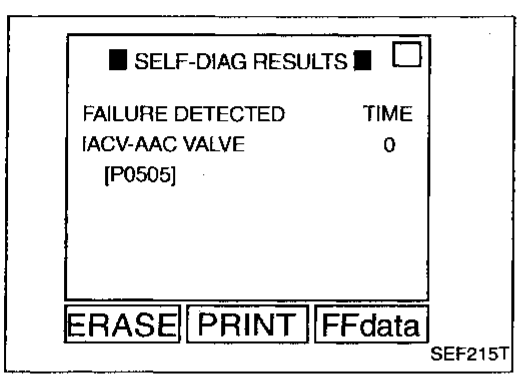
The 1st trip DTC (whose number is the same as the DTC number) is displayed for the latest self-diagnostic result obtained after the ECM memory is cleared. When the self-diagnosis results in "NG" for the 1st trip, the 1st trip DTC is stored in the ECM memory. If the self-diagnosis results in "OK" for the 2nd trip, the 1st trip DTC will be cleared from the ECM memory. If, on the other hand, the self-diagnosis results in "NG" for the 2nd trip, both the DTC and the 1st trip DTC will be stored in the ECM memory and the MIL will illuminate. In other words, the DTC is stored in the ECM memory and the MIL illuminates when the self-diagnosis results in "NG" in two consecutive trips. If a non-diagnostic operation (For example: Driving pattern A. Refer to EC-54.) is performed between the 1st and 2nd trips, only the 1st trip DTC will continue to be stored in the ECM memory. For items whose diagnosis results in "NG" after only one trip (the MIL illuminates), both the DTC and the 1st trip DTC will be stored in the ECM memory.
The 1st trip DTC, along with the DTC, is cleared from the ECM memory in a method outlined later. (Refer to EC-48.) For items whose 1st trip DTCs are displayed, refer to EC-46. These items are prescribed by legal regulations to continuously monitored system/components. However, other items also can be displayed on the CONSULT screen or with the ECM set in Diagnostic Test Mode II (Self-diagnostic results).
1st trip DTC detection is performed without causing the MIL to light up. This does not warn the driver of a problem. Also, the result of the 1st trip DTC detection does not bring the vehicle owner any disadvantage when the vehicle is taken in for the I/M test. When the 1st trip DTC is detected, Nissan first clears it and then tries to perform "DTC confirmation procedure" or "Overall function check" to analyze the problem. If the problem is duplicated, Nissan determines the problem as a malfunctioning item, requiring repair.
The 1st trip DTC is specified in Mode 7 of SAE J1979.

How to read DTC and 1st trip DTC

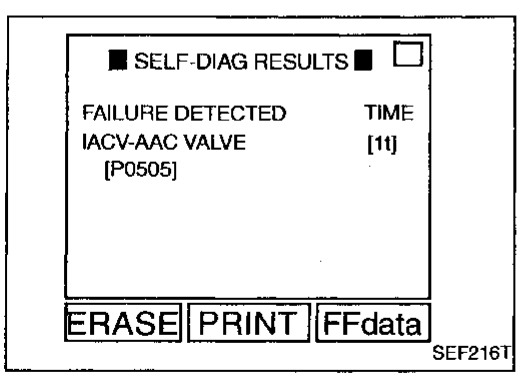
DTC and 1st trip DTC can be read by the following methods.

1. The number of blinks of the malfunction indicator lamp in the Diagnostic Test Mode II (Self-Diagnostic Results) Examples: 0101, 0201, 1003, 1104, etc.
   These DTCs are controlled by NISSAN.
2. CONSULT or GST (Generic Scan Tool) Examples: P0340, P1320, P0705, P0750, etc.
   These DTCs are prescribed by SAE J2012.
   (CONSULT also displays the malfunctioning component or system.)

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



A sample of CONSULT display for DTC is shown at left. DTC or 1st trip DTC of a malfunction is displayed in SELF-DIAGNOSTIC RESULTS mode of CONSULT. Time data indicates how many times the vehicle was driven after the last detection of a DTC.
If the DTC is being detected currently, the time data will be "0".



If a 1st trip DTC is stored in the ECM, the time data will be "[1t]".

Malfunction Indicator Lamp (MIL) (Cont'd)

HOW TO ERASE DIAGNOSTIC TEST MODE II (Self-diagnostic results)

The diagnostic trouble code can be erased from the backup memory in the ECM when the diagnostic test mode is changed from Diagnostic Test Mode II to Diagnostic Test Mode I. (Refer to "HOW TO SWITCH DIAGNOSTIC TEST MODES".)

- **If the battery terminal is disconnected, the diagnostic trouble code will be lost from the backup memory within 24 hours.**
- **Be careful not to erase the stored memory before starting trouble diagnoses.**

DIAGNOSTIC TEST MODE II—FRONT HEATED OXYGEN SENSOR MONITOR

In this mode, the MALFUNCTION INDICATOR LAMP displays the condition of the fuel mixture (lean or rich) which is monitored by the front heated oxygen sensor.

MALFUNCTION INDICATOR LAMP	Fuel mixture condition in the exhaust gas	Air fuel ratio feedback control condition
ON	Lean	Closed loop system
OFF	Rich	
*Remains ON or OFF	Any condition	Open loop system

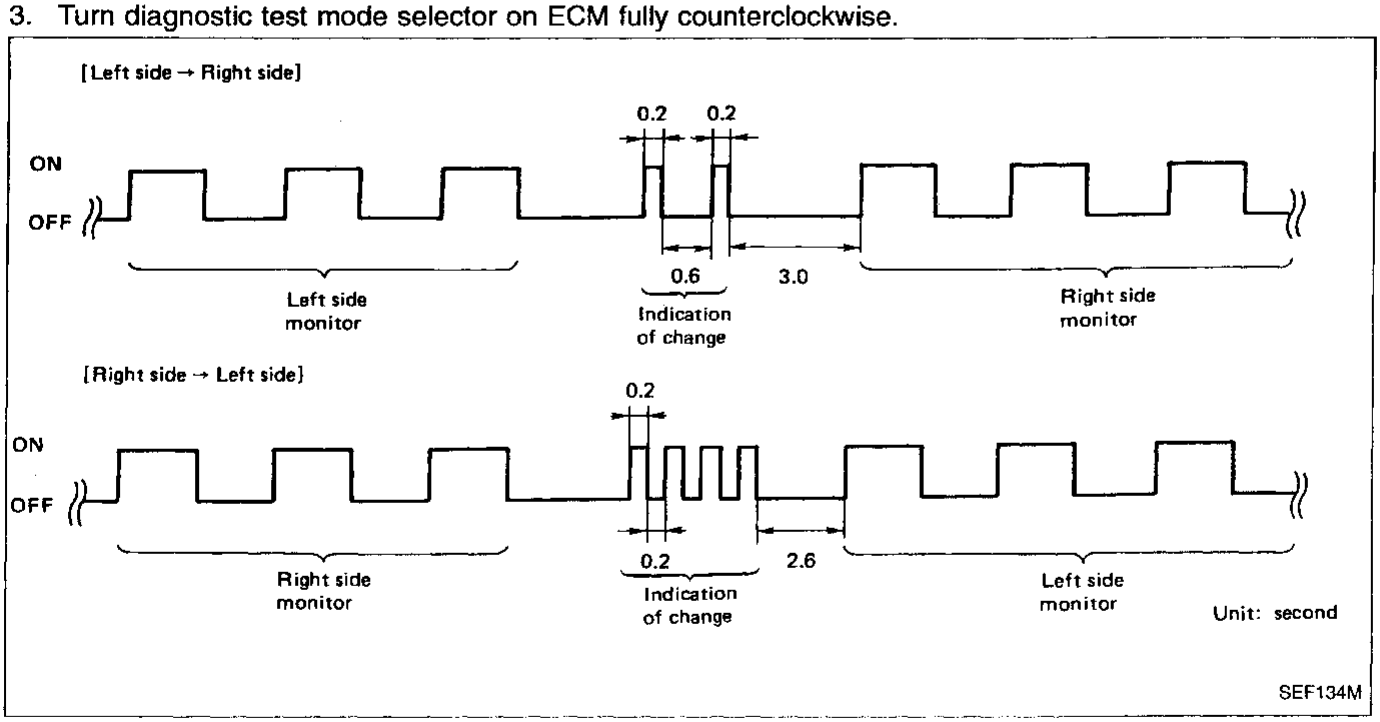
*: Maintains conditions just before switching to open loop.

To check the front heated oxygen sensor function, start engine in the Diagnostic Test Mode II and warm it up until engine coolant temperature indicator points to the middle of the gauge.
Next run engine at about 2,000 rpm for about 2 minutes under no-load conditions. Then make sure that the MALFUNCTION INDICATOR LAMP comes ON more than 5 times within 10 seconds with engine running at 2,000 rpm under no-load.

How to switch monitored sensor from left bank to right bank or vice versa

- **The following procedure should be performed while the engine is running.**

1. Turn diagnostic test mode selector on ECM fully clockwise.
2. Wait at least 2 seconds.
3. Turn diagnostic test mode selector on ECM fully counterclockwise.



CONSULT (Cont'd)

ACTIVE TEST MODE

TEST ITEM	CONDITION	JUDGEMENT	CHECK ITEM (REMEDY)
FUEL INJECTION	• Engine: Return to the original trouble condition • Change the amount of fuel injection using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	• Harness and connector • Fuel injectors • Front heated oxygen sensor
IACV-AAC/V OPENING	• Engine: After warming up, idle the engine. • Change the IACV-AAC valve opening step using CONSULT.	Engine speed changes according to the opening step.	• Harness and connector • IACV-AAC valve
ENG COOLANT TEMP	• Engine: Return to the original trouble condition • Change the engine coolant temperature using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	• Harness and connector • Engine coolant temperature sensor • Fuel injectors
IGNITION TIMING	• Engine: Return to the original trouble condition • Timing light: Set • Retard the ignition timing using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	• Camshaft position sensor (PHASE) • Crankshaft position sensor (REF) • Crankshaft position sensor (POS)
POWER BALANCE	• Engine: After warming up, idle the engine. • A/C switch "OFF" • Shift lever "N" • Cut off each injector signal one at a time using CONSULT.	Engine runs rough or dies.	• Harness and connector • Compression • Injectors • Power transistor • Spark plugs • Ignition coils
COOLING FAN	• Ignition switch: ON • Turn the cooling fan "ON" and "OFF" using CONSULT.	Cooling fan moves and stops.	• Harness and connector • Cooling fan motor
FUEL PUMP RELAY	• Ignition switch: ON (Engine stopped) • Turn the fuel pump relay "ON" and "OFF" using CONSULT and listen to operating sound.	Fuel pump relay makes the operating sound.	• Harness and connector • Fuel pump relay
EGRC SOLENOID VALVE	• Ignition switch: ON • Turn solenoid valve "ON" and "OFF" with the CONSULT and listen to operating sound.	Solenoid valve makes an operating sound.	• Harness and connector • Solenoid valve
SELF-LEARNING CONT	• In this test, the coefficient of self-learning control mixture ratio returns to the original coefficient by touching "CLEAR" on the screen.		
ENGINE MOUNTING	• Engine: After warming up, run engine at idle speed. • Gear position: "D" range (Vehicle stopped) • Turn front engine mounting "IDLE" and "TRAVEL" with the CONSULT.	Body vibration changes according to the front engine mounting condition.	• Harness and connector • Front engine mounting
PURG VOL CONT/V	• Engine: After warming up, run engine at 1,500 rpm. • Change the EVAP canister purge volume control valve opening step using CONSULT.	Engine speed changes according to the opening step.	• Harness and connector • EVAP canister purge volume control valve
PURG CONT S/V	• Start engine. • Turn the EVAP canister purge control solenoid valve "ON" and "OFF" using CONSULT and listen for operating sound.	EVAP canister purge control solenoid valve makes an operating sound. Check vacuum signal for EVAP canister purge control valve. VC ON ... Vacuum exists. VC OFF ... Vacuum does not exist.	• Harness and connector • EVAP canister purge control solenoid valve • Vacuum hose
MAP/BARO SW/V	• Ignition switch: ON (Engine stopped) • Turn the MAP/BARO switch solenoid valve between "MAP" and "BARO" using CONSULT and listen for operating sound.	MAP/BARO switch solenoid valve makes an operating sound.	• Harness and connector • MAP/BARO switch solenoid valve
FPCM	• Start engine. • Turn the FPCM between "LOW" and "HI" using CONSULT and check that "FPCM DR VOLT" of CONSULT changes.	"FPCM DR VOLT" of CONSULT changes as follows; HI ... Approx. 0V LOW ... Approx. 3.7V	• Harness and connector • FPCM • Dropping resistor
TANK F/TEMP SEN	• Change the tank fuel temperature using CONSULT.		

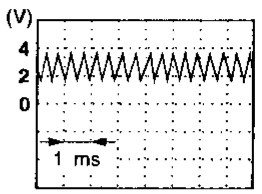
Fail-Safe Chart

The ECM enters fail-safe mode, if any of the following malfunctions is detected due to the open or short circuit.
When the ECM enters the fail-safe mode, the MIL illuminates.

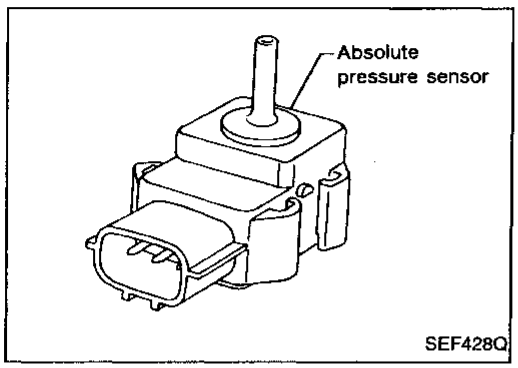
<table>
<tr><th colspan="2">DTC No.</th><th rowspan="2">Detected items</th><th rowspan="2">Engine operating condition in fail-safe mode</th></tr>
<tr><th>CONSULT GST</th><th>ECM*1</th></tr>
<tr><td>P0100</td><td>0102</td><td>Mass air flow sensor circuit</td><td>Engine speed will not rise more than 2,400 rpm due to the fuel cut.</td></tr>
<tr><td>P0115</td><td>0103</td><td>Engine coolant temperature sensor circuit</td><td>Engine coolant temperature will be determined by ECM based on the time after turning ignition switch "ON" or "START".
CONSULT displays the engine coolant temperature decided by ECM.
<table>
<tr><th>Condition</th><th>Engine coolant temperature decided (CONSULT display)</th></tr>
<tr><td>Just as ignition switch is turned ON or Start</td><td>40°C (104°F)</td></tr>
<tr><td>More than 4 minutes after ignition ON or Start</td><td>80°C (176°F)</td></tr>
<tr><td>Except as shown above</td><td>40 - 80°C (104 - 176°F)
(Depends on the time)</td></tr>
</table></td></tr>
<tr><td>P0120</td><td>0403</td><td>Throttle position sensor circuit</td><td>Throttle position will be determined based on the amount of mass air flow and the engine speed.
Therefore, acceleration will be poor.
<table>
<tr><th></th><th>Driving condition</th></tr>
<tr><td>When engine is idling</td><td>Normal</td></tr>
<tr><td>When accelerating</td><td>Poor acceleration</td></tr>
</table></td></tr>
<tr><td>P1335</td><td>0407</td><td>Crankshaft position sensor (REF) circuit</td><td>Compression TDC signal (120° signal) is controlled by camshaft position sensor (PHASE) signal and crankshaft position sensor (POS) signal. Ignition timing will be delayed 0° to 2°.</td></tr>
<tr><td>Unable to access ECCS</td><td>Unable to access Diagnostic Test Mode II</td><td>ECM</td><td>ECM fail-safe activating condition
The computing function of the ECM was judged to be malfunctioning.
When the fail-safe system activates, i.e. if the ECM detects a malfunction condition in the CPU of ECM, the MALFUNCTION INDICATOR LAMP on the instrument panel lights to warn the driver.
However, it is not possible to access ECCS and DTC cannot be confirmed.
Engine control with ECM fail-safe
When ECM fail-safe is operating, fuel injection, ignition timing, fuel pump operation, IACV-AAC valve operation and cooling fan operation are controlled under certain limitations.
<table>
<tr><th></th><th>ECM fail-safe operation</th></tr>
<tr><td>Engine speed</td><td>Engine speed will not rise more than 3,000 rpm.</td></tr>
<tr><td>Fuel injection</td><td>Simultaneous multiport fuel injection system</td></tr>
<tr><td>Ignition timing</td><td>Ignition timing is fixed at the preset valve.</td></tr>
<tr><td>Fuel pump</td><td>Fuel pump relay is "ON" when engine is running and "OFF" when engine stalls.</td></tr>
<tr><td>IACV-AAC valve</td><td>Full open</td></tr>
<tr><td>Cooling fans</td><td>Cooling fan relay "ON" (High speed condition) when engine is running, and "OFF" when engine stalls.</td></tr>
</table>
Replace ECM, if ECM fail-safe condition is confirmed.</td></tr>
</table>

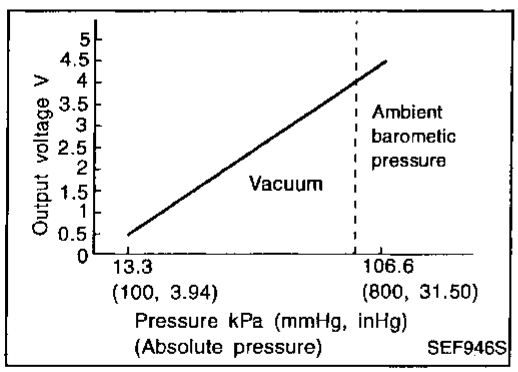
*1: In Diagnostic Test Mode II (Self-diagnostic results)

ECM Terminals and Reference Value (Cont'd)

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC voltage)
49	W	Crankshaft position sensor (POS)	Engine is running. └ Idle speed	Approximately 2.5V★  SEF646T
50 51	W W	Front heated oxygen sensor (Right bank) Front heated oxygen sensor (Left bank)	Engine is running. └ After warming up sufficiently and engine speed is 2,000 rpm.	0 - Approximately 1.0V (periodically change)
52	P/L	Tank fuel temperature sensor	Engine is running.	0 - 5.0V Output voltage varies with fuel temperature.
54	W	Mass air flow sensor	Engine is running. (Warm-up condition) └ Idle speed	1.0 - 1.7V
			Engine is running. (Warm-up condition) └ Engine speed is 2,000 rpm.	1.5 - 2.1V
55	B	Mass air flow sensor ground	Engine is running. (Warm-up condition) └ Idle speed	Approximately 0V
56	W	Rear heated oxygen sensor	Engine is running. └ After warming up sufficiently and engine speed is 2,000 rpm.	0 - Approximately 1.0V
58	SB	Intake air temperature sensor	Engine is running.	0 - 5.0V Output voltage varies with intake air temperature.
59	Y	Engine coolant temperature sensor	Engine is running.	0 - 5.0V Output voltage varies with engine coolant temperature.
61	W	Absolute pressure sensor	Ignition switch "ON" └ Engine is not running.	Approximately 4.4V
			Engine is running. (Warm-up condition) └ Idle speed (5 seconds after starting engine)	Approximately 1.2V
62	W	EVAP control system pressure sensor	Ignition switch "ON"	Approximately 3.4V
63	L/OR	EGR temperature sensor	Engine is running. (Warm-up condition) └ Idle speed	Less than 4.5V
			Engine is running. (Warm-up condition) └ EGR system is operating.	0 - 1.0V

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)





Absolute Pressure Sensor

COMPONENT DESCRIPTION

The absolute pressure sensor is connected to the MAP/BARO switch solenoid valve with a duct. The sensor detects ambient barometric pressure and intake manifold pressure respectively, and modifies the voltage signal received from the ECM. The modified signal will then be returned to the ECM. As the pressure increases, the voltage rises. The absolute pressure sensor is not directly used to control the engine system. It is used only for on board diagnosis.

CONSULT REFERENCE VALUE IN DATA MONITOR MODE

- Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ABSOL PRES/SE	• Engine: After warming up	Engine is not running	Approx. 4.4V
		Idle	Approx. 1.2V

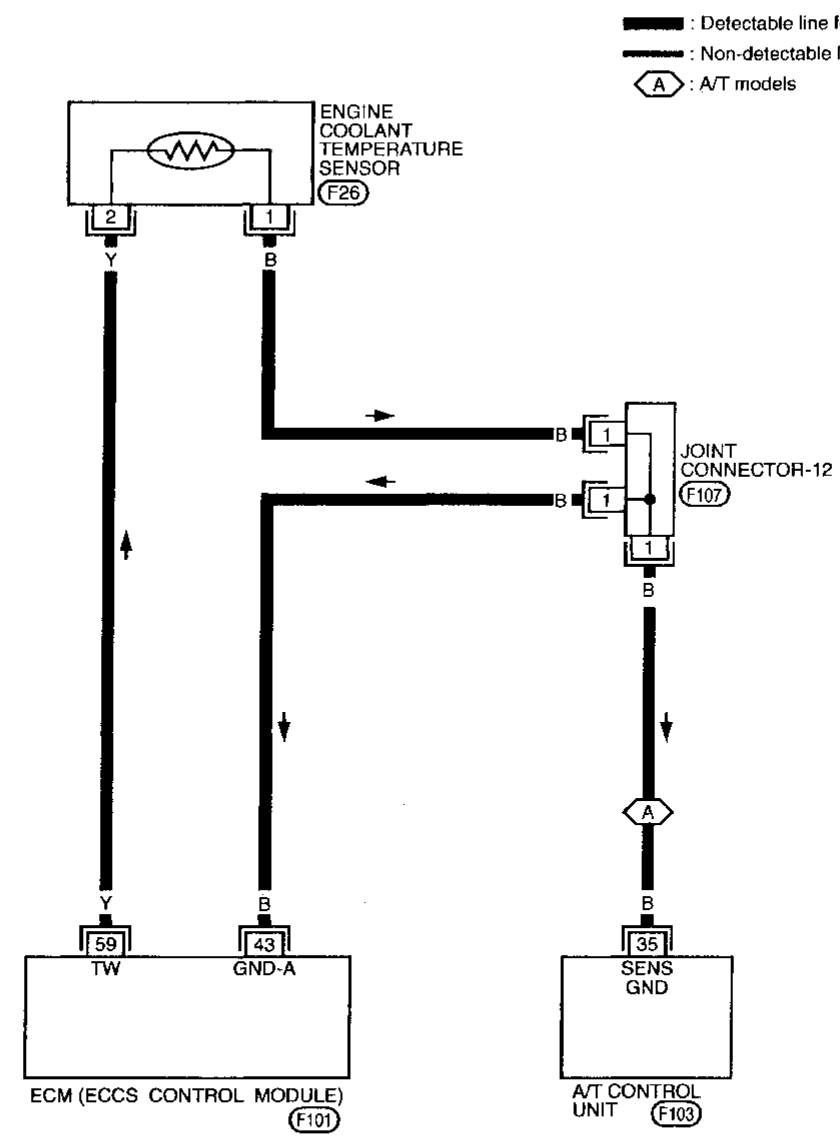
ECM TERMINALS AND REFERENCE VALUE

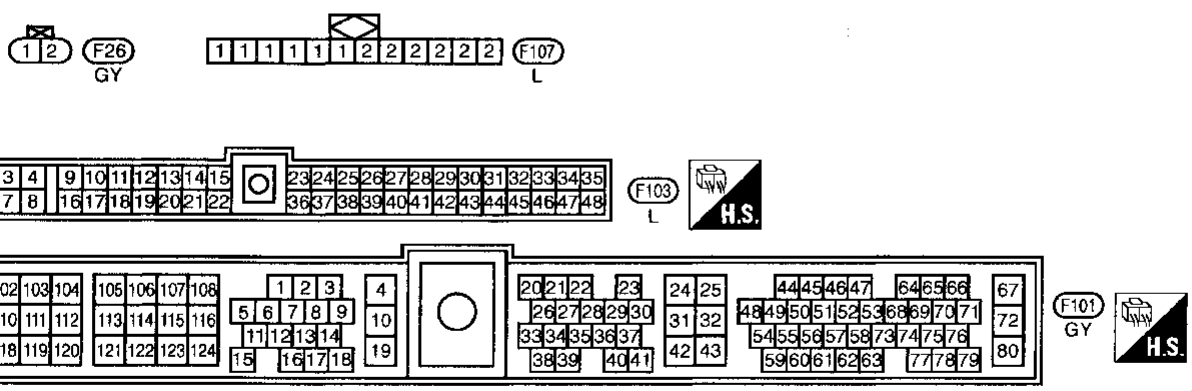
Remarks: Specification data are reference values, and are measured between each terminal and ㉕ (ECCS ground) with a voltmeter.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC voltage)
61	W	Absolute pressure sensor	Ignition switch "ON" └ Engine is not running.	Approximately 4.4V
			Engine is running. (Warm-up condition) └ Idle speed (5 seconds after starting engine)	Approximately 1.2V
42	R	Sensor's power supply	Ignition switch "ON"	Approximately 5V
43	B	Sensor's ground	Engine is running. (Warm-up condition) └ Idle speed	0V

Engine Coolant Temperature Sensor (ECTS) (Cont'd)

EC-ECTS-01





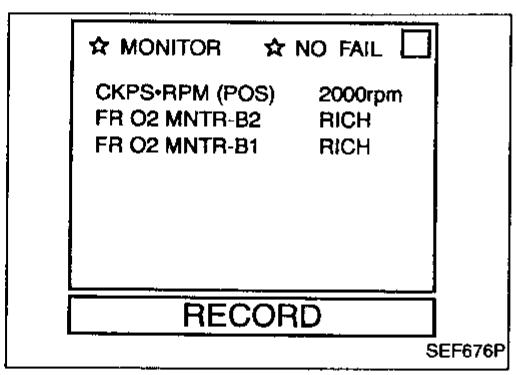
MEC649B

Closed Loop Control

ON BOARD DIAGNOSIS LOGIC

★ The closed loop control has the one trip detection logic.

Diagnostic Trouble Code No.	Malfunction is detected when ...	Check Items (Possible Cause)
P0130 0307	• The closed loop control function for right bank does not operate even when vehicle is driving in the specified condition.	• The front heated oxygen sensor (right bank) circuit is open or shorted. • Front heated oxygen sensor (right bank) • Front heated oxygen sensor heater (right bank)
P0150 0308	• The closed loop control function for left bank does not operate even when vehicle is driving in the specified condition.	• The front heated oxygen sensor (left bank) circuit is open or shorted. • Front heated oxygen sensor (left bank) • Front heated oxygen sensor heater (left bank)



OVERALL FUNCTION CHECK

This procedure can be used for checking the overall function of the closed loop control. During this check, a DTC might not be confirmed.

1) Start engine and warm it up sufficiently.
2) Select "MANU TRIG" and "HI SPEED" in "DATA MONITOR" mode with CONSULT, and select "FRO2 MNTR-B1(B2)".
3) Hold engine speed at 2,000 rpm under no load during the following steps.
4) Touch "RECORD" on CONSULT screen.
5) Make sure of the following.

• "FR O2 MNTR-B1(B2)" in "DATA MONITOR" mode changes from "RICH" to "LEAN" to "RICH" 5 times in 10 seconds.
5 times (cycles) are counted as shown below:

cycle	1	2	3	4	5
FR O2 MNTR-B1(B2)	R-L-R-L-R	L-R-L-R-L	R-L-R-L-R	L-R-L-R-L	R-L-R-L-R

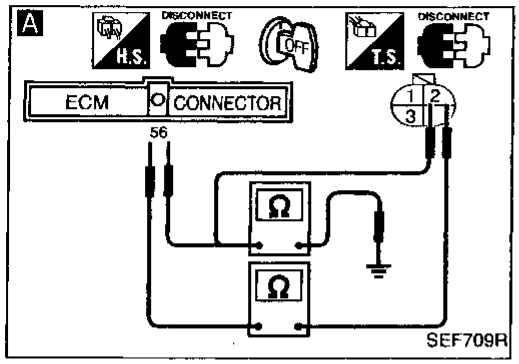
R = "FR O2 MNTR-B1(B2)", "RICH"
L = "FR O2 MNTR-B1(B2)", "LEAN"

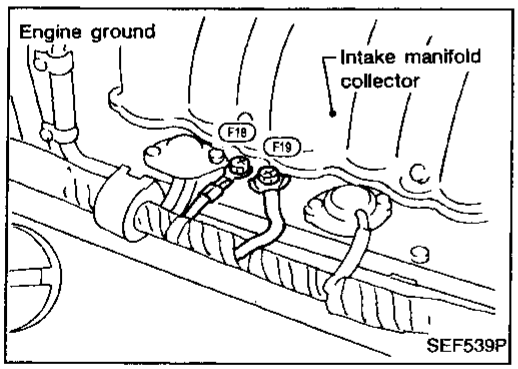
OR

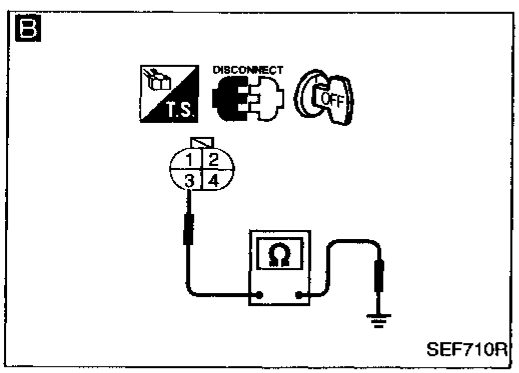
1) Start engine and warm it up sufficiently.
2) Make sure that malfunction indicator lamp goes on more than 5 times within 10 seconds while keeping at 2,000 rpm in Diagnostic Test Mode II (Front heated oxygen sensor monitor).

Rear Heated Oxygen Sensor (Rear HO2S) (Cont'd)

DIAGNOSTIC PROCEDURE







INSPECTION START

A

CHECK INPUT SIGNAL CIRCUIT.
1. Turn ignition switch "OFF".
2. Disconnect rear heated oxygen sensor harness connector and ECM harness connector.
3. Check harness continuity between ECM terminal ⑯ and terminal ② .
   Continuity should exist.
4. Check harness continuity between ECM terminal ⑯ (or terminal ②) and ground.
   Continuity should not exist.

If OK, check harness for short.

NG → Check the following.
- Harness connectors (F105) , (M50)
- Harness connectors (M4) , (B1)

If NG, repair harness or connectors.

OK ↓

Loosen and retighten engine ground screws.

B

CHECK GROUND CIRCUIT.
1. Turn ignition switch "OFF".
2. Disconnect ECM harness connector.
3. Check harness continuity between terminal ③ and engine ground.
   Continuity should exist.

If OK, check harness for short.

NG → Check the following.
- Harness connectors (F105) , (M50)
- Harness connectors (M4) , (B1)
- Harness for open or short between rear heated oxygen sensor and ECM

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENT
(Rear heated oxygen sensor heater).
Refer to "COMPONENT INSPECTION" on next page.

NG → Replace rear heated oxygen sensor.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

INSPECTION END

Front Heated Oxygen Sensor Heater (Left bank) (Cont'd)

DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE

1) Turn ignition switch "ON" and select "DATA MONITOR" mode with CONSULT.
2) Start engine and run it at least 5 seconds at idle speed.

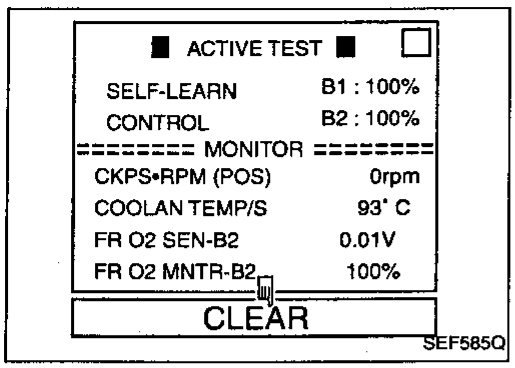
OR

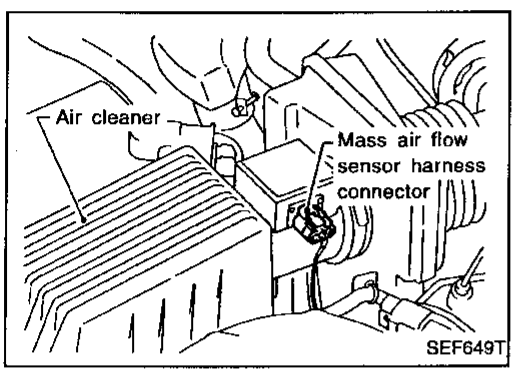
1) Start engine and run it at least 5 seconds at idle speed.
2) Turn ignition switch "OFF" and wait at least 5 seconds.
3) Start engine and run it at least 5 seconds at idle speed.
4) Select "MODE 3" with GST.

OR

1) Start engine and run it at least 5 seconds in idle condition.
2) Turn ignition switch "OFF", wait at least 5 seconds and then turn "ON".
3) Perform "Diagnostic Test Mode II (Self-diagnostic results)" with ECM.

- **When using GST, "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE" should be performed twice as much as when using CONSULT or ECM (Diagnostic Test Mode II) because GST cannot display MODE 7 (1st trip DTC) concerning this diagnosis. Therefore, using CONSULT or ECM (Diagnostic Test Mode II) is recommended.**





Fuel Injection System Function (Left bank) (Lean side) (Cont'd)

DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE (Overall)

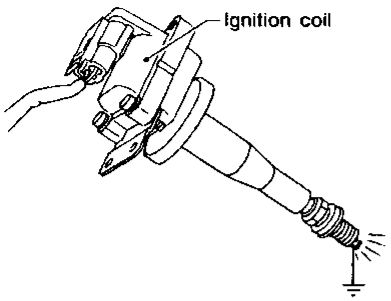
1) Start engine and warm it up sufficiently.
2) Turn ignition switch "OFF" and wait at least 5 seconds.
3) Turn ignition switch "ON" and select "SELF-LEARN CONTROL" in "ACTIVE TEST" mode with CONSULT.
4) Clear the self-learning control coefficient by touching "CLEAR".
5) Select "DATA MONITOR" mode with CONSULT.
6) Start engine again and wait at least 10 minutes at idle speed.
   The DTC P0174 should be detected at this stage, if a malfunction exists.
7) If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.

OR

1) Disconnect mass air flow sensor harness connector.
2) Start engine and run it at least 3 seconds at idle speed.
3) Stop engine and reconnect mass air flow sensor harness connector.
4) Turn ignition switch "ON".
5) Perform Diagnostic Test Mode II (Self-diagnostic results) with ECM. Make sure DTC 0102 is detected.
6) Erase the DTC 0102 by changing from Diagnostic Test Mode II to Diagnostic Test Mode I.
7) Perform "Diagnostic Test Mode II (Self-diagnostic results)" with ECM. Make sure DTC 0505 is detected.
8) Start engine again and wait at least 10 minutes at idle speed.
   The DTC 0210 should be detected at this stage, if a malfunction exists.
9) If it is difficult to start engine at step 8, the fuel injection system also has a malfunction.

No. 6 - 1 Cylinder Misfire, Multiple Cylinder Misfire (Cont'd)

D



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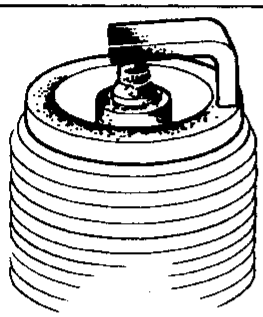
E



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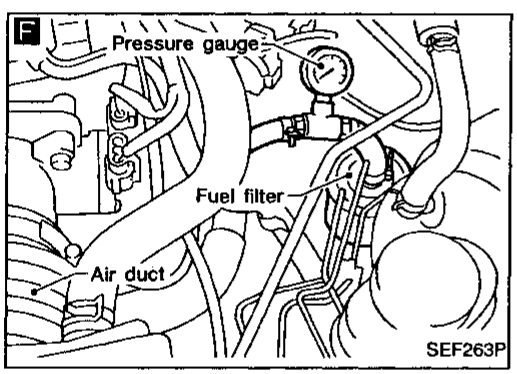
F



SEF263P

G

COMPRESSION PRESSURE

SEF309G

Ⓐ

E

CHECK SPARK PLUGS.
Remove the spark plugs and check for fouling, etc.

NG → Repair or replace spark plug(s).

OK

F

CHECK FUEL PRESSURE.
1. Release fuel pressure to zero. (Refer to page EC-26.)
2. Install fuel pressure gauge and check fuel pressure.

At idle:
Approx. 235 kPa (2.4 kg/cm², 34 psi)

NG → Check fuel pump and circuit.

OK

G

CHECK COMPRESSION PRESSURE.
- Check compression pressure.

Standard:
kPa (kg/cm², psi)/300 rpm
1,275 (13.0, 185)
Minimum:
kPa (kg/cm², psi)/300 rpm
981 (10.0, 142)
Difference between each cylinder:
kPa (kg/cm², psi)/300 rpm
98 (1.0, 14)

NG → Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

OK

CHECK IGNITION TIMING.
Perform BASIC INSPECTION, EC-78.

NG → Adjust ignition timing.

OK

CHECK MASS AIR FLOW SENSOR.
Check "MASS AIR FLOW" in "DATA MONITOR" mode with CONSULT.
2.0 - 6.0 gm/sec: at idling
7.0 - 20.0 gm/sec: at 2,500 rpm

— OR —

Check "mass air flow" in MODE 1 with GST.
2.0 - 6.0 gm/sec: at idling
7.0 - 20.0 gm/sec: at 2,500 rpm

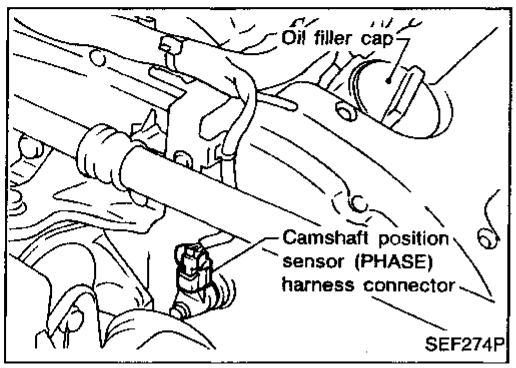
NG → Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or engine grounds.
(See page EC-103.)
If NG, repair or replace it.

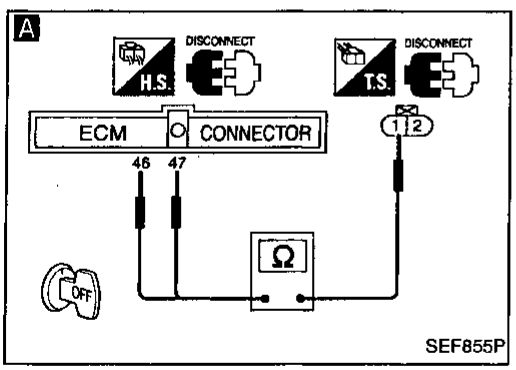
OK

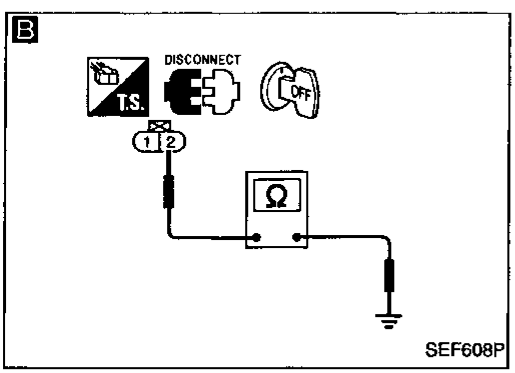
(Go to Ⓑ on next page.)

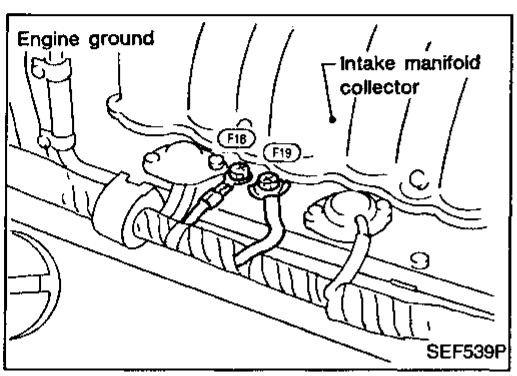
Camshaft Position Sensor (CMPS) (PHASE) (Cont'd)

DIAGNOSTIC PROCEDURE









INSPECTION START

CHECK STARTING SYSTEM.
Does the engine turn over?
(Does the starter motor operate?)

No → Check starting system. (Refer to EL section.)

Yes

A

CHECK INPUT SIGNAL CIRCUIT.
1. Turn ignition switch "OFF".
2. Disconnect camshaft position sensor (PHASE) harness connector and ECM harness connector.
3. Check harness continuity between terminal ① and ECM terminals ㊻, ㊼.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK

B

CHECK GROUND CIRCUIT.
1. Turn ignition switch "OFF".
2. Check harness continuity between terminal ② and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Engine ground screw (Loosen and retighten.)
- Harness or connectors

If NG, repair harness or connectors.

OK

CHECK COMPONENT
[Camshaft position sensor (PHASE)].
Refer to "COMPONENT INSPECTION", EC-208.

NG → Replace camshaft position sensor (PHASE).

OK

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed.

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Trouble is not fixed.

Visually check the surface of camshaft sprocket for chipping.

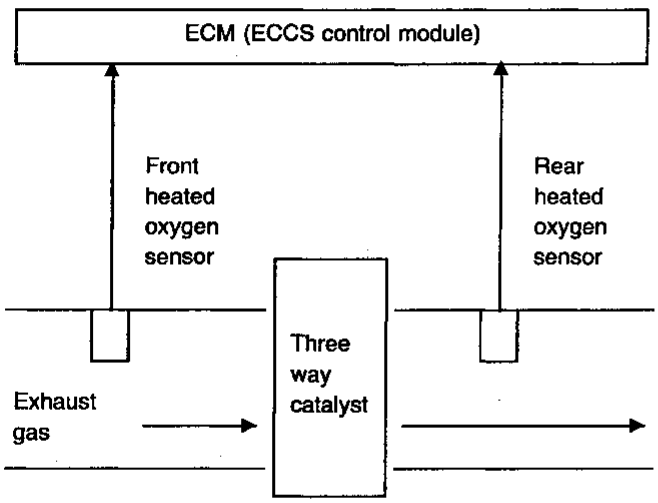
NG → Replace camshaft sprocket.

OK

INSPECTION END

Three Way Catalyst Function

ON BOARD DIAGNOSIS LOGIC

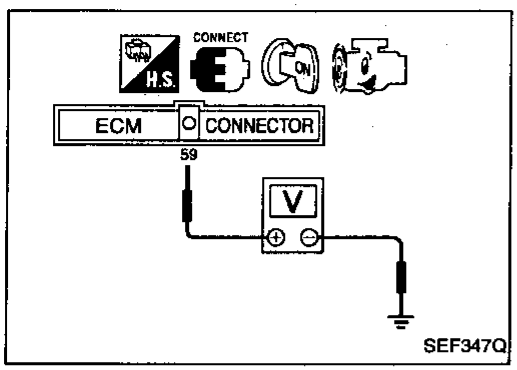


ECM monitors the switching frequency ratio of front and rear heated oxygen sensors.
A three way catalyst with high oxygen storage capacity will indicate a low switching frequency of rear heated oxygen sensor. As oxygen storage capacity decreases, the rear heated oxygen sensor switching frequency will increase.
When the frequency ratio of front and rear heated oxygen sensors approaches a specified limit value, the three way catalyst malfunction is diagnosed.

Diagnostic Trouble Code No.	Malfunction is detected when ...	Check Items (Possible Cause)
P0420 0702	• Three way catalyst does not operate properly. • Three way catalyst does not have enough oxygen storage capacity.	• Three way catalyst • Exhaust tube • Intake air leaks • Injectors • Injector leaks

OVERALL FUNCTION CHECK

This procedure can be used for checking the overall function of the three way catalyst.
During this check, a DTC might not be confirmed.



Evaporative Emission (EVAP) Canister Purge Control Valve/Solenoid Valve (Cont'd)

OR

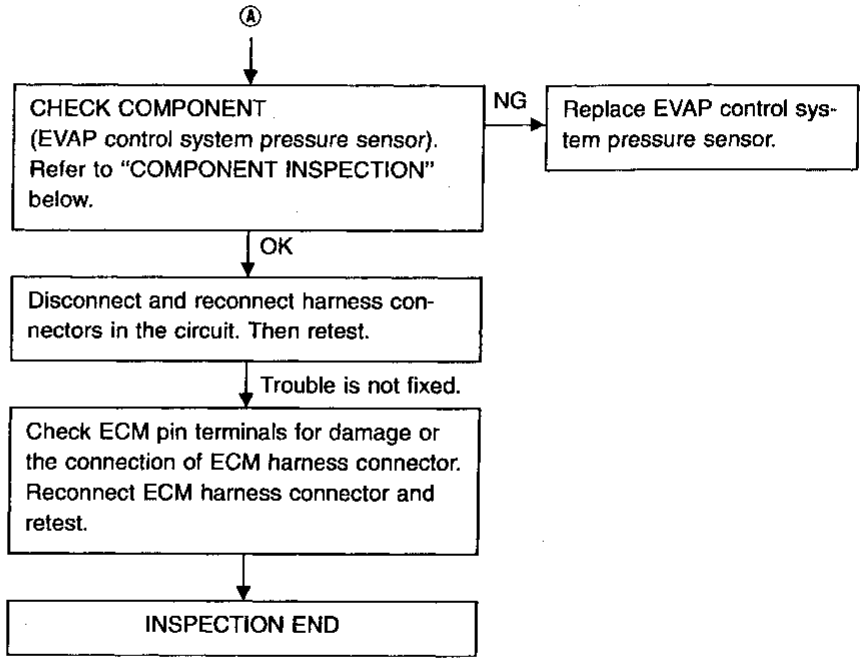
NO TOOLS

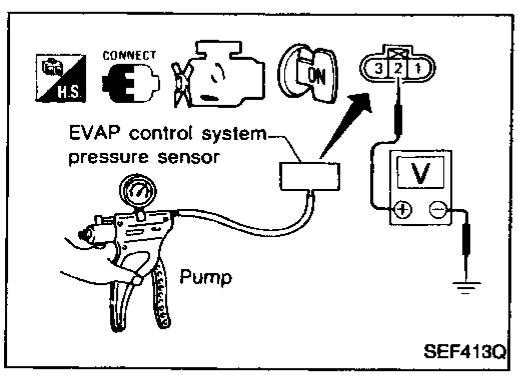
1) Jack up drive wheels.
2) Turn ignition switch "ON".
3) Start engine and warm it up until the voltage between ECM terminal 59 and ground drops to 1.2 to 1.9V. (If the voltage drops below the above range, stop engine and wait until the voltage rises to within this range.)
4) Start engine and let it idle at least 70 seconds.
5) Maintain the following conditions at least 5 seconds.

Gear position:
"2" or "D" range (A/T)
"3rd" or "4th" gear (M/T)
Vehicle speed:
40 - 80 km/h (25 - 50 MPH)
Engine speed:
1,500 - 2,500 rpm
Voltage between ECM terminal 59 and ground:
More than 0.8V

6) Turn ignition switch "OFF", wait at least 5 seconds and then turn "ON".
7) Perform "Diagnostic Test Mode II (Self-diagnostic results)" with ECM.

Evaporative Emission (EVAP) Control System Pressure Sensor (Cont'd)





COMPONENT INSPECTION

EVAP control system pressure sensor

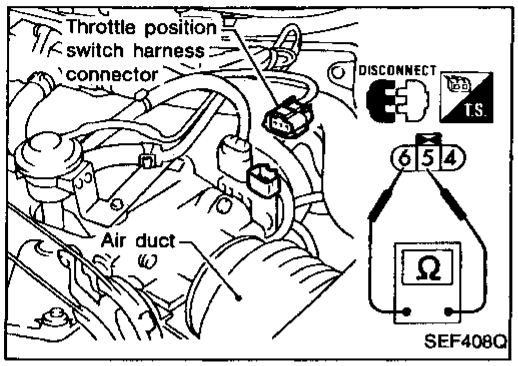
1. Remove EVAP control system pressure sensor from bracket with its harness connector connected.
2. Remove hose from EVAP control system pressure sensor.
3. Apply vacuum and pressure to EVAP control system pressure sensor with pump as shown in figure.
4. Check output voltage between terminal ② and engine ground.

Pressure (Relative to atmospheric pressure)	Voltage (V)
+4.0 kPa (+30 mmHg, +1.18 inHg)	Approximately 4.6
−9.3 kPa (−70 mmHg, −2.76 inHg)	Approximately 0.5

5. If NG, replace EVAP control system pressure sensor.

Closed Throttle Position Switch (Cont'd)

COMPONENT INSPECTION



Closed throttle position switch

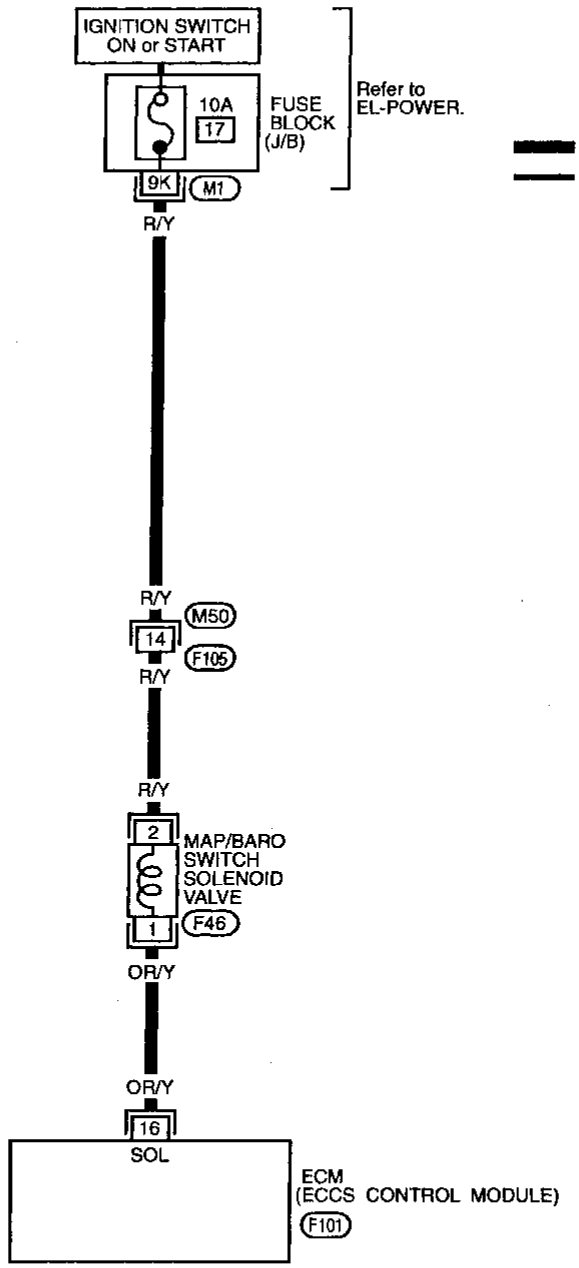
1. Start engine and warm it up sufficiently.
2. Turn ignition switch "OFF".
3. Disconnect throttle position switch harness connector.
4. Check continuity between terminals ⑤ and ⑥.

Accelerator pedal conditions	Continuity
Completely released	Yes
Partially released or completely depressed	No

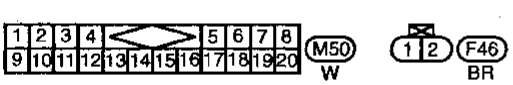
If NG, replace throttle position switch.

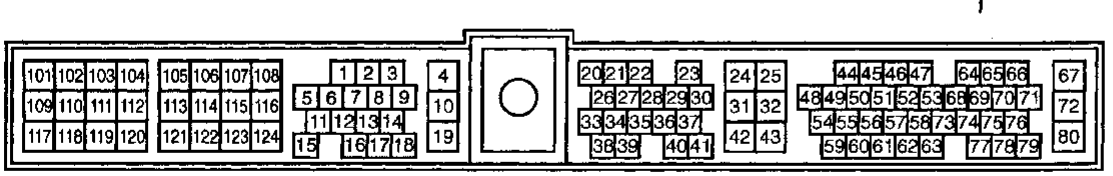
Manifold Absolute Pressure (MAP)/Barometric Pressure (BARO) Switch Solenoid Valve (Cont'd)

EC-SW/V-01



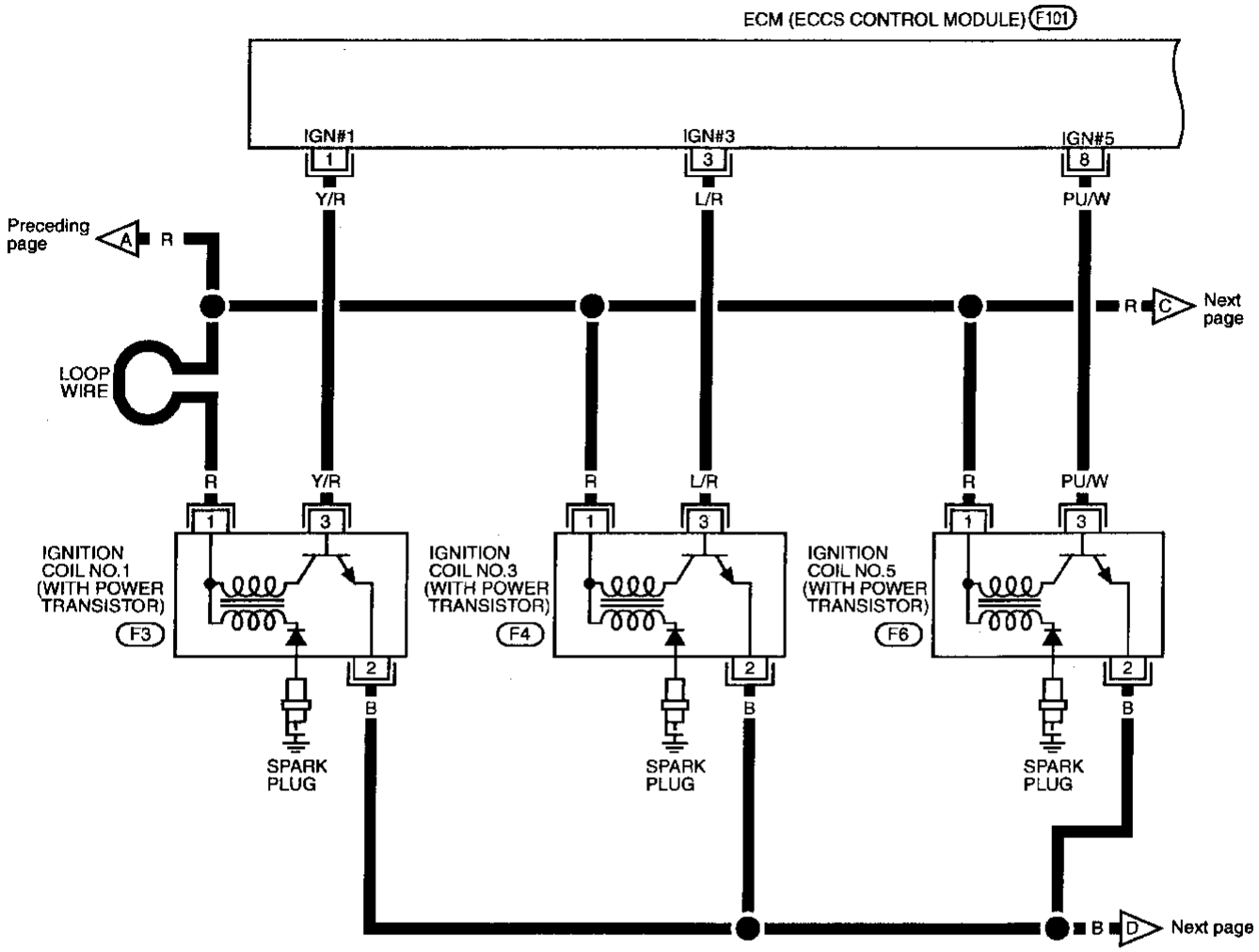
Refer to last page (Foldout page).
M1

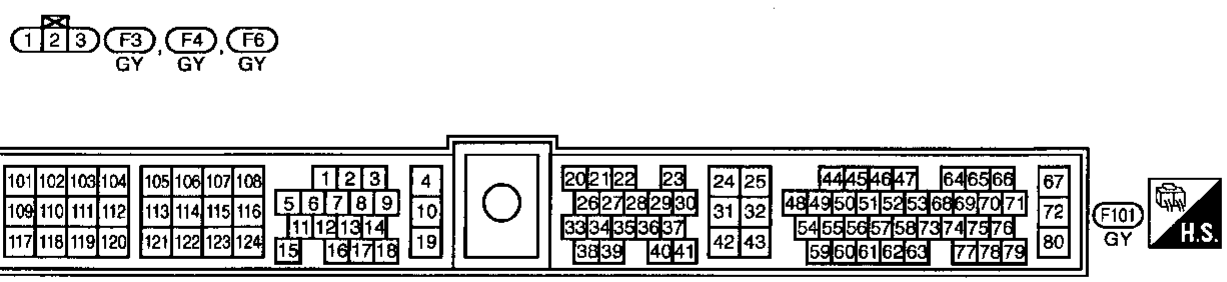




MEC684B

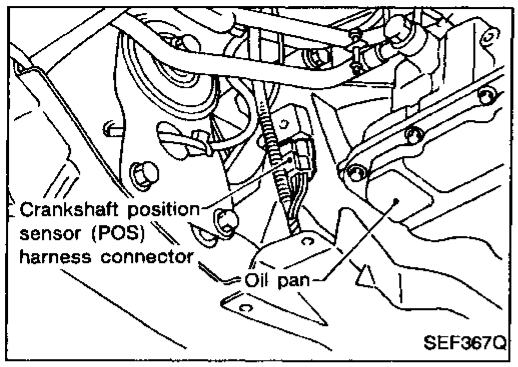
EC-IGN/SG-02

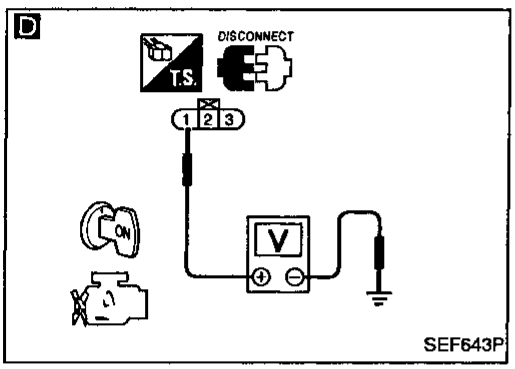


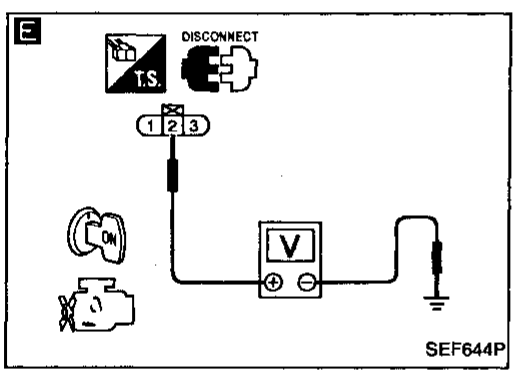


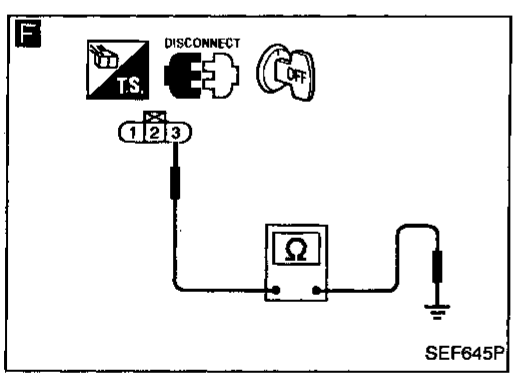
MEC652B

Crankshaft Position Sensor (CKPS) (POS) (COG) (Cont'd)









Ⓐ

D CHECK POWER SUPPLY-III.
1. Reconnect crankshaft position sensor (POS) sub-harness connector.
2. Disconnect crankshaft position sensor (POS) harness connector.
3. Turn ignition switch "ON".
4. Check voltage between terminal ① and ground with CONSULT or tester.

Voltage: Battery voltage

NG → Check the following.
- Harness connectors (F111), (F27)
- Harness for open or short between crankshaft position sensor (POS) and crankshaft position sensor (POS) sub-harness connector

If NG, repair harness or connectors.

OK ↓

E CHECK POWER SUPPLY-IV.
Check voltage between terminal ② and ground with CONSULT or tester.

Voltage: Approximately 5V

NG → Check the following.
- Harness connectors (F111), (F27)
- Harness for open or short between crankshaft position sensor (POS) and crankshaft position sensor (POS) sub-harness connector

If NG, repair harness or connectors.

OK ↓

F CHECK GROUND CIRCUIT-II.
1. Turn ignition switch "OFF".
2. Check harness continuity between terminal ③ and engine ground.

Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F111), (F27)
- Harness for open or short between crankshaft position sensor (POS) and crankshaft position sensor (POS) sub-harness connector

If NG, repair harness or connectors.

OK ↓

Loosen and retighten the fixing bolt of the crankshaft position sensor (POS). Then retest.

Trouble is not fixed. ↓

CHECK COMPONENT
[Crankshaft position sensor (POS)].
Refer to "COMPONENT INSPECTION", EC-306.

NG → Replace crankshaft position sensor (POS).

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Trouble is not fixed. ↓

Visually check signal plate (flywheel) gear teeth (cogs) for chipping.

NG → Replace signal plate (flywheel).

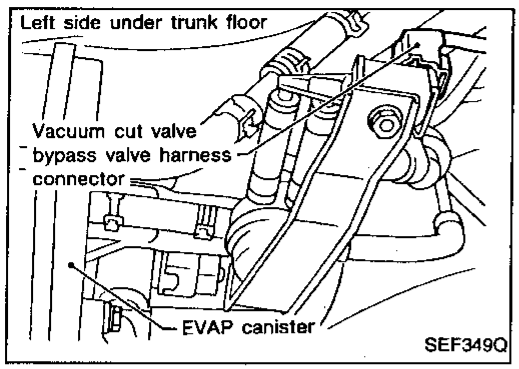
OK ↓

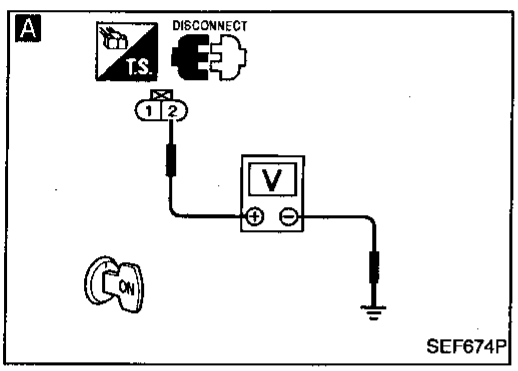
INSPECTION END

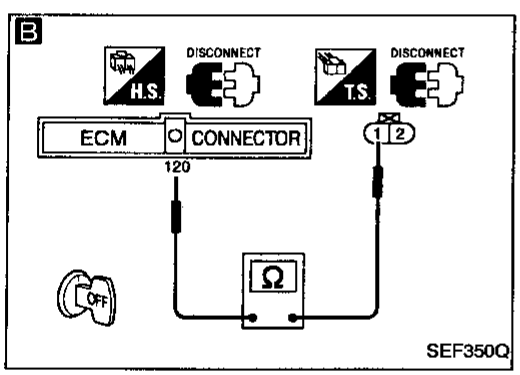
Vacuum Cut Valve Bypass Valve (Cont'd)

DIAGNOSTIC PROCEDURE

Procedure for malfunction A







INSPECTION START

A

CHECK POWER SUPPLY.
1) Disconnect vacuum cut valve bypass valve harness connector.
2) Turn ignition switch "ON".
3) Check voltage between terminal ② and ground with CONSULT or tester.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (M71), (B102), (B110), (B23)
- 10A fuse
- Harness for open or short between vacuum cut valve bypass valve and fuse

If NG, repair harness or connectors.

OK ↓

B

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal (120) and terminal ①.
Continuity should exist.

If OK, check harness for short.

NG → Check the following.
- Harness connectors (B23), (B110), (B102), (M71), (M58), (F102)
- Harness for open or short between vacuum cut valve bypass valve and ECM.

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENT
(Vacuum cut valve bypass valve).
Refer to "COMPONENT INSPECTION".
(See page EC-321.)

NG → Replace vacuum cut valve bypass valve.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

INSPECTION END

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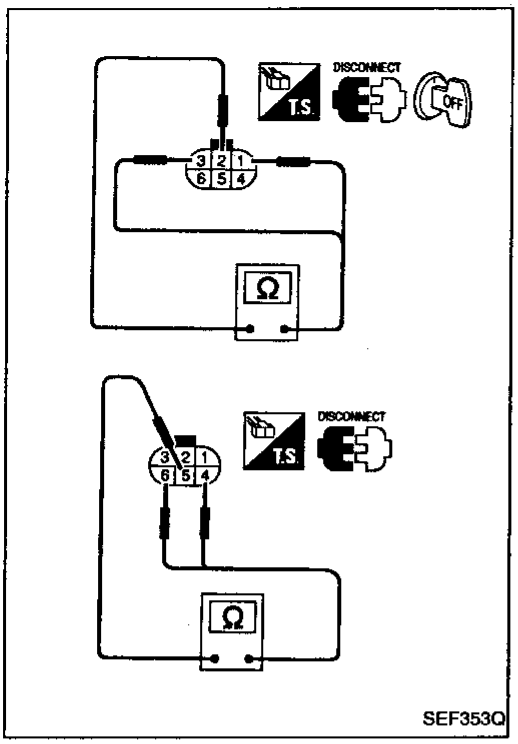
Evaporative Emission (EVAP) Control System Purge Flow Monitoring (Cont'd)



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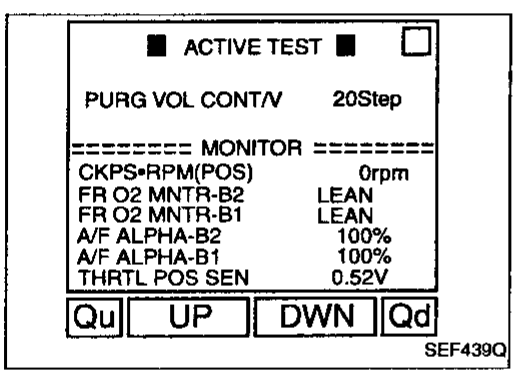

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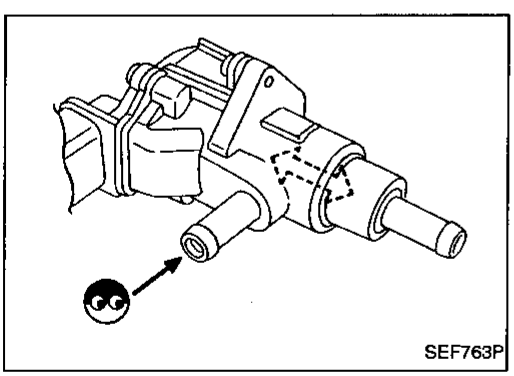
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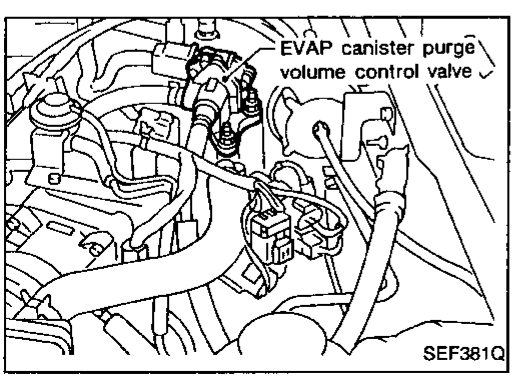


SEF381Q

COMPONENT INSPECTION

EVAP canister purge volume control valve

1. Disconnect EVAP canister purge volume control valve harness connector.
2. Check resistance between the following terminals.
   terminal ② and terminals ①, ③
   terminal ⑤ and terminals ④, ⑥
   Resistance:
   Approximately 30Ω [At 25°C (77°F)]
3. Reconnect EVAP canister purge volume control valve harness connector.
4. Remove EVAP canister purge volume control valve from intake manifold collector and disconnect hoses from the valve.
   (Plug the purge hoses. The EVAP canister purge volume control valve harness connector should remain connected.)
5. Turn ignition switch "ON".
6. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode with CONSULT and ensure the EVAP canister purge volume control valve shaft smoothly moves forward and backward according to the valve opening.
   If NG, replace the EVAP canister purge volume control valve.

OR

1. Disconnect EVAP canister purge volume control valve harness connector.
2. Check resistance between the following terminals.
   terminal ② and terminals ①, ③
   terminal ⑤ and terminals ④, ⑥
   Resistance:
   Approximately 30Ω [At 25°C (77°F)]
3. Reconnect EVAP canister purge volume control valve harness connector.
4. Remove EVAP canister purge volume control valve from intake manifold collector and disconnect hoses from the valve.
   (Plug the purge hoses. The EVAP canister purge volume control valve harness connector should remain connected.)
5. Turn ignition switch "ON" and "OFF" and ensure the EVAP canister purge volume control valve shaft smoothly moves forward and backward according to the ignition switch position.
   If NG, replace the EVAP canister purge volume control valve.

Overheat (Cont'd)

Ⓒ

CHECK COMPONENT
(Cooling fan motors).
Refer to "COMPONENT INSPECTION", EC-351.

NG → Replace cooling fan motors.

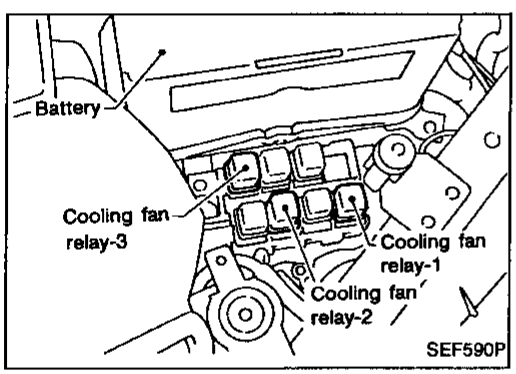
OK

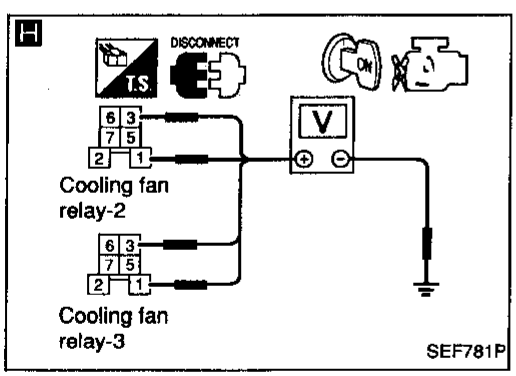
Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed.

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

INSPECTION END





PROCEDURE B

INSPECTION START

H

CHECK POWER SUPPLY.
1. Turn ignition switch "OFF".
2. Disconnect cooling fan relay-2 and cooling fan relay-3.
3. Turn ignition switch "ON".
4. Check voltage between cooling fan relay-3 terminals ①, ③ and ground, and between cooling fan relay-2 terminals ①, ③ and ground with CONSULT or tester.
Voltage: Battery voltage

NG → Check the following.
- Joint connector-2 (E10)
- 30A fusible links
- Harness for open or short between cooling fan relay-2, 3 and fuse
- Harness for open or short between cooling fan relay-2, 3 and battery

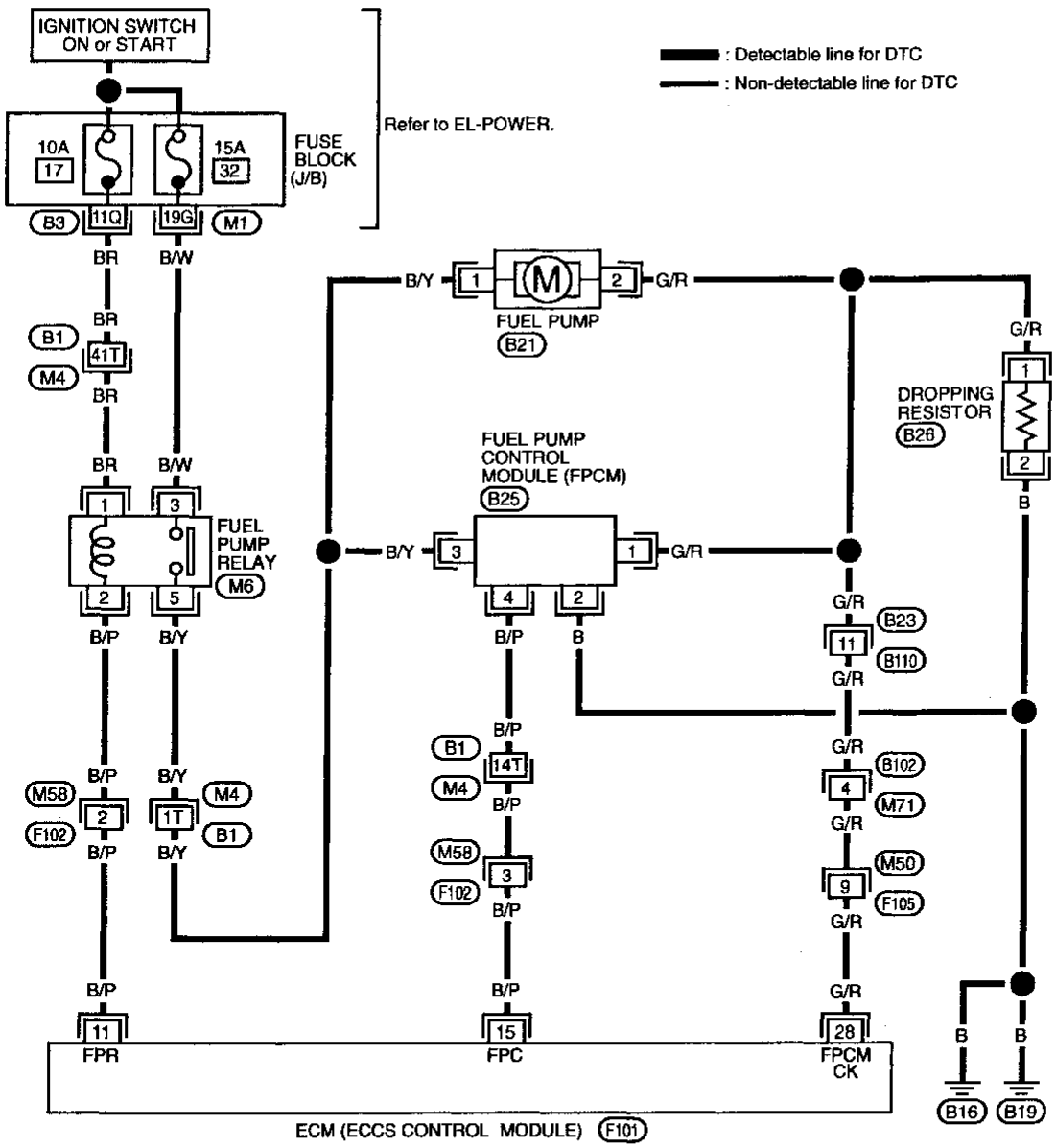
If NG, repair harness or connectors.

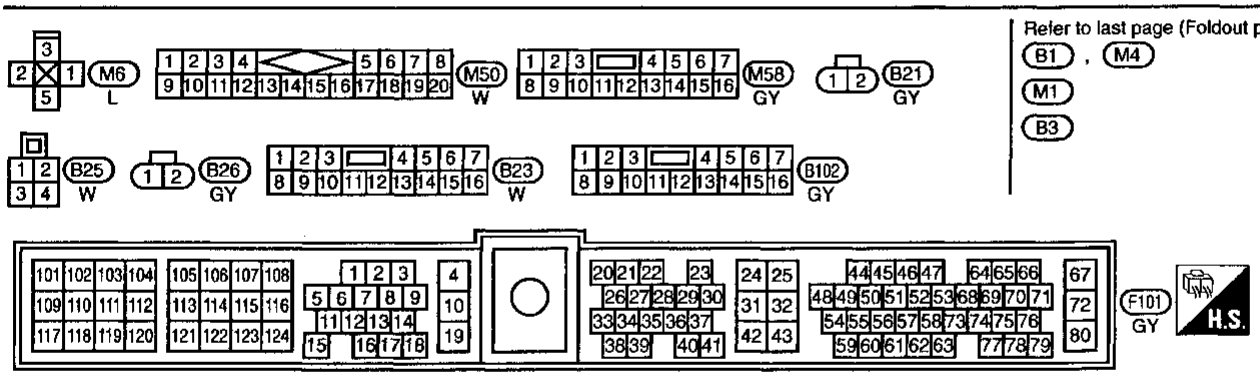
OK

Ⓓ

Fuel Pump Control (Cont'd)

EC-F/PUMP-01



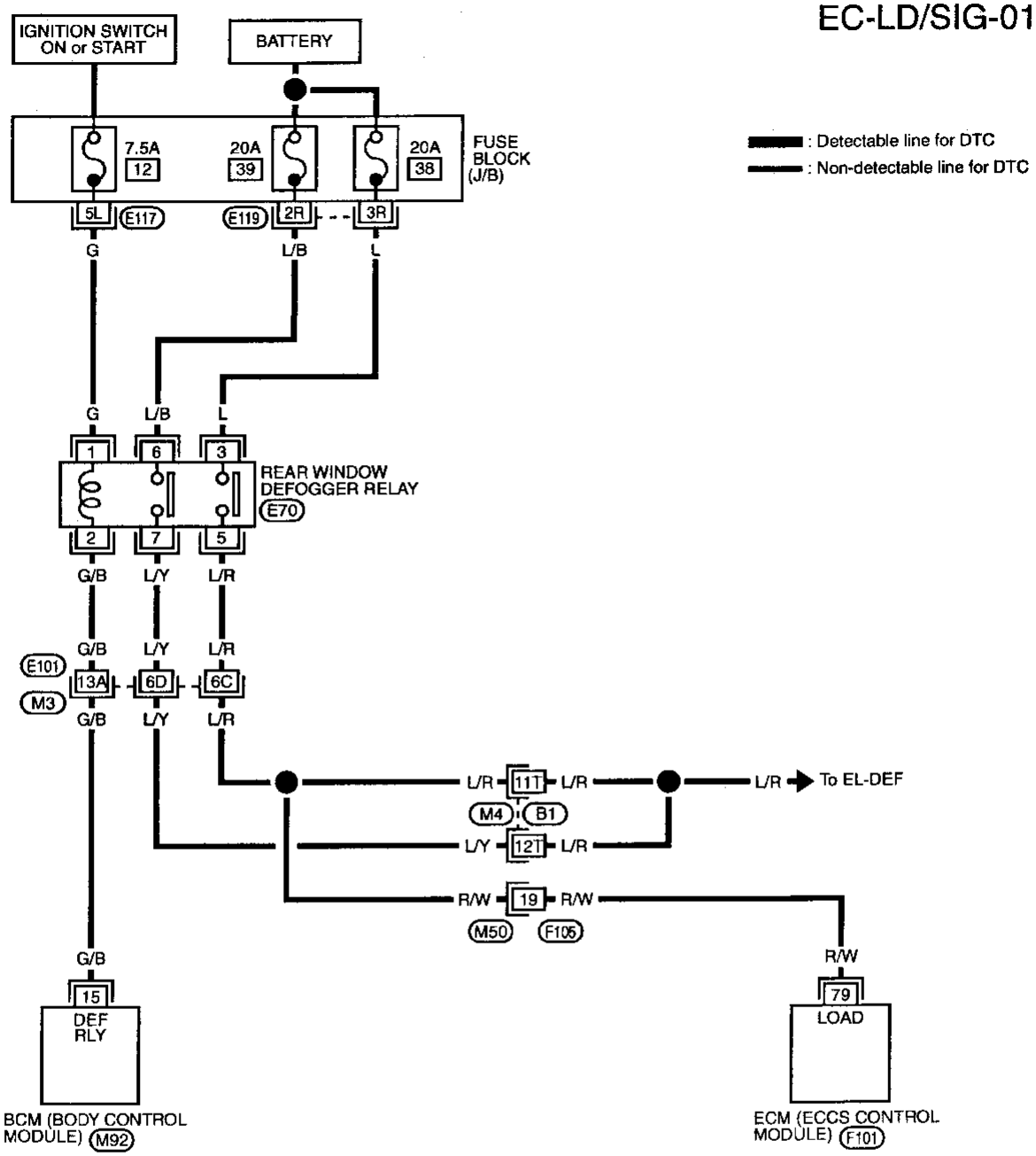


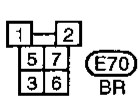
Refer to last page (Foldout page).
B1 , M4
M1
B3

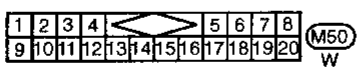
SEF243T

Electrical Load Signal

EC-LD/SIG-01







Refer to last page (Foldout page).

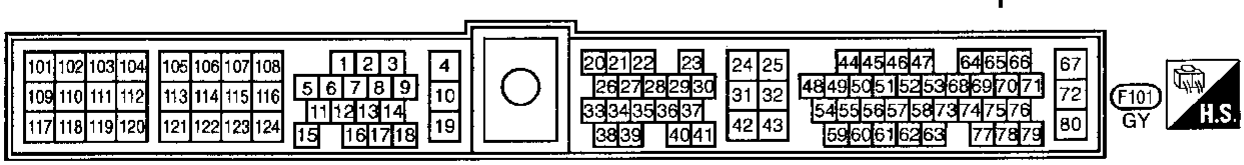
B1 , M4

E101 , M3

E117

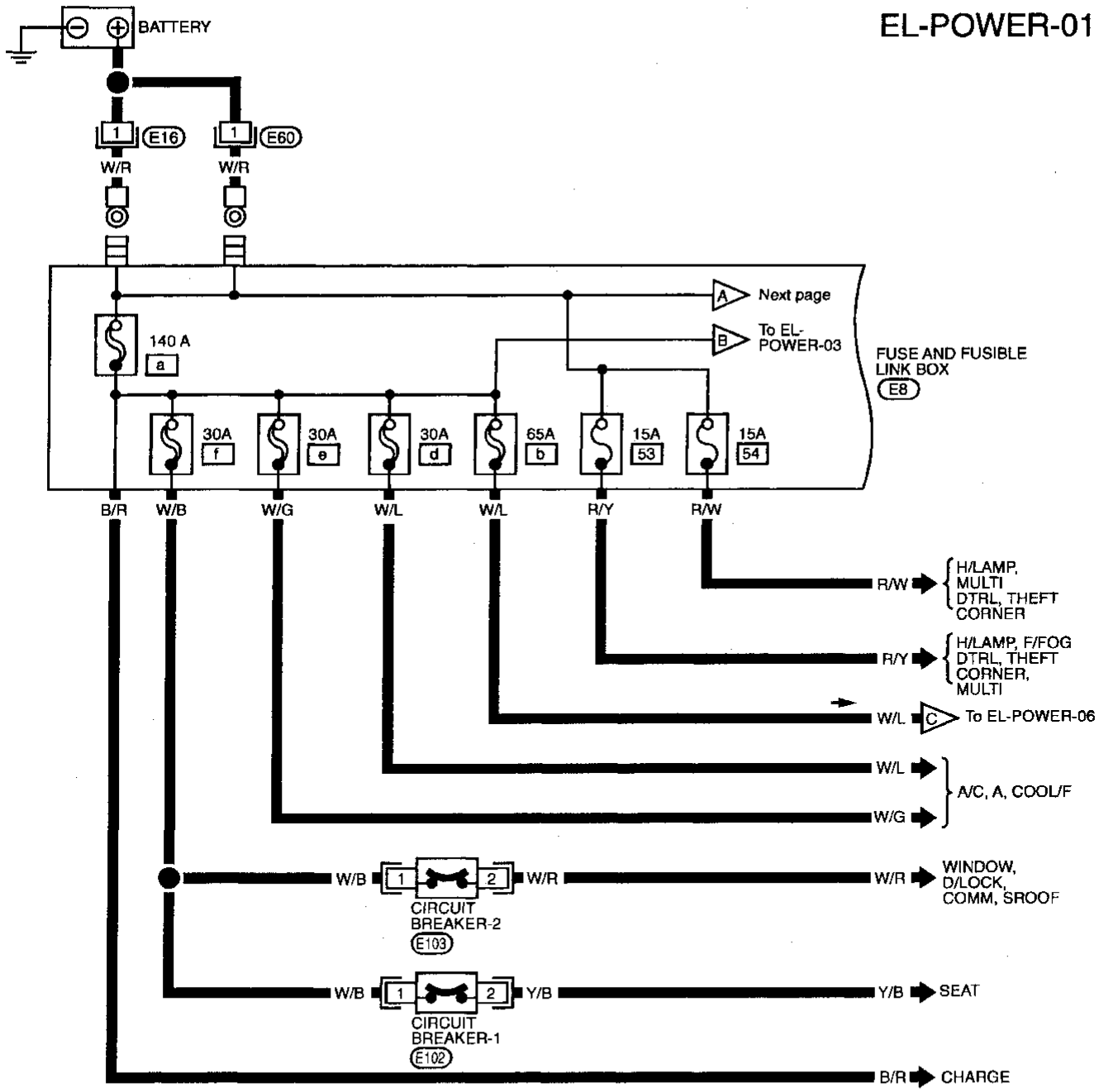
E119

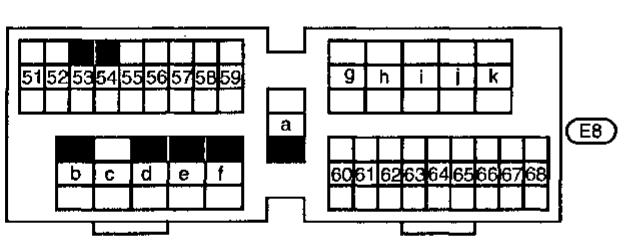
M92

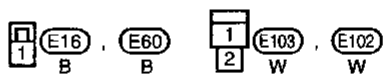


SEF246T

Wiring Diagram — POWER —







MEL595G

EARTH	CONNECT TO	CONN. NO.	CELL CODE
M13/M73	AUDIO AMP RELAY	M79	EL-AUDIO
	BCM (BODY CONTROL MODULE)	M48	EL-COMM
	BLOWER RELAY	M1	EL-POWER
	CIGARETTE LIGHTER SOCKET	M45	EL-HORN
	CLOCK	M59	EL-HORN
	CLOCK (ILLUMINATION)	M59	EL-ILL
	CLUTCH INTERLOCK SWITCH	M16	EL-START
	COMBINATION FLASHER UNIT	M34	EL-TURN
	COMBINATION METER (AIR BAG)	M29	RS-SRS EL-WARN
	COMBINATION METER (BUZZER)	M29	EL-METER
	COMBINATION METER (CRUISE INDICATOR LAMP)	M29	EL-ASCD EL-WARN
	COMBINATION METER (FUEL GAUGE)	M29	EL-METER
	COMBINATION METER (HIGH BEAM INDICATOR)	M29	EL-H/LAMP EL-DTRL
	COMBINATION METER (SPEEDOMETER)	M29	AT-A/T EL-METER EL-ASCD EC-VSS
	COMBINATION METER (TACHOMETER)	M29	EL-METER
	COMBINATION METER (TURN)	M29	EL-TURN
	COMBINATION METER (WATER TEMP GAUGE)	M29	EL-METER
	DATA LINK CONNECTOR FOR CONSULT	M2	EC-MIL/DL AT-A/T BR-ABS RS-SRS EL-COMM
	DATA LINK CONNECTOR FOR GST	M81	EC-MIL/DL
	DOOR MIRROR REMOTE CONTROL SWITCH	M26	EL-MIRROR
	FAN CONTROL AMP.	M57	HA-A/C, A
	FRONT WIPER MOTOR	M101	EL-WIPER
	FUEL FILLER LID OPENER SWITCH	M86	EL-TLID
	GLOVE BOX LAMP SWITCH	M55	EL-ILL
	IGNITION RELAY	M1	EL-POWER
	ILLUMINATION CONTROL SWITCH	M32	EL-ILL EL-I/MIRROR
	INTAKE DOOR MOTOR	M69	HA-A/C, A
	MODE DOOR MOTOR	M38	HA-A/C, A
	PUSH CONTROL UNIT	M40	HA-A/C, A
	REAR WINDOW DEFOGGER SWITCH	M60	EL-DEF
	REAR WINDOW DEFOGGER SWITCH (INDICATOR LAMP)	M60	EL-DEF
	SUNROOF RELAY	M7	EL-SROOF
	IACV-FICD SOLENOID VALVE-2	F9	EC-FICD
	DOOR MIRROR DEFOGGER LH	D5	EL-DEF
	DOOR MIRROR DEFOGGER RH	D34	EL-DEF
	DRIVER DOOR CONTROL UNIT (LCU01)	D9	EL-COMM EL-STEP/L
	DRIVER SIDE KEY CYLINDER SWITCH	D7	EL-THEFT
	PASSENGER SIDE KEY CYLINDER SWITCH	D37	EL-THEFT

System Description

The alternator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged.
AC voltage is converted into DC voltage by the diode assembly in the alternator.
Power is supplied at all times to alternator terminal Ⓢ through:

- 140A fusible link (letter [a], located in the fuse and fusible link box), and
- 7.5A fuse (No. [60], located in the fuse and fusible link box).

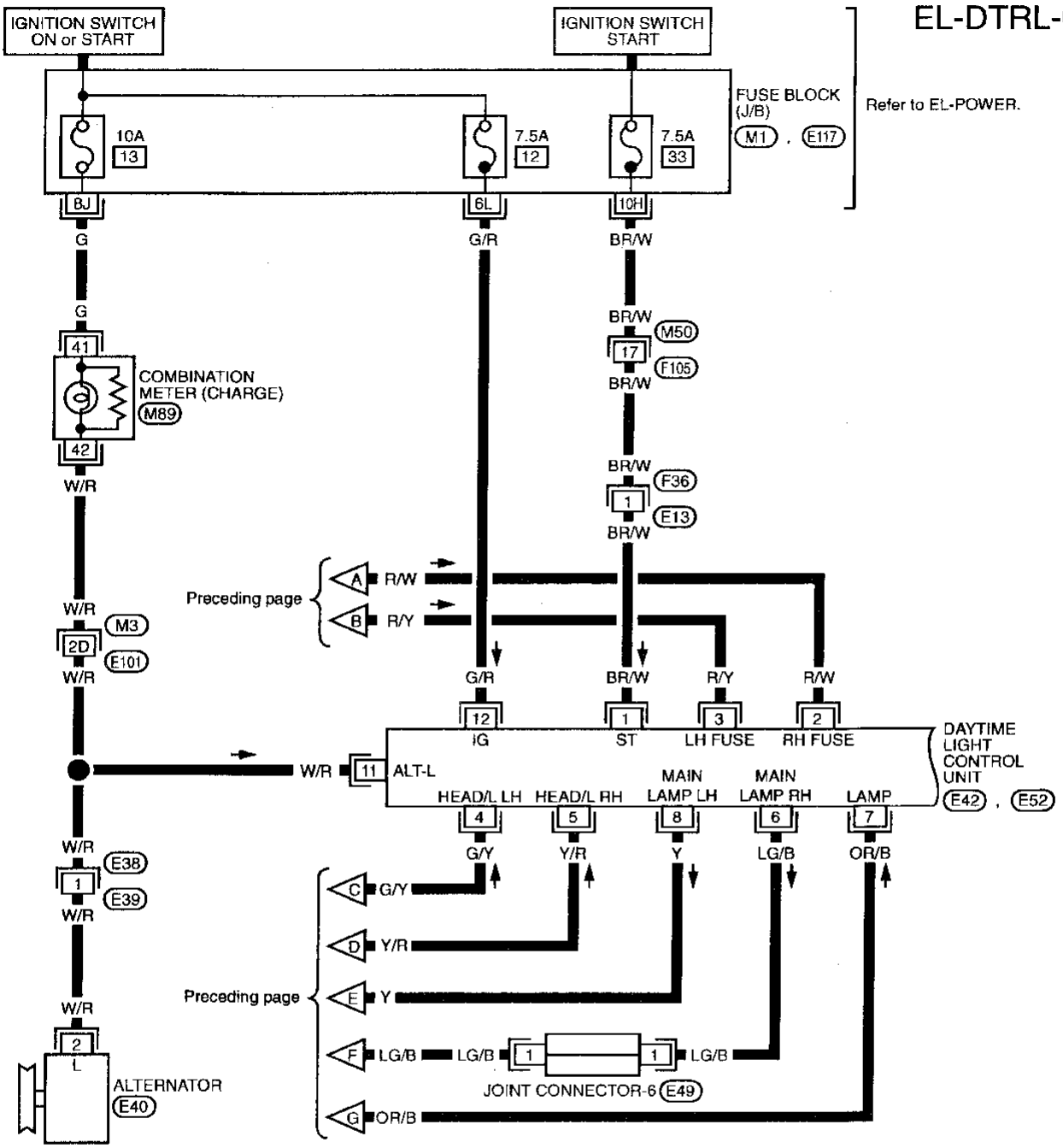
Voltage output through alternator terminal Ⓑ, is controlled by the IC regulator at terminal Ⓢ. The charging circuit is protected by the 140A fusible link.
Terminal Ⓔ of the alternator supplies ground through body ground (E35).
With the ignition switch in the ON or START position, power is supplied

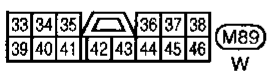
- through 10A fuse [No. [13], located in the fuse block (J/B)]
- to combination meter terminal ㊶ for the charge warning indicator.

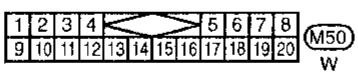
Ground is supplied to terminal ㊷ of the combination meter through terminal Ⓛ of the alternator. With power and ground supplied, the charge warning indicator will illuminate. When the alternator is providing sufficient voltage, the ground is opened and the charge warning indicator will go off.
If the charge warning indicator illuminates with the engine running, a malfunction is indicated. Refer to "Trouble Diagnoses" (EL-37).

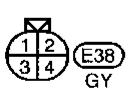
Wiring Diagram — DTRL — (Cont'd)

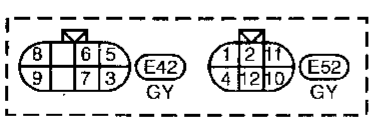
EL-DTRL-02

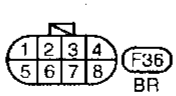


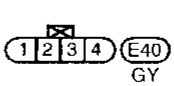


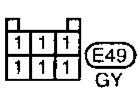










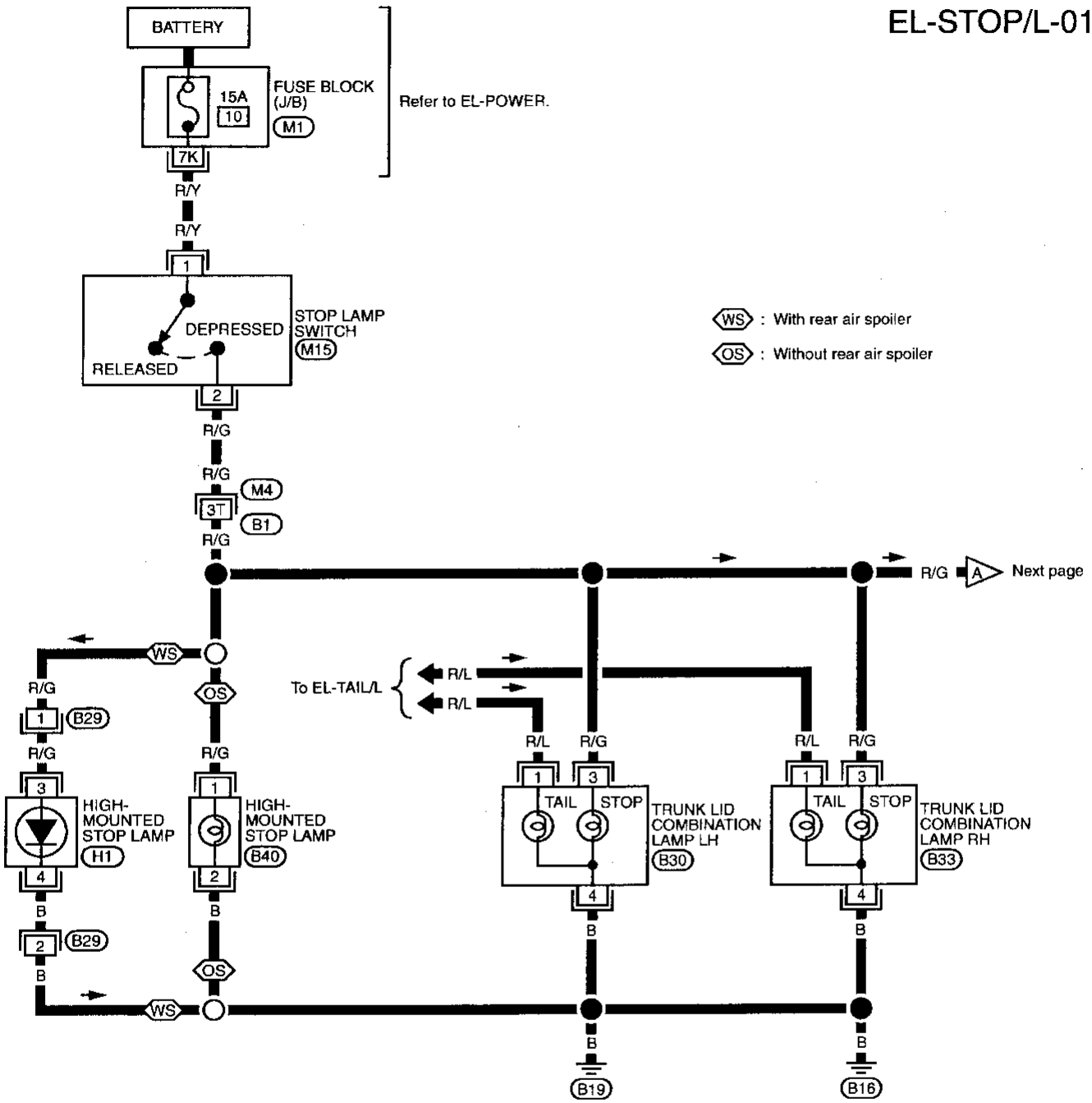


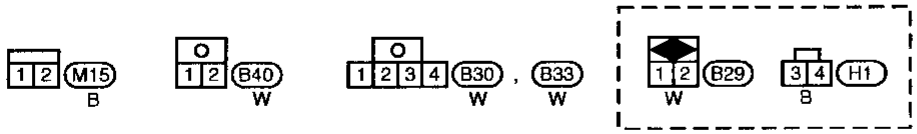
Refer to last page (Foldout page).
M3 , E101
M1
E117
E49

MEL613G

Stop Lamp/Wiring Diagram — STOP/L —

EL-STOP/L-01



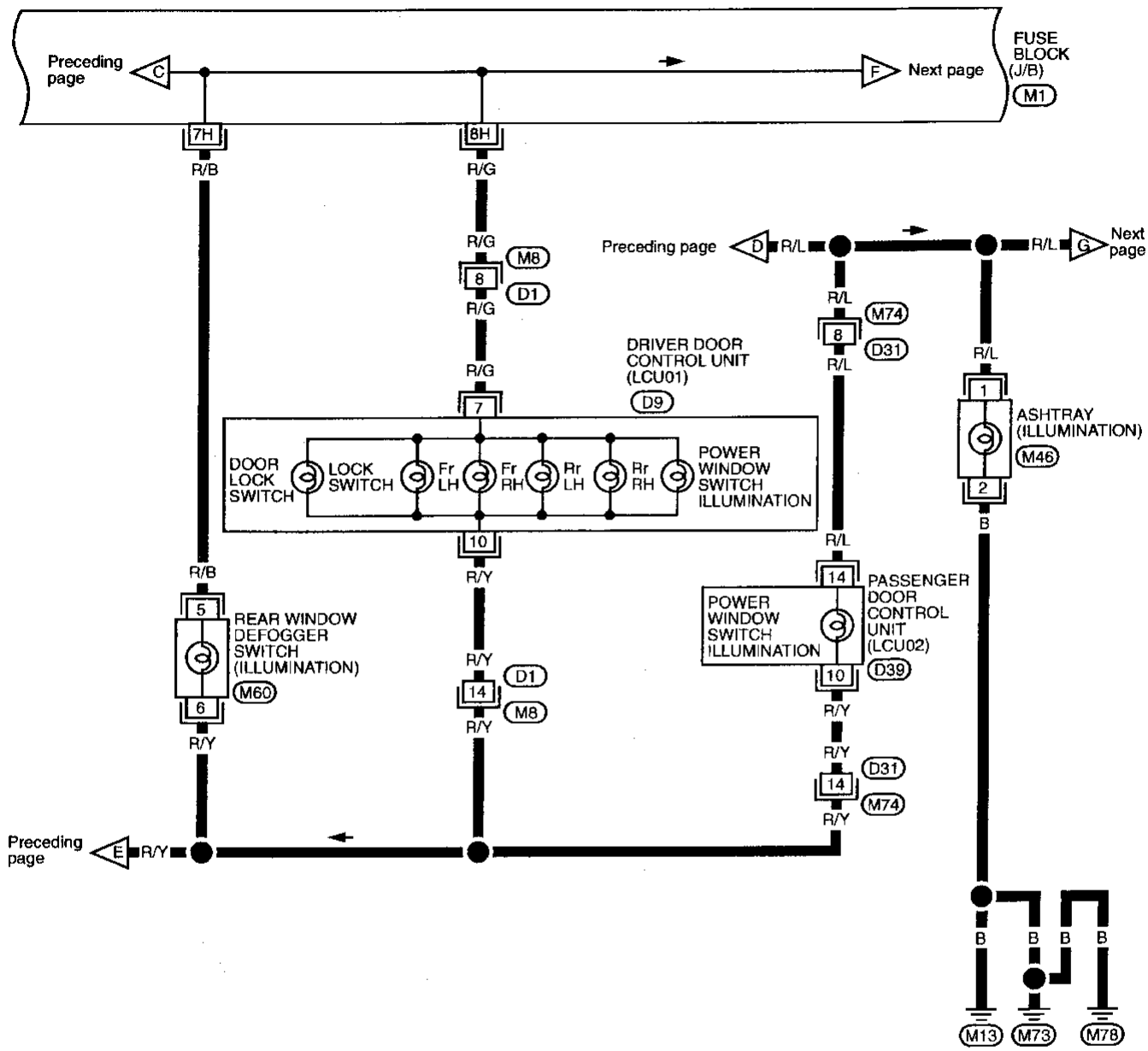


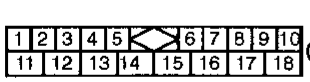
Refer to last page (Foldout page).
M4 , B1
M1

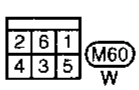
MEL620G

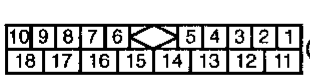
Illumination/Wiring Diagram — ILL — (Cont'd)

EL-ILL-03







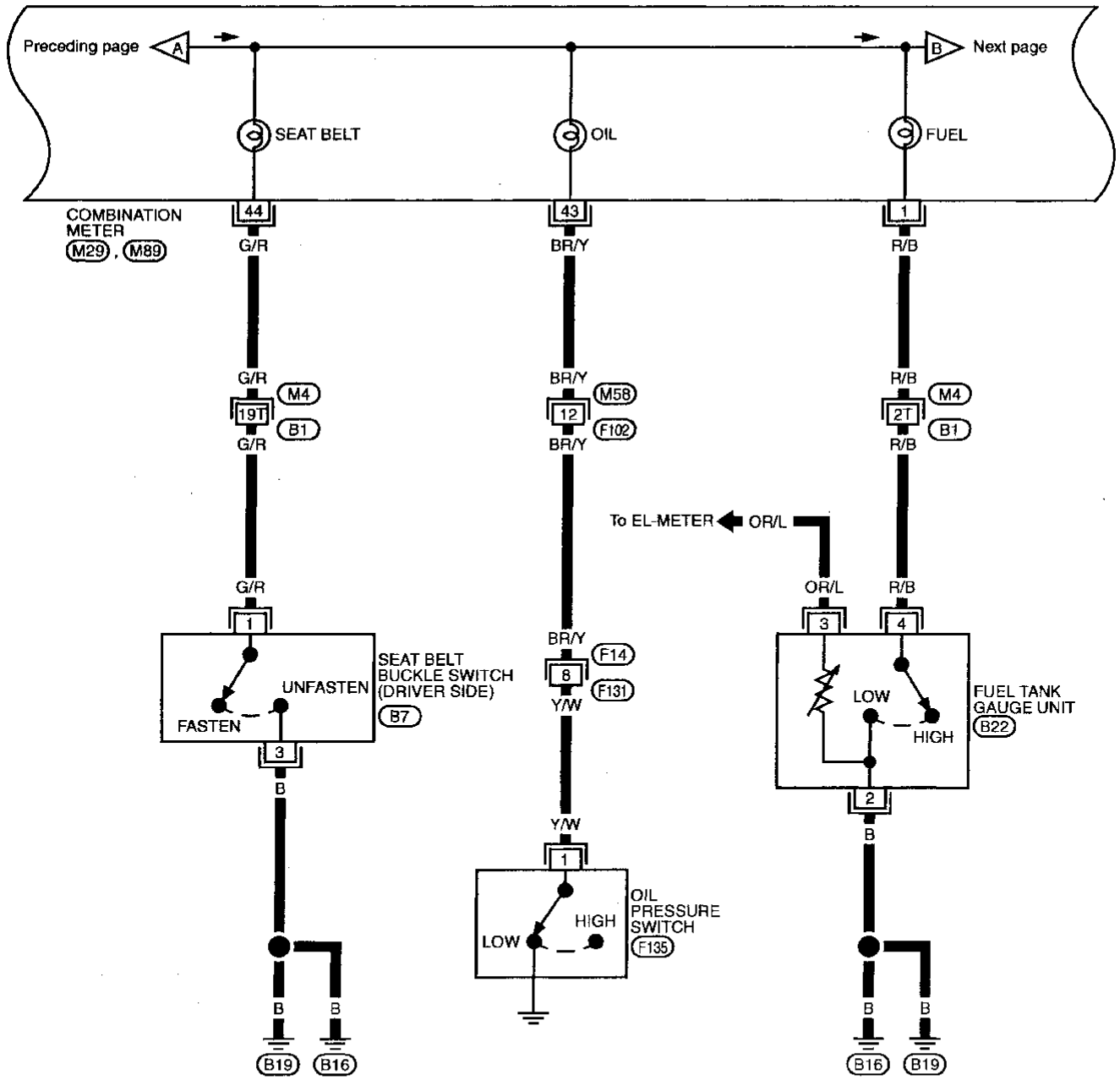


Refer to last page (Foldout page).
M1

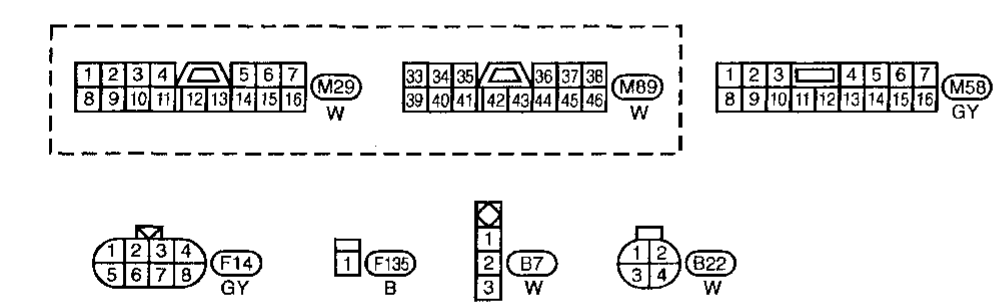
MEL629G

Wiring Diagram — WARN — (Cont'd)

EL-WARN-02



Refer to last page (Foldout page).
M4 , B1



MEL635G

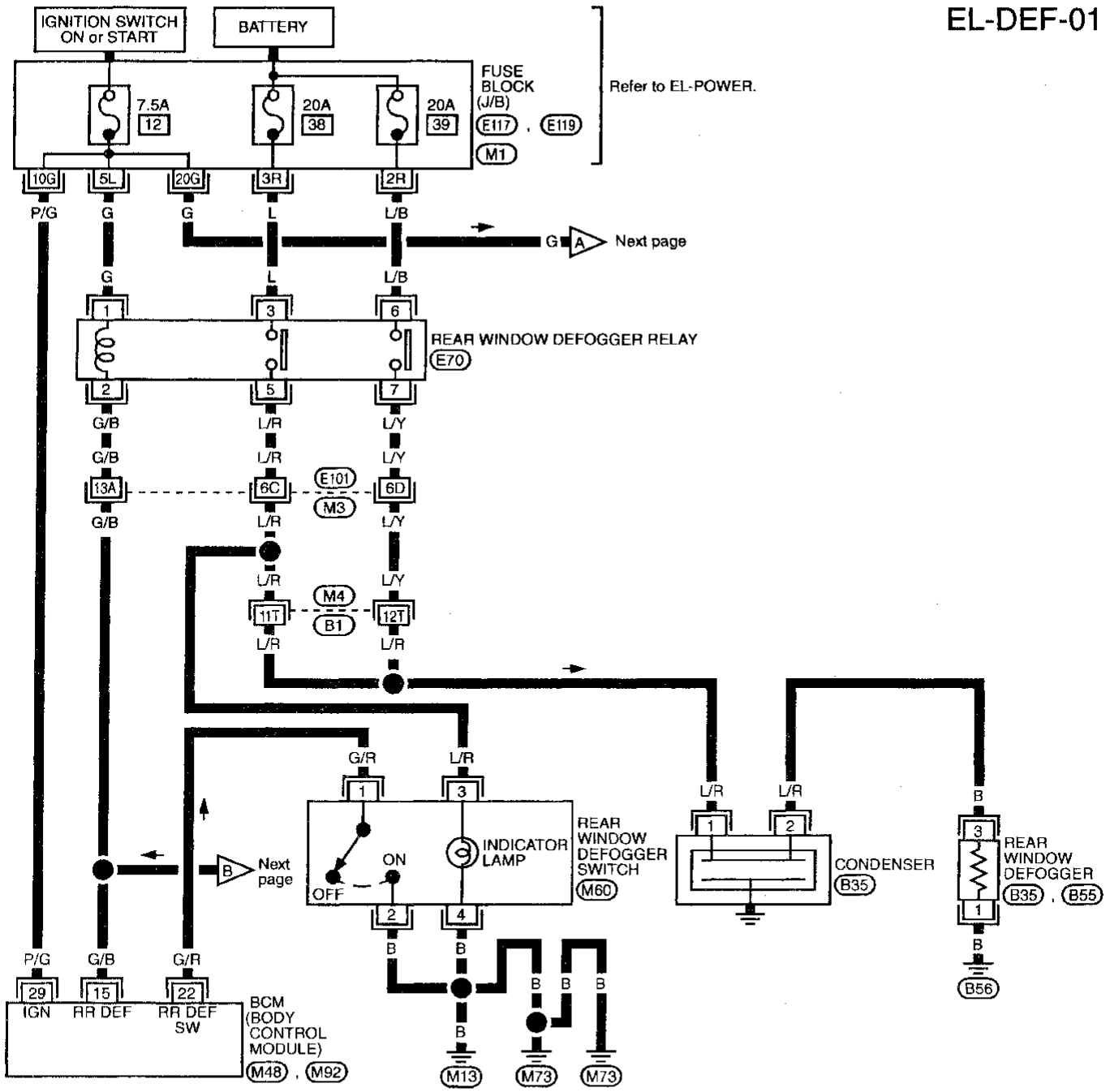
System Description (Cont'd)

- to BCM terminal ㉖
- from terminal ⑱ of the front wiper switch
- through terminal ⑰ of the front wiper switch, and
- through body grounds (E5) and (E30).

With power and ground supplied, the washer motor operates.
The front wiper motor operates at low speed for about 3 seconds. This feature is controlled by the BCM in the same manner as the intermittent operation.

Wiring Diagram — DEF —

EL-DEF-01

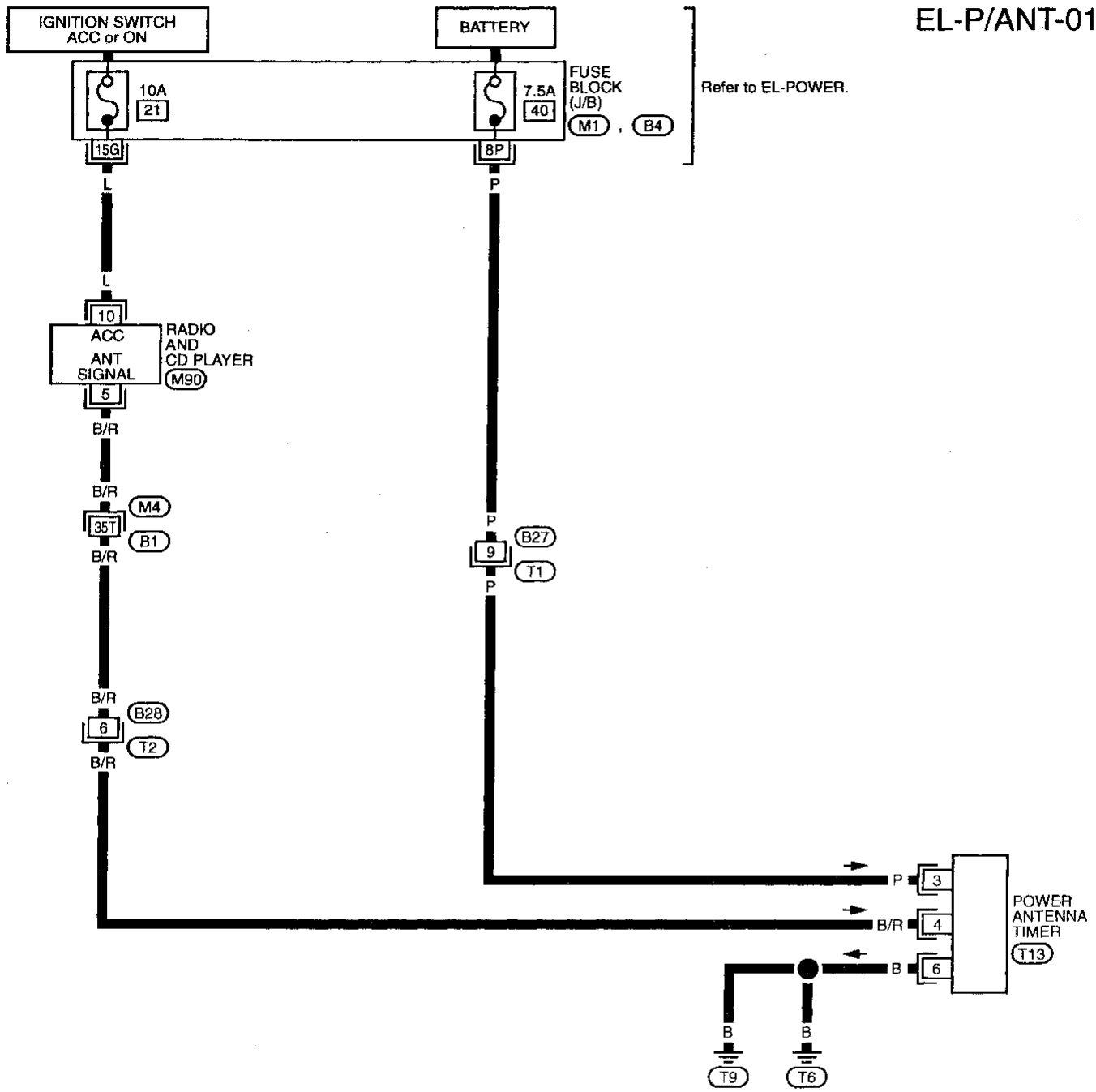


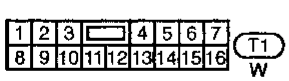
Refer to last page (Foldout page).

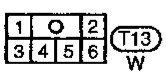
M3, E101
M4, B1
M1
E117
E119
M48
M92

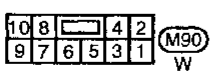
MEL642G

Power Antenna/Wiring Diagram — P/ANT —







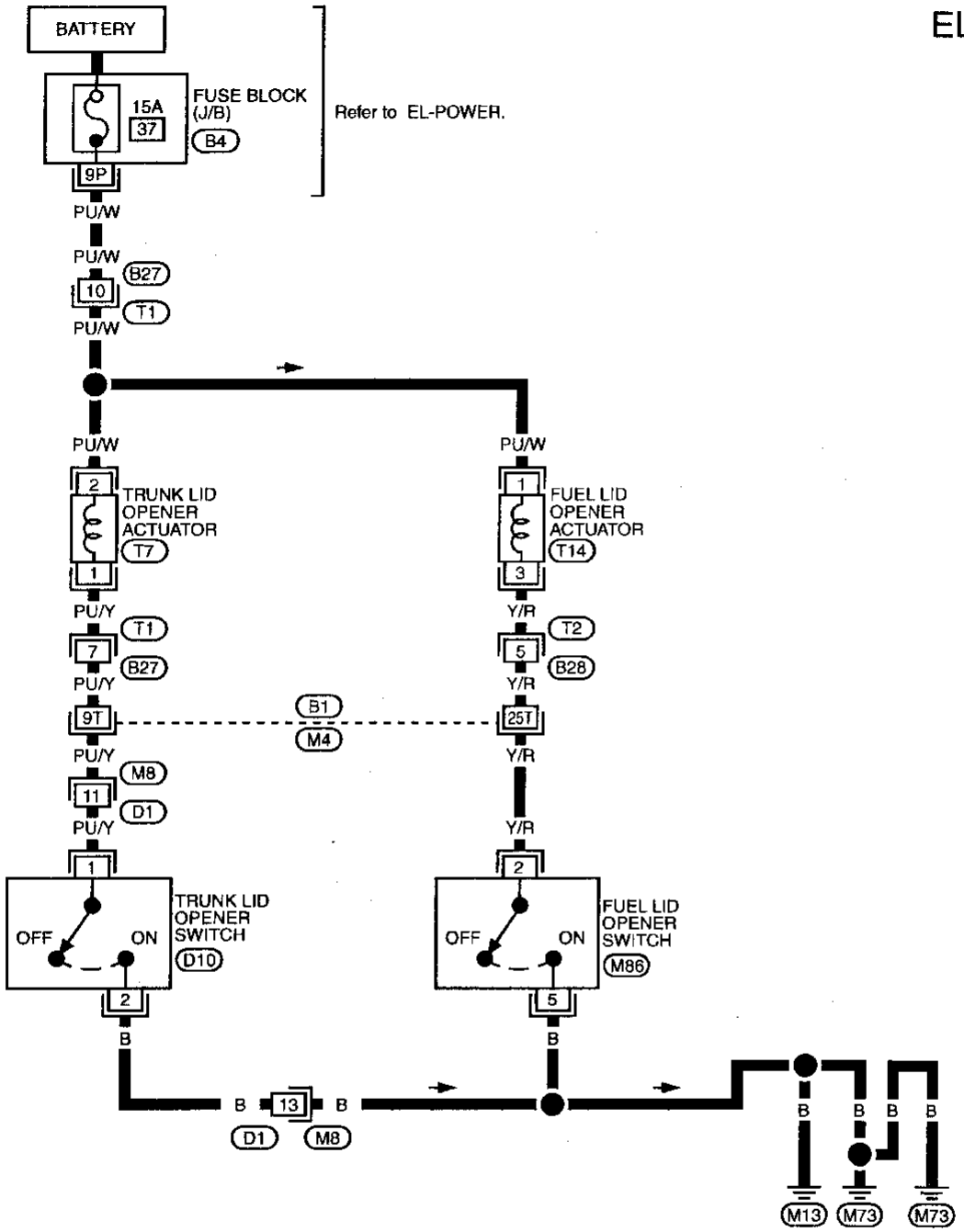


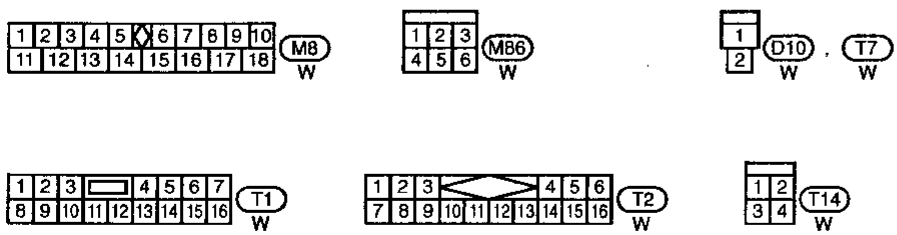
Refer to last page (Foldout page).
M4 , B1
M1
B4

MEL646G

Wiring Diagram — TLID —

EL-TLID-01





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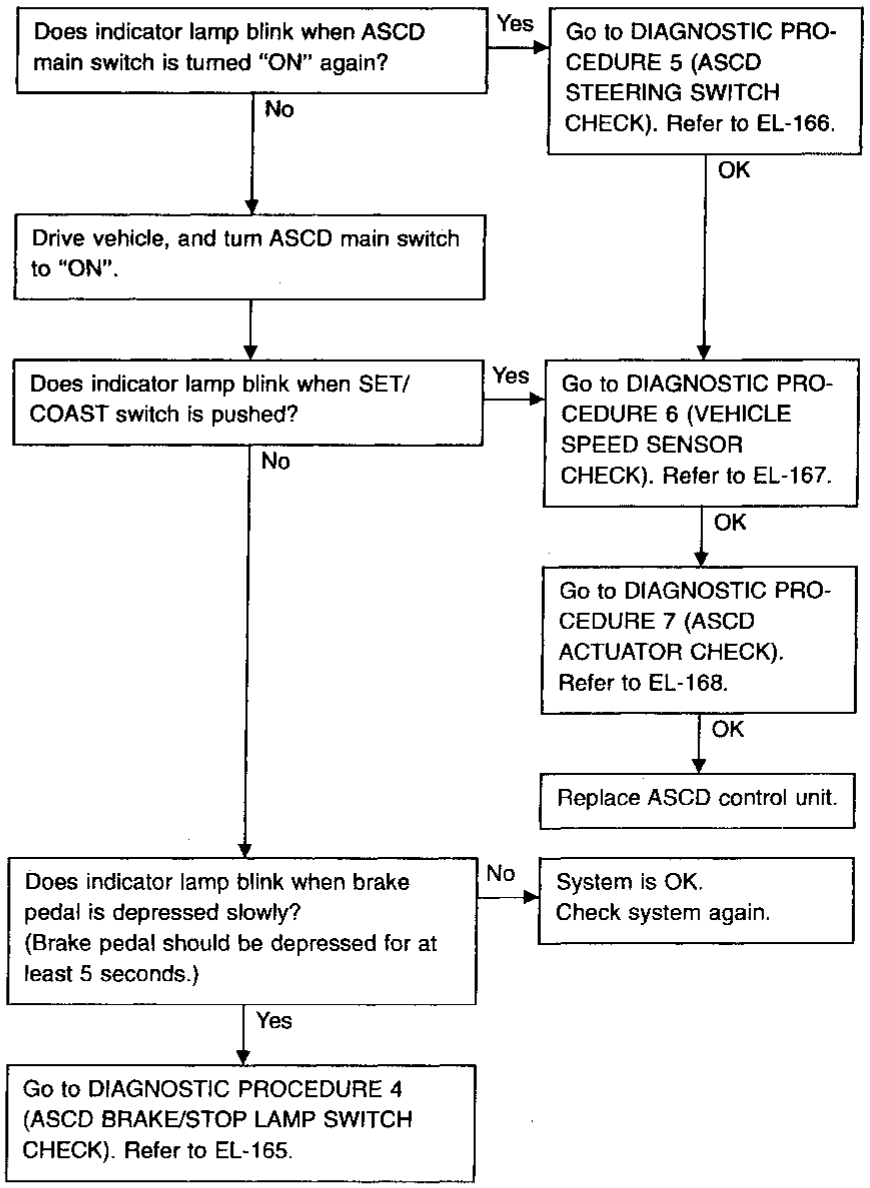
M4 , B1
B4

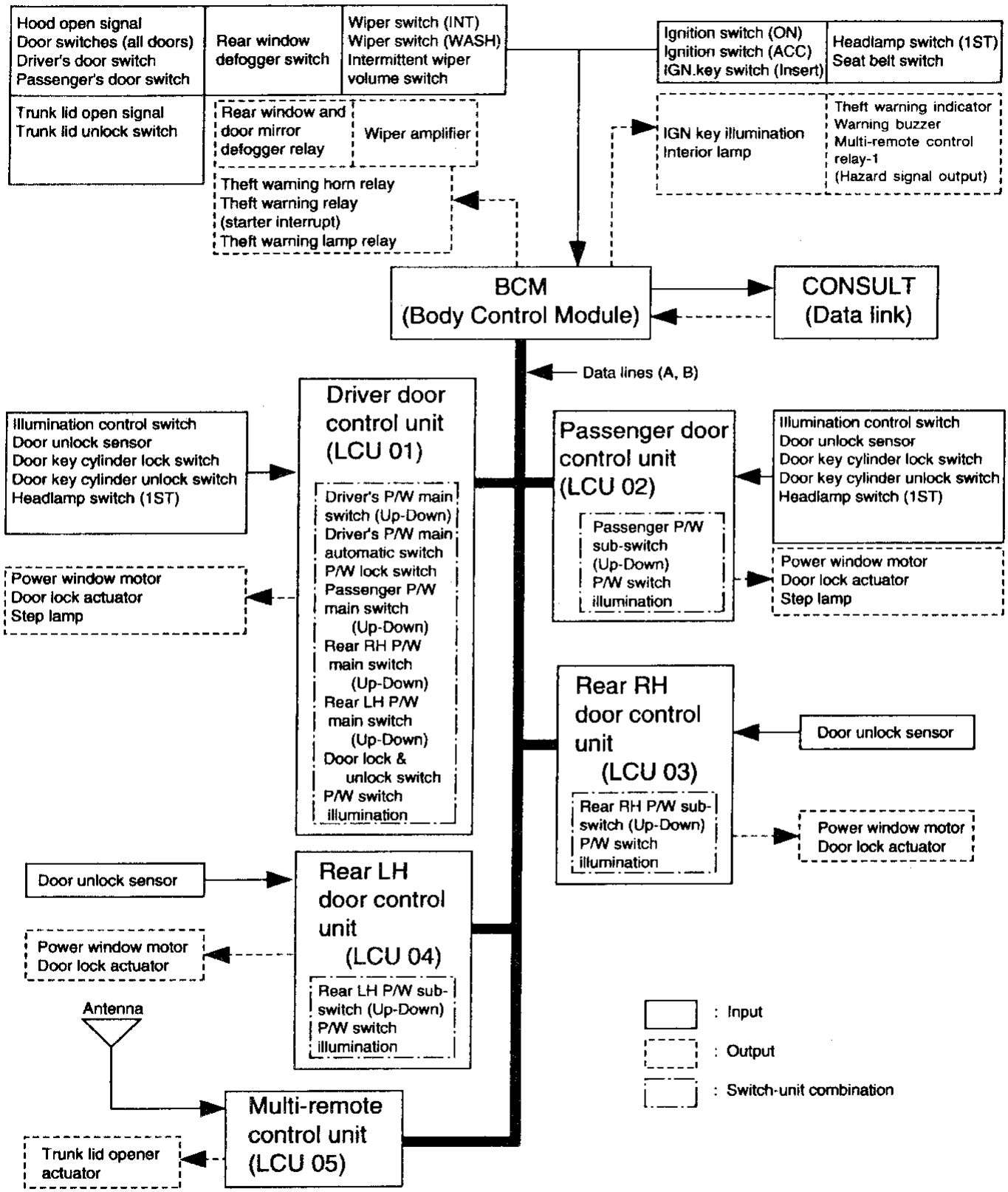
MEL652G

Trouble Diagnoses (Cont'd)

Fail-safe system check



System Diagram

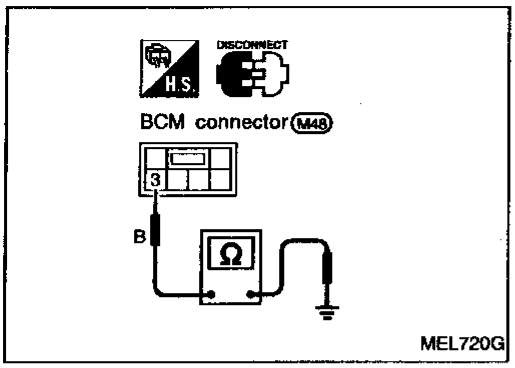


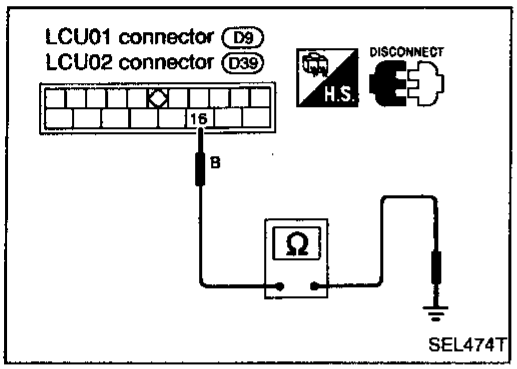
SEL325UA

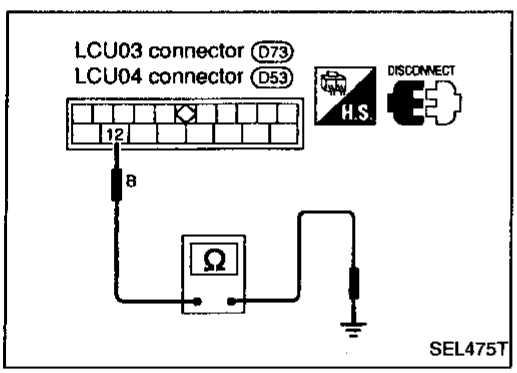
Body Control Module (BCM) (Cont'd)

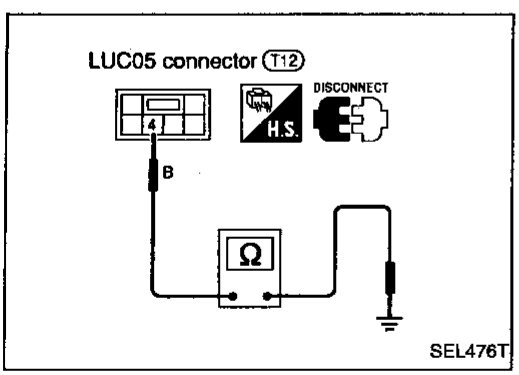
INPUT/OUTPUT OPERATION SIGNAL

Terminal No.	Connections	INPUT (I)/ OUTPUT (O)	Operated condition		Voltage (V) (Approximate values)
1	Power source	—	—		12
2	Theft warning indicator	O	Theft warning control	Illuminated	0
				Turned off	12
3	Ground	—	—		—
4	—	—	—		—
5	Interior lamp	O	ON (Illuminated)		0
			OFF		12
6 7 8	—	—	—		—
9	Seat belt switch	I	When the seat belt is fastened		5
			When the seat belt is not fastened		0
10	Wiper amplifier (ON signal)	O	Ignition switch "ACC" or "ON" Wiper switch	ON	0
				OFF	12
11	Multi-remote control relay	O	Flasher lamp	ON	0
				OFF	12
12	Ignition keyhole illumination	O	ON		0
			OFF		12
13	Theft warning horn relay and theft warning lamp relay	O	ON		0
			OFF		12
14	Theft warning relay	O	Theft warning control	ON	0
				OFF	12
15	Defogger relay	O	Ignition switch "ON" Time control	ON	0
				OFF	12
16	Buzzer	O	ON		0
			OFF		12
17	Intermittent wiper volume switch	I	Intermittent time	Max. (20 sec)	3.6
				Min. (2 sec)	0
18	Trunk lid unlock switch	I	Unlocked (ON)		0
			Neutral (OFF)		5
19	Passenger's door switch	I	ON (Open)		0
			OFF (Closed)		12
20	—	—	—		—









Power Supply and Ground Circuit Check

GROUND CIRCUIT CHECK

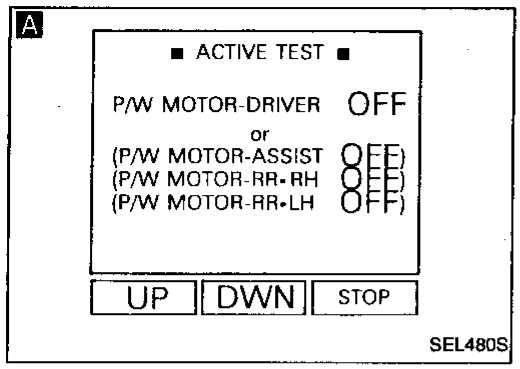
Control unit	Terminals	Continuity
BCM	③ - Ground	Yes
LCU01	⑯ - Ground	
LCU02		
LCU03	⑫ - Ground	
LCU04		
LCU05	④ - Ground	

Trouble Diagnoses (Cont'd)

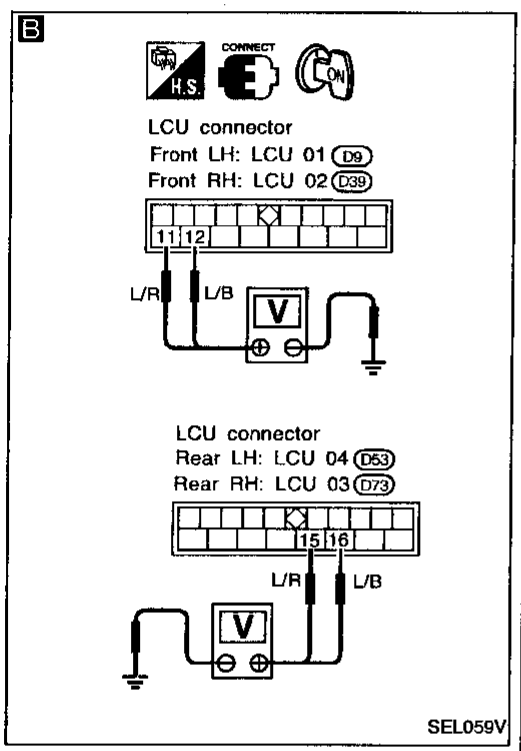
DIAGNOSTIC PROCEDURE 5

(Power window regulator check)

A



B



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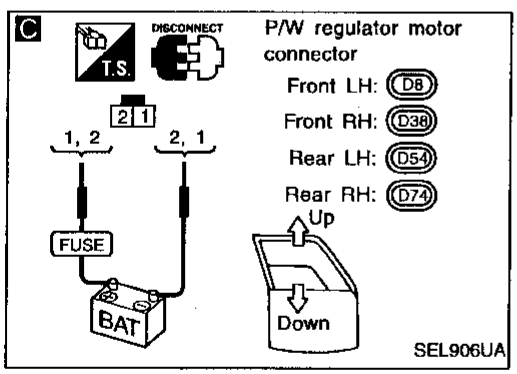


A

CHECK POWER WINDOW REGULATOR CIRCUIT.

CONSULT

See "P/W MOTOR" in ACTIVE TEST mode.

Perform operation shown on display.

Power window motor should operate.

OR

ON-BOARD

(for driver window)

Check driver power window operation in driver power window operation (Mode IV). (Refer to On-board Diagnosis, EL-211.)

NOTE (except for driver window):

If CONSULT is not available, start with the diagnostic procedure B .

OK → Power window regulator is OK.

NG ↓

B

CHECK LCU OUTPUT SIGNAL TO POWER WINDOW REGULATOR.

Check voltage between LCU connector terminals and ground.

Operation		Terminals ⊕	Terminals ⊖	Voltage
Front (LCU01, LCU02)	Down	⑫	Ground	Battery voltage
	Up	⑪	Ground	
Rear (LCU03, LCU04)	Down	⑱	Ground	
	Up	⑲	Ground	

Refer to wiring diagram in EL-207, 208 or 209.

NG → Replace LCU for malfunctioning portion.

OK ↓

C

CHECK POWER WINDOW REGULATOR MOTOR.

1. Disconnect power window regulator motor connector.
2. Apply 12V DC direct current to motor and check operation.

Terminals ⊕	Terminals ⊖	Operation
①	②	Downward
②	①	Upward

NG → Replace power window motor.

OK ↓

Check harness for open or short between power window switch, and power window motor.

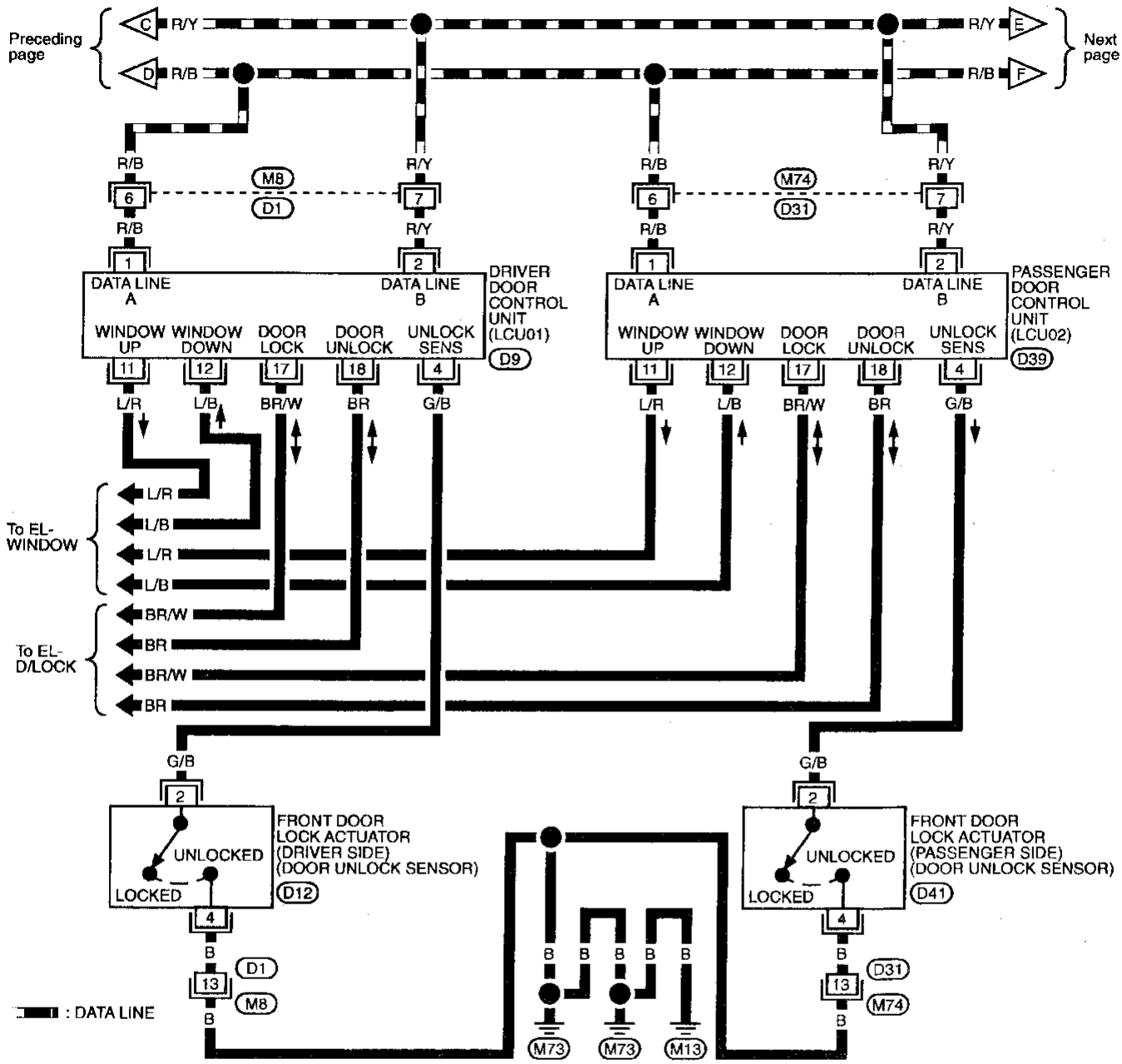
Trouble Diagnoses (Cont'd)

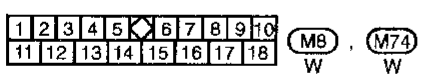
SYMPTOM CHART

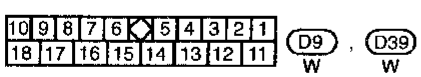
PROCEDURE	Self-diagnosis		Diagnostic procedure						
REFERENCE PAGE	EL-226	EL-228	EL-232	EL-233	EL-234	EL-235	EL-236	EL-237	EL-180
SYMPTOM	CONSULT	On-board diagnosis (Mode III)	Procedure 1 (Front door switch check)	Procedure 2 (Key switch check)	Procedure 3 (Lock & unlock switch check)	Procedure 4 (Door key cylinder switch check)	Procedure 5 (Door unlock sensor check)	Procedure 6 (Door lock actuator check)	Wake-up diagnosis
Key reminder door system does not operate properly.	X	X	X	X			X	X	
One or more doors are not locked and/or unlocked	X	X					X	X	
Lock & unlock switch does not operate.	X	X			X				X (LCU01)
None of the doors lock/unlock when operating door key cylinder switch.	X	X				X			X (LCU01, LCU02)
None of the doors lock when operating front door knob lock switch.	X	X					X		X (LCU01, LCU02)

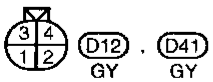
Wiring Diagram — MULTI — (Cont'd)

EL-MULTI-05







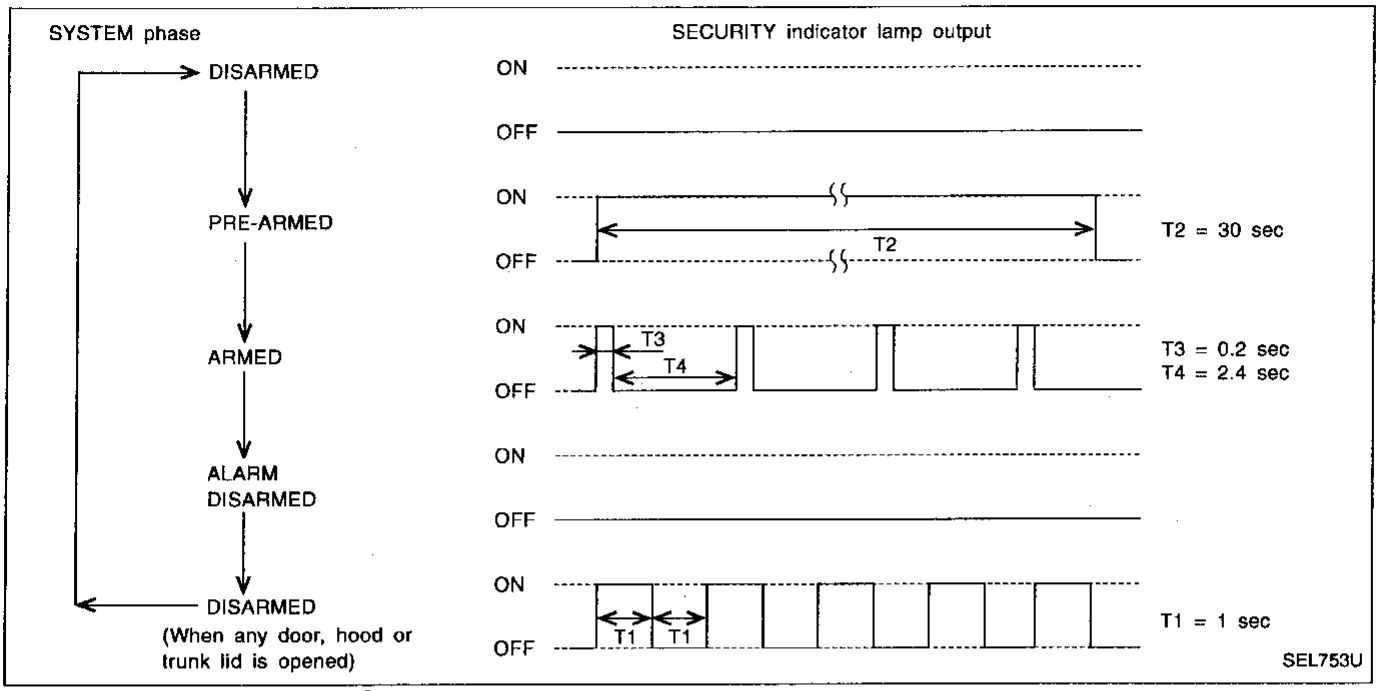


MEL683G

System Description

DESCRIPTION

1. Operation flow



2. Setting the theft warning system

Initial condition

(1) Close all doors.
(2) Close hood and trunk lid.

Disarmed phase

The theft warning system is in the disarmed phase when any door(s), hood or trunk lid is opened. The security indicator lamp blinks every second.

Pre-armed phase and armed phase

The theft warning system turns into the "pre-armed" phase when hood, trunk lid and all doors are closed and locked by key or multi-remote controller. (The security indicator lamp illuminates.)
After about 30 seconds, the system automatically shifts into the "armed" phase (the system is set). (The security indicator lamp blinks every 2.4 seconds.)

3. Canceling the set theft warning system

When the following (a) or (b) operation is performed, the armed phase is canceled.
(a) Unlock the doors with the key or multi-remote controller.
(b) Open the trunk lid with the key. When the trunk lid is closed after opening the trunk lid with the key, the system returns to the armed phase.

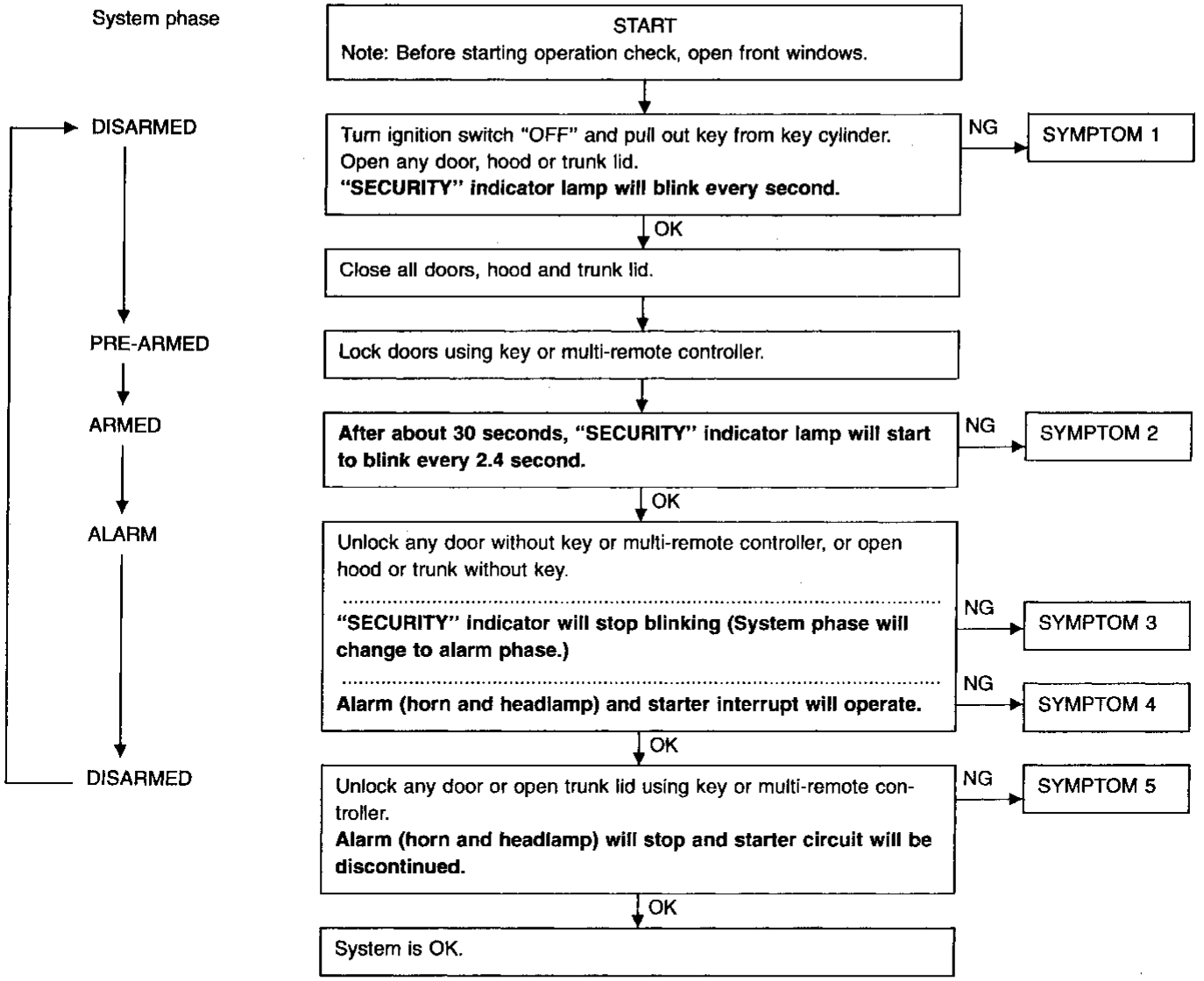
4. Activating the alarm operation of the theft warning system

Make sure the system is in the armed phase. (The security indicator lamp blinks every 2.4 seconds.)
When the following operation (a) or (b) is performed, the system sounds the horns and flashes the headlamps for about 2.5 minutes. (At the same time, the system disconnects the starting system circuit.)
(a) Engine hood, trunk lid or any door is opened before unlocking door with key or multi remote controller.
(b) Door is unlocked without using key or multi remote controller.

Trouble Diagnoses (Cont'd)

PRELIMINARY CHECK

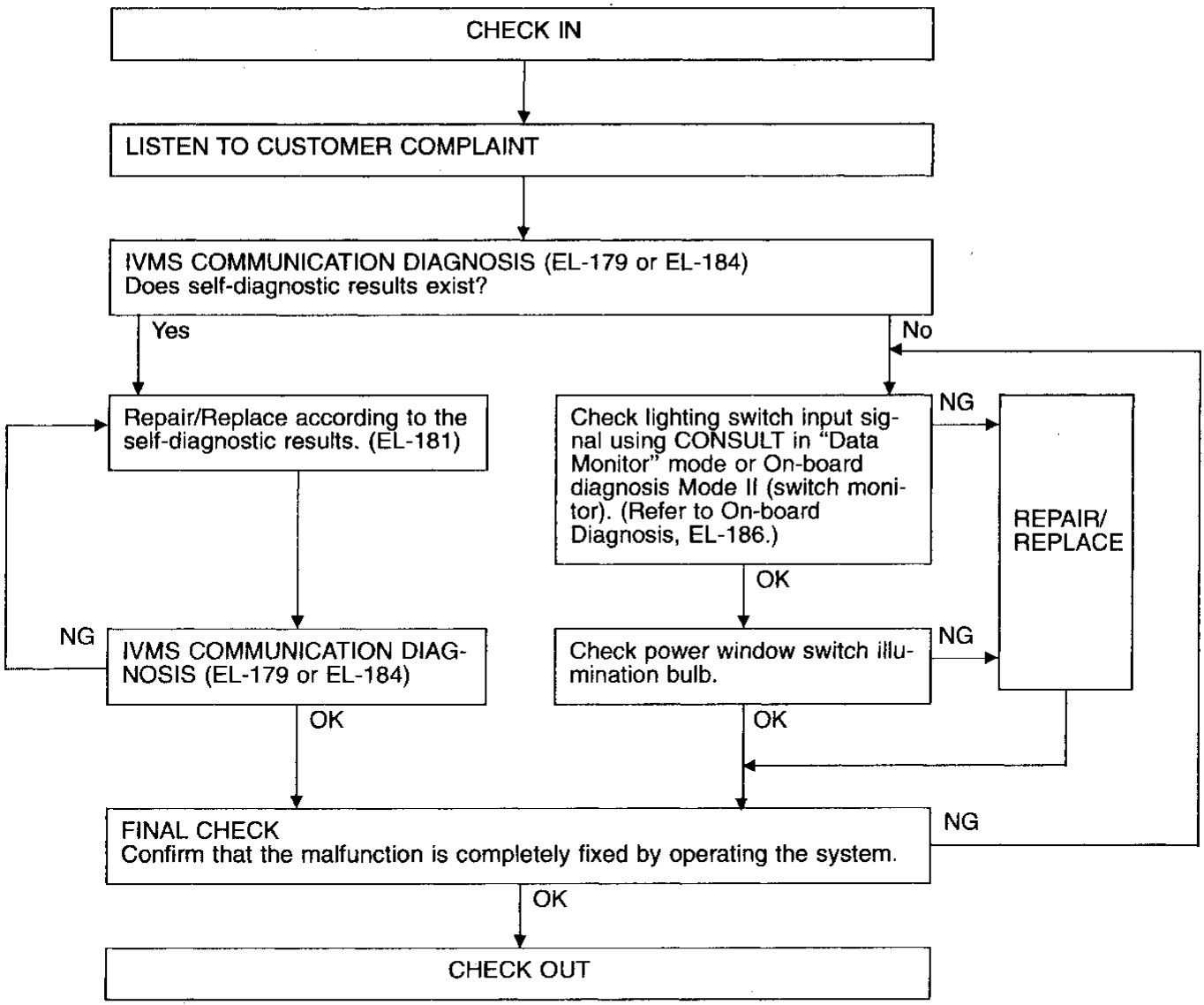
The system operation is canceled by turning ignition switch to "ACC" at any step between START and ARMED in the following flow chart.



After performing preliminary check, go to symptom chart in next page.

Trouble Diagnoses (Cont'd)

WORK FLOW



NOTICE:

- **When LCU connectors are disconnected for more than 1 minute such as during trouble diagnoses, the "disconnected" data will be memorized by the BCM. Therefore, after reconnecting the LCU connectors, erase the memory.**
- **To erase the memory, perform the procedure below.**
  Erase the memory with CONSULT (refer to EL-179) or remove turn the ignition switch to "OFF" position and remove 7.5A fuse (No. 56 located in the fuse and fusible link box).

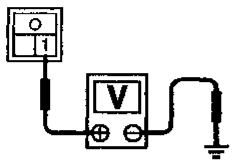
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE

SYMPTOM: Step lamp does not illuminate/does not go off when door is opened/closed.

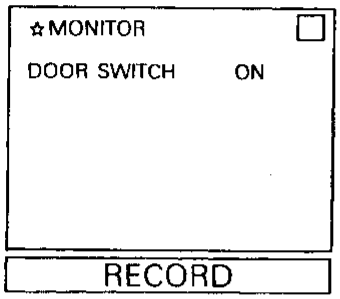
A

Step lamp connector (D11), (D40)



SEL673UB

B



SEL299S

Check step lamp bulb. → NG → Replace bulb.

OK ↓

A

POWER SUPPLY CIRCUIT CHECK
1. Disconnect step lamp connector.
2. Check voltage between step lamp terminal ① and ground.
Battery voltage should exist.

NG → Check the following.
- 7.5A fuse [No. 26], located in the fuse block (J/B)]
- Harness for open or short between fuse and step lamp

OK ↓

B

DOOR SWITCH INPUT SIGNAL CHECK

CONSULT

See "DOOR SWITCH" in "Data Monitor" mode.
When all doors are closed:
DOOR SWITCH OFF
When at least one door is open:
DOOR SWITCH ON

NG → Check the following.
- Door switch
- Door switch ground condition
- Harness for open or short between door switch and BCM

OR

ON-BOARD

Perform On-board diagnosis — Mode II (switch monitor) for all door switches.
Refer to EL-186.

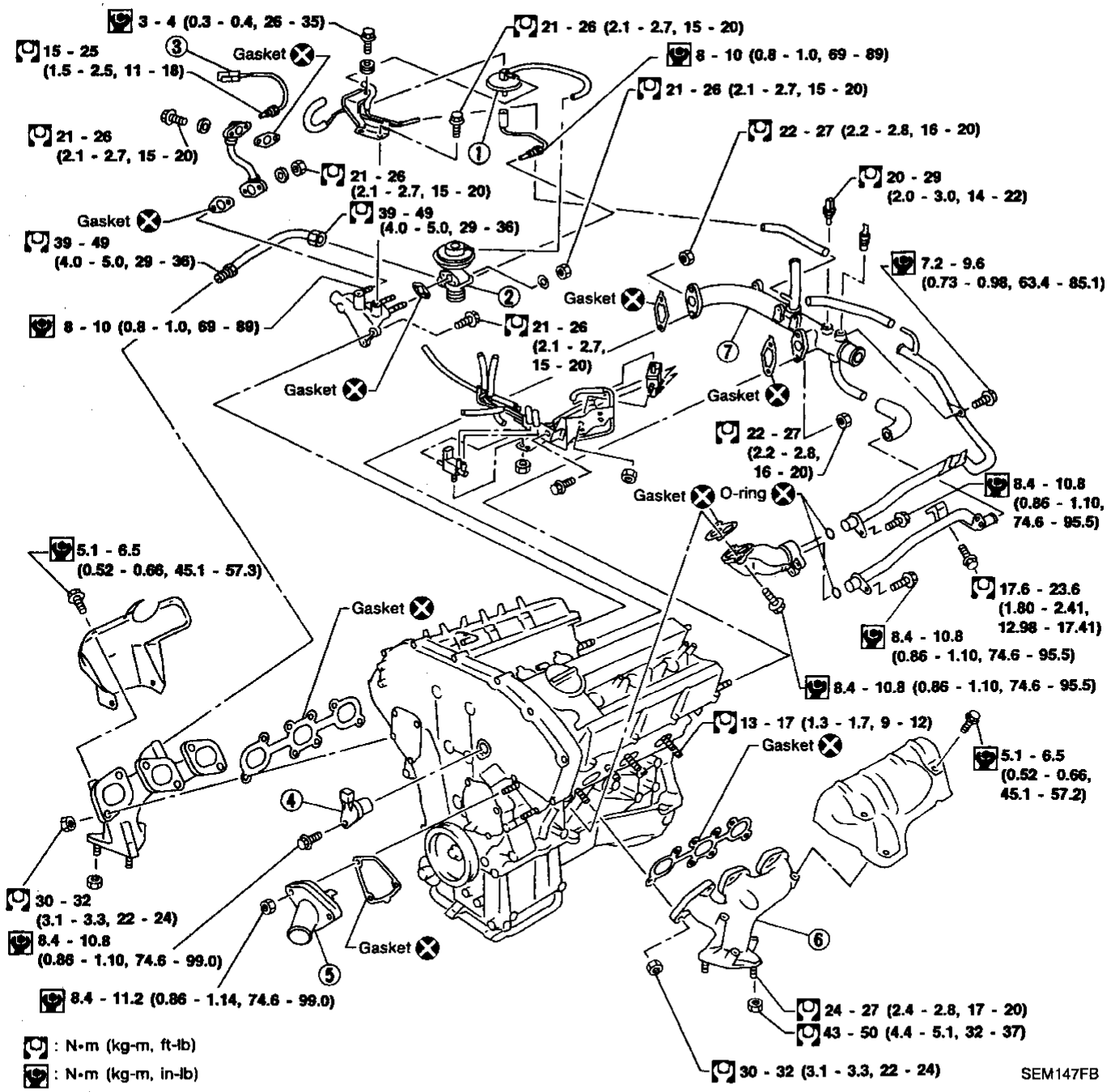
OK ↓

Check harness for open or short between step lamp and LCU.

E2 (F1)	GY/2	:	Power steering oil pressure switch
D2★ (F2)	GY/3	:	Front heated oxygen sensor RH
E2★ (F3)	GY/3	:	Ignition coil No. 1
E2★ (F4)	GY/3	:	Ignition coil No. 3
F2★ (F5)	W/6	:	EVAP canister purge volume control valve
F2★ (F6)	GY/3	:	Ignition coil No. 5
F3★ (F7)	GY/3	:	Throttle position switch
G3★ (F8)	BR/3	:	Throttle position sensor
G3 (F9)	R/2	:	IACV-FICD solenoid valve-2
F2★ (F10)	W/6	:	IACV-AAC valve
G2★ (F11)	BR/2	:	EGR temperature sensor
G3 (F12)	PU/2	:	IACV-FICD solenoid valve-1
D2★ (F14)	GY/8	:	To (F131)
C3★ (F15)	GY/2	:	Camshaft position sensor (PHASE)
D3 (F17)	B/2	:	Injector No. 2
C2★ (F18)	–	:	Engine ground
D3★ (F19)	–	:	Engine ground
D3 (F20)	B/2	:	Injector No. 4
E3 (F21)	B/2	:	Injector No. 6
F2 (F22)	GY/2	:	Condenser
F3★ (F23)	B/2	:	To (F121)
F3★ (F24)	G/2	:	EGRC-solenoid valve (For California) EGR valve and canister control solenoid valve (For Non-California)
E4 (F25)	B/1	:	Thermal transmitter
E4★ (F26)	GY/2	:	Engine coolant temperature sensor
D4★ (F27)	B/4	:	To (F111)
D3★ (F28)	GY/3	:	Front heated oxygen sensor LH
E3★ (F29)	GY/3	:	Ignition coil No. 6
D3★ (F30)	GY/3	:	Ignition coil No. 4
C3★ (F31)	GY/3	:	Ignition coil No. 2
F4★ (F32)	GY/4	:	Neutral and reverse position switch (For M/T models)
G4★ (F33)	GY/3	:	Mass air flow sensor
G3★ (F34)	W/2	:	Intake air temperature sensor
G4★ (F35)	GY/2	:	Dropping resistor (For A/T models)
G4★ (F36)	BR/8	:	To (E13)
G4★ (F37)	B/8	:	To (E14)
E4 (F38)	BR/3	:	Front engine mounting (For A/T models)
F4★ (F39)	GY/8	:	Inhibitor switch (For A/T models)
F4★ (F40)	B/2	:	EVAP canister purge control solenoid valve
F4★ (F41)	GY/3	:	Revolution sensor (For A/T models)
F4★ (F42)	BR/8	:	Terminal cord assembly (For A/T models)
F4★ (F43)	GY/2	:	Vehicle speed sensor
D4★ (F45)	GY/3	:	Absolute pressure sensor
E4★ (F46)	BR/2	:	MAP/BARO switch solenoid valve
F4 (F47)	W/2	:	Inhibitor switch (For A/T models)
A4★ (F101)	GY/104	:	ECM (ECCS control module)
C4★ (F102)	GY/16	:	To (M58)
C5★ (F103)	L/48	:	A/T control unit
A5 (F104)	W/12	:	To (M51)
A5★ (F105)	W/20	:	To (M50)
A4 (F106)	GY/6	:	Joint connector-11
A5★ (F107)	L/12	:	Joint connector-12
D4★ (F111)	B/4	:	To (F27)
E4★ (F112)	GY/3	:	Crankshaft position sensor (POS)
F3★ (F121)	B/2	:	To (F23)
E3★ (F122)	B/2	:	Knock sensor
D2★ (F131)	GY/8	:	To (F14)
E2★ (F132)	B/2	:	Injector No. 1
E2★ (F133)	B/2	:	Injector No. 3
E3★ (F134)	B/2	:	Injector No. 5
D4 (F135)	B/1	:	Oil pressure switch
D4★ (F136)	GY/2	:	Crankshaft position sensor (REF)

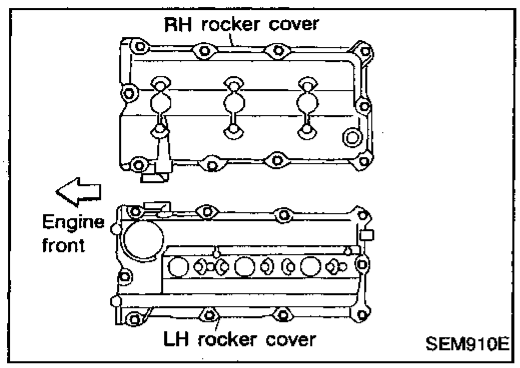
★ : Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

SEC. 140•147•210•211•221



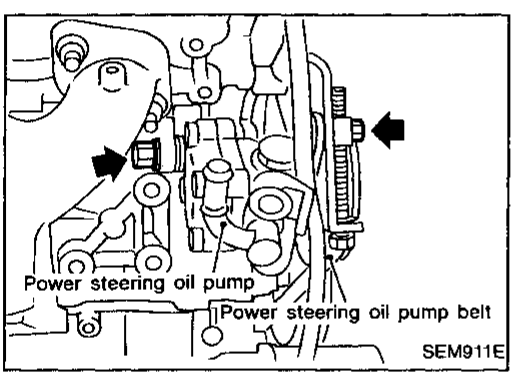
① EGRC-BPT valve
② EGR valve
③ EGR temperature sensor
④ Camshaft position sensor (PHASE)
⑤ Thermostat with water inlet
⑥ Exhaust manifold
⑦ Water outlet

Removal (Cont'd)

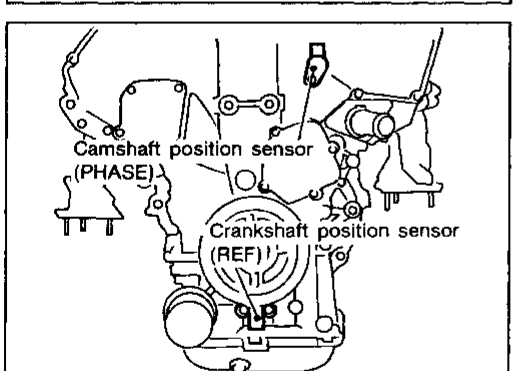


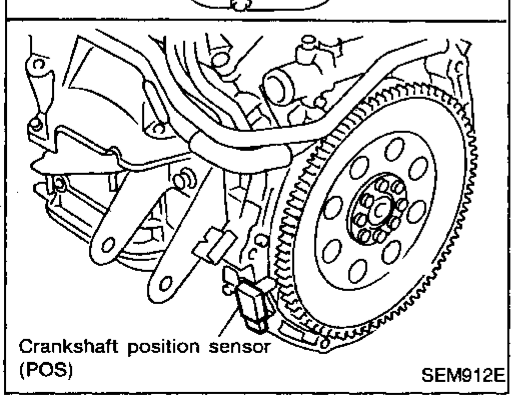
12. Remove RH and LH rocker covers from cylinder head.

13. Remove engine undercover.
14. Remove front RH wheel and engine side cover.
15. Remove drive belts and idler pulley bracket.



16. Remove power steering oil pump belt and power steering oil pump assembly.





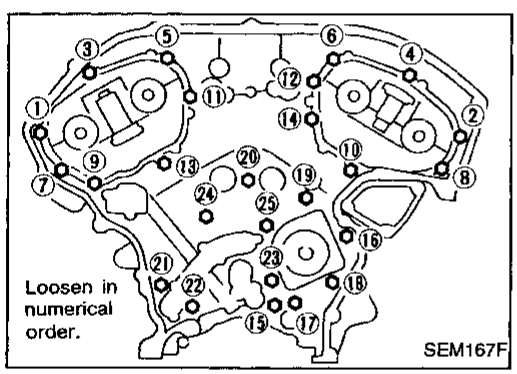
17. Remove camshaft position sensor (PHASE) and crankshaft position sensors (REF)/(POS).

CAUTION:

- **When installing camshafts, chain tensioners, oil seals, or other sliding parts, lubricate contacting surfaces with new engine oil.**
- **Apply new engine oil to threads and seat surfaces when installing cylinder head, camshaft sprocket, crankshaft pulley, and camshaft bracket.**
- **Attach tags to valve lifters so as not to mix them up.**

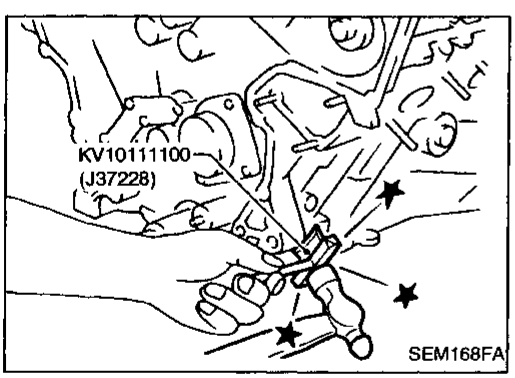
Removal

- **This removal is the same procedure as that for timing chain. Refer to "Removal" in "TIMING CHAIN" (EM-19).**
- **Apply paint to camshaft sprockets for alignment during installation.**

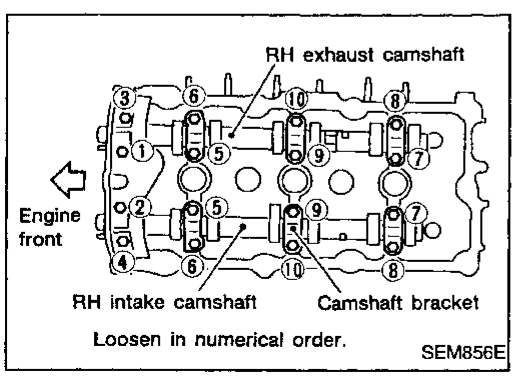


Disassembly

1. Remove rear timing chain case bolts.



2. Remove rear timing chain case.

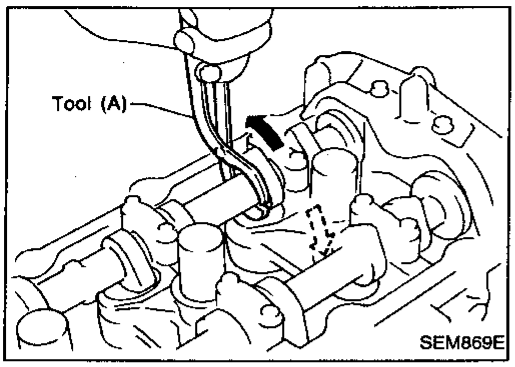


3. Remove intake and exhaust camshafts and camshaft brackets.
   - Equally loosen camshaft bracket bolts in several steps in the numerical order shown in the figure.

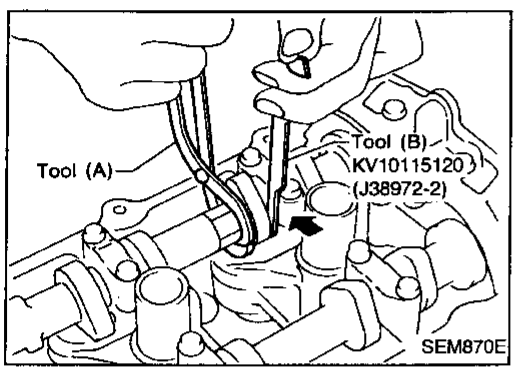
For reinstallation, be sure to put marks on camshaft bracket before removal.

4. Remove valve component parts.
   Refer to "VALVE OIL SEAL" in "OIL SEAL REPLACEMENT" (EM-31).

Adjusting (Cont'd)



3. Rotate Tool (A) (See figure.) so that valve lifter is pushed down.

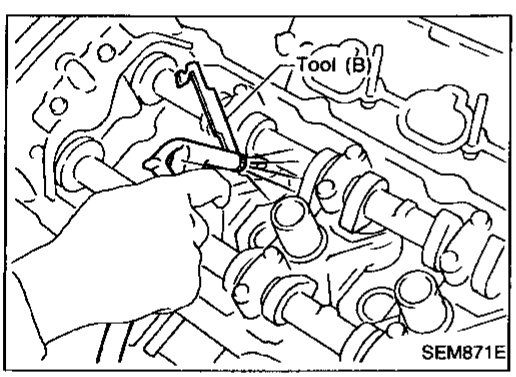


4. Place Tool (B) between camshaft and the edge of the valve lifter to retain valve lifter.

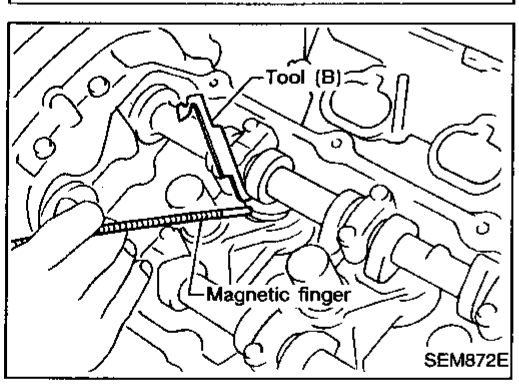
CAUTION:

- **Tool (B) must be placed as close to camshaft bracket as possible.**
- **Be careful not to damage cam surface with Tool (B).**

5. Remove Tool (A).



6. Blow air into the hole to separate adjusting shim from valve lifter.



7. Remove adjusting shim using a small screwdriver and a magnetic finger.
8. Determine replacement adjusting shim size following formula.

- Using a micrometer determine thickness of removed shim.
- Calculate thickness of new adjusting shim so valve clearance comes within specified values.

R = Thickness of removed shim
N = Thickness of new shim
M = Measured valve clearance

Intake:

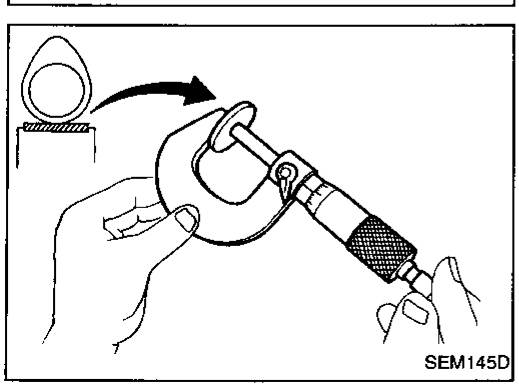
N = R + [M – 0.30 mm (0.0118 in)]

Exhaust:

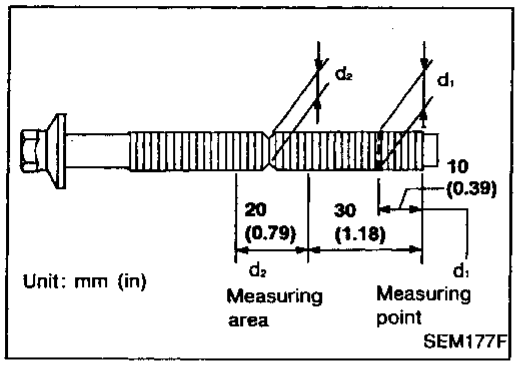
N = R + [M – 0.33 mm (0.0130 in)]

Shims are available in 64 sizes from 2.32 mm (0.0913 in) to 2.95 mm (0.1161 in), in steps of 0.01 mm (0.0004 in).

- Select new shim with thickness as close as possible to calculated value.

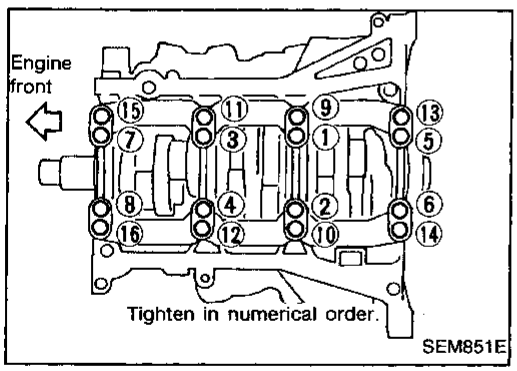


Assembly (Cont'd)



2. Instructions for re-use of main bearing cap bolts.

- **A plastic zone tightening method is used for tightening main bearing cap bolts. Measure d1 and d2 as shown in the figure.**
  d2: Select minimum diameter in the measuring area.
  If the difference between d1 and d2 exceeds the limit, replace the bolts with new ones.
  Limit (d1 - d2): 0.11 mm (0.0043 in)

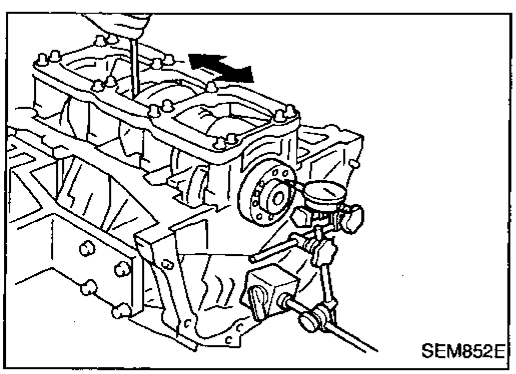


3. After installing crankshaft, main bearing cap, main bearing beam and bearing cap bolts, tighten bearing cap bolts in numerical order.

- **Tightening procedure**

(1) Tighten all bolts to 32 to 38 N·m (3.3 to 3.9 kg-m, 24 to 28 ft-lb).
(2) Turn all bolts 90 to 95 degrees clockwise with angle wrench.

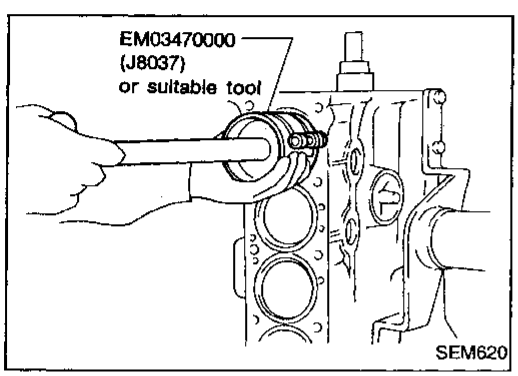
- **Prior to tightening bearing cap bolts, place bearing beam in its proper position by shifting crankshaft in the axial direction.**
- **After securing bearing cap bolts, make sure crankshaft turns smoothly by hand.**
- **Lubricate threads and seat surfaces of the bolts with new engine oil.**



4. Measure crankshaft end play.
   Crankshaft end play:
   Standard: 0.10 - 0.25 mm (0.0039 - 0.0098 in)
   Limit: 0.30 mm (0.0118 in)

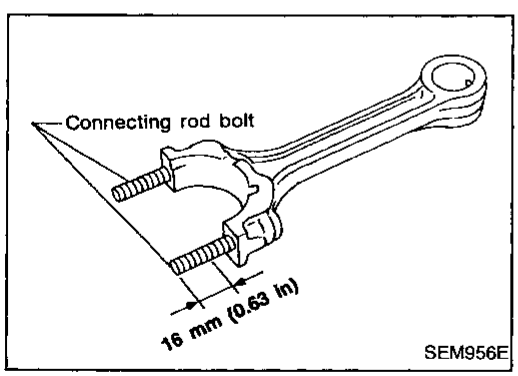
If beyond the limit, replace bearing with a new one.

5. Install connecting rod bearings in connecting rods and connecting rod caps.
- Confirm that correct bearings are used.



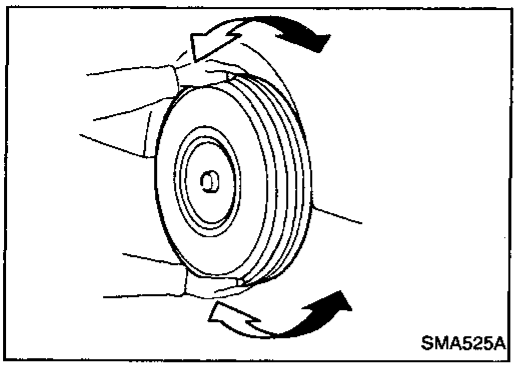
6. Install pistons with connecting rods.
a. Install them into corresponding cylinders with Tool.

- **Be careful not to scratch cylinder wall with the connecting rod.**
- **Arrange so that front mark on piston head faces toward engine front.**



b. A plastic zone tightening method is used for tightening connecting rod bolts and nuts. Check the old bolts for deformation before re-using them.

- **Ensure that the connecting rod nut can be screwed smoothly as far as the bolt thread end.**
- **If this is not possible, use slide calipers to measure the outside diameter of the narrowest thread part of the bolt at 16 mm (0.63 in) from the thread end. Replace the connecting rod bolt and nut, if under the limit.**
  Standard: 7.90 - 8.00 mm (0.3110 - 0.3150 in)
  Limit: 7.75 mm (0.3051 in)

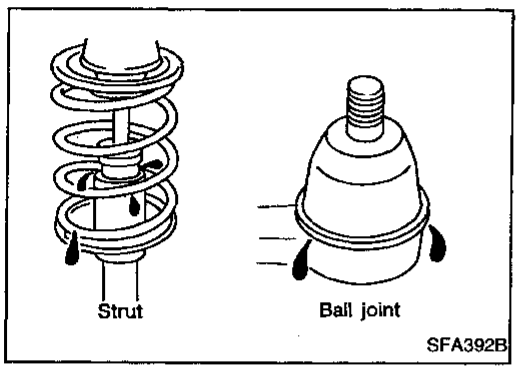

SMA525A

Front Axle and Front Suspension Parts

Check front axle and front suspension parts for looseness, cracks, wear or other damage.

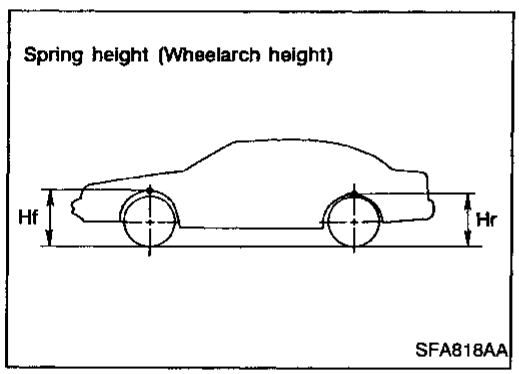
- Shake each front wheel to check for excessive play.
- Make sure that cotter pins are inserted.
- Retighten all axle and suspension nuts and bolts to the specified torque.

Tightening torque:
Refer to FRONT SUSPENSION (FA-20).



SFA392B

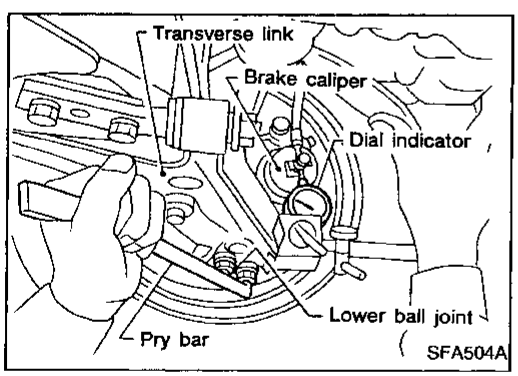
- Check strut (shock absorber) for oil leakage or other damage.
- Check suspension ball joint for grease leakage and ball joint dust cover for cracks or other damage.
  If ball joint dust cover is cracked or damaged, replace transverse link.



SFA818AA

- Check spring height from top of wheelarch to the ground.

(1) Vehicle must be unladen*, parked on a level surface, and tires checked for proper inflation and wear (tread wear indicator must not be showing).
*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.
(2) Bounce vehicle up and down several times before measuring.
Standard height: Refer to SDS (FA-25).
(3) Spring height is not adjustable. If out of specification, check for worn springs or suspension parts.

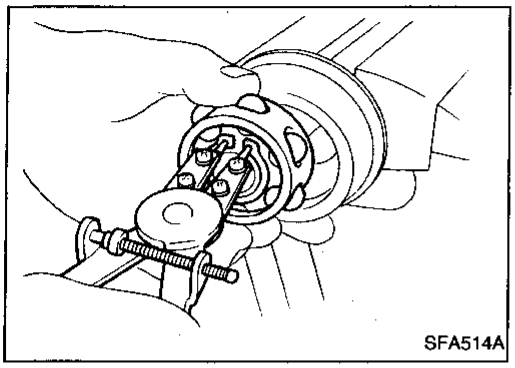


SFA504A

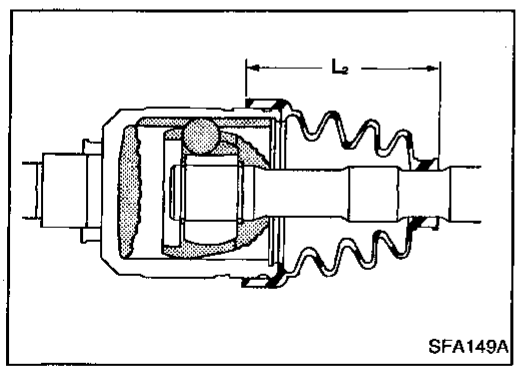
- Check suspension ball joint end play.

(1) Jack up front of vehicle and set the stands.
(2) Clamp dial indicator onto transverse link and place indicator tip on lower edge of brake caliper.
(3) Make sure front wheels are straight and brake pedal is depressed.
(4) Place a pry bar between transverse link and inner rim of road wheel.
(5) While raising and releasing pry bar, observe maximum dial indicator value. **Vertical end play: 0 mm (0 in)**
(6) If ball joint movement is beyond specifications, remove and replace it.

Drive Shaft (Cont'd)


SFA514A

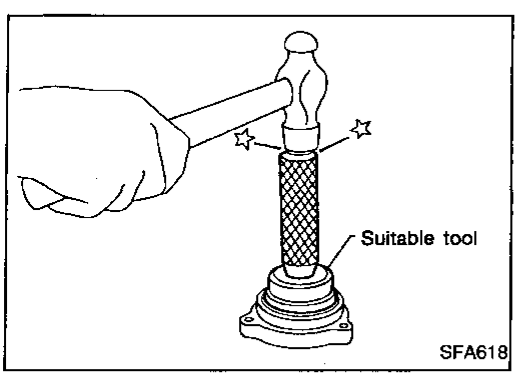
2. Install ball cage, inner race and balls as a unit, making sure the marks which were made during disassembly are properly aligned.
3. Install new snap ring.



SFA149A

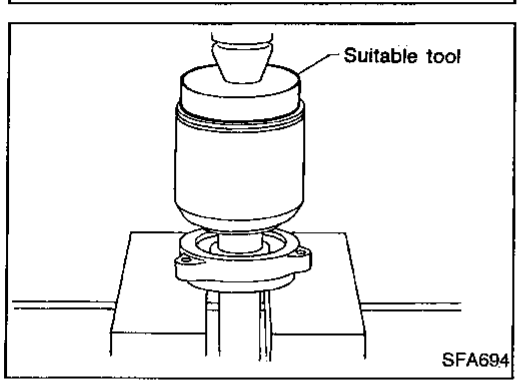
4. Pack drive shaft with specified amount of grease.
   Specified amount of grease:
   165 - 175 g (5.82 - 6.17 oz)
5. Install slide joint housing, then install new snap ring.
6. Make sure that boot is properly installed on the drive shaft groove.
   Set boot so that it does not swell and deform when its length is "L_2".
   Length "L_2": 97 - 99 mm (3.82 - 3.90 in)
7. Lock new larger and smaller boot bands securely with a suitable tool.

Support bearing



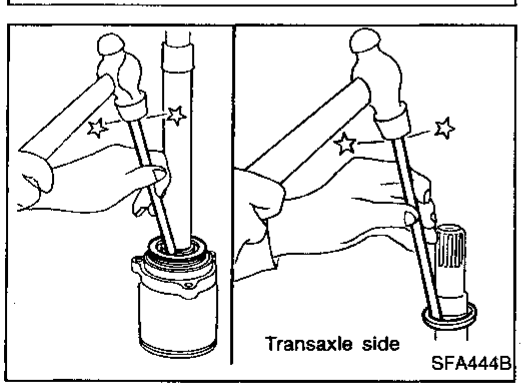
SFA618

- Press bearing into retainer.



SFA694

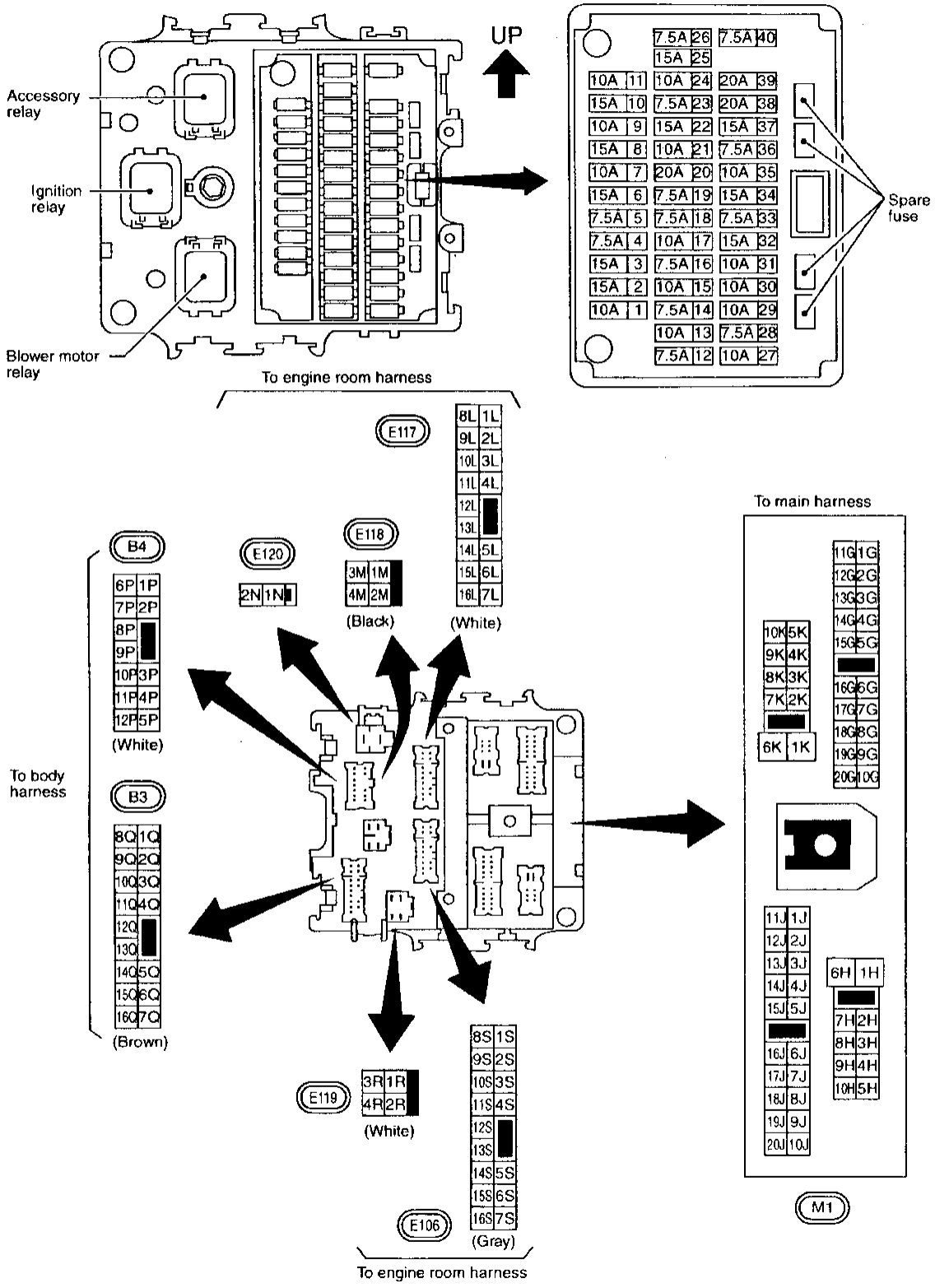
- Press drive shaft into bearing.



SFA444B

- Install snap ring.
- Install new dust shield.

Terminal Arrangement



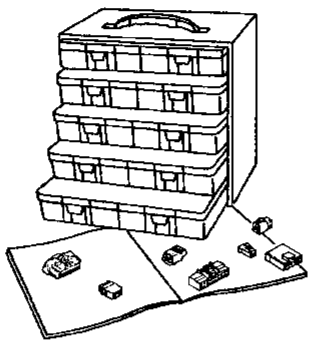
Description

Number	Item	Description
①	Power condition	• This shows the condition when the system receives battery positive voltage (can be operated).
②	Fusible link	• The double line shows that this is a fusible link. • The open circle shows current flow in, and the shaded circle shows current flow out.
③	Fusible link/fuse location	• This shows the location of the fusible link or fuse in the fusible link or fuse box. For arrangement, refer to EL section ("POWER SUPPLY ROUTING").
④	Fuse	• The single line shows that this is a fuse. • The open circle shows current flow in, and the shaded circle shows current flow out.
⑤	Current rating	• This shows the current rating of the fusible link or fuse.
⑥	Connectors	• This shows that connector (E3) is female and connector (M1) is male. • The G/R wire is located in the 1A terminal of both connectors. • Terminal number with an alphabet (1A, 5B, etc.) indicates that the connector is SMJ connector. Refer to GI-17.
⑦	Optional splice	• The open circle shows that the splice is optional depending on vehicle application.
⑧	Splice	• The shaded circle shows that the splice is always on the vehicle.
⑨	Page crossing	• This arrow shows that the circuit continues to an adjacent page. • The A will match with the A on the preceding or next page.
⑩	Common connector	• The dotted lines between terminals show that these terminals are part of the same connector.
⑪	Option abbreviation	• This shows that the circuit is optional depending on vehicle application.
⑫	Relay	• This shows an internal representation of the relay. For details, refer to EL section ("STANDARDIZED RELAY").
⑬	Connectors	• This shows that the connector is connected to the body or a terminal with bolt or nut.
⑭	Wire color	• This shows a code for the color of the wire. B = Black, BR = Brown W = White, OR = Orange R = Red, P = Pink G = Green, PU = Purple L = Blue, GY = Gray Y = Yellow, SB = Sky Blue LG = Light Green, CH = Dark Brown DG = Dark Green When the wire color is striped, the base color is given first, followed by the stripe color as shown below: Example: L/W = Blue with White Stripe
⑮	Option description	• This shows a description of the option abbreviation used on the page.
⑯	Switch	• This shows that continuity exists between terminals 1 and 2 when the switch is in the A position. Continuity exists between terminals 1 and 3 when the switch is in the B position.
⑰	Assembly parts	• Connector terminal in component shows that it is a harness incorporated assembly.
⑱	Cell code	• This identifies each page of the wiring diagram by section, system and wiring diagram page number.

Circuit Inspection

CONNECTOR AND TERMINAL PIN KIT

Use the connector and terminal pin kit listed below when replacing connectors or terminals.
The connector and terminal pin kit contains some of the most commonly used NISSAN connectors and terminals.

Tool number (Kent-Moore No.) Tool name	Description
— (J38751-95NI) Connector and terminal pin kit	 AGI063

INTRODUCTION

In general, testing electrical circuits is an easy task if it is approached in a logical and organized method. Before beginning it is important to have all available information on the system to be tested. Also, get a thorough understanding of system operation. Then you will be able to use the appropriate equipment and follow the correct test procedure.
You may have to simulate vehicle vibrations while testing electrical components. **Gently shake** the wiring harness or electrical component to do this.

OPEN — A circuit is open when there is no continuity through a section of the circuit.

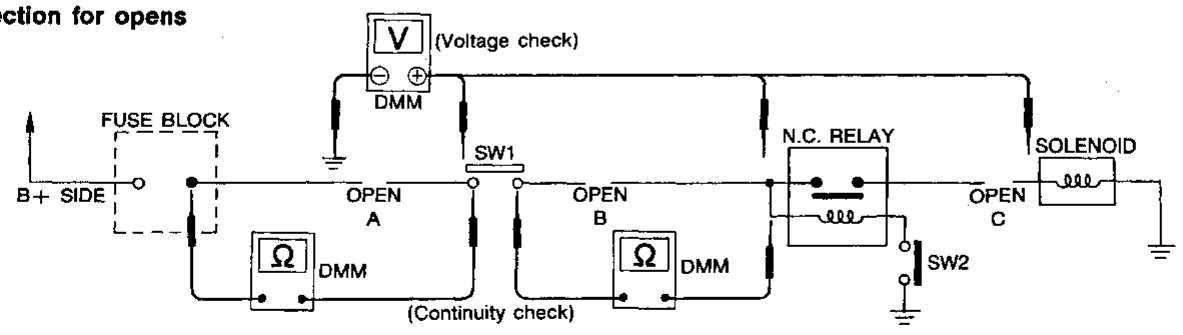
SHORT — There are two types of shorts.

- SHORT CIRCUIT — When a circuit contacts another circuit and causes the normal resistance to change.
- SHORT TO GROUND — When a circuit contacts a ground source and grounds the circuit.

TESTING FOR "OPENS" IN THE CIRCUIT

Before you begin to diagnose and test the system, you should rough sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system.

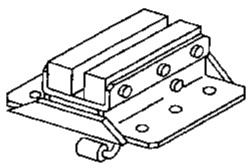
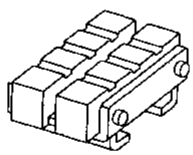
Inspection for opens

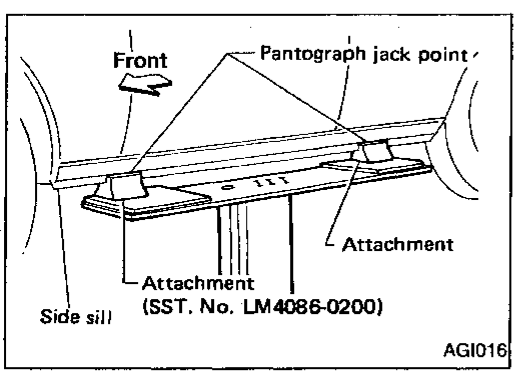


Preparation

SPECIAL SERVICE TOOLS

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

Tool number (Kent-Moore number) Tool name	Description
LM4086-0200 (—) Board on attachment	 NT001
LM4519-0000 (—) Safety stand attachment	 NT002



Board-on Lift

CAUTION:
Make sure vehicle is empty when lifting.

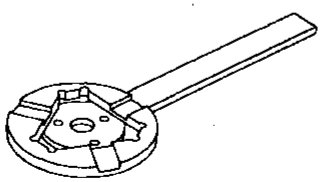
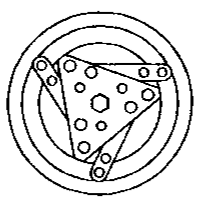
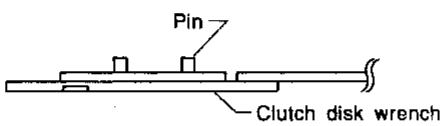
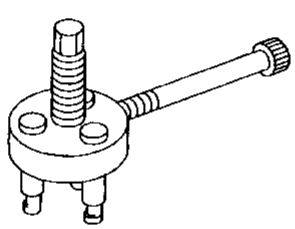
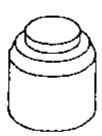
- **The board-on lift attachment (LM4086-0200) set at front end of vehicle should be set on the front of the sill under the front door opening.**
- **Position attachments at front and rear ends of board-on lift.**

Precautions for Servicing Compressor

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same position as it is when mounted on the car.**
- **When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to HA-94.**
- **Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.**
- **After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.**
- **After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.**

Special Service Tools

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

Tool number (Kent-Moore No.) Tool name	Description
KV99106100 (J-41260) Clutch disc wrench	Removing center bolt  NT232  When replacing the magnet clutch in the above compressor, use a clutch disc wrench with the pin side on the clutch disc to remove it.  NT378
KV99232340 (J-38874) or KV992T0001 (—) Clutch disc puller	Removing clutch disc  NT376
KV99106200 (J-41261) Pulley installer	Installing pulley  NT235

Control Operation (Cont'd)

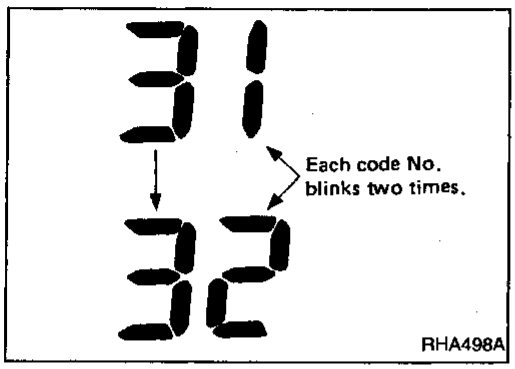
RECIRCULATION (REC) SWITCH

ON position: Interior air is recirculated inside the vehicle.
OFF position: Automatic control resumes.
Recirculation is canceled when AUTO, DEF or ECON is selected. Recirculation resumes when another mode is chosen.

DEFROST (DEF) SWITCH

Positions the mode doors to the defrost position. Also positions the air intake doors to the outside air position. The compressor operates at ambient temperature approx. 2°C (35°F) or above.

Self-diagnosis (Cont'd)



RHA498A

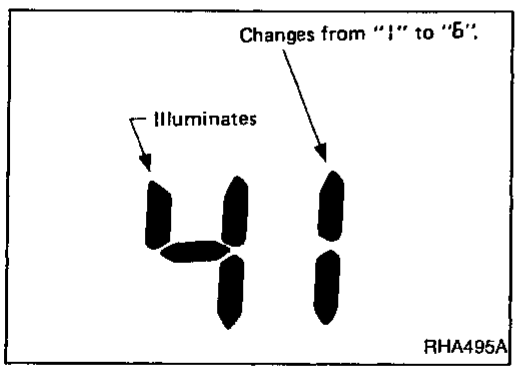
If two or more mode or intake doors are out of order, corresponding code numbers respectively blink two times.
If mode door motor harness connector is disconnected, the following display pattern will appear.

31 → 32 → 33 → 34 →35

If intake mode door harness connector is disconnected, the following display pattern will appear.

36 → 38 →39

If any mode door motor position switch is malfunctioning, mode door motor will also malfunction.



RHA495A

STEP 4: Checks operation of each actuator

Display shows "41 " in STEP 4 mode.
When DEF switch is pressed one time, display shows "42 ". Thereafter, each time the switch is pressed, display advances one number at a time, up to "46 ", then returns to "41 ".

Discharge air flow

Switch mode/ indicator	Air outlet/distribution		
	Face	Foot	Defroster
	100%	—	—
	60%	40%	—
	—	78%	22%
	—	60%	40%
	—	—	100%

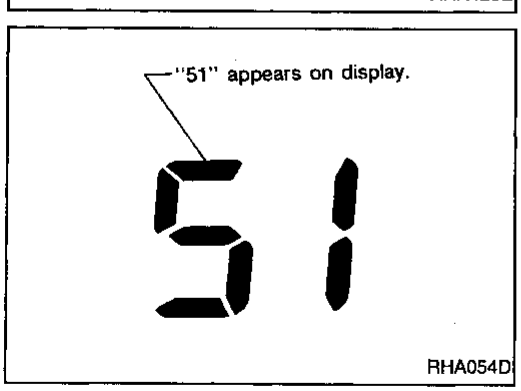
RHA429E

During inspection in STEP 4, the auto amp. will forcefully transmit an output to the affected actuators. The corresponding code Nos. are shown on display as indicated in the table below.

Checks must be made visually, by listening to any noise, or by touching air outlets with your hand, etc. for improper operation.

Code No. / Actuator	41	42	43	44	45	46
Mode door	VENT	B/L	B/L	FOOT	F/D	DEF
Intake door	REC	REC	20% FRE	FRE	FRE	FRE
Air mix door	Full Cold	Full Cold	Full Hot	Full Hot	Full Hot	Full Hot
Blower motor	4 - 5 V	9 - 11 V	7 - 9 V	7 - 9 V	7 - 9 V	10 - 12 V
Compressor	ON	ON	OFF	OFF	ON	ON

Operating condition of each actuator cannot be checked by indicators.



RHA054D

STEP 5: Checks temperature detected by sensors, and detects multiplex communication error

Checks temperature detected by sensors

Display shows "51 " in STEP 5 mode.

- When FRONT DEF switch is pressed one time, display shows temperature detected by ambient sensor.
- When FRONT DEF switch is pressed second time, display shows temperature detected by in-vehicle sensor.
- When FRONT DEF switch is pressed third time, display returns to original presentation "51 ".

Performance Chart

TEST CONDITION

Testing must be performed as follows:

Vehicle location: Indoors or in the shade (in a well ventilated place)
Doors: Closed
Door window: Open
Hood: Open
TEMP. setting: Max. COLD
Discharge Air: Face Vent
Recirculation switch: ON
FAN speed: 4-speed
A/C switch: ON
Engine speed: 1,500 rpm
Operate the air conditioning system for 10 minutes before taking measurements.

TEST READING

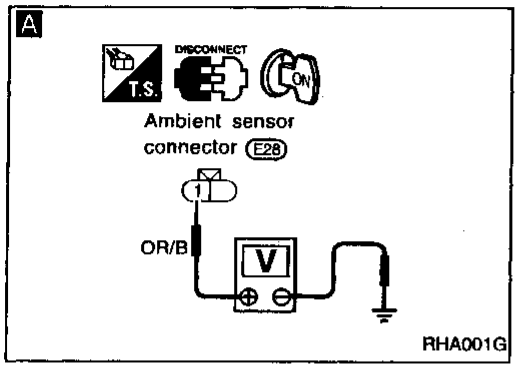
Recirculating-to-discharge air temperature table

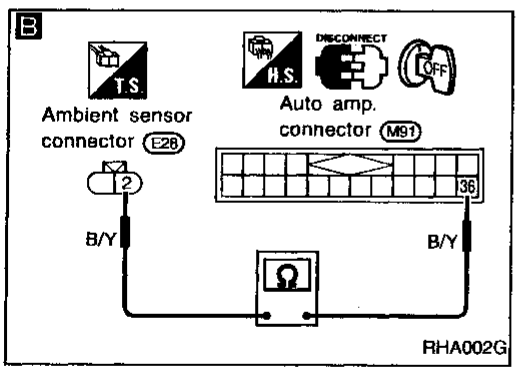
Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	1.5 - 2.6 (35 - 37)
	25 (77)	3.7 - 5.7 (39 - 42)
	30 (86)	7.6 - 10.0 (46 - 50)
	35 (95)	12.4 - 15.2 (54 - 59)
60 - 70	20 (68)	2.6 - 3.6 (37 - 38)
	25 (77)	5.7 - 7.6 (42 - 46)
	30 (86)	10.0 - 12.4 (50 - 54)
	35 (95)	15.2 - 18.0 (59 - 64)

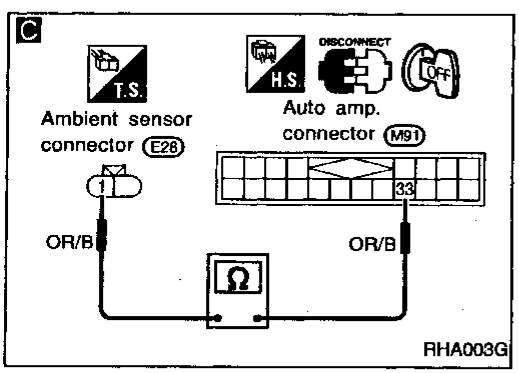
Ambient air temperature-to-operating pressure table

Ambient air		High-pressure (Discharge side) kPa (kg/cm^2, psi)	Low-pressure (Suction side) kPa (kg/cm^2, psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	785 - 1,040 (8.0 - 10.6, 114 - 151)	137 - 167 (1.4 - 1.7, 20 - 24)
	25 (77)	981 - 1,304 (10.0 - 13.3, 142 - 189)	137 - 167 (1.4 - 1.7, 20 - 24)
	30 (86)	1,167 - 1,550 (11.9 - 15.8, 169 - 225)	147 - 177 (1.5 - 1.8, 21 - 26)
	35 (95)	1,373 - 1,804 (14.0 - 18.4, 199 - 262)	157 - 186 (1.6 - 1.9, 23 - 27)
	40 (104)	1,550 - 2,059 (15.8 - 21.0, 225 - 299)	167 - 206 (1.7 - 2.1, 24 - 30)

If pressure is not within range, refer to "Trouble Diagnoses for Abnormal Pressure".







Diagnostic Procedure 1

SYMPTOM: Ambient sensor circuit is open or shorted. (21 or −21 is indicated on display as a result of conducting Self-diagnosis STEP 2.)

A

CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (BCM).
Disconnect ambient sensor harness connector.
Do approx. 5 volts exist between ambient sensor harness terminal ① and body ground?

No → Disconnect auto amp. (BCM) harness connector.

C

Note

Check circuit continuity between ambient sensor harness terminal ① and auto amp. (BCM) harness terminal ㉝.
Continuity should exist.
If OK, check harness for short.

OK → Replace auto amp. (BCM).

Yes → Disconnect auto amp. (BCM) harness connector.

B

Note

Check circuit continuity between ambient sensor harness terminal ② and auto amp. (BCM) harness terminal ㊱.
Continuity should exist.
If OK, check harness for short.

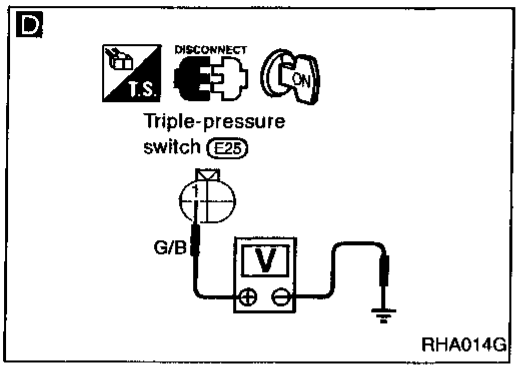
OK → CHECK AMBIENT SENSOR.
(Refer to Control System Input Components.) (HA-82)

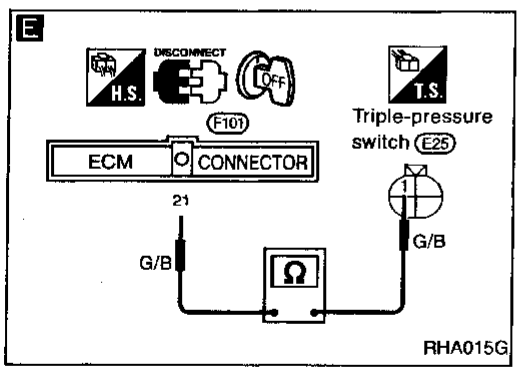
NG → Replace ambient sensor.

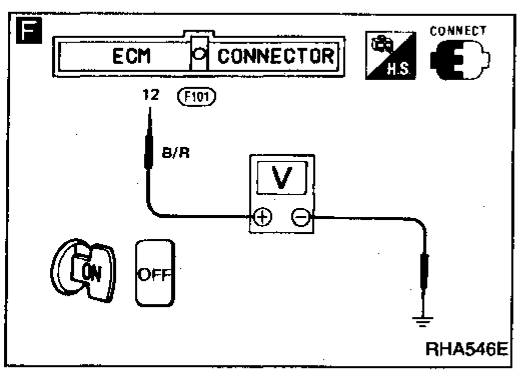
OK → Replace auto amp. (BCM).

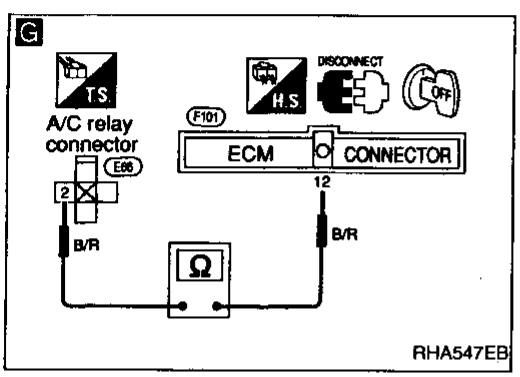
Note:
If the result is NG after checking circuit continuity, repair harness or connector.

Diagnostic Procedure 11 (Cont'd)









Ⓐ

D

CHECK TRIPLE-PRESSURE SWITCH CIRCUIT BETWEEN TRIPLE-PRESSURE SWITCH AND ECM (ECCS CONTROL MODULE).
Disconnect triple-pressure switch harness connector.
Do approx. 12 volts exist between triple-pressure switch harness terminal ① and body ground?

No → Disconnect ECM (ECCS control module) harness connector.

E Note

Check circuit continuity between ECM (ECCS control module) harness terminal ㉑ and triple-pressure switch harness terminal ①.
Continuity should exist.
If OK, check harness for short.

OK → CHECK ECM (ECCS control module).

Yes →

CHECK TRIPLE-PRESSURE SWITCH.
(Refer to Electrical Components Inspection.) (HA-78)

NG → Replace triple-pressure switch.

OK →

Reconnect triple-pressure switch harness connector.

F

CHECK COIL SIDE CIRCUIT OF A/C RELAY.
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal ⑫ and body ground?

No → **G** Note

Check circuit continuity between A/C relay harness terminal ② and ECM (ECCS control module) harness terminal ⑫.
Continuity should exist.
If OK, check harness for short.

OK → Ⓑ (Go to next page.)

Yes →

CHECK ECM (ECCS CONTROL MODULE).
(Refer to EC section.)

Note:
If the result is NG after checking circuit continuity, repair harness or connector.

Control System Output Components (Cont'd)

AUTOMATIC MODE

In the automatic mode, the blower motor speed is calculated by the auto amp. based on inputs from the PBR, in-vehicle sensor, intake sensor, sunload sensor, and ambient sensor. The blower motor applied voltage ranges from approximately 4.5 volts (lowest speed) to 12 volts (highest speed).
To control blower speed, the auto amp. supplies a signal (in the range of 2.5V to 9V), to the fan control amplifier. Based on this signal, the fan control amplifier controls the current flow from the blower motor to ground.

STARTING FAN SPEED CONTROL

Start up from "COLD SOAK" condition (Automatic mode)

In a cold start up condition where the engine coolant temperature is below 50°C (122°F), the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature. In the most extreme case (very low ambient) the blower starting delay will be 150 seconds. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 50°C (122°F). Then the blower speed will increase to the objective speed.

Start up from normal or "HOT SOAK" condition (Automatic mode)

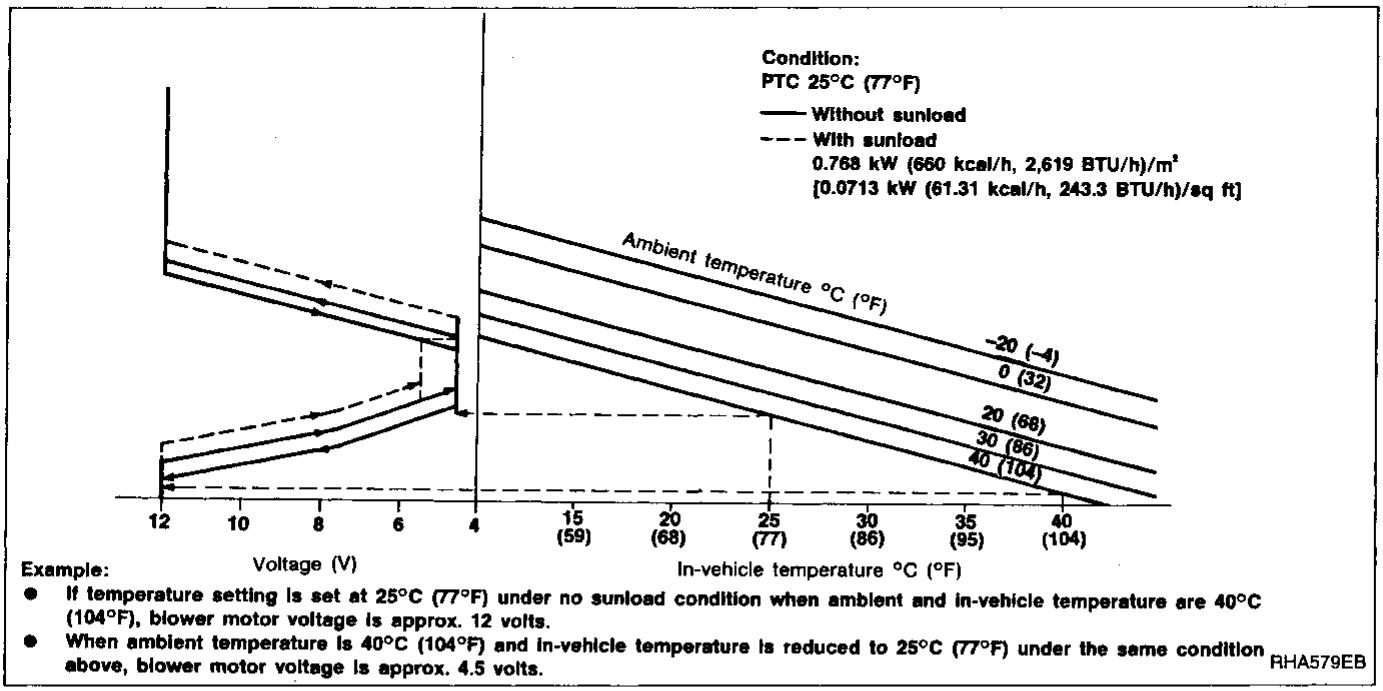
The blower will begin operation momentarily after the AUTO button is pushed. The blower speed will gradually rise to the objective speed over a time period of 5 seconds or less (actual time depends on the objective blower speed).

BLOWER SPEED COMPENSATION

Sunload

When the in-vehicle temperature and the set temperature are very close, the blower will operate at low speed. The low speed varies depending on the sunload. During conditions of high sunload, the blower low speed is "normal" low speed (approx. 5.5V). During lesser sunload conditions, the low speed will drop to "low" low speed (approx. 4.5V).

Fan speed control specification



Example:

- If temperature setting is set at 25°C (77°F) under no sunload condition when ambient and in-vehicle temperature are 40°C (104°F), blower motor voltage is approx. 12 volts.
- When ambient temperature is 40°C (104°F) and in-vehicle temperature is reduced to 25°C (77°F) under the same condition above, blower motor voltage is approx. 4.5 volts.

RHA579EB

General Specifications

COMPRESSOR

Model	CALSONIC make V-6
Type	V-6 variable displacement
Displacement cm^3 (cu in)/rev.	
Max.	184 (11.228)
Min.	14.5 (0.885)
Cylinder bore x stroke mm (in)	37 (1.46) x [2.3 - 28.6 (0.091 - 1.126)]
Direction of rotation	Clockwise (viewed from drive end)
Drive belt	Poly V

LUBRICANT

Model	CALSONIC make V-6
Name	Nissan A/C System Oil Type S
Part number	KLH00-PAGS0
Capacity mℓ (US fl oz, Imp fl oz)	
Total in system	250 (8.5, 8.8)
Compressor (Service part) charging amount	250 (8.5, 8.8)

REFRIGERANT

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.65±0.05 (1.43±0.11)

Inspection and Adjustment

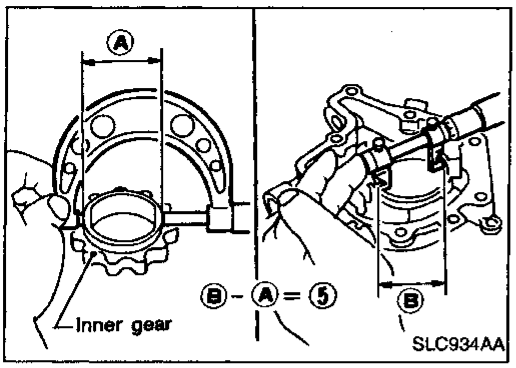
ENGINE IDLING SPEED (When A/C is ON)

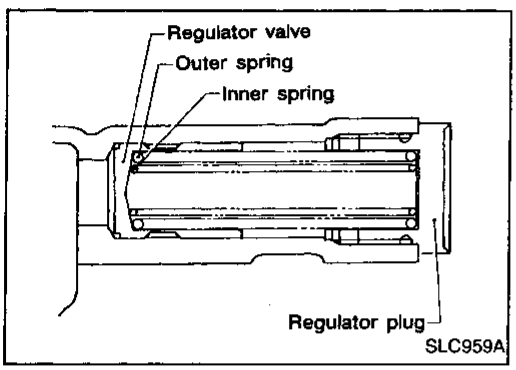
- Refer to EC section.

BELT TENSION

- Refer to Checking Drive Belts (MA section).

Oil Pump (Cont'd)

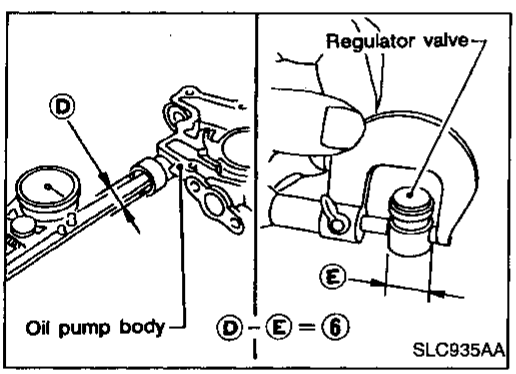




REGULATOR VALVE INSPECTION

1. Visually inspect components for wear and damage.
2. Check oil pressure regulator valve sliding surface and valve spring.
3. Coat regulator valve with engine oil. Check that it falls smoothly into the valve hole by its own weight.

If damaged, replace regulator valve set or oil pump body.

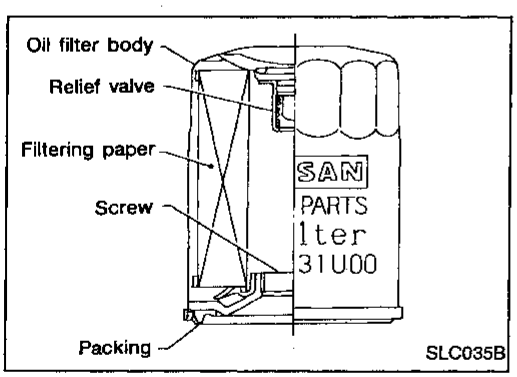


4. Check regulator valve to oil pump body clearance.

Clearance:

⑥ : 0.040 - 0.097 mm (0.0016 - 0.0038 in)

If it exceeds the limit, replace oil pump body.



OIL FILTER

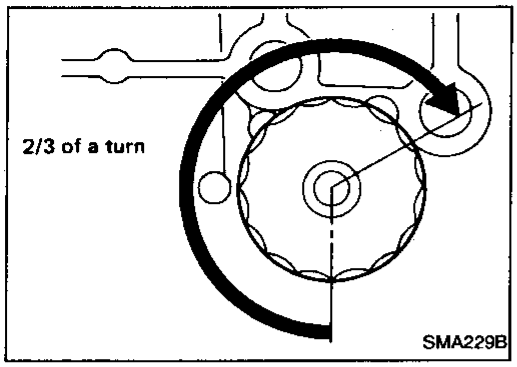
The oil filter is a small, full-flow cartridge type and is provided with a relief valve.

MAINTENANCE

SECTION MA

CONTENTS

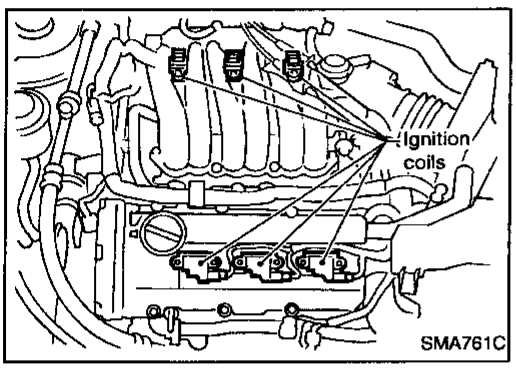
Changing Oil Filter (Cont'd)



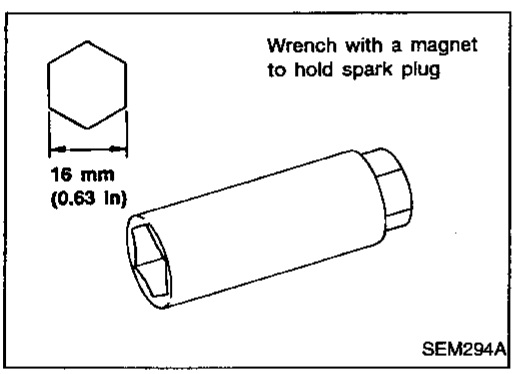
4. Screw in the oil filter until a slight resistance is felt, then tighten additionally 2/3 turn.
5. Add engine oil.

Refer to "Changing Engine Oil", MA-14 .

Changing Spark Plugs



1. Remove left side rocker cover ornament.
2. Disconnect ignition coil harness connectors.
3. Loosen ignition coil fixing bolts and pull out coil from intake manifold connector.



4. Remove spark plugs with suitable spark plug wrench.

Spark plug (Platinum-tipped type):

Make	NGK
Standard type	PFR5G-11
Hot type	PFR4G-11
Cold type	PFR6G-11

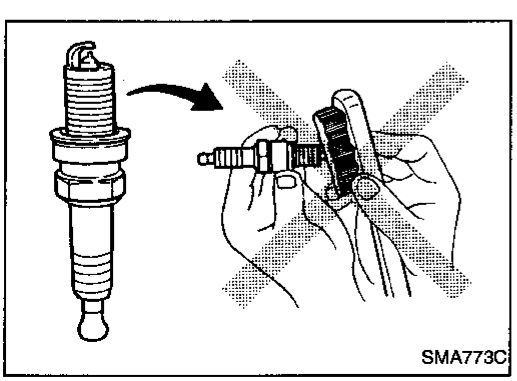
Use standard type spark plug for normal condition.
The hot type spark plug is suitable when fouling may occur with the standard type spark plug such as:

- frequent engine starts
- low ambient temperatures

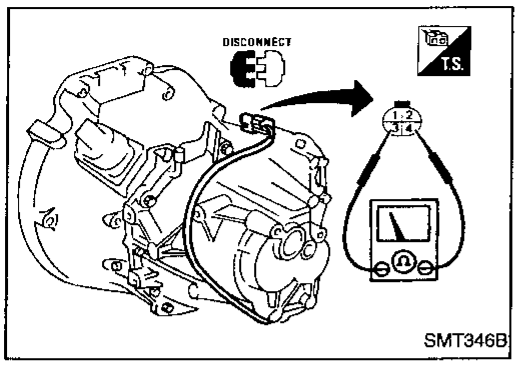
The cold type spark plug is suitable when spark knock may occur with the standard type spark plug such as:

- extended highway driving
- frequent high engine revolution

: 20 - 29 N·m
(2.0 - 3.0 kg-m, 14 - 22 ft-lb)



- **Do not use a wire brush for cleaning.**
- **If plug tip is covered with carbon, spark plug cleaner may be used.**
  Cleaner air pressure:
  Less than 588 kPa (6 kg/cm², 85 psi)
  Cleaning time:
  Less than 20 seconds

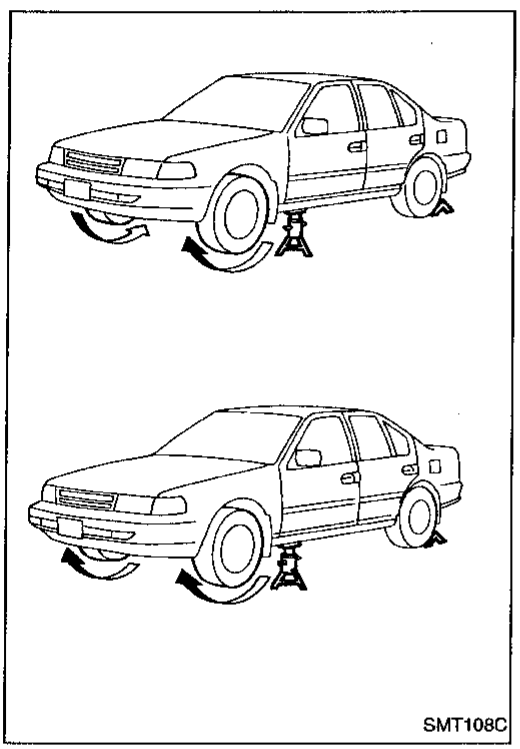


Position Switch Check

BACK-UP LAMP SWITCH AND NEUTRAL POSITION SWITCH

- Check continuity.

Gear position	Continuity
Reverse	② - ④
Neutral	① - ③
Except reverse and neutral	No



Viscous Coupling Check

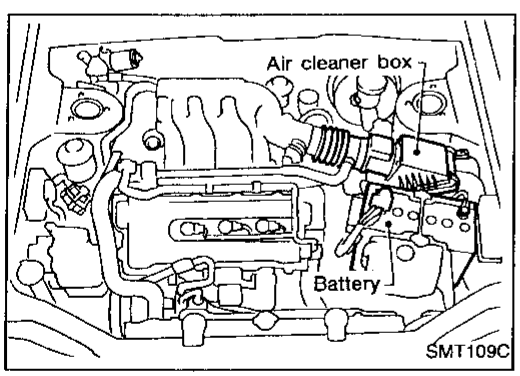
1. Apply parking brake firmly and place shift lever in the neutral position.
2. Jack up front wheels.
3. Rotate one front wheel and check turning direction of the other front wheel.

Turning direction of the two wheels is opposite:

The viscous coupling is not functioning normally.

Turning direction of the two wheels is the same:

If differential side gear and pinion mate gear thrust washers are OK, viscous coupling is functioning normally.



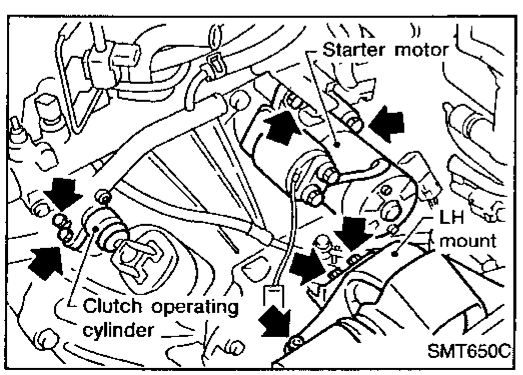
Removal

CAUTION:

Remove the crankshaft position sensor (POS) from transaxle assembly before separating transaxle from engine.

Be careful not to damage sensor edge.

1. Remove battery and its bracket.
2. Remove air cleaner box with mass air flow sensor.



3. Remove clutch operating cylinder from transaxle. Tighten clutch operating cylinder to the specified torque. Refer to CL section ("CLUTCH SYSTEM — Hydraulic Type").
4. Remove clutch hose clamp.
5. Disconnect speedometer pinion, position switch and ground harness connectors.
6. Remove starter motor from transaxle.
7. Remove crankshaft position sensor (POS) from transaxle front side.

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