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INFINITI®

Q45

MODEL FY33 SERIES

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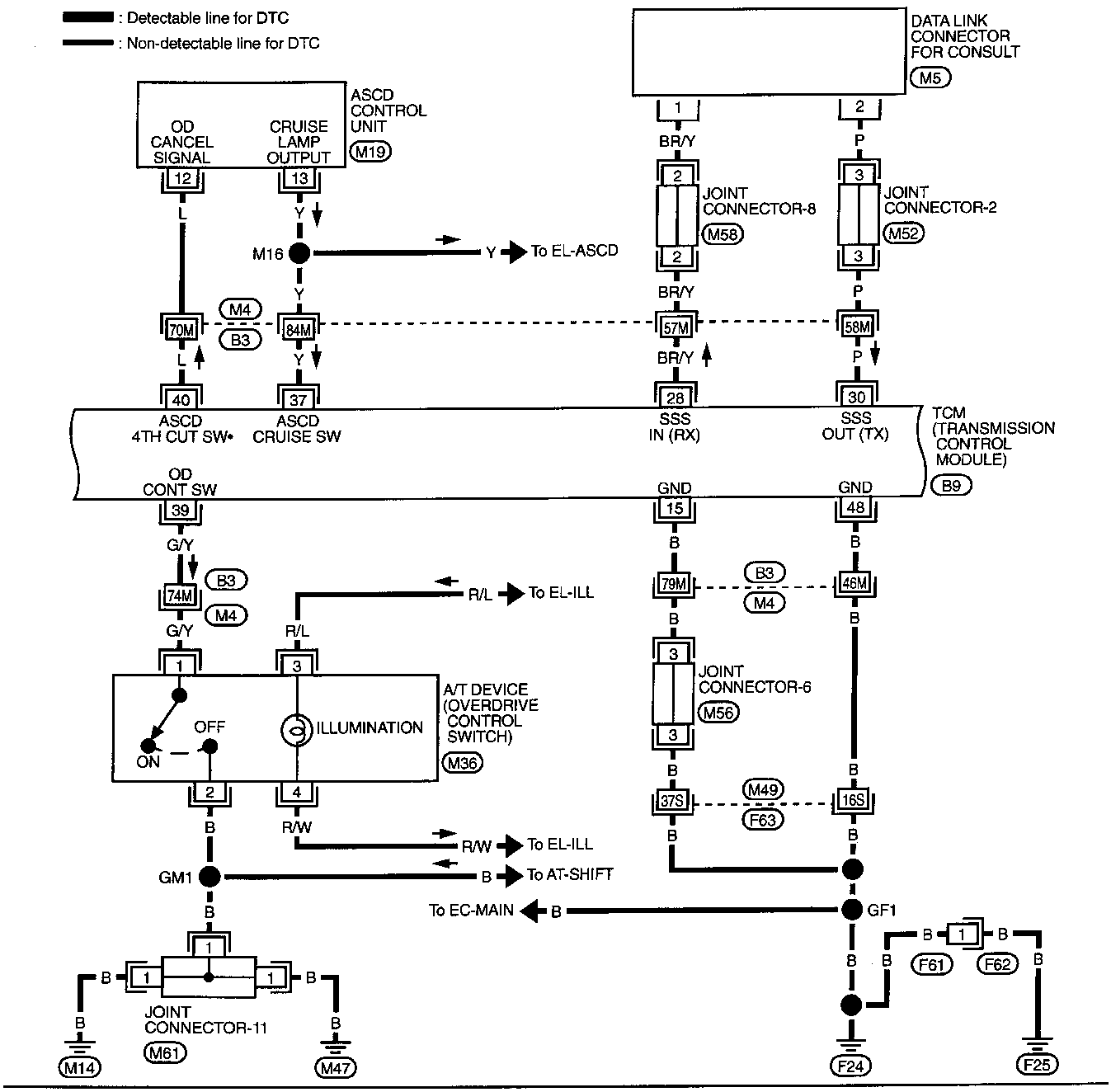


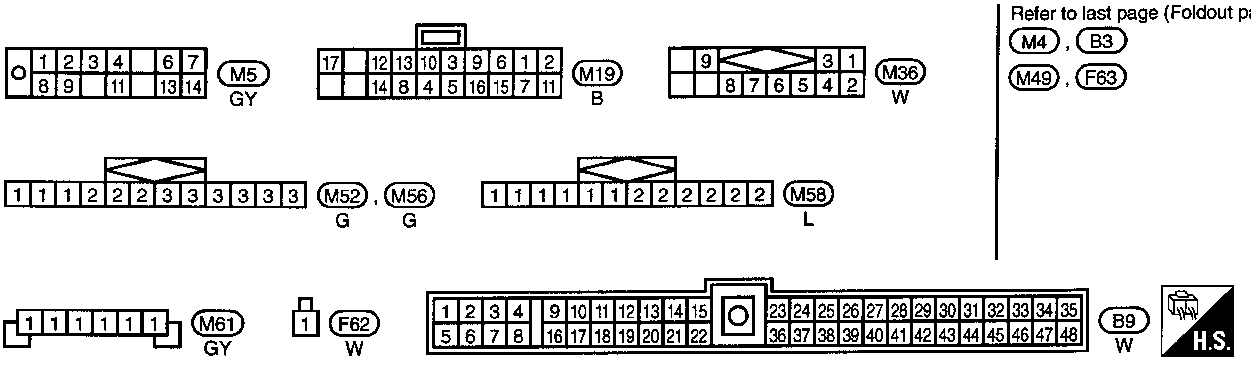
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Wiring Diagram (Cont'd)

AT-A/T-04





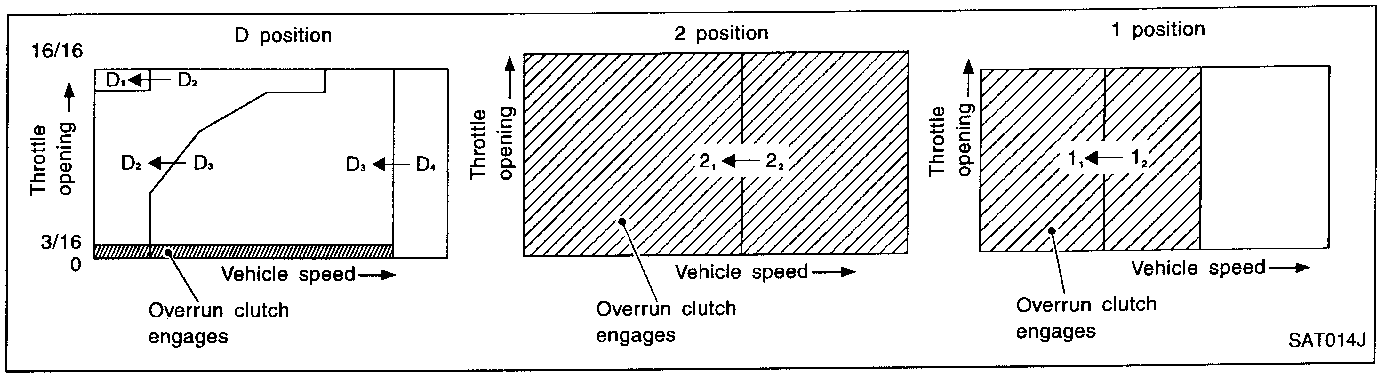
Refer to last page (Foldout page).
M4, B3
M49, F63

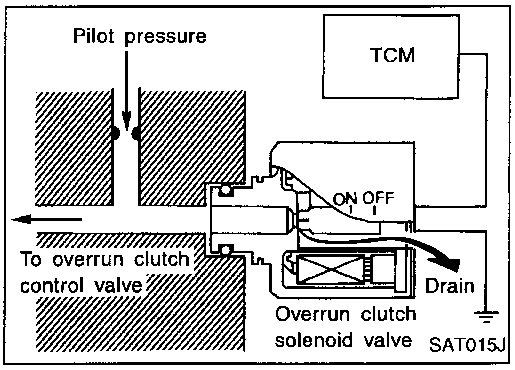
TAT208

Control Mechanism (Cont'd)

Overrun clutch operating conditions

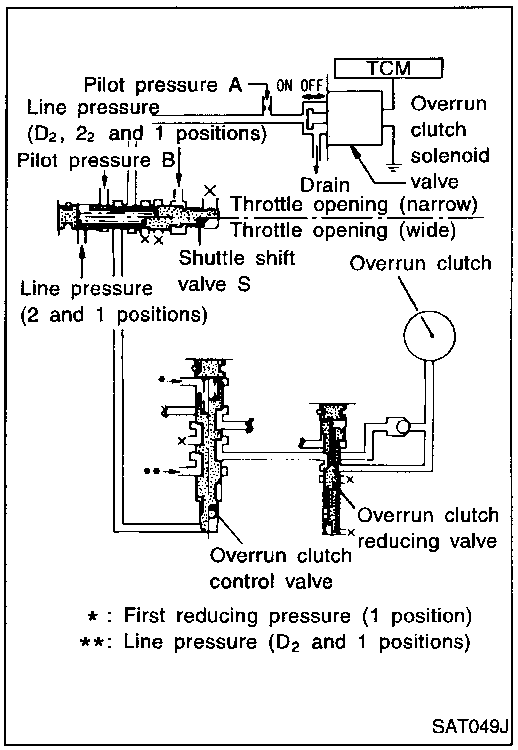
	Gear position	Throttle opening
"D" position	D_1, D_2, D_3 gear position	Less than 3/16
"2" position	2_1, 2_2 gear position	
"1" position	1_1, 1_2 gear position	At any position





Overrun clutch solenoid valve control

The overrun clutch solenoid valve is operated by an ON-OFF signal transmitted by the TCM to provide overrun clutch control (engine brake control).
When this solenoid valve is "ON", the pilot pressure drain port closes. When it is "OFF", the drain port opens.
During the solenoid valve "ON" pilot pressure is applied to the end face of the overrun clutch control valve.



Overrun clutch control valve operation

When the solenoid valve is "ON", pilot pressure A is applied to the overrun clutch control valve through shuttle shift valve S. This pushes up the overrun clutch control valve. The line pressure, which is routed by the overrun clutch reducing valve, is then shut off so that the clutch does not engage.
When the solenoid valve is "OFF", pilot pressure A is not generated. At this point, the overrun clutch control valve moves downward by spring force. As a result, overrun clutch operation pressure is provided by the overrun clutch reducing valve. This causes the overrun clutch to engage.
In the "1" position, the overrun clutch control valve remains pushed down so that the overrun clutch is engaged at all times.

Diagnostic Worksheet

INFORMATION FROM CUSTOMER

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

Customer name MR/MS	Model & Year	VIN
Trans. model	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	☐ Continuous ☐ Intermittent (times a day)	
Symptoms	☐ Vehicle does not move. (☐ Any position ☐ Particular position)	
	☐ No up-shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → O/D)	
	☐ No down-shift (☐ O/D → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)	
	☐ Lockup malfunction	
	☐ Shift point too high or too low.	
	☐ Shift shock or slip (☐ N → D ☐ Lockup ☐ Any drive position)	
	☐ Noise or vibration	
	☐ No kickdown	
	☐ No pattern select	
	☐ Others ( )	
O/D OFF indicator lamp	Blinks for about 8 seconds.	
	☐ Continuously lit	☐ Not lit
Malfunction indicator lamp (MIL)	☐ Continuously lit	☐ Not lit

Symptom Chart (Cont'd)

Reference page (AT-)		ON vehicle										OFF vehicle					
		58, 198	198, 138	88, 91, 152	61	130, 222	134, 129	115, 144	84, 196	196	196	206, 218	235, 239	241, 251	241, 249	210, 245	157, 257
Reference page (AT-)	Numbers are arranged in the order of inspection. Perform inspections starting with number one and work up. Circled numbers indicate that the transmission must be removed from the vehicle.	Fluid level Control linkage adjustment	PNP switch adjustment Throttle position sensor (Adjustment)	Revolution sensor and vehicle speed sensor Engine speed signal	Engine idling speed Line pressure	Control valve assembly Shift solenoid valve A	Shift solenoid valve B Line pressure solenoid valve	Torque converter clutch solenoid valve Overrun clutch solenoid valve	A/T fluid temperature sensor Accumulator N-D	Accumulator 1-2 Accumulator 2-3	Accumulator 3-4 (N-R) Ignition switch and starter	Torque converter Oil pump	Reverse clutch High clutch	Forward clutch Forward one-way clutch	Overrun clutch Low one-way clutch	Low & reverse brake Brake band	Turbine revolution sensor Parking components
—	Too sharp a shock in change from "D_3" to "D_4".		1		2	4					3				⑥	⑤	
—	Almost no shock or clutches slipping in change from "D_1" to "D_2".	1	2		3	5				4						⑥	
—	Almost no shock or slipping in change from "D_2" to "D_3".	1	2		3	5				4			⑥			⑦	
—	Almost no shock or slipping in change from "D_3" to "D_4".	1	2		3	5					4		⑥			⑦	
—	Vehicle braked by gear change from "D_1" to "D_2".	1											② ④		⑤	③	
—	Vehicle braked by gear change from "D_2" to "D_3".	1														②	
—	Vehicle braked by gear change from "D_3" to "D_4".	1											④	③	②		
—	Maximum speed not attained. Acceleration poor.	1	2			5 3	4					⑪ ⑩	⑥ ⑦			⑨ ⑧	
—	Failure to change gear from "D_4" to "D_3".	1	2			6 4	5	3							⑧	⑦	
—	Failure to change gear from "D_3" to "D_2" or from "D_4" to "D_2".	1	2			5 3	4						⑤			⑦	
—	Failure to change gear from "D_2" to "D_1" or from "D_3" to "D_1".	1	2			5 3	4						⑦		⑥	⑧	
—	Gear change shock felt during deceleration by releasing accelerator pedal.		1		2	4		3									
—	Too high a change point from "D_4" to "D_3", from "D_3" to "D_2", from "D_2" to "D_1".		1	2													
—	Kickdown does not operate when depressing pedal in "D_4" within kickdown vehicle speed.		1	2		3	4										
—	Kickdown operates or engine overruns when depressing pedal in "D_4" beyond kickdown vehicle speed limit.		2	1		3	4										
—	Races extremely fast or slips in changing from "D_4" to "D_3" when depressing pedal.	1	2		3	5	4						⑥	⑦			
—	Races extremely fast or slips in changing from "D_4" to "D_2" when depressing pedal.	1	2		3	6 5	4							⑧		⑦	
—	Races extremely fast or slips in changing from "D_3" to "D_2" when depressing pedal.	1	2		3	5	4		6	7			⑩	⑨		⑧	
—	Races extremely fast or slips in changing from "D_4" or "D_3" to "D_1" when depressing pedal.	1	2		3	5	4							⑥ ⑦	⑧		
—	Vehicle will not run in any position.	1 2			3		4					⑨ ⑤	⑥			⑧ ⑦	⑩
—	Transmission noise in "D", "2", "1" and "R" positions.	1										②					

A/T 1st Gear Function

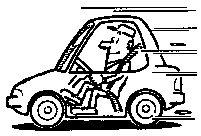
DESCRIPTION

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- 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 first gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard
6	R/Y	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in "D_1" or "D_4".)	Battery voltage
				When shift solenoid valve A does not operate. (When driving in "D_2" or "D_3".)	1V or less
7	LG/B	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in "D_1" or "D_2".)	Battery voltage
				When shift solenoid valve B does not operate. (When driving in "D_3" or "D_4".)	1V or less

ON BOARD DIAGNOSTIC LOGIC

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:
Torque converter slip ratio = A x C/B
A: Output shaft revolution signal from revolution sensor
B: Engine speed signal from ECM
C: Gear ratio determined as gear position which TCM supposes
If the actual gear position is higher than the position (1st) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.
This malfunction will be caused when either shift solenoid valve A is stuck open or shift solenoid valve B is stuck open.

A/T 4th Gear Function (Cont'd)

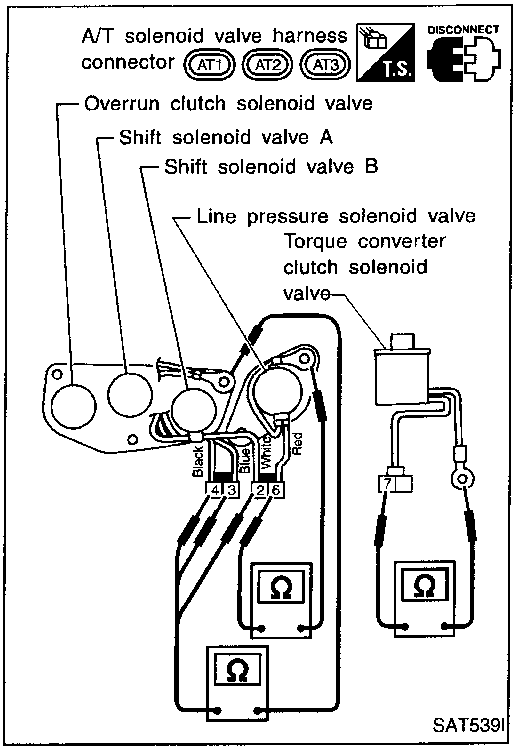
COMPONENT INSPECTION

Solenoid valves

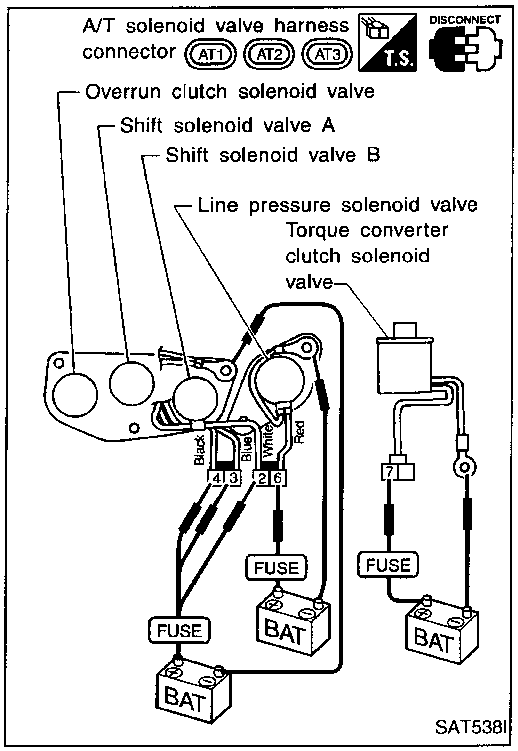
- For removal, refer to AT-196.

Resistance check

- Check resistance between two terminals.

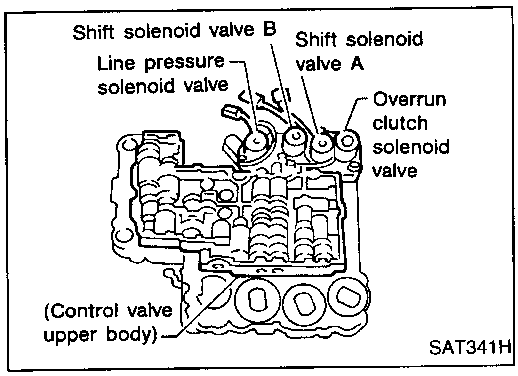


Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve A	③	Ground	20 - 40Ω
Shift solenoid valve B	②		
Overrun clutch solenoid valve	④		
Line pressure solenoid valve	⑥		2.5 - 5Ω
Torque converter clutch solenoid valve	⑦		10 - 20Ω



Operation check

- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



Shift Solenoid Valve B

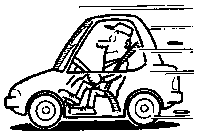
DESCRIPTION

Shift solenoid valves A and B are turned "ON" or "OFF" by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

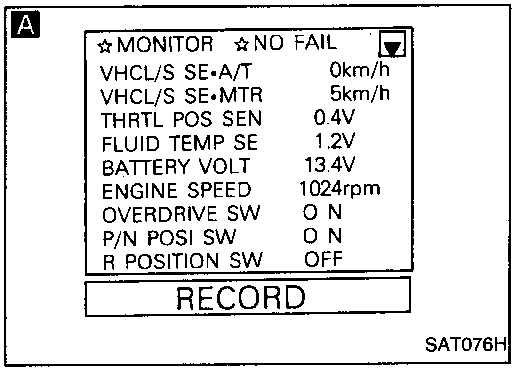
Terminal No.	Wire color	Item	Condition		Judgement standard
7	LG/B	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in "D_1" or "D_2".)	Battery voltage
				When shift solenoid valve B does not operate. (When driving in "D_3" or "D_4".)	1V or less

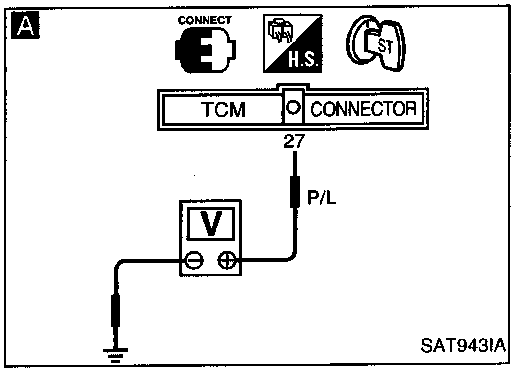
ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when ...	Check item (Possible cause)
: SFT SOL B/CIRC : P0755 : MIL Code No. 1201	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	• Harness or connectors (The solenoid circuit is open or shorted.) • Shift solenoid valve B

Vehicle Speed Sensor·MTR (Cont'd)

DIAGNOSTIC PROCEDURE





INSPECTION START

A

CHECK INPUT SIGNAL.

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT.
3. Read out the value of "VHCL/S SE·MTR" while driving. Check the value changes according to driving speed.

OR

1. Start engine.
2. Check voltage between TCM terminal ㉗ and ground while driving at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.

Voltage:

Voltage varies between less than 1V and more than 4.5V.

NG →

Check the following items:

- Vehicle speed sensor and ground circuit for vehicle speed sensor Refer to EL section ("METERS AND GAUGES").
- Harness for short or open between TCM and vehicle speed sensor (Main harness)

OK ↓

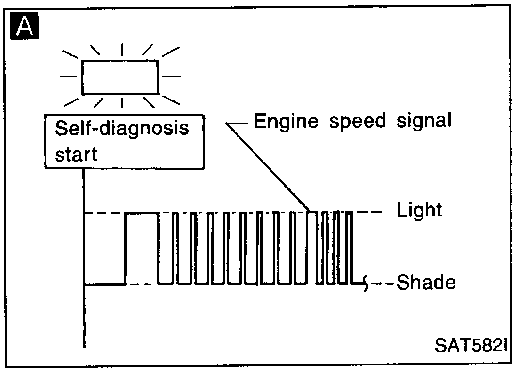
Perform DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE, AT-153.

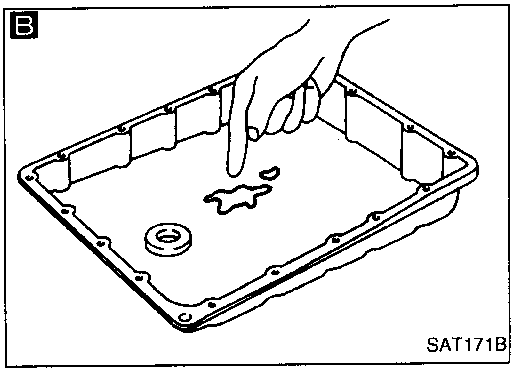
NG →

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK ↓

INSPECTION END





13. A/T Does Not Hold Lock-up Condition

SYMPTOM:

A/T does not hold lock-up condition for more than 30 seconds.

A

Does self-diagnosis show damage to engine speed signal circuit after cruise test?

Yes → Check engine speed signal circuit. Refer to "DTC P0725", AT-91.

No ↓

B

1. Remove oil pan.
2. Check A/T fluid condition.

NG → 1. Remove control valve assembly. Refer to AT-196.
2. Check the following items:
- Torque converter clutch control valve
- Pilot valve
- Pilot filter
3. Disassemble A/T.
4. Check torque converter and oil pump assembly.

OK ↓

1. Remove control valve assembly. Refer to AT-196.
2. Check the following items:
- Torque converter clutch control valve
- Pilot valve
- Pilot filter

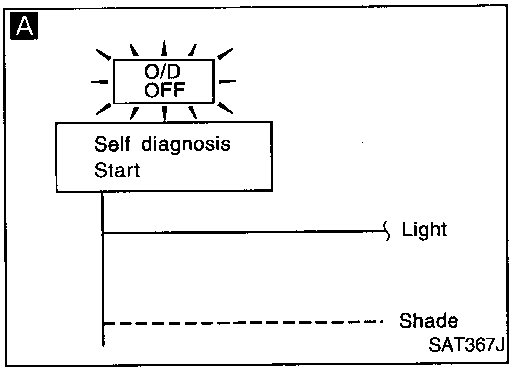
OK → OK

Check again.

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

OK ↓

INSPECTION END



14. Lock-up Is Not Released

SYMPTOM:

Lock-up is not released when accelerator pedal is released.

Does "ECU INPUT SIGNALS" in "DATA MONITOR" show damage to closed throttle position switch circuit?

Yes → Check closed throttle position switch circuit. Refer to "DTC P1705", AT-138.

OR

A

Does self-diagnosis show damage to closed throttle position switch circuit?

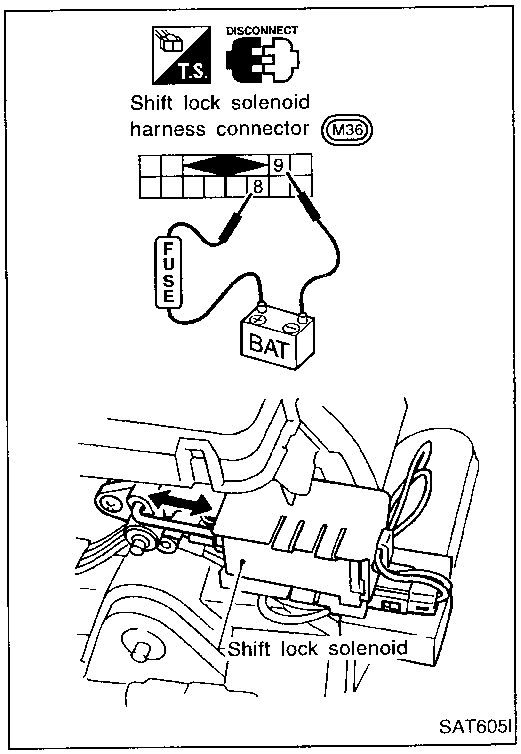
No ↓

Check again.

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

OK ↓

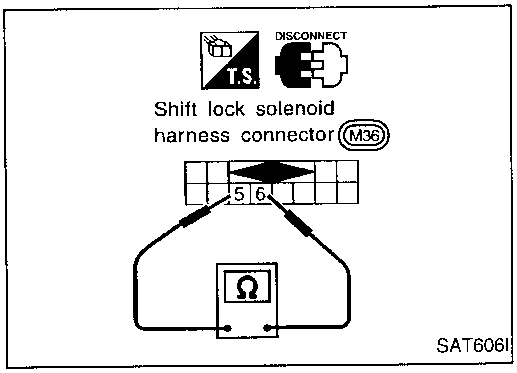
INSPECTION END



Component Check

SHIFT LOCK SOLENOID

- Check operation by applying battery voltage to shift lock solenoid harness connector.

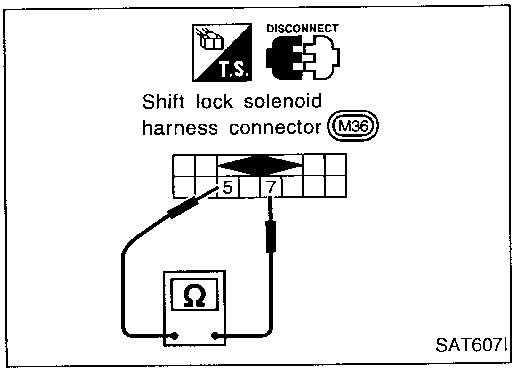


DETENTION SWITCH

Shift

- Check continuity between terminals ⑤ and ⑥ of shift lock solenoid harness connector.

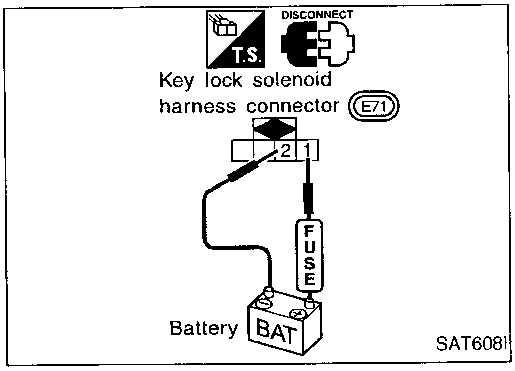
Condition	Continuity
• When selector lever is set in "P" position, and selector lever button pushed. • When selector lever is set in any position except "P", and selector lever button released.	Yes
Except the above	No



Key

- Check continuity between terminals ⑤ and ⑦ of shift lock solenoid harness connector.

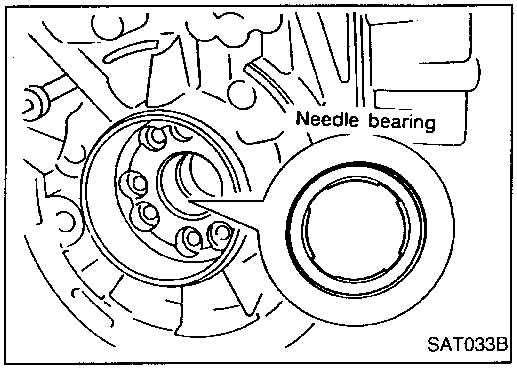
Condition	Continuity
• When selector lever is set in "P" position, and selector lever button pushed. • When selector lever is set in any position except "P", and selector lever button released.	Yes
Except the above	No



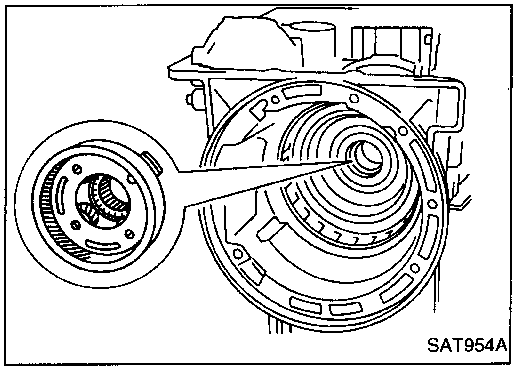
KEY LOCK SOLENOID

- Check operation by applying battery voltage to key lock solenoid harness connector.

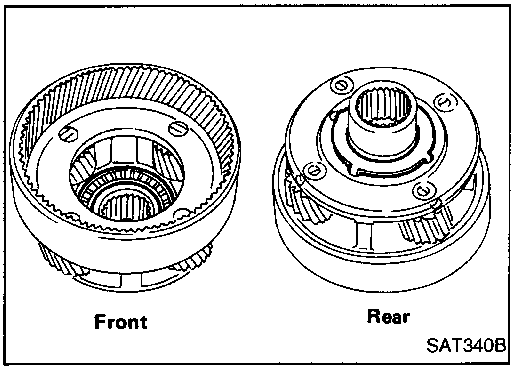
Operating sound must be emitted.



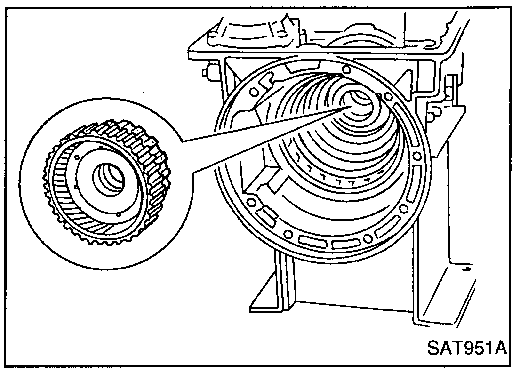
f. Remove needle bearing from transmission case.



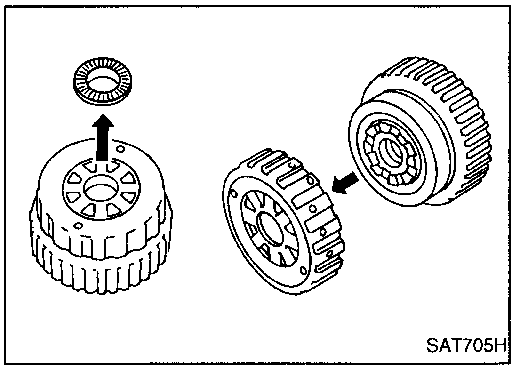
20. Remove rear side clutch and gear components.
a. Remove front internal gear.



b. Remove front needle bearing from front internal gear.
c. Remove rear bearing race from front internal gear.

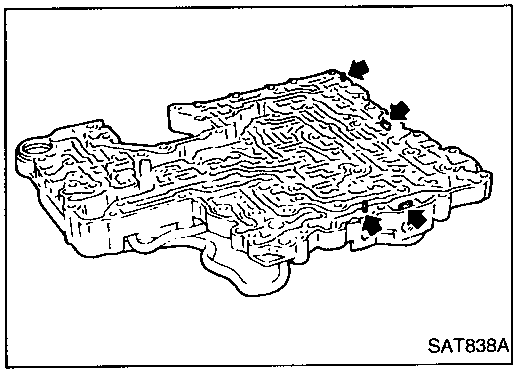


d. Remove rear internal gear, forward clutch hub and overrun clutch hub as a set from transmission case.



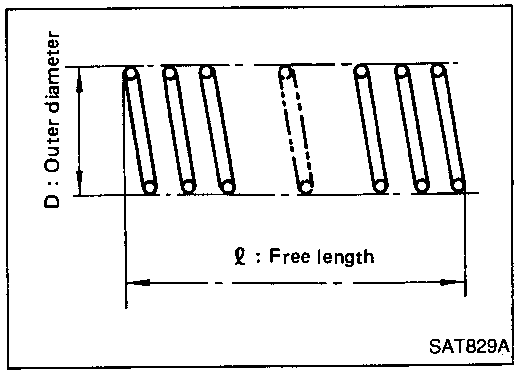
e. Remove needle bearing from overrun clutch hub.
f. Remove overrun clutch hub from rear internal gear and forward clutch hub.

Control Valve Lower Body (Cont'd)


SAT838A

DISASSEMBLY

1. Remove valves at parallel pins.
2. Remove valves at retainer plates.
   For removal procedures, refer to "DISASSEMBLY" in "Control Valve Upper Body", AT-229.



SAT829A

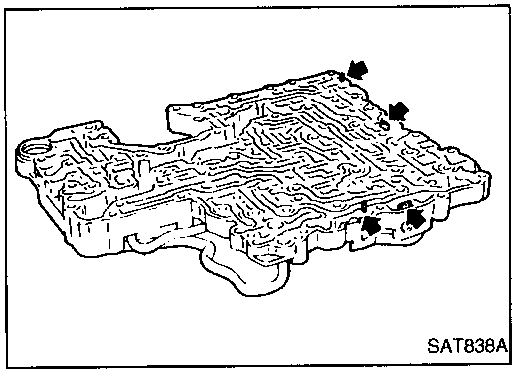
INSPECTION

Valve springs

- Check each valve spring for damage or deformation. Also measure free length and outer diameter.
  Inspection standard:
  Refer to SDS, AT-278.
- Replace valve springs if deformed or fatigued.

Control valves

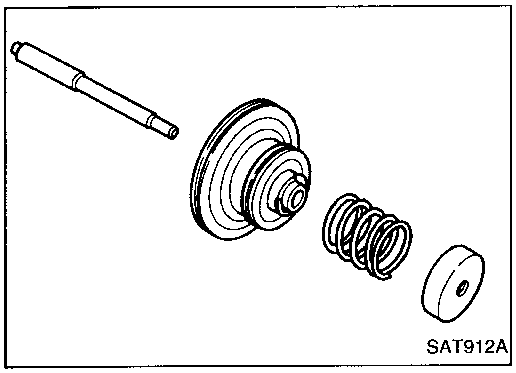
- Check sliding surfaces of control valves, sleeves and plugs for damage.


SAT838A

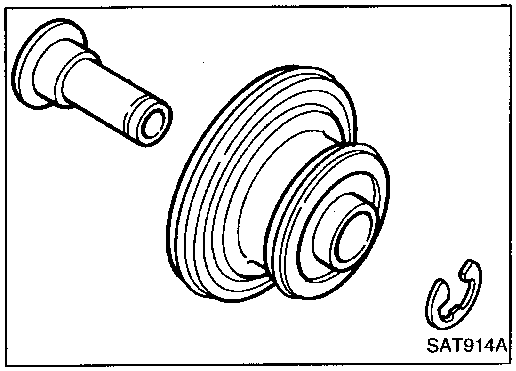
ASSEMBLY

- Install control valves.
  For installation procedures, refer to "ASSEMBLY" in "Control Valve Upper Body", AT-230.

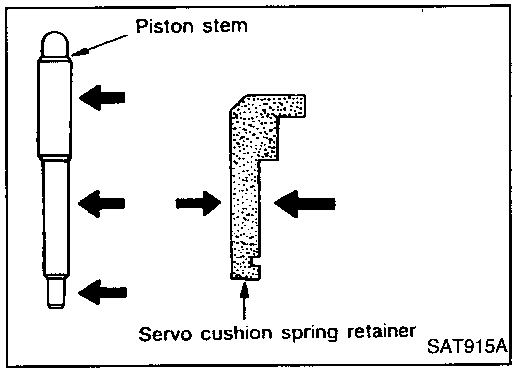
Band Servo Piston Assembly (Cont'd)


SAT912A

6. Remove servo piston spring retainer, return spring B and piston stem from band servo piston.
7. Remove E-ring from band servo piston.


SAT914A

8. Remove servo cushion spring retainer from band servo piston.
9. Remove D-rings from band servo piston.
10. Remove O-rings from servo piston retainer.

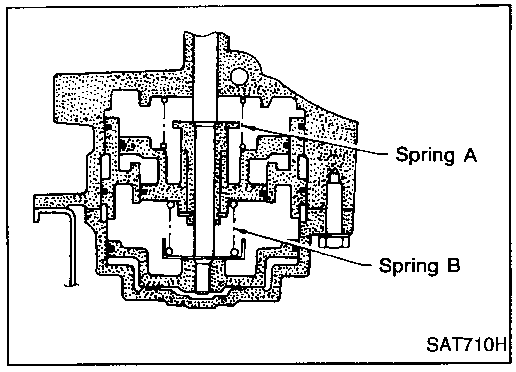


SAT915A

INSPECTION

Pistons, retainers and piston stem

- Check frictional surfaces for abnormal wear or damage.

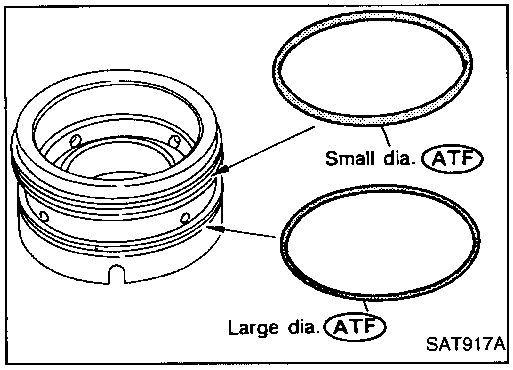


SAT710H

Return springs

- Check for deformation or damage. Measure free length and outer diameter.

Inspection standard:
Refer to SDS, AT-278.



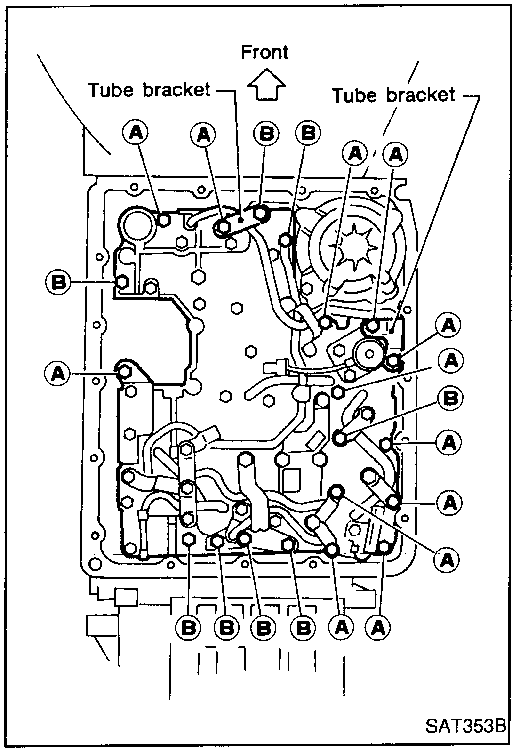
SAT917A

ASSEMBLY

1. Install O-rings onto servo piston retainer.

- **Apply ATF to O-rings.**
- **Pay attention to position of each O-ring.**

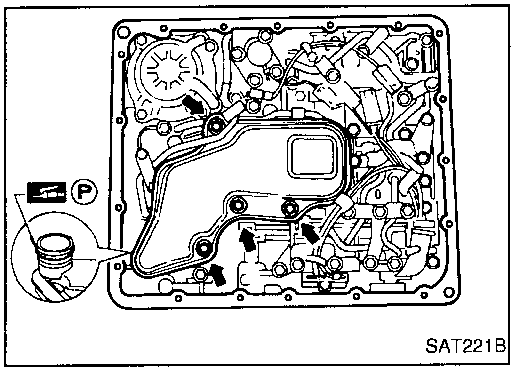
Assembly (2) (Cont'd)



e. Install control valve assembly on transmission case.
f. Install connector tube brackets and tighten bolts Ⓐ and Ⓑ.

- **Check that terminal assembly harness does not catch.**

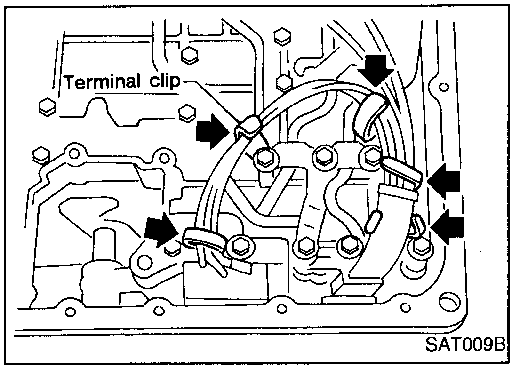
Bolt	ℓ mm (in) ℓ
Ⓐ	33 (1.30)
Ⓑ	45 (1.77)



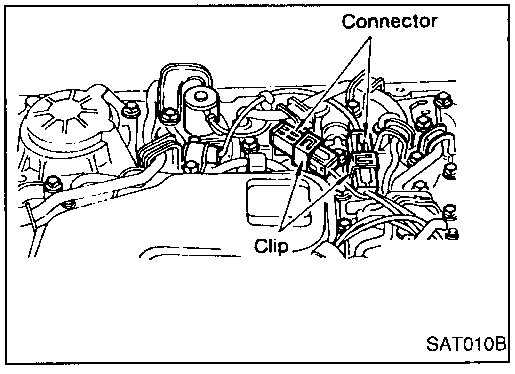
g. Install O-ring on oil strainer.

- **Apply petroleum jelly to O-ring.**

h. Install oil strainer on control valve.

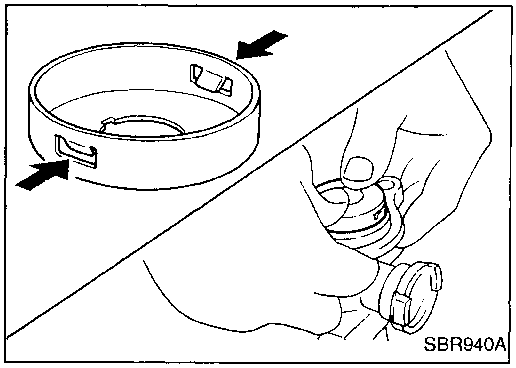


i. Securely fasten terminal harness with clips.



j. Install torque converter clutch solenoid valve and A/T fluid temperature sensor connectors.

Assembly (Cont'd)

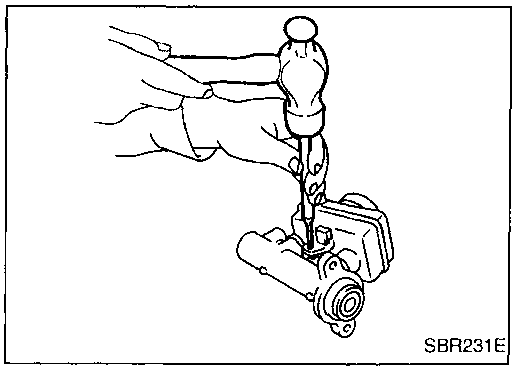

SBR940A

2. Install stopper cap.

Before installing stopper cap, ensure that claws are bent inward.

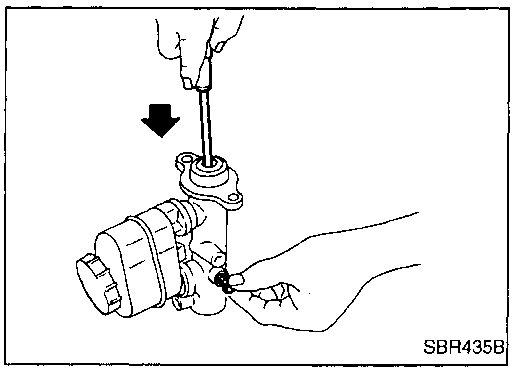
— For TOKICO make —

3. Push reservoir tank seals into cylinder body.
4. Push reservoir tank into cylinder body.

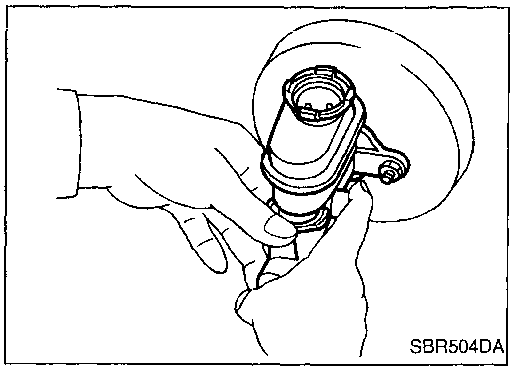

SBR231E

— For NABCO make —

3. Push reservoir tank seals and reservoir tank into cylinder body.
4. Install spring pin.


SBR435B

5. Install valve stopper while piston is pushed into cylinder.


SBR504DA

Installation

CAUTION:

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

1. Place master cylinder onto brake booster and secure mounting nuts lightly.
2. Torque mounting nuts.
   : 12 - 15 N·m (1.2 - 1.5 kg-m, 9 - 11 ft-lb)
3. Bleed air from master cylinder.

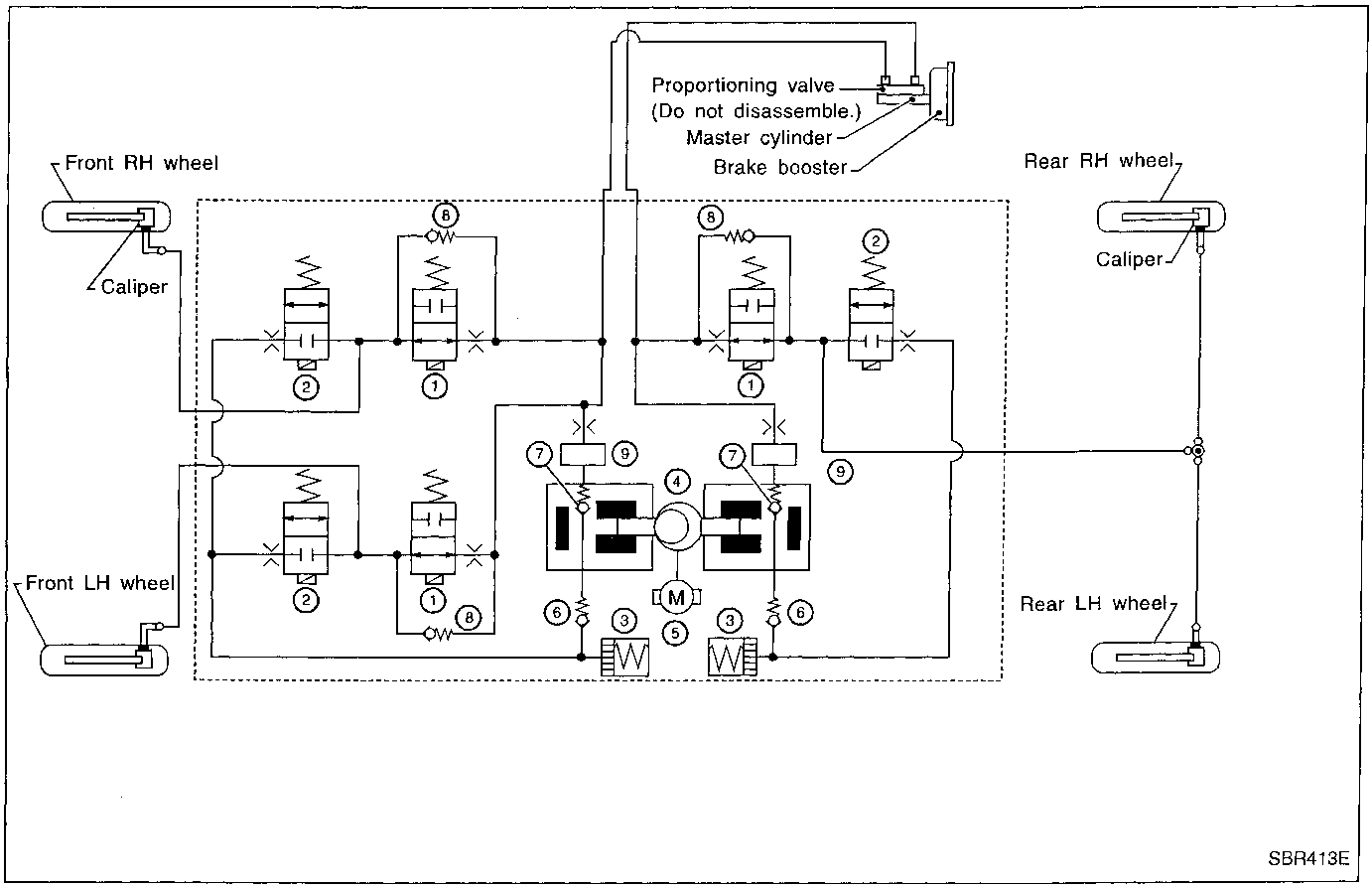
a. Fill up reservoir tank with new brake fluid.
b. Plug all ports on master cylinder with fingers to prevent air suction while releasing brake pedal.
c. Have driver depress brake pedal slowly several times until no air comes out of master cylinder.
d. Fit brake lines to master cylinder.
e. Torque flare nuts.
   : 15 - 17 N·m (1.5 - 1.7 kg-m, 11 - 12 ft-lb)

4. Bleed air from each caliper. Refer to "Bleeding Brake System", BR-6.

ABS (Anti-lock brake system) Operation

- When the vehicle speed is less than 10 km/h (6 MPH) this system does not work.
- The Anti-Lock Brake System (ABS) has a self-test function. The system turns on the ABS warning lamp for 1 second each time the ignition switch is turned "ON". After the engine is started, the ABS warning lamp turns off. The system performs a test the first time the vehicle reaches 6 km/h (4 MPH). A mechanical noise may be heard as the ABS performs this self-test. This is a normal part of the self-test feature. If a malfunction is found during this check, the ABS warning lamp will stay on.
- While driving, a mechanical noise may be heard during ABS operation. This is a normal condition.

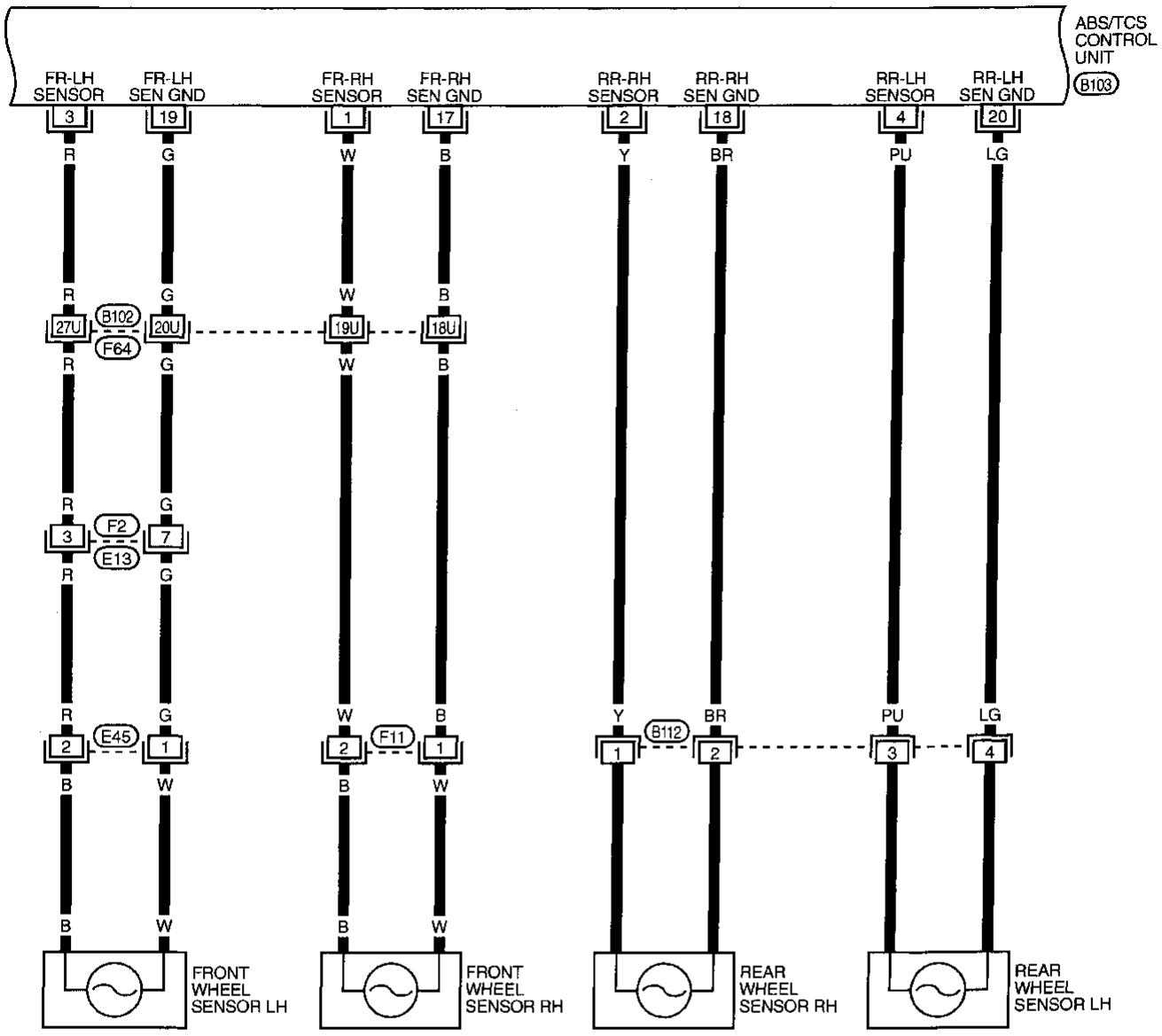
ABS Hydraulic Circuit

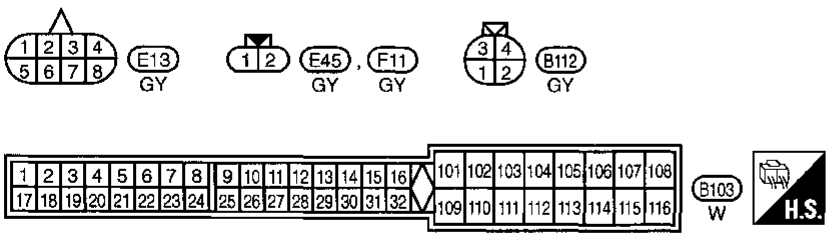


① Inlet solenoid valve
② Outlet solenoid valve
③ Reservoir
④ Pump
⑤ Motor
⑥ Inlet valve
⑦ Outlet valve
⑧ Bypass check valve
⑨ Damper

Wiring Diagram — TCS — (Cont'd)

BR-TCS-05





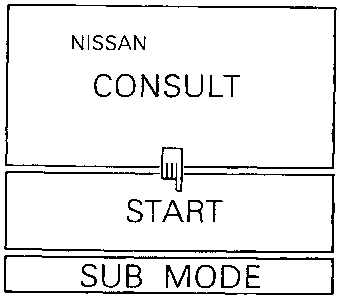
Refer to last page (Foldout page).
F64, B102

TBR150

CONSULT Inspection Procedure for TAC Module (Cont'd)

DATA MONITOR PROCEDURE

A

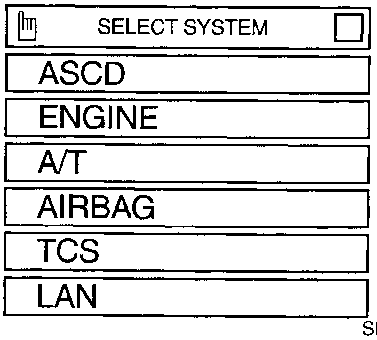


SEF392I

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 "TCS".
C 3) Touch "DATA MONITOR".

B

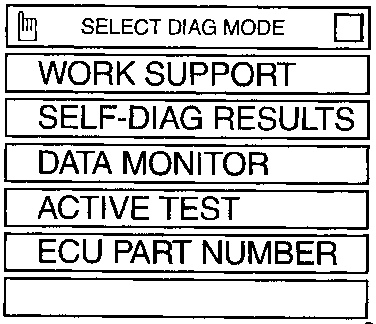


SBR634D

D 1) Touch "SETTING" on "SELECT MONITOR ITEM" screen.
E 2) Select "AUTO", "MANUAL" or "SPECIAL" as required, then touch "LOW-SPEED RECORD".*
D 3) Touch "START" on "SELECT MONITOR ITEM".

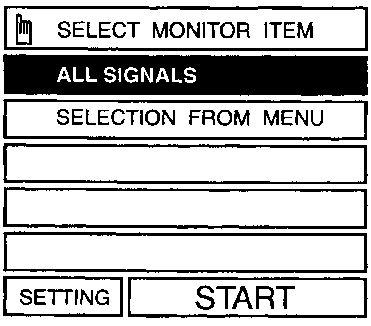
*Reference: If a problem occurs during data monitoring in the AUTO mode, data will be recorded. If CONSULT is set in the "SPECIAL" mode, data will automatically be recorded with the TCS in operation.

C



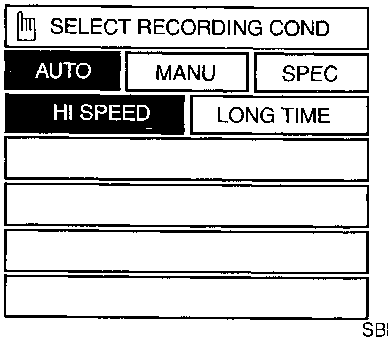
SBR635D

D



SBR936C

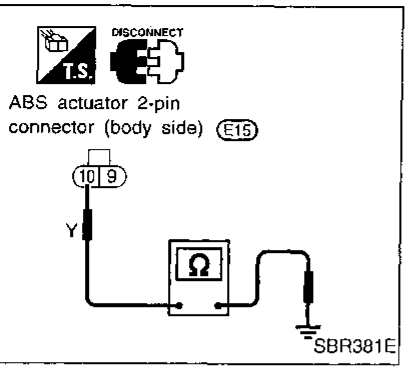
E



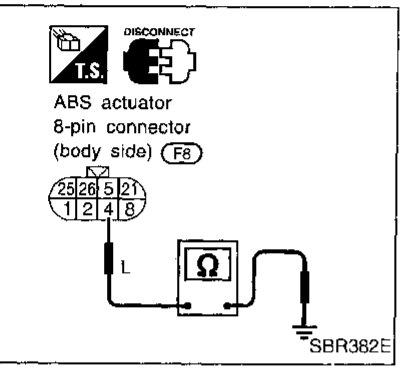
SBR637D

Diagnostic Procedure 10 (Motor relay or motor) (Cont'd)

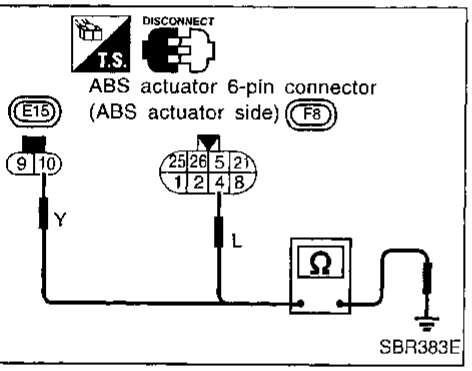
E



F



G



Ⓑ

Replace fusible link.
Does the fusible link blow out?

No → Inspection end

Yes

E

MOTOR POWER SUPPLY CIRCUIT

1. Disconnect battery cable and ABS actuator 2-pin connector E15.
2. Check continuity between ABS actuator 2-pin connector E15 (body side) terminal ⑩ and ground.
   Continuity should not exist.

NG → Check the following.
- Harness connector E15
- Harness for open or short between ABS actuator and fuse

If NG, repair harness or connectors.

OK

F

1. Disconnect ABS actuator 8-pin connector and control unit connector.
2. Check continuity between ABS actuator 8-pin connector F8 (body side) terminal ④ and ground.
   Continuity should not exist.

NG → Check the following.
- Harness connectors B103, F8
- Harness for open or short between ABS actuator (body side) and ABS/TCS control unit

If NG, repair harness or connectors.

OK

G

Check continuity between ABS actuator 8-pin connector F8 (ABS actuator side) terminal ④ and ground, 2-pin connector E15 (ABS actuator side) terminal ⑩ and ground.
Continuity should not exist.

NG → Replace ABS actuator.

OK

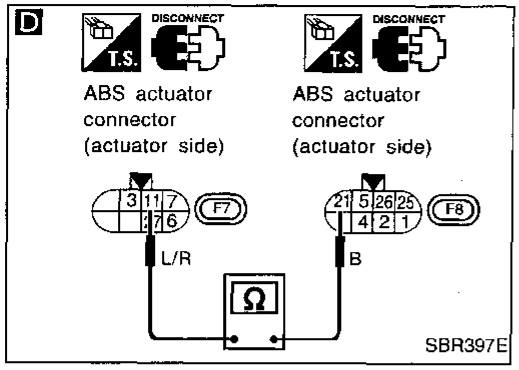
MOTOR CHECK

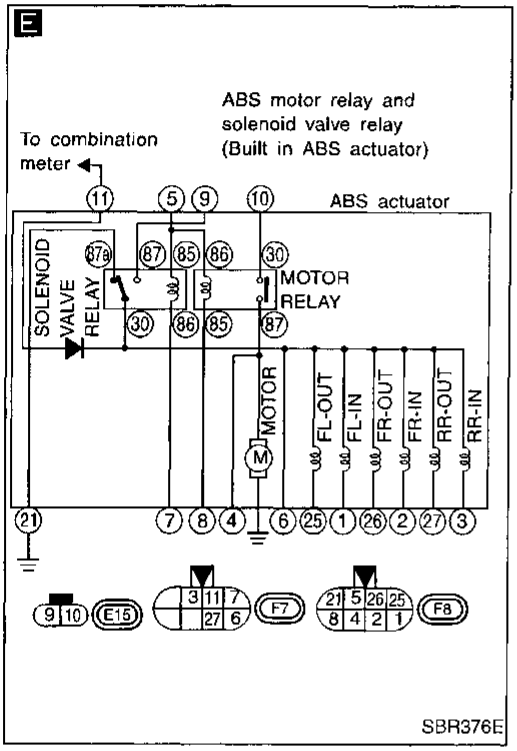
Go to D in Diagnostic Procedure 10 (preceding page).

OK

Check ABS/TCS control unit pin terminals for damage or the connection of ABS/TCS control unit harness connector.
Reconnect ABS/TCS control unit harness connector. Then retest.

Diagnostic Procedure 25 (ABS warning lamp does not come on when ignition switch is turned on.) (Cont'd)





Ⓐ

D

1. Disconnect ABS actuator 8-pin connector.
2. Check continuity between ABS actuator 8-pin connector (ABS actuator side) terminals ⑪⊖ and ㉑⊕.
   Continuity should exist.

Note: Pay attention to tester polarity*.

NG → Replace ABS actuator.

OK ↓

CONTROL UNIT POWER SUPPLY CIRCUIT.

NG → Repair harness and connectors.

Go to **A** in Diagnostic Procedure 26, BR-114.

OK ↓

E

CHECK SOLENOID VALVE RELAY.

NG → Replace ABS relay unit.

Relay type		Solenoid valve relay
Condition		Continuity existence between terminals ⑥ and ㉑
Battery voltage not applied between each terminal	⑤ and ⑦	Yes
Battery voltage applied between each terminal	⑤ and ⑦	No
Check resistance between each terminal	⑤ and ⑦	Approx. 100Ω

OK ↓

Go to Diagnostic Procedure 11, BR-94.

***: Specifications may vary depending on the type of tester. Before performing this inspection, refer to the instruction manual of the tester.**

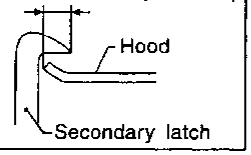
Body Front End (Cont'd)

SEC. 263•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)

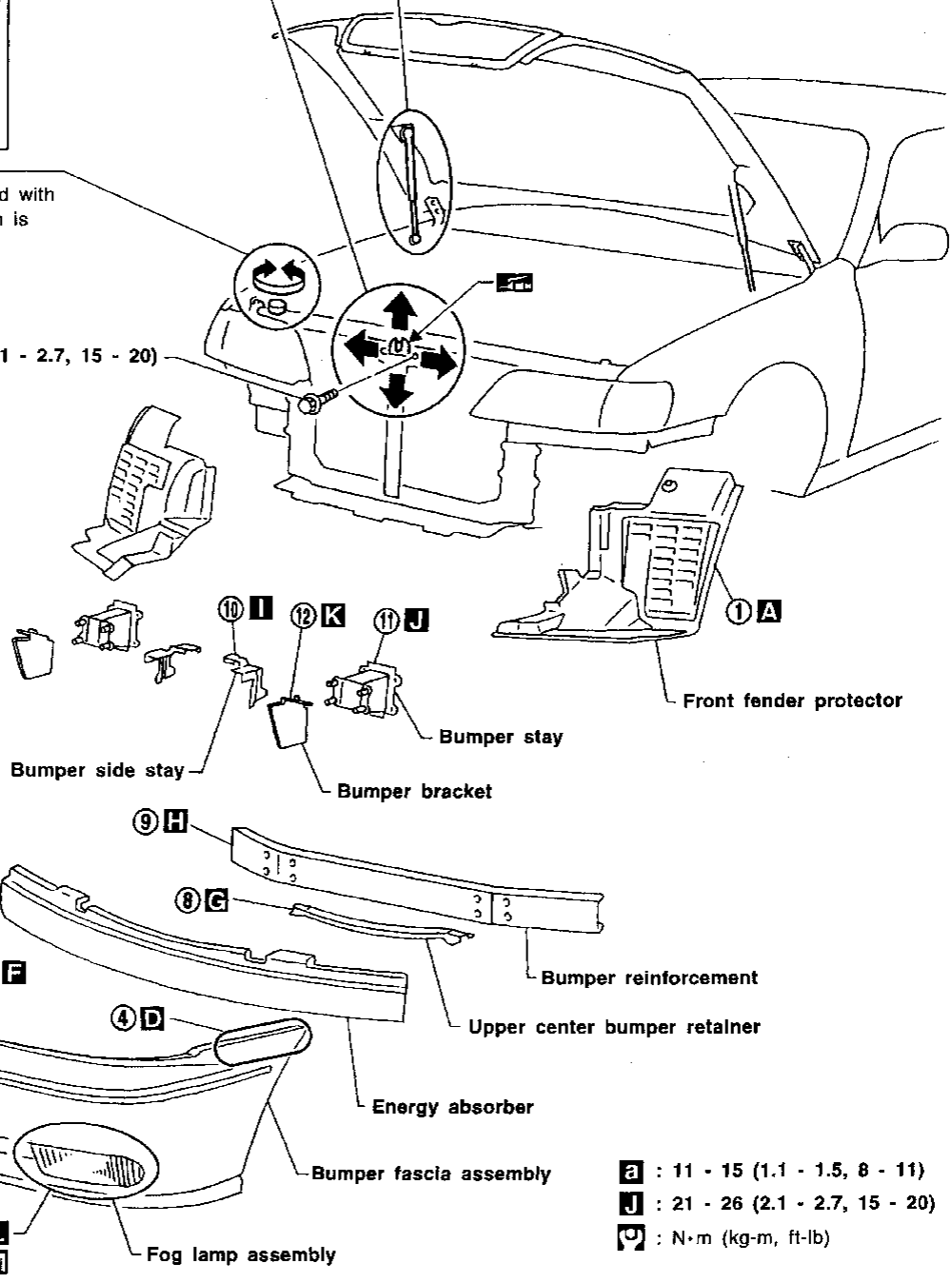


Bumper rubber adjustment
- Adjust so that hood is aligned with fender. At that time deflection is approx. 2 mm (0.08 in).

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

Hood adjustment and hood stay installation a

21 - 26 (2.1 - 2.7, 15 - 20)

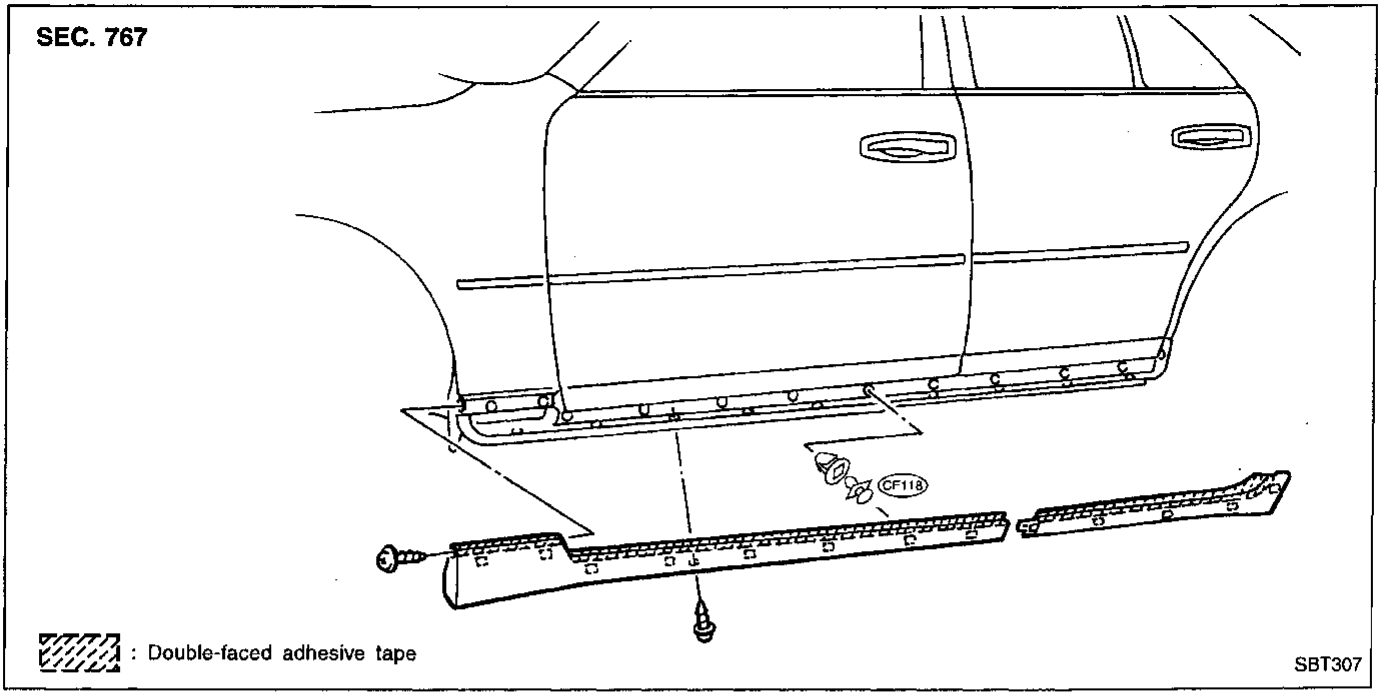


a : 11 - 15 (1.1 - 1.5, 8 - 11)
J : 21 - 26 (2.1 - 2.7, 15 - 20)
: N·m (kg-m, ft-lb)

SBT279-B

⑨ Mudguard center

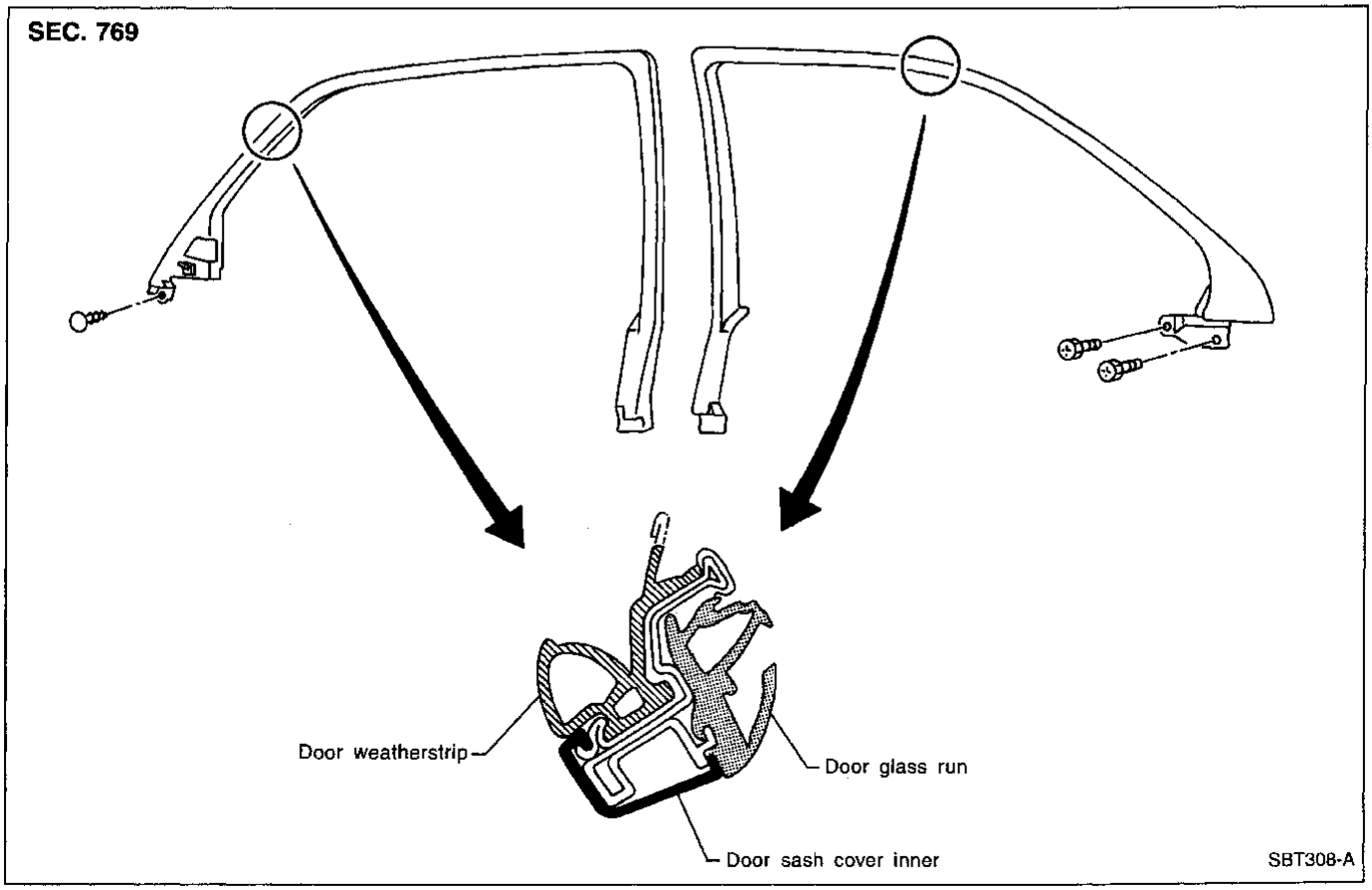
SEC. 767



- **With a vehicle coated with Hard Clear Coat, use double-faced 3M adhesive tape Product No. 4210 or equivalent, after priming with 3M primer Product No. N-200 or C-100 or equivalent.**

⑩ Sash cover inner

SEC. 769



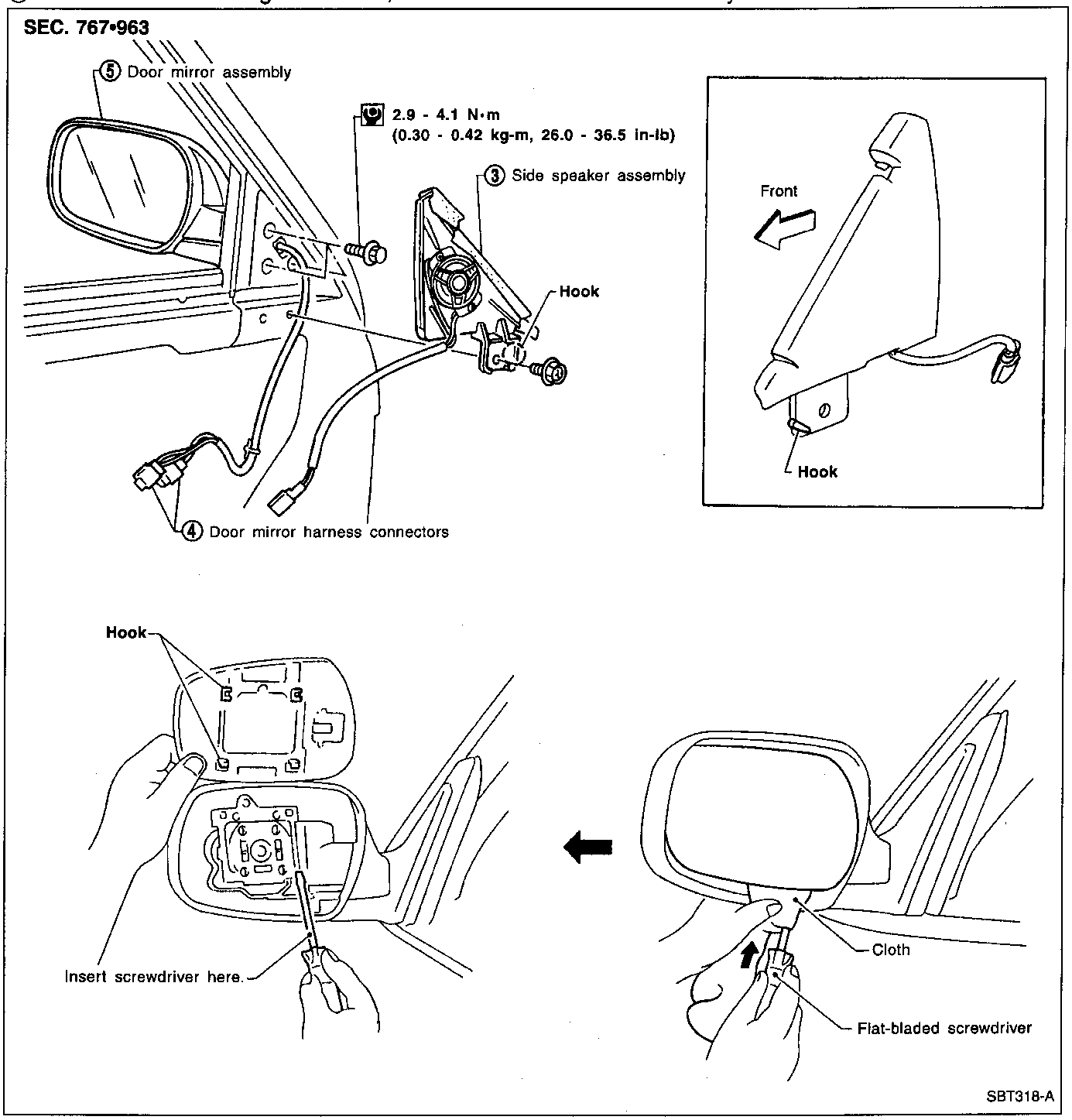
Door Mirror

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

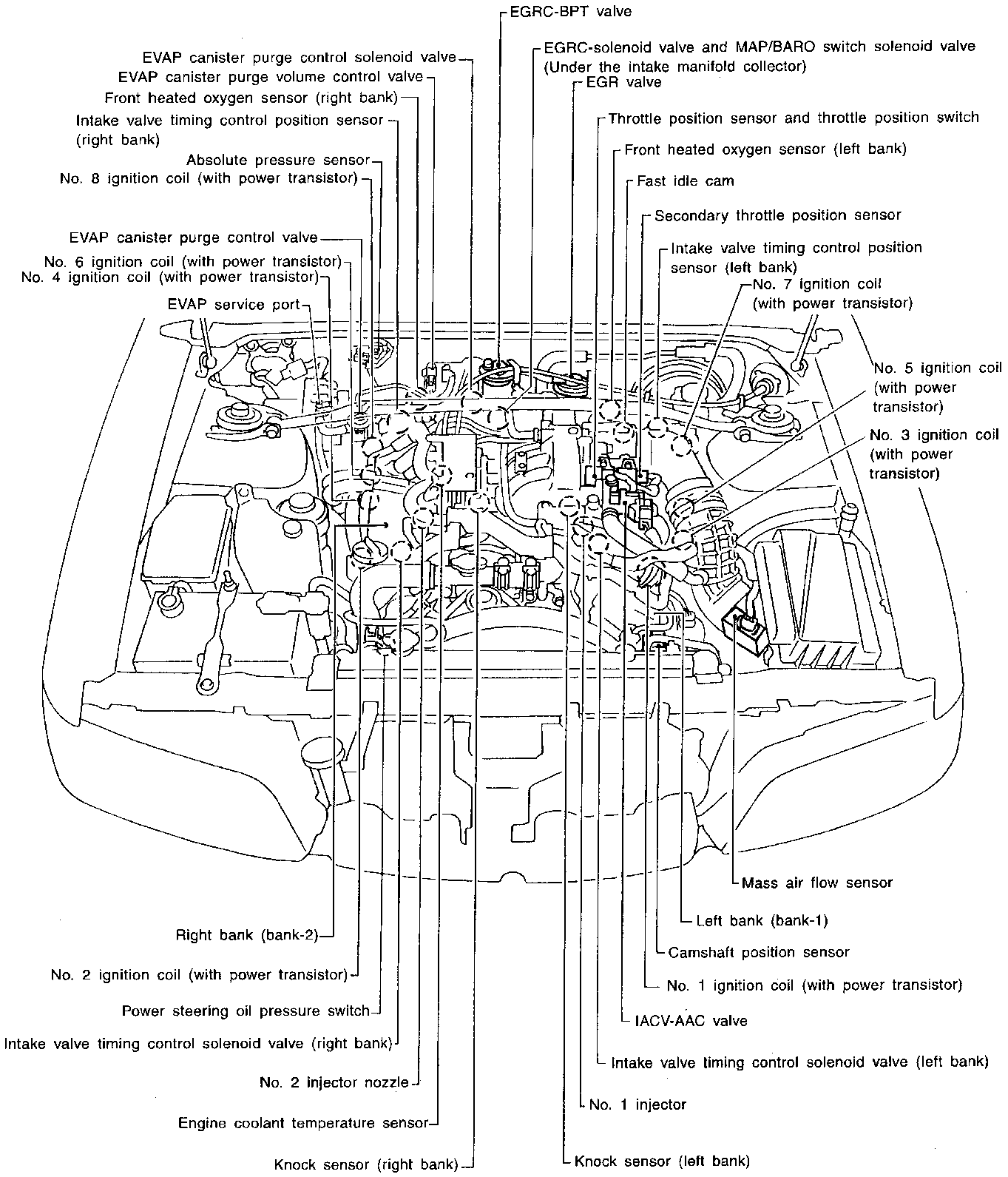
★ **For Wiring Diagram, refer to "POWER DOOR MIRROR" in EL section.**

REMOVAL — Door mirror

① Remove door trim. Refer to "Door Trim" in "INTERIOR TRIM" for details, BT-20.
② Remove sash inner cover. Refer to "Sash inner cover" in "INTERIOR TRIM" for details, BT-27.
③ Remove bolt securing side speaker, then remove side speaker assembly. Disconnect side speaker harness connector.
④ Disconnect door mirror harness connector.
⑤ Remove bolts securing door mirror, then remove door mirror assembly.



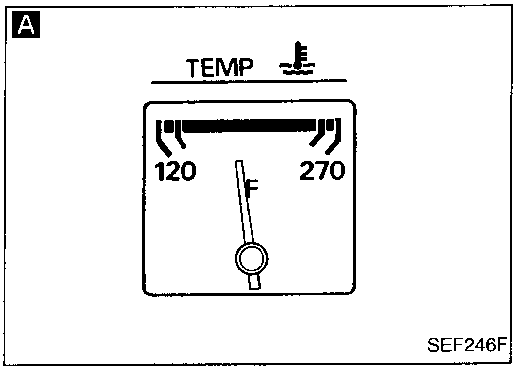
Engine Control Component Parts Location



SEF347W

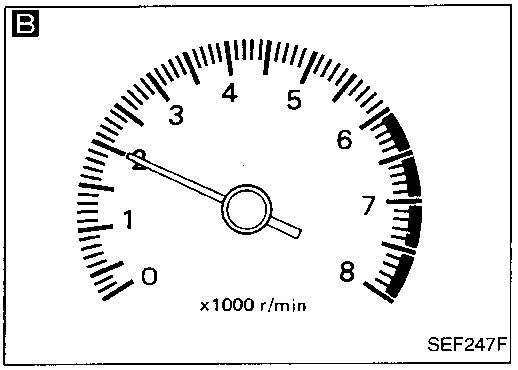
Idle Speed/Ignition Timing/Idle Mixture Ratio Adjustment (Cont'd)

A



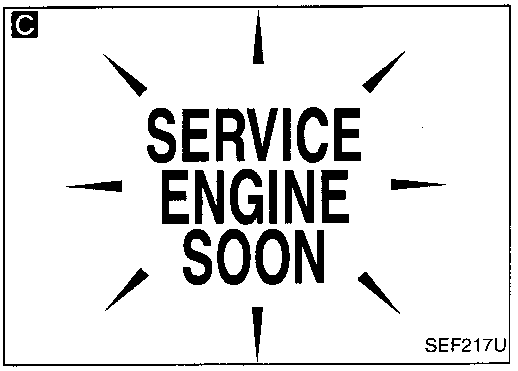
SEF246F

B



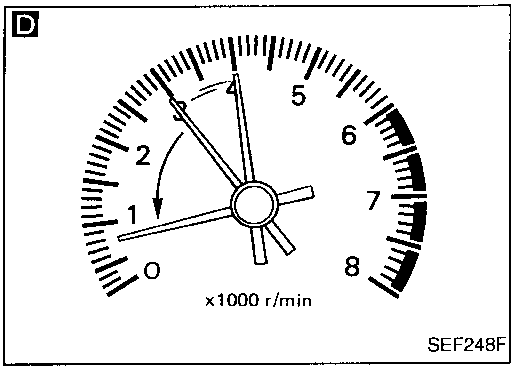
SEF247F

C



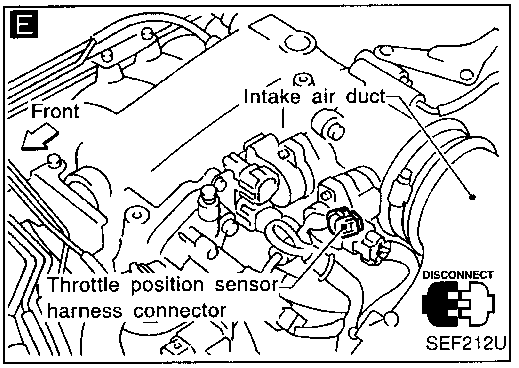
SEF217U

D



SEF248F

E



SEF212U

START

Visually check the following:
- Air cleaner clogging
- Hoses and ducts for leaks
- EGR valve operation
- Electrical connectors
- Gasket
- Throttle position

A

Start engine and warm it up until engine coolant temperature indicator points to the middle of gauge and ensure that engine speed is below 1,000 rpm.

B

Open engine hood and run engine at about 2,000 rpm for about 2 minutes under no-load.

C

Perform diagnostic test mode II (Self-diagnostic results).

OK

NG

Repair or replace components as necessary.

Does engine run smoothly?

OK

NG

Clean injectors.

D

Race engine two or three times under no-load, then run engine at idle speed.

← Ⓑ

E

1. Turn off engine and disconnect throttle position sensor harness connector.
2. Start engine.

F

Check ignition timing with a timing light.

15°±2° BTDC (in "N" position)

OK

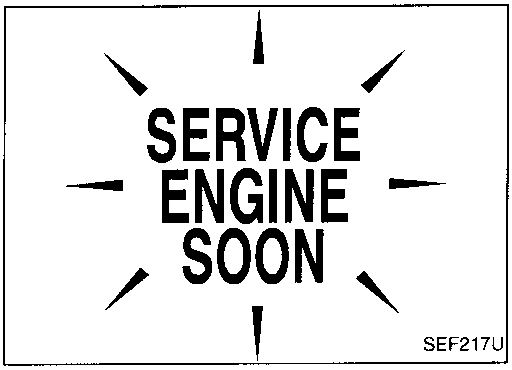
NG

Adjust ignition timing by turning camshaft position sensor after loosening securing bolts which secures camshaft position sensor.

Connect throttle position sensor harness connector.

→ Ⓑ

Ⓐ



Malfunction Indicator Lamp (MIL)

The malfunction indicator lamp is located on the instrument panel.

1. The malfunction indicator lamp will light up when the ignition switch is turned ON without the engine running. This is a bulb check.
   - If the malfunction indicator lamp does not light up, refer to EL section WARNING LAMPS or see EC-517.
2. When the engine is started, the malfunction indicator lamp should go off.
   If the lamp remains on, the on board diagnostic system has detected an engine system malfunction.

ON BOARD DIAGNOSTIC SYSTEM FUNCTION

The on board diagnostic system has the following four functions.

Diagnostic Test Mode I

1. BULB CHECK : This function checks the bulb for damage (blown, open circuit, etc.) of the malfunction indicator lamp.
   If the MIL does not come on, check MIL circuit and ECM test mode. (See next page.)
2. MALFUNCTION WARNING : This is a usual driving condition. When a malfunction is detected twice in two consecutive driving cycles (2 trip detection logic), the MIL will light up to inform the driver that a malfunction has been detected.
   The following malfunctions will light up or blink the MIL in the 1st trip.
   - "Misfire (possible three way catalyst damage)"
   - "Closed loop control"
   - Fail-safe mode

Diagnostic Test Mode II

3. SELF-DIAGNOSTIC RESULTS : This function allows DTCs and 1st trip DTCs to be read.
4. FRONT HEATED OXYGEN SENSOR MONITOR : This function allows the fuel mixture condition (lean or rich), monitored by front heated oxygen sensor, to be read.

MIL Flashing without DTC

If the ECM is in Diagnostic Test Mode II, the MIL may flash when the engine is running. In this case, check ECM test mode selector following "HOW TO SWITCH DIAGNOSTIC TEST MODES" on next page.
How to switch the diagnostic test (function) modes and details of the above functions are described later. (See page EC-55.)

Condition		Diagnostic Test Mode I	Diagnostic Test Mode II
Ignition switch in "ON" position	Engine stopped	BULB CHECK	SELF-DIAGNOSTIC RESULTS
	Engine running	MALFUNCTION WARNING	FRONT HEATED OXYGEN SENSOR MONITOR

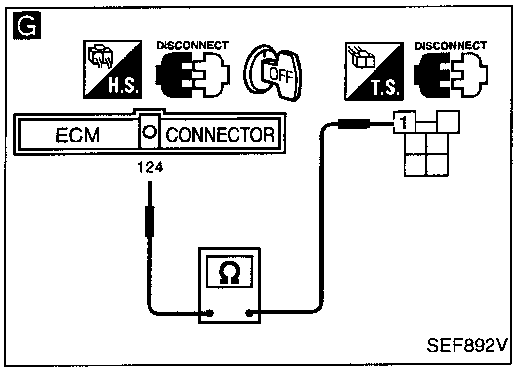
CONSULT (Cont'd)

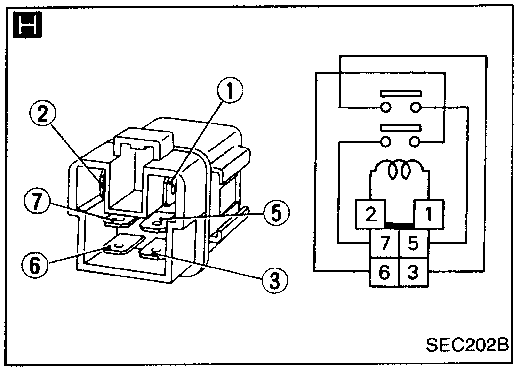
FUNCTION TEST ITEM	CONDITION	JUDGEMENT		CHECK ITEM (REMEDY)
START SIGNAL CIRCUIT	• Ignition switch: ON → START • Start signal circuit is tested when engine is started by operating the starter. Battery voltage and water temperature before cranking, and average battery voltage, mass air flow sensor output voltage and cranking speed during cranking are displayed.	Start signal: OFF → ON		• Harness and connector • Ignition switch
PW/ST SIGNAL CIRCUIT	• Ignition switch: ON (Engine running) • Power steering circuit is tested when steering wheel is rotated fully and then set to a straight line running position.	Locked position	ON	• Harness and connector • Power steering oil pressure switch • Power steering oil pump
		Neutral position	OFF	
VEHICLE SPEED SEN CKT	• Vehicle speed sensor circuit is tested when vehicle is running at a speed of 10 km/h (6 MPH) or higher.	Vehicle speed sensor input signal is greater than 4 km/h (2 MPH)		• Harness and connector • Vehicle speed sensor • Electric speedometer
IGN TIMING ADJ	• After warming up, idle the engine. • Ignition timing is checked by reading ignition timing with a timing light and checking whether it agrees with specifications.	The timing light indicates the same value on the screen.		• Adjust ignition timing (by moving camshaft position sensor) • Camshaft position sensor drive mechanism
MIXTURE RATIO TEST	• Air-fuel ratio feedback circuit (injection system, ignition system, vacuum system, etc.) is tested by examining the front heated oxygen sensor output at 2,000 rpm under non-loaded state.	Front heated oxygen sensor COUNT: More than 5 times during 10 seconds		• INJECTION SYS (Injector, fuel pressure regulator, harness or connector) • IGNITION SYS (Spark plug, ignition coil with power transistor harness or connector) • VACUUM SYS (Intake air leaks) • Front heated oxygen sensor circuit • Front heated oxygen sensor operation • Fuel pressure high or low • Mass air flow sensor
POWER BALANCE	• After warming up, idle the engine. • Injector operation of each cylinder is stopped one after another, and resultant change in engine rotation is examined to evaluate combustion of each cylinder. (This is only displayed for models where a sequential multiport fuel injection system is used.)	Difference in engine speed is greater than 25 rpm before and after cutting off the injector of each cylinder.		• Injector circuit (Injector, harness or connector) • Ignition circuit (Spark plug, ignition coil with power transistor harness or connector) • Compression • Valve timing
IACV-AAC/V SYSTEM	• After warming up, idle the engine. • IACV-AAC valve system is tested by detecting change in engine speed when IACV-AAC valve opening is changed to 1 step, 25 steps and 102 steps.	Difference in engine speed is greater than 150 rpm between when valve opening is at 102 steps and at 25 steps.		• Harness and connector • IACV-AAC valve • Air passage restriction between air inlet and IACV-AAC valve • IAS (Idle adjusting screw) adjustment

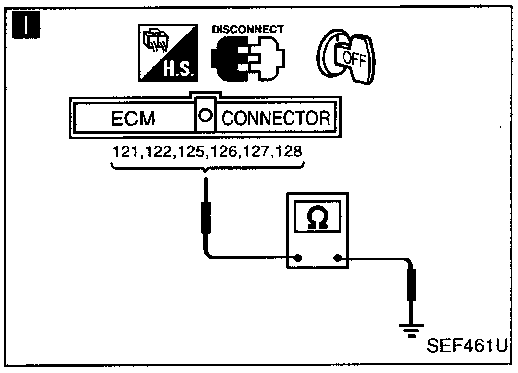
CONSULT Reference Value in Data Monitor Mode (Cont'd)

MONITOR ITEM	CONDITION		SPECIFICATION
IGNITION SW	• Ignition switch: ON → OFF		ON → OFF
INJ PULSE-B1 INJ PULSE-B2	• Engine: After warming up • Air conditioner switch: "OFF" • Shift lever: "N" • No-load	Idle	2.4 - 3.2 msec.
		2,000 rpm	1.9 - 2.8 msec.
B/FUEL SCHDL	ditto	Idle	1.0 - 1.6 msec
		2,000 rpm	2.5 - 3.5 msec
IGN TIMING	ditto	Idle	15° BTDC
		2,000 rpm	More than 25° BTDC
IACV-AAC/V	ditto	Idle	2 - 10 step
		2,000 rpm	—
A/F ALPHA-B1 A/F ALPHA-B2	• Engine: After warming up	Maintaining engine speed at 2,000 rpm	50 - 159%
EVAP SYS PRES	• Ignition switch: ON		Approx. 3.4V
AIR COND RLY	• Air conditioner switch: OFF → ON		OFF → ON
FUEL PUMP RLY	• Ignition switch is turned to ON (Operates for 1 second) • Engine running and cranking		ON
	Except as shown above		OFF
INT/V SOL-B1 INT/V SOL-B2	• Engine is running • Engine speed is more than 2,000 rpm • Quickly depressed accelerator pedal. • Vehicle speed is more than 4 km/h (2 MPH)		OFF → ON (Using "INT/V TIM-B1(-2)", the difference of degree between "OFF" and "ON" is approximately 20 deg.)
INT/V TIM-B1 INT/V TIM-B2	• Engine is running		Advanced angle (degree signal) of the intake camshaft should be displayed.
COOLING FAN	• After warming up engine, idle the engine. • Air conditioner switch: "OFF"	Engine coolant temperature is 94°C (201°F) or less	OFF
		Engine coolant temperature is between 95°C (203°F) and 104°C (219°F) at vehicle speed less than 80 km/h (50 MPH)	HIGH
		Engine coolant temperature is 105°C (221°F) or more	HIGH
EGRC SOL/V	• Engine: After warming up • Air conditioner switch: "OFF" • Shift lever: "D" • No-load	Idle	OFF (Cut)
		Revving engine up from idle to 3,000 rpm	ON (Flow)
VENT CONT/V	• Ignition switch: ON		OFF
FR O2 HTR-B1	• Engine speed: Idle		ON
FR O2 HTR-B2	• Engine speed: Above 3,200 rpm		OFF
RR O2 HTR-B1	• Engine speed: Idle [after driving 2 minutes at 70 km/h (43 MPH) or more]		ON
RR O2 HTR-B2	• Engine speed: Above 3,600 rpm • Ignition switch: ON (Engine stopped)		OFF
VC/V BYPASS/V	• Ignition switch: ON		OFF
PURG CONT S/V	• Engine: After warming up	Idle	OFF
		2,000 rpm	ON
CAL/LD VALUE	• Engine: After warming up • Air conditioner switch: "OFF" • Shift lever: "N" • No-load	Idle	13.0 - 32%
		2,500 rpm	13.0 - 25.5%
ABSOL TH·P/S	• Engine: After warming up • Ignition switch: ON (Engine stopped) • More than −40.0 kPa (−300 mmHg, −11.81 inHg) of vacuum is applied to the throttle opener with a handy vacuum pump.	Throttle valve fully closed	0.0%
		Throttle valve fully opened	Approx. 88%

Main Power Supply and Ground Circuit (Cont'd)







Ⓐ

G

CHECK OUTPUT SIGNAL CIRCUIT.
1. Check harness continuity between ECM terminal (124) and relay terminal ①.
   Continuity should exist.
   If OK, check harness for short to ground and short to power.

NG → Repair open circuit or short to ground or short to power in harness or connectors.

OK ↓

H

CHECK ECCS RELAY.
1. Apply 12V direct current between relay terminals ① and ②.
2. Check continuity between relay terminals ③ and ⑤, ⑥ and ⑦.
   12V (① - ②) applied:
   Continuity exists.
   No voltage applied:
   No continuity

NG → Replace ECCS relay.

OK ↓

I

CHECK GROUND CIRCUIT.
1. Turn ignition switch "OFF".
2. Loosen and retighten engine ground screws.
3. Disconnect ECM harness connector.
4. Check harness continuity between ECM terminals (121), (122), (125), (126), (127), (128) and engine ground.
   Continuity should exist.
   If OK, check harness for short to ground and short to power.

NG → Check the following.
- Harness connectors (F61), (F62)
- Harness for open or short between engine grounds (F24) and (F25)

If NG, repair open circuit or short to ground or short to power in harness or connectors.

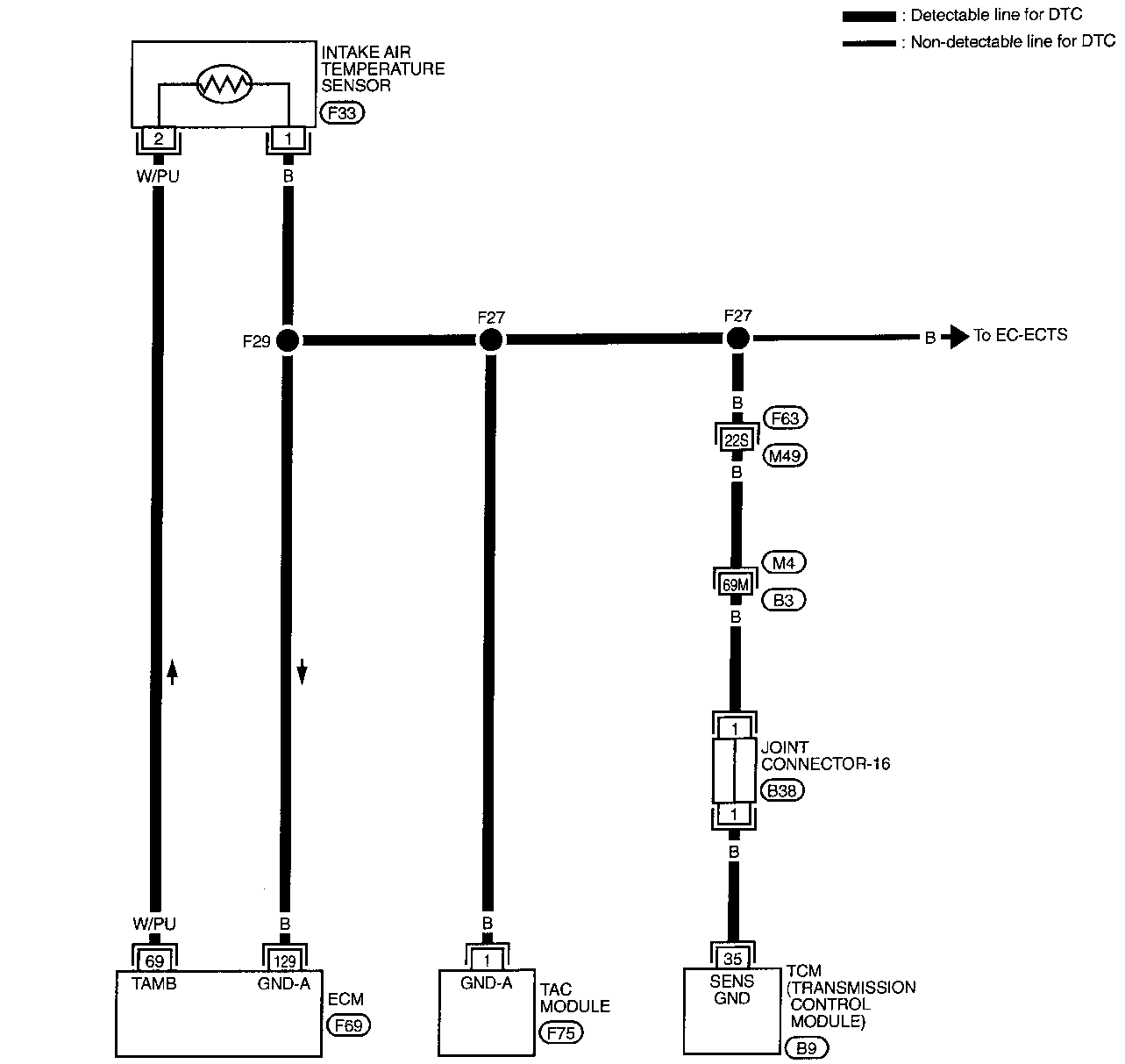
OK ↓

Perform "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT", EC-108.

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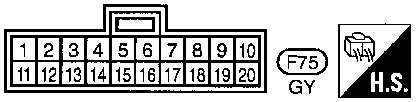
INSPECTION END

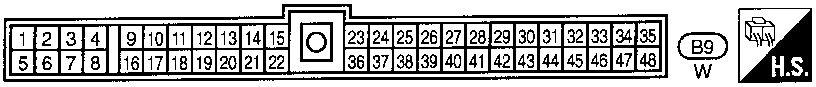
EC-IATS-01

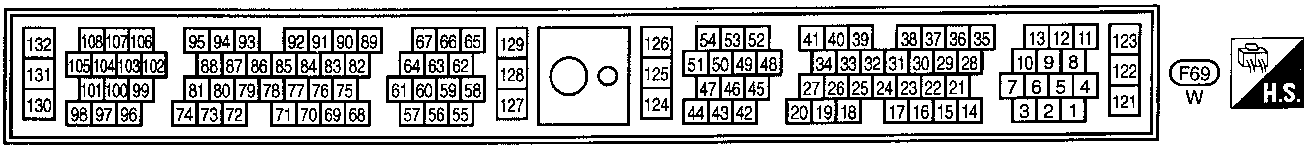




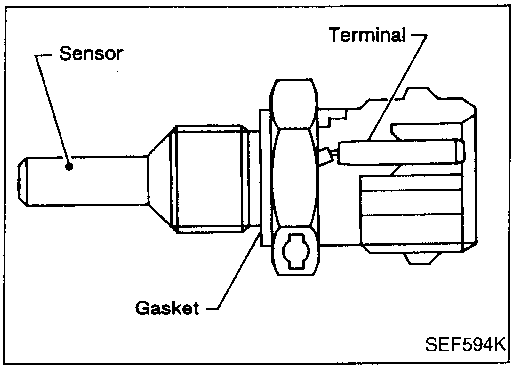
Refer to last page (Foldout page).
M4, B3
M49, F63

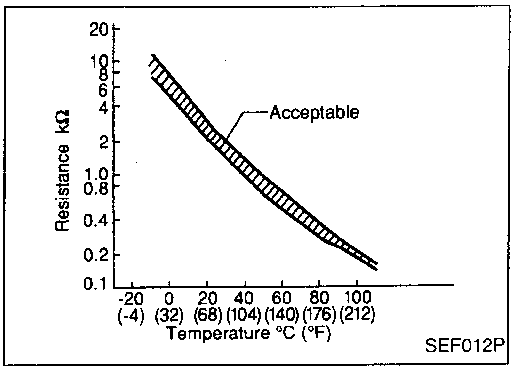






TEC641





Engine Coolant Temperature (ECT) Sensor

COMPONENT DESCRIPTION

The engine coolant temperature sensor is located near the No. 2 injector. The sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

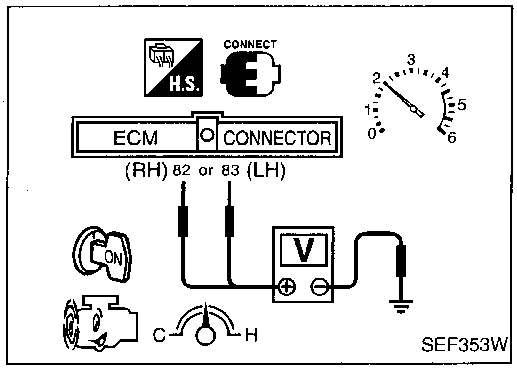
<Reference data>

Engine coolant temperature °C (°F)	Voltage* (V)	Resistance (kΩ)
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	1.0	0.236 - 0.260

*: These data are reference values and are measured between ECM terminal (67) (Engine coolant temperature sensor) and ECM terminal (128) (ECM ground).

ON BOARD DIAGNOSIS LOGIC

Diagnostic Trouble Code No.	Malfunction is detected when ...	Check Items (Possible Cause)
P0125 0908	• Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine. • Engine coolant temperature is insufficient for closed loop fuel control.	• Harness or connectors (High resistance in the circuit) • Engine coolant temperature sensor • Thermostat



Front Heated Oxygen Sensor (Rich shift monitoring) (Front HO2S) (P0132: Left bank), (P0152: Right bank) (Cont'd)

OR

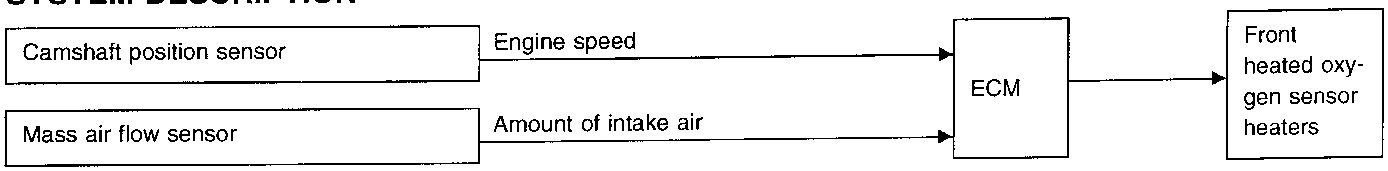
OVERALL FUNCTION CHECK

Use this procedure to check the overall function of the front heated oxygen sensor circuit. During this check, a 1st trip DTC might not be confirmed.

1) Start engine and warm it up to normal operating temperature.
2) Set voltmeter probes between ECM terminal ⑫ RH, ⑬ LH (sensor signal) and ground.
3) Check the following with engine speed held at 2,000 rpm constant under no load.
- The maximum voltage is over 0.8V at least one time.
- The minimum voltage is below 0.35V at least one time.
4) If NG, go to "DIAGNOSTIC PROCEDURE", EC-175.

Front Heated Oxygen Sensor Heater (P0135: Left bank), (P0155: Right bank)

SYSTEM DESCRIPTION



The ECM performs ON/OFF control of the front heated oxygen sensor heaters corresponding to the engine speed.

OPERATION

Engine speed rpm	Front heated oxygen sensor heaters
Above 3,200	OFF
Below 3,200	ON

CONSULT REFERENCE VALUE IN DATA MONITOR MODE

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
O2 SEN HTR-B1 O2 SEN HTR-B2	• Engine speed: Idle	ON
	• Engine speed: Above 3,200	OFF

ECM TERMINALS AND REFERENCE VALUE

Specification data are reference values, and are measured between each terminal and (128) (ECM ground).

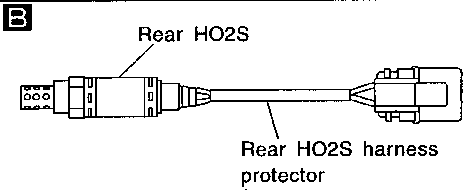
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC voltage)
17 (LH)	G/W	Front heated oxygen sensor heaters (left bank)	Engine is running. └ Engine speed is below 3,200 rpm.	0 - 0.5V
16 (RH)	L/Y		Engine is running. └ Engine speed is above 3,200 rpm.	BATTERY VOLTAGE (11 - 14V)

ON BOARD DIAGNOSIS LOGIC

Diagnostic Trouble Code No.	Malfunction is detected when	Check Items (Possible Cause)
P0135 0901 (Left bank)	• The current amperage in the front heated oxygen sensor heater circuit is out of the normal range. (The improper voltage drop signal is sent to ECM through the front heated oxygen sensor heater.)	• Harness or connectors (The front heated oxygen sensor heater circuit is open or shorted.) • Front heated oxygen sensor heater
P0155 1001 (Right bank)		

Rear Heated Oxygen Sensor (Max. Voltage Monitoring) (Rear HO2S) (P0138: Left bank), (P0158: Right bank) (Cont'd)

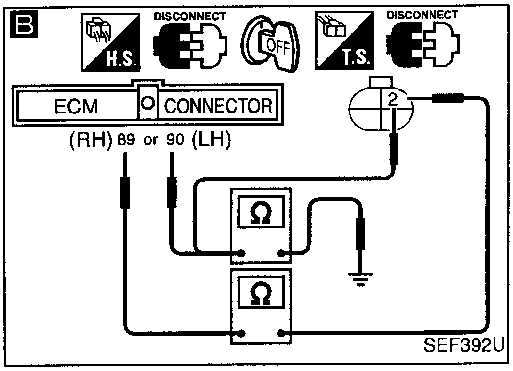
B



Rear HO2S harness protector color:
P0138 (-B1) Left bank: White
P0158 (-B2) Right bank: Red

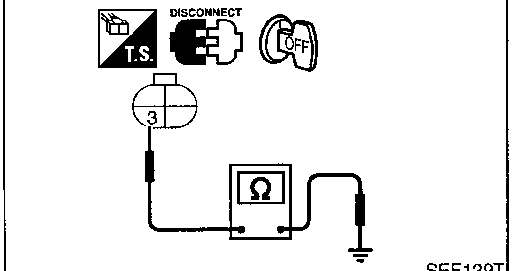
SEF418W

B



SEF392U

C



SEF129T

Ⓐ

B

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 terminals and sensor.

P code	Terminals		Bank (Harness protector color)
	ECM	Sensor	
P0138	90	2	LH (White)
P0158	89	2	RH (Red)

Continuity should exist.

4. Check harness continuity between ECM and sensor or ground terminals.

P code	Terminals		Bank (Harness protector color)
	ECM or sensor	Ground	
P0138	90 or 2	Ground	LH (White)
P0158	89 or 2	Ground	RH (Red)

Continuity should not exist.
If OK, check harness for short to ground and short to power.

NG → Check the following.
- Harness connectors (F3), (E12) (LH) or (F14), (F131) (RH)
- Harness connectors (E19), (E102) (LH)

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

OK ↓

C

CHECK GROUND CIRCUIT.
1. Turn ignition switch "OFF".
2. Loosen and retighten ground screws.
3. Check harness continuity between terminal ③ and engine ground.
Continuity should exist.
If OK, check harness for short to ground and short to power.

NG → Check the following.
- Harness connectors (F3), (E12) (LH) or (F14), (F131) (RH)
- Harness connectors (E19), (E102) (LH)
- Harness connectors (F62), (F61)
- Harness for open or short between rear heated oxygen sensor and engine ground

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

OK ↓

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

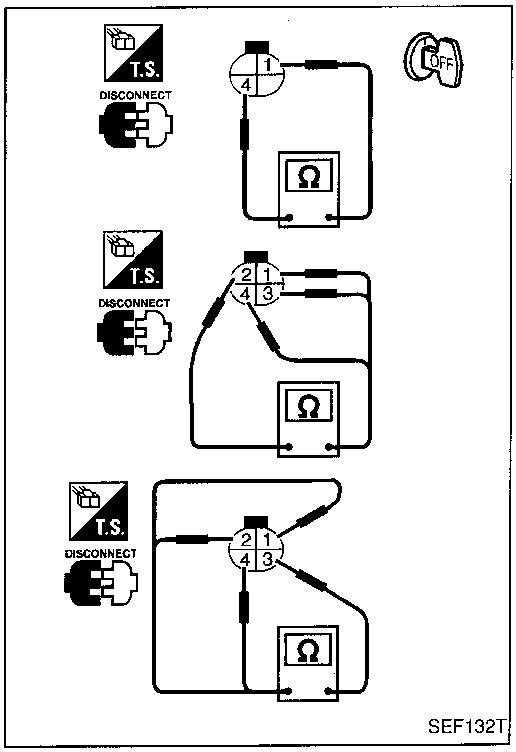
NG → REPLACE REAR HO2S.
1. Check rear HO2S harness protector color.
White: Left bank (-B1)
Red: Right bank (-B2)
2. Replace malfunctioning rear HO2S.

OK ↓

Perform "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT", EC-108.

↓

INSPECTION END



Rear Heated Oxygen Sensor Heaters (P0141: Left bank), (P0161: Right bank) (Cont'd)

COMPONENT INSPECTION

Rear heated oxygen sensor heater

Check the following.

1. Check resistance between terminals ④ and ① .
   Resistance: 2.3 - 4.3Ω at 25°C (77°F)
2. Check continuity.

Terminal No.	Continuity
② and ① , ③ , ④	No
③ and ① , ② , ④	

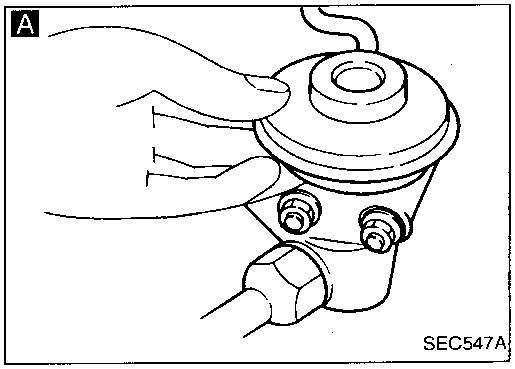
If NG, replace the front heated oxygen sensor.

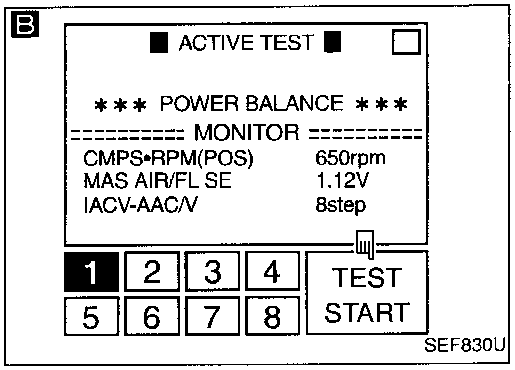
CAUTION:

Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.

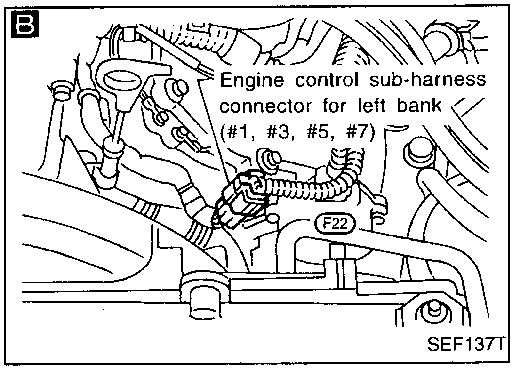
No. 1 - 8 Cylinder Misfire, Multiple Cylinder Misfire (Cont'd)

DIAGNOSTIC PROCEDURE

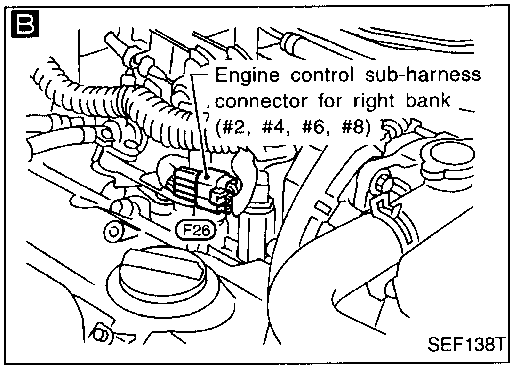

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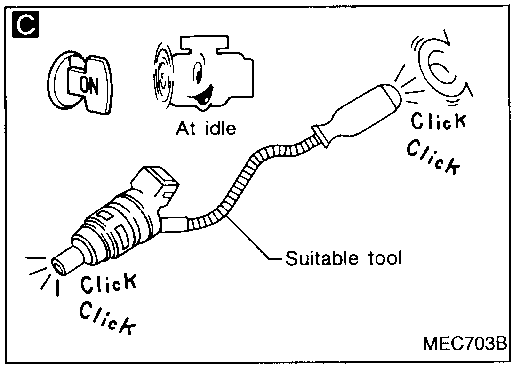
SEF830U



SEF137T



SEF138T



MEC703B

INSPECTION START

CHECK FOR INTAKE AIR LEAK.
Start engine and run it at idle speed. Listen for the sound of the intake air leak.
NG → Discover air leak location and repair.
OK

CHECK FOR EXHAUST SYSTEM CLOGGING.
Stop engine and visually check exhaust tube, three way catalyst and muffler for dent.
NG → Repair or replace it.
OK

A

CHECK EGR FUNCTION.
Perform DTC CONFIRMATION PROCEDURE for EGR Function, EC-405.
NG → Repair EGR system.
OK

B

PERFORM POWER BALANCE TEST.
1. Perform "POWER BALANCE" in "ACTIVE TEST" mode.
2. Is there any cylinder which does not produce a momentary engine speed drop?

OR

When disconnecting each injector harness connector one at a time, is there any cylinder which does not produce a momentary engine speed drop?

No → Go to E .
Yes

C

CHECK INJECTOR.
Does each injector make an operating sound at idle?
No → Check injector(s) and circuit(s). Refer to EC-497.
Yes

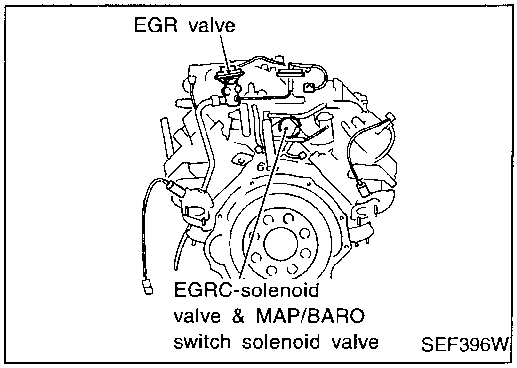
D

CHECK IGNITION SPARK.
1. Disconnect ignition coil assembly from rocker cover.
2. Connect a known good spark plug to the ignition coil assembly.
3. Place end of spark plug against a suitable ground and crank engine.
4. Check for spark.

NG → Check ignition coil with power transistor and their circuits. Refer to EC-381.
OK

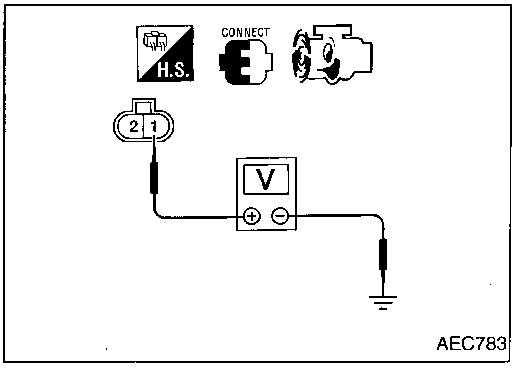
(Go to Ⓐ on next page.)

EGR Function (Close) (Cont'd)



THRTL POS SEN: X – (X + 0.53) V
X = Voltage value measured at step 7)
Selector lever: Suitable position
If "TESTING" is not displayed after 5 minutes, retry from step 2).

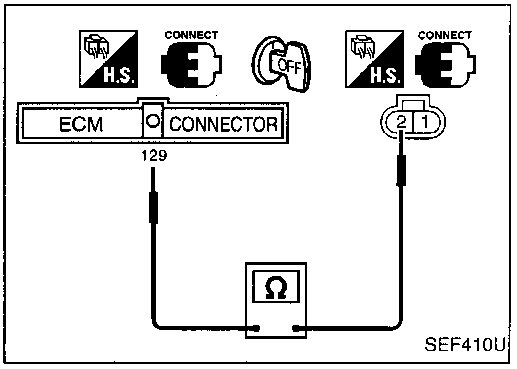
9) Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS". If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE", EC-276.

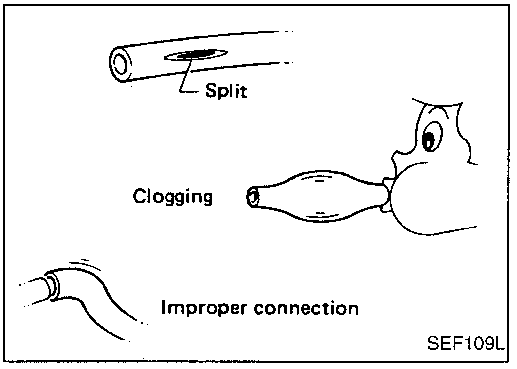


OVERALL FUNCTION CHECK

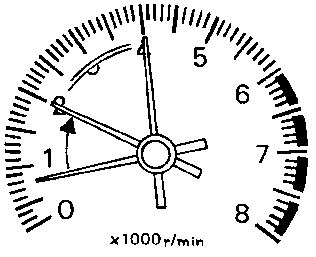
Use this procedure to check the overall EGR function. During this check, a 1st trip DTC might not be confirmed.

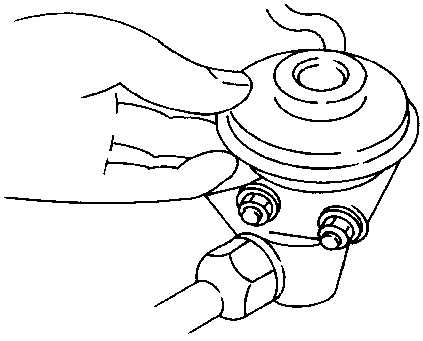
1) Lift up drive wheels.
   Start engine (TCS switch "OFF") and warm it up to normal operating temperature.
2) Shift to "D" position.
3) Check the EGR valve lifting when revving engine from idle up to 3,000 rpm.
   EGR valve should lift up and down without sticking.
4) Check voltage between EGR temperature sensor harness connector terminal ① and ground at idle speed.
   Less than 4.5V should exist.
5) Turn ignition switch "OFF".
6) Check harness continuity between EGR temperature sensor harness connector terminal ② and ECM terminal (129).
   Continuity should exist.
7) Perform "COMPONENTS INSPECTION", "EGR temperature sensor". Refer to EC-279.
8) If NG, go to "DIAGNOSTIC PROCEDURE", EC-276.





Overall function check





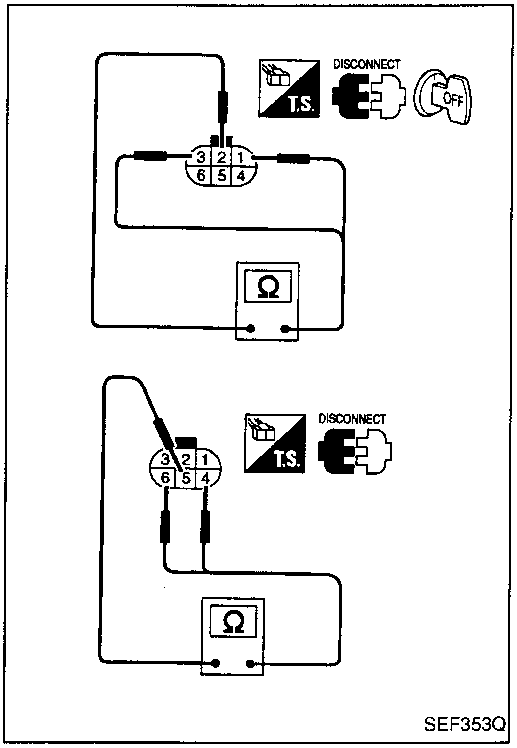
Check the EGR valve lifting when revving engine from 2,000 rpm up to 4,000 rpm.

SEF642Q

Evaporative Emission (EVAP) Control System (Small Leak) (Negative Pressure) (Cont'd)

COMPONENT INSPECTION

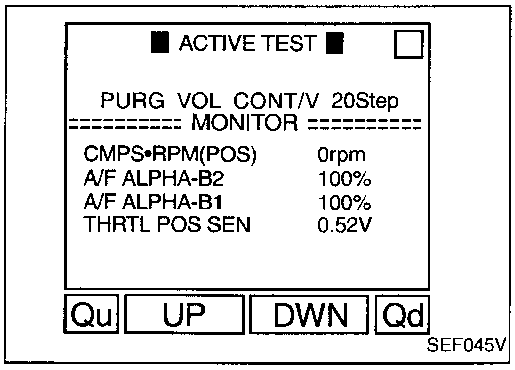
EVAP canister purge volume control valve



SEF353Q

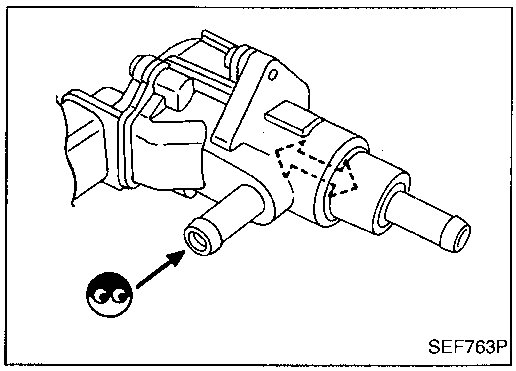
1. Disconnect EVAP canister purge volume control valve harness connector.
2. Check resistance between the following terminals.
   terminal ② and terminals ①, ③
   terminal ⑤ and terminals ④, ⑥
   Resistance:
   Approximately 35 - 43Ω [At 25°C (77°F)]
3. Reconnect EVAP canister purge volume control valve 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. Check that EVAP canister purge volume control valve shaft moves smoothly forward and backward according to the valve opening.
   If NG, replace the EVAP canister purge volume control valve.

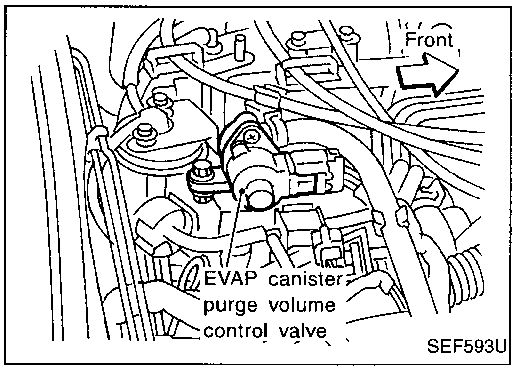
OR



SEF045V

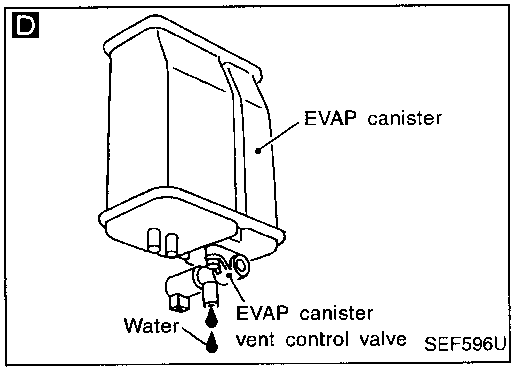
1. Disconnect EVAP canister purge volume control valve harness connector.
2. Check resistance between the following terminals.
   terminal ② and terminals ①, ③
   terminal ⑤ and terminals ④, ⑥
   Resistance:
   Approximately 35 - 43Ω [At 25°C (77°F)]
3. Reconnect EVAP canister purge volume control valve 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". Check that EVAP canister purge volume control valve shaft moves smoothly forward and backward according to the ignition switch position.
   If NG, replace the EVAP canister purge volume control valve.


SEF763P



SEF593U

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



Ⓐ

CHECK COMPONENT
(EVAP canister purge volume control valve).
Refer to "COMPONENT INSPECTION", EC-294.

NG → Replace EVAP canister purge volume control valve.

OK

CHECK COMPONENT
(EVAP canister vent control valve).
Refer to "COMPONENT INSPECTION", EC-309.

OK

CHECK COMPONENT
(EVAP control system pressure sensor).
Refer to "COMPONENT INSPECTION" below.

NG → Replace EVAP control system pressure sensor.

OK

CHECK RUBBER TUBE FOR CLOGGING.
Check obstructed water separator and rubber tube to EVAP canister vent control valve and clean the rubber tube using air blower.
For water separator, refer to "COMPONENT INSPECTION", EC-423.

NG → Clean, repair or replace rubber tube and/or water separator.

OK

D

CHECK IF EVAP CANISTER IS SATURATED WITH WATER.

1. Remove EVAP canister with EVAP canister vent control valve attached.
2. Check if water will drain from the EVAP canister. If it will, weigh the EVAP canister with the vent control valve attached.
   If the weight is:
   More than 1.8 kg (4.0 lb) → NG
   Less than 1.8 kg (4.0 lb) → OK

NG → Replace EVAP canister and check the following:
1. Check hose connections to the EVAP canister and water separator for clogging and poor connection.
2. Check water separator. Refer to "COMPONENT INSPECTION", EC-296.

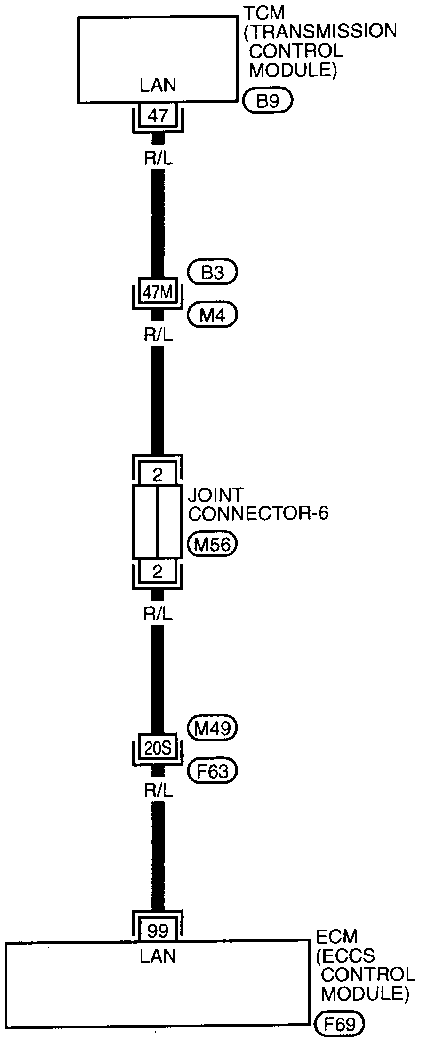
OK

Perform "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT", EC-108.

INSPECTION END

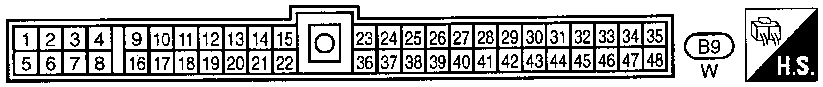
A/T Communication Line (P0600) and A/T Diagnostic Communication Line (P1605) (Cont'd)

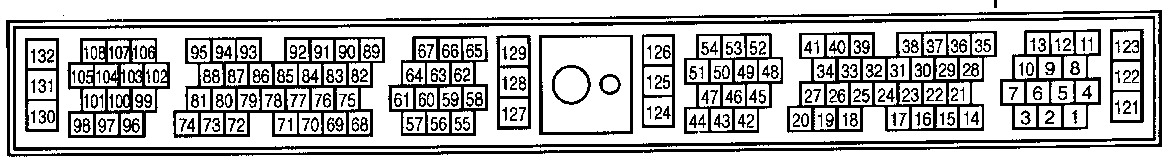
EC-AT/C-01



Refer to last page (Foldout page).
M4, B3
M49, F63

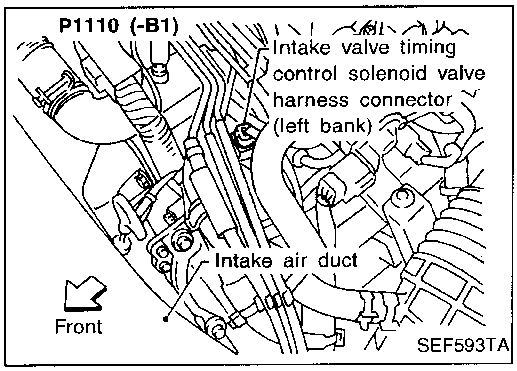


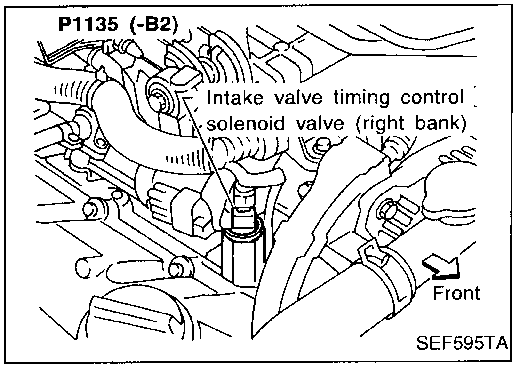


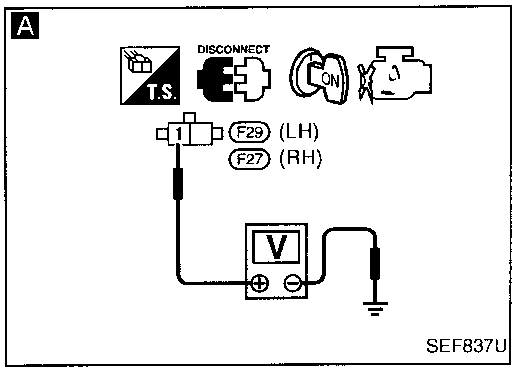


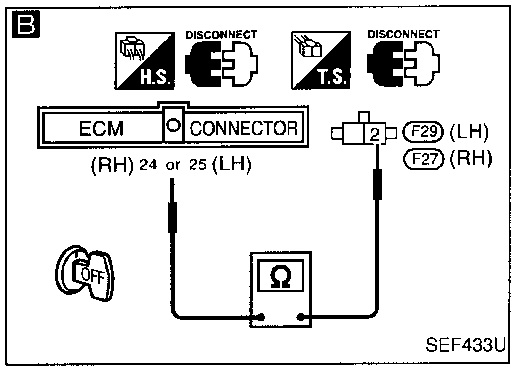
TEC265

Intake Valve Timing Control (P1110: Left bank), (P1135: Right bank) (Cont'd)









DIAGNOSTIC PROCEDURE

INSPECTION START

A

CHECK POWER SUPPLY.
1. Stop engine.
2. Disconnect intake valve timing control solenoid valve harness connector.
3. Turn ignition switch "ON".
4. Check voltage between terminal ① and ground.
   Voltage: Battery voltage

NG → Check the following.
- Harness connectors F63, M49
- 10A fuse
- Harness for open or short between the intake valve timing control solenoid valve and fuse

If NG, repair harness or connectors.

OK ↓

B

CHECK OUTPUT SIGNAL CIRCUIT.
1. Turn ignition switch "OFF".
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal RH ㉔, ㉕ LH and solenoid valve terminal ②.
   Continuity should exist.

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

NG → Repair harness or connectors.

OK ↓

CHECK ENGINE OIL PRESSURE.
Refer to LC section ("Oil Pressure Check", "ENGINE LUBRICATION SYSTEM").

NG → Repair lubrication system.

OK ↓

CHECK INTAKE AIR SYSTEM.
Check intake air system for leaks.

NG → Repair intake air system.

OK ↓

CHECK INTAKE VALVE TIMING CONTROL POSITION SENSOR.
Refer to DTC P1140, EC-363.

NG → Repair or replace.

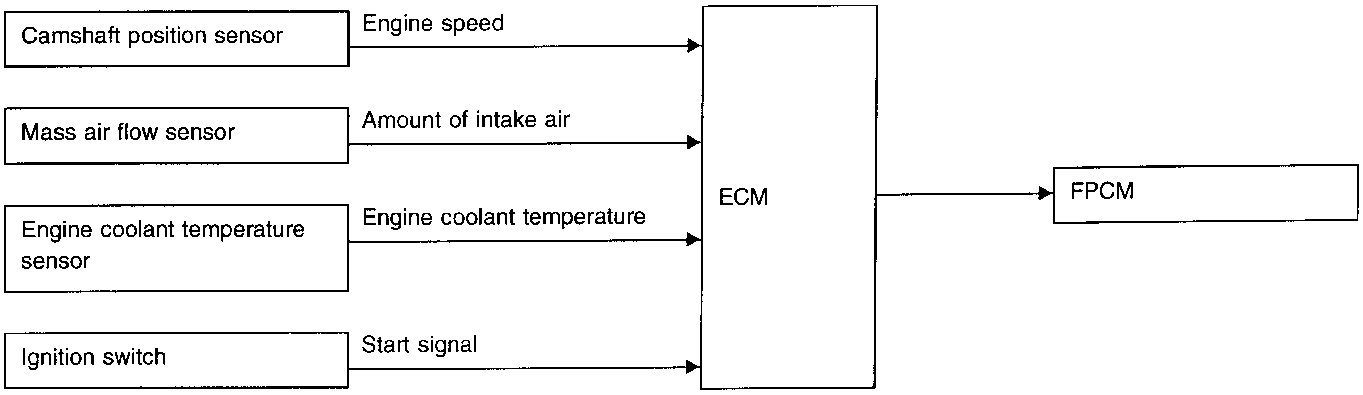
OK ↓

Ⓐ

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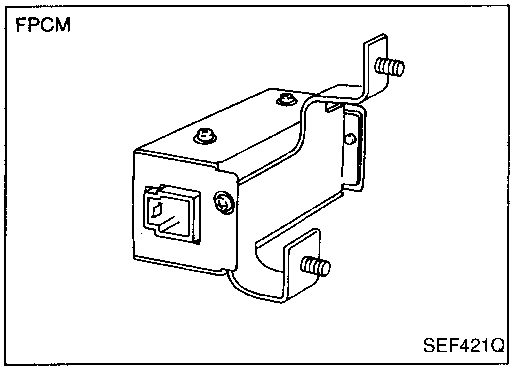
Fuel Pump Control Module (FPCM)

SYSTEM DESCRIPTION



This system controls the fuel pump operation. The amount of fuel flow delivered from the fuel pump is altered between two flow rates by the FPCM operation. The FPCM determines the voltage supplied to the fuel pump (and therefore fuel flow) according to the following conditions.

Conditions	Amount of fuel flow	Supplied voltage
• Engine cranking • Within 16 seconds after starting engine [above 100°C (212°F)] • Engine is running under heavy load and high speed conditions	high	Battery voltage (11 - 14V)
Except the above	low	Approximately 7V



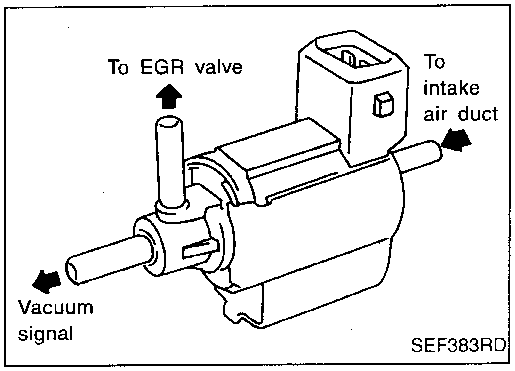
COMPONENT DESCRIPTION

The FPCM adjusts the voltage supplied to the fuel pump to control the amount of fuel flow. When the FPCM increases the voltage supplied to the fuel pump, the fuel flow is increased. When the FPCM decreases the voltage, the fuel flow is decreased.

CONSULT REFERENCE VALUE IN DATA MONITOR MODE

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
FPCM	• Within 16 seconds after starting the engine, when engine coolant temperature is more than 100°C (212°F)	HIGH → LOW
FPCM D/R VOLT	• Within 16 seconds after starting the engine, when engine coolant temperature is more than 100°C (212°F)	Approx. 5.0V → Approx. 0.4V



EGRC-solenoid Valve

COMPONENT DESCRIPTION

The EGRC-solenoid valve responds to signals from the ECM. When the ECM sends an ON (ground) signal, the coil in the solenoid valve is energized. A plunger will then move to flow the vacuum signal (from the intake manifold collector to the EGR valve.)
The vacuum signal passes through the solenoid valve. The signal then reaches the EGR valve. When the ECM sends an OFF signal, the plunger is returned by the spring and cut the vacuum signal.

CONSULT REFERENCE VALUE IN DATA MONITOR MODE

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
EGRC SOL/V	• Engine: After warming up • Air conditioner switch: "OFF" • Shift lever: "D" • No-load	Idle	OFF
		Revving engine up from idle to 3,000 rpm	ON

ECM TERMINALS AND REFERENCE VALUE

Specification data are reference values, and are measured between each terminal and (128) (ECM ground).

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC voltage)
10	L/Y	EGRC-solenoid valve	Engine is running. (Warm-up condition) └ Lift up drive wheels and rev engine up from idle to 3,000 rpm in "1st" position.	0 - 0.7V
			Engine is running. (Warm-up condition) └ Idle speed	BATTERY VOLTAGE (11 - 14V)

ON BOARD DIAGNOSIS LOGIC

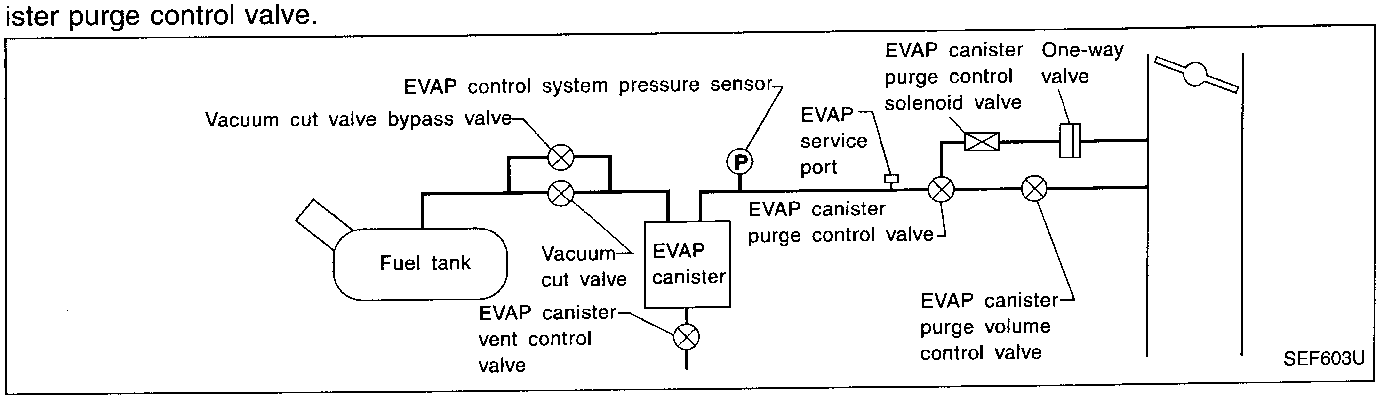
Diagnostic Trouble Code No.	Malfunction is detected when	Check Items (Possible Cause)
P1400 1005	• The improper voltage signal is sent to ECM through EGRC-solenoid valve.	• Harness or connectors (The EGRC-solenoid valve circuit is open or shorted.) • EGRC-solenoid valve

Evaporative Emission (EVAP) Control System (Small Leak) (Positive Pressure)

Note: If DTC P1448 is displayed with P1440, perform TROUBLE DIAGNOSIS FOR DTC P1448 first. (See EC-446.)

ON BOARD DIAGNOSIS LOGIC

This diagnosis detects leaks in the EVAP purge line using of vapor pressure in the fuel tank.
The EVAP canister vent control valve is closed to shut the EVAP purge line. The vacuum cut valve bypass valve will then be opened to clear the line between the fuel tank and the EVAP canister purge control valve. The EVAP control system pressure sensor can now monitor the pressure inside the fuel tank.
If pressure increases, the ECM will check for leaks in the line between the vacuum cut valve and EVAP canister purge control valve.

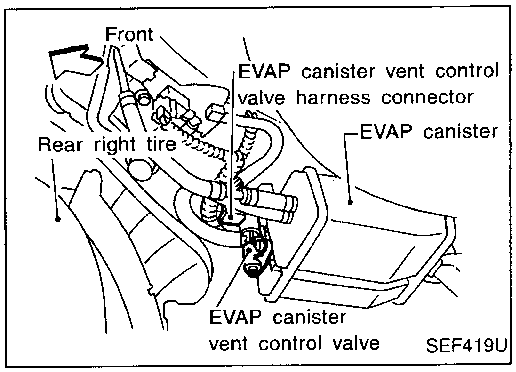


ON BOARD DIAGNOSIS LOGIC

Diagnostic Trouble Code No.	Malfunction is detected when	Check Items (Possible Cause)
P1440 0213	• EVAP control system has a leak. • EVAP control system does not operate properly.	• Incorrect fuel tank vacuum relief valve • Incorrect fuel filler cap used • Fuel filler cap remains open or fails to close. • Foreign matter caught in fuel filler cap. • Leak is in line between intake manifold and EVAP canister purge control valve. • Foreign matter caught in EVAP canister vent control valve. • EVAP canister or fuel tank leaks • EVAP purge line (pipe and rubber tube) leaks • EVAP purge line rubber tube bent. • Blocked or bent rubber tube to EVAP control system pressure sensor • EVAP control system pressure sensor • Loose or disconnected rubber tube • EVAP canister vent control valve and the circuit • EVAP canister purge control valve • EVAP canister purge volume control valve • EVAP canister purge control solenoid valve • Absolute pressure sensor • Tank fuel temperature sensor • MAP/BARO switch solenoid valve • Blocked or bent rubber tube to MAP/BARO switch solenoid valve • O-ring of EVAP canister vent control valve is missing or damaged. • Water separator • EVAP canister is saturated with water.

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**
- **Use only a genuine NISSAN rubber tube as a replacement.**



Evaporative Emission (EVAP) Canister Vent Control Valve (Close)

COMPONENT DESCRIPTION

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.
This solenoid (the EVAP canister vent control valve) responds to signals from the ECM.
When the ECM sends an ON signal, the coil in the solenoid valve is energized.
A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.
This solenoid valve is used only for diagnosis, and usually remains opened.
When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows "EVAP Control System (Small Leak)" diagnosis.

CONSULT REFERENCE VALUE IN DATA MONITOR MODE

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	• Ignition switch: ON	OFF

ECM TERMINALS AND REFERENCE VALUE

Specification data are reference values and are measured between each terminal and (128) (ECM ground).

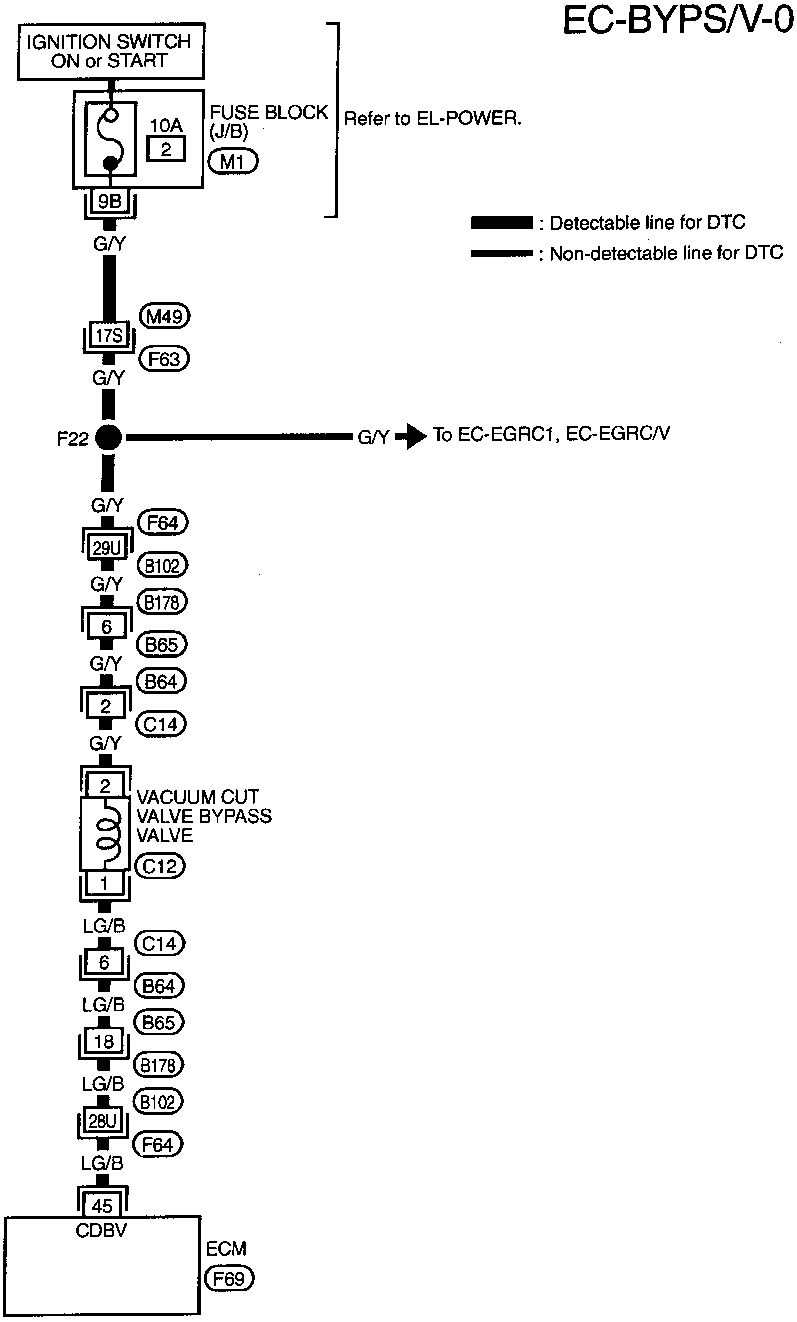
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
20	P/B	EVAP canister vent control valve	Ignition switch "ON"	BATTERY VOLTAGE (11 - 14V)

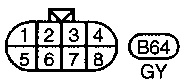
ON BOARD DIAGNOSIS LOGIC

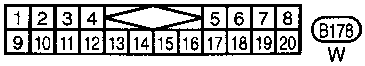
Diagnostic Trouble Code No.	Malfunction is detected when	Check Items (Possible Cause)
P1446 0215	• EVAP canister vent control valve remains closed under specified driving conditions.	• EVAP canister vent control valve • EVAP control system pressure sensor and the circuit • Blocked rubber tube to EVAP canister vent control valve • Water separator • EVAP canister is saturated with water.

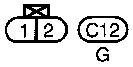
Vacuum Cut Valve Bypass Valve (Circuit) (Cont'd)

EC-BYPS/V-01







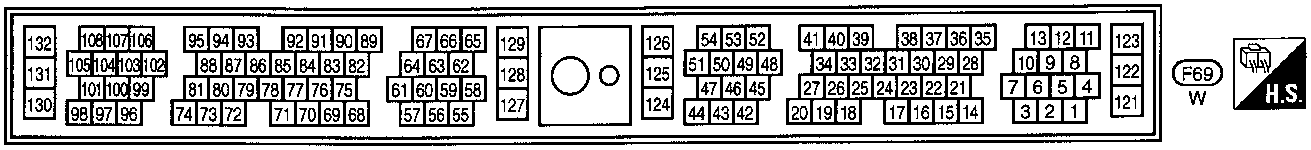


Refer to last page (Foldout page).

M49, F63

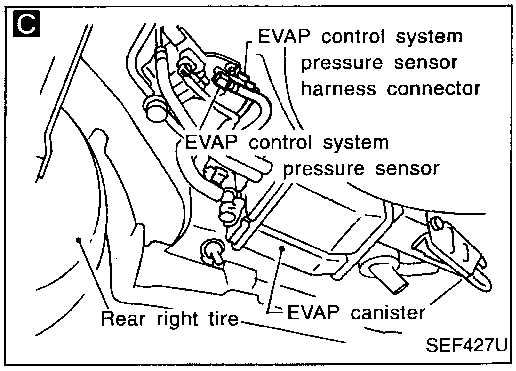
F64, B102

M1



TEC656

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



Ⓐ

C

CHECK COMPONENT
(EVAP control system pressure sensor).
1. Check disconnection of hose connected to the sensor.
2. Check sensor harness connector for water soak.
   Water should not exist.
   If OK, go to step 3.
3. Check EVAP control system pressure sensor, refer to "COMPONENT INSPECTION", EC-310.

NG → Replace EVAP control system pressure sensor and repair or replace harness and connector.

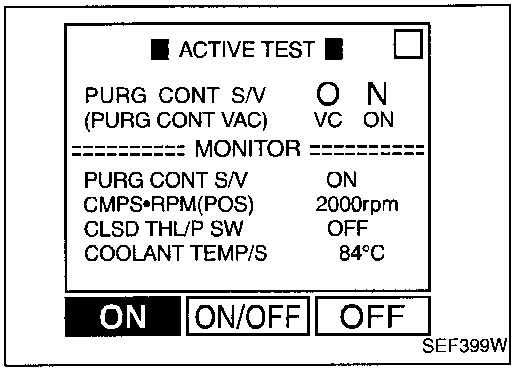
OK ↓

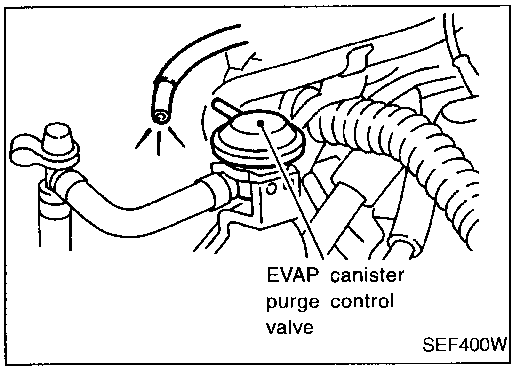
CHECK EVAPORATIVE EMISSION LINE.
Check EVAP purge line hoses for leak or clogging.
Refer to "Evaporative Emission Line Drawing", EC-26.

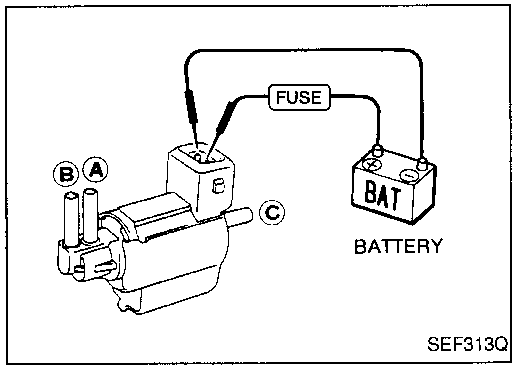
NG → Repair EVAP purge line hoses.

OK ↓

INSPECTION END







COMPONENT INSPECTION

EVAP canister purge control solenoid valve

1. Turn ignition switch "ON".
2. Select "PURG CONT S/V" of "ACTIVE TEST" mode with CONSULT.
3. Start engine and warm it up to normal operating temperature.
4. Disconnect vacuum hose at EVAP canister purge control valve.
5. Touch "ON" and "OFF" and check for vacuum passing through the hose.

Condition	Vacuum
Idle	Not exist
2,000 rpm	Exist

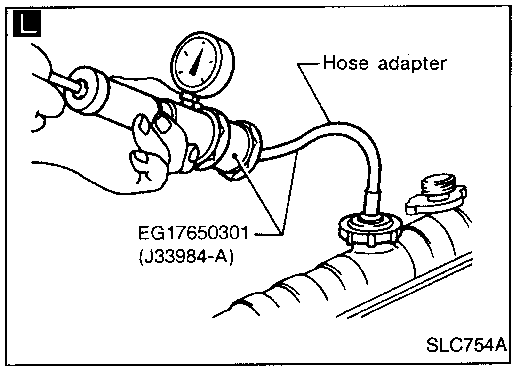
OR

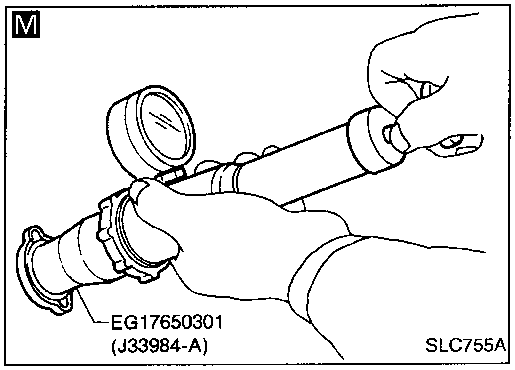
Check air passage continuity.

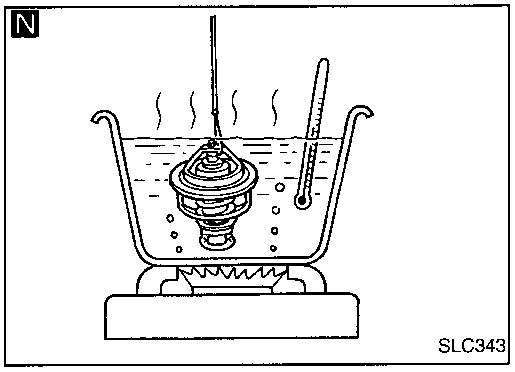
Condition	Air passage continuity between Ⓐ and Ⓑ	Air passage continuity between Ⓐ and Ⓒ
12V direct current supply between terminals	Yes	No
No supply	No	Yes

If NG or operation takes more than 1 second, replace solenoid valve.

Overheat (Cont'd)







Ⓑ

L

CHECK COOLING SYSTEM FOR LEAK.
Apply pressure to the cooling system with a tester, and check if the pressure drops.
Testing pressure:
157 kPa (1.6 kg/cm², 23 psi)
Pressure should not drop.
CAUTION:
Higher than the specified pressure may cause radiator damage.

NG → Check the following for leak.
- Hose
- Radiator
- Water pump

Refer to LC section ("Water Pump").

OK ↓

M

CHECK RADIATOR CAP.
Apply pressure to cap with a tester.
Radiator cap relief pressure:
Standard
98 - 118 kPa (1.0 - 1.2 kg/cm², 14 - 17 psi)
Limit
59 - 118 kPa (0.6 - 1.2 kg/cm², 9 - 17 psi)

NG → Replace radiator cap.

OK ↓

N

CHECK THERMOSTAT.
1. Check valve seating condition at normal room temperatures.
   It should seat tightly.
2. Check valve opening temperature and maximum valve lift.
   Valve opening temperature:
   82°C (180°F) [standard]
   Maximum valve lift:
   More than 8.6 mm/95°C (0.339 in/203°F)
3. Check if valve is closed at 5°C (9°F) below valve opening temperature.

For details, refer to LC section ("Thermostat").

NG → Replace thermostat.

OK ↓

Check engine coolant temperature sensor. Refer to "COMPONENT INSPECTION", EC-141.

NG → Replace engine coolant temperature sensor.

OK ↓

If the cause can not be isolated, go to "MAIN 12 CAUSES OF OVERHEATING", EC-495.

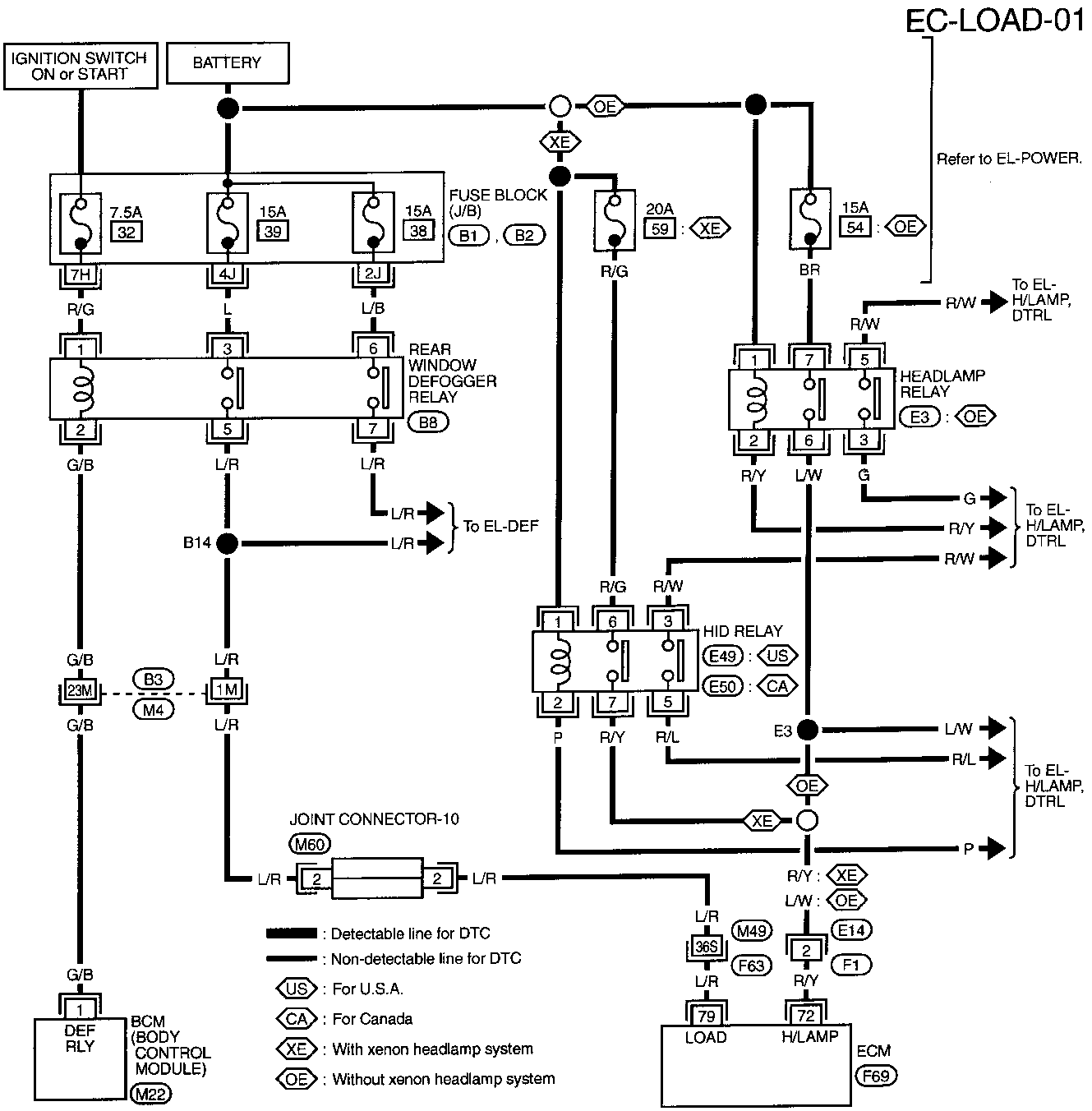
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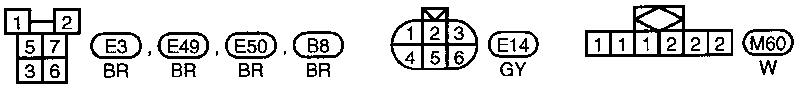
INSPECTION END

Perform FINAL CHECK by the following procedure after repair is completed.

1. Warn up engine. Run the vehicle for at least 20 minutes. Pay attention to engine coolant temperature gauge on the instrument panel. If the reading shows an abnormally high temperature, another part may be malfunctioning.
2. Stop vehicle and let engine idle. Check the intake and exhaust systems for leaks by listening for noise or visually inspecting the components.
3. Allow engine to cool and visually check for oil and coolant leaks. Then, perform "OVERALL FUNCTION CHECK".

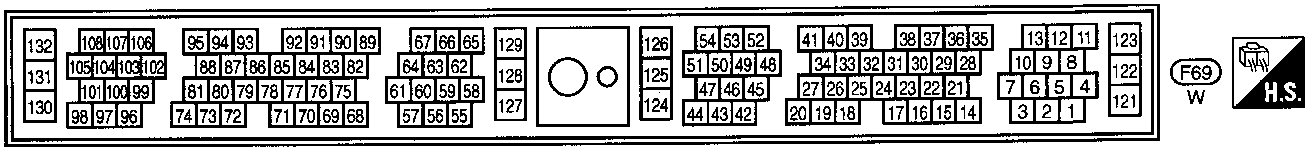
Electrical Load Signal





Refer to last page (Foldout page).

M4 , B3
M49 , F63
M22
B1
B2



TEC659

CLICK HERE TO DOWNLOAD THE COMPLETE MANUAL

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- You can download the complete manual from: www.heydownloads.com by clicking the link below

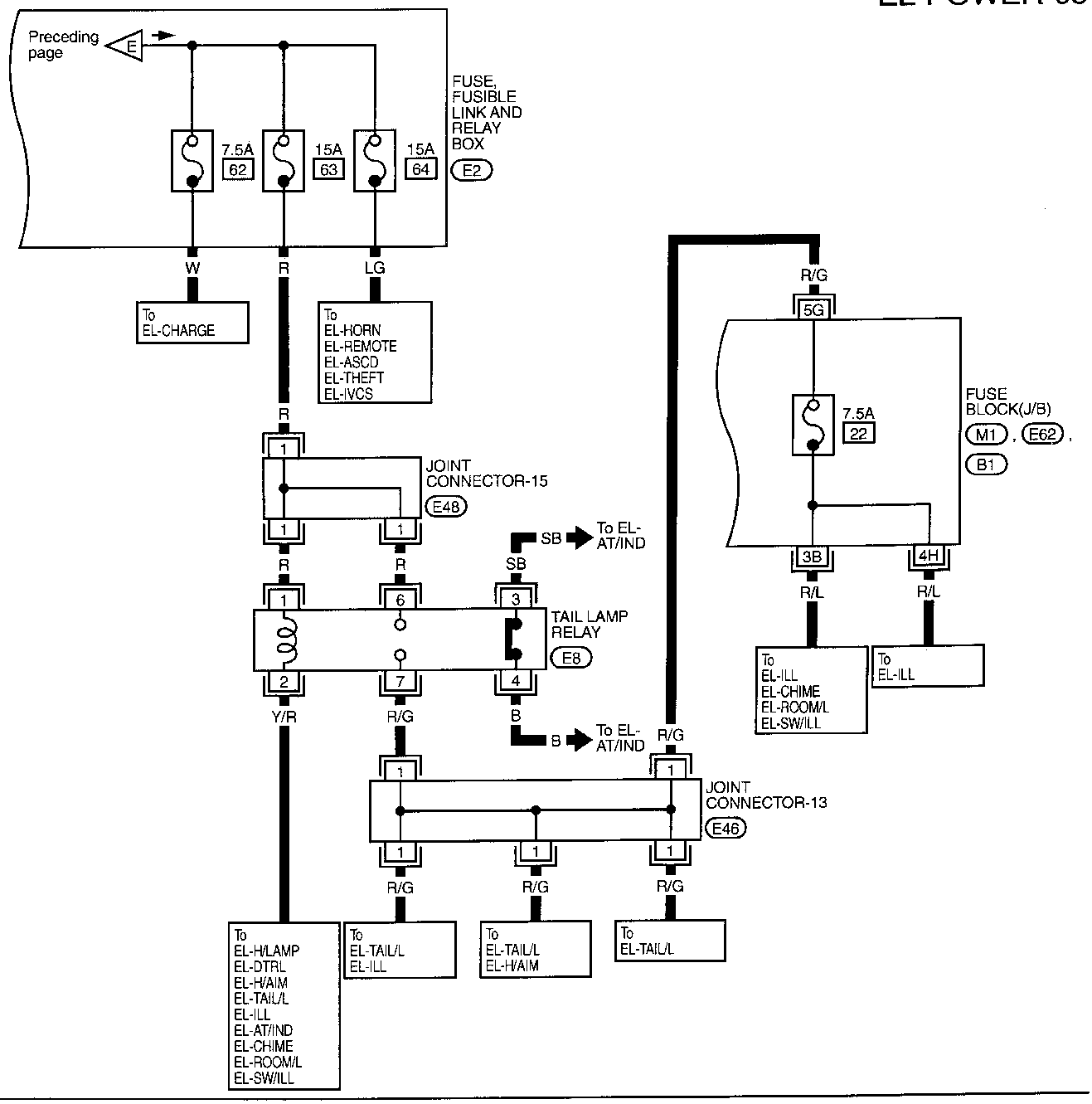


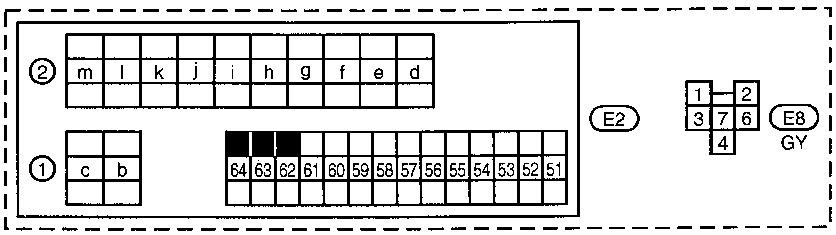
- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

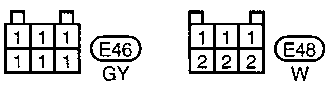
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Wiring Diagram — POWER — (Cont'd)

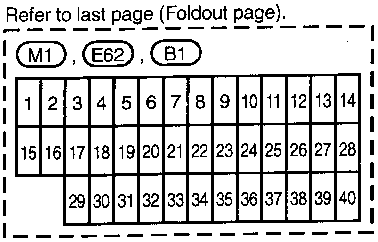
EL-POWER-05







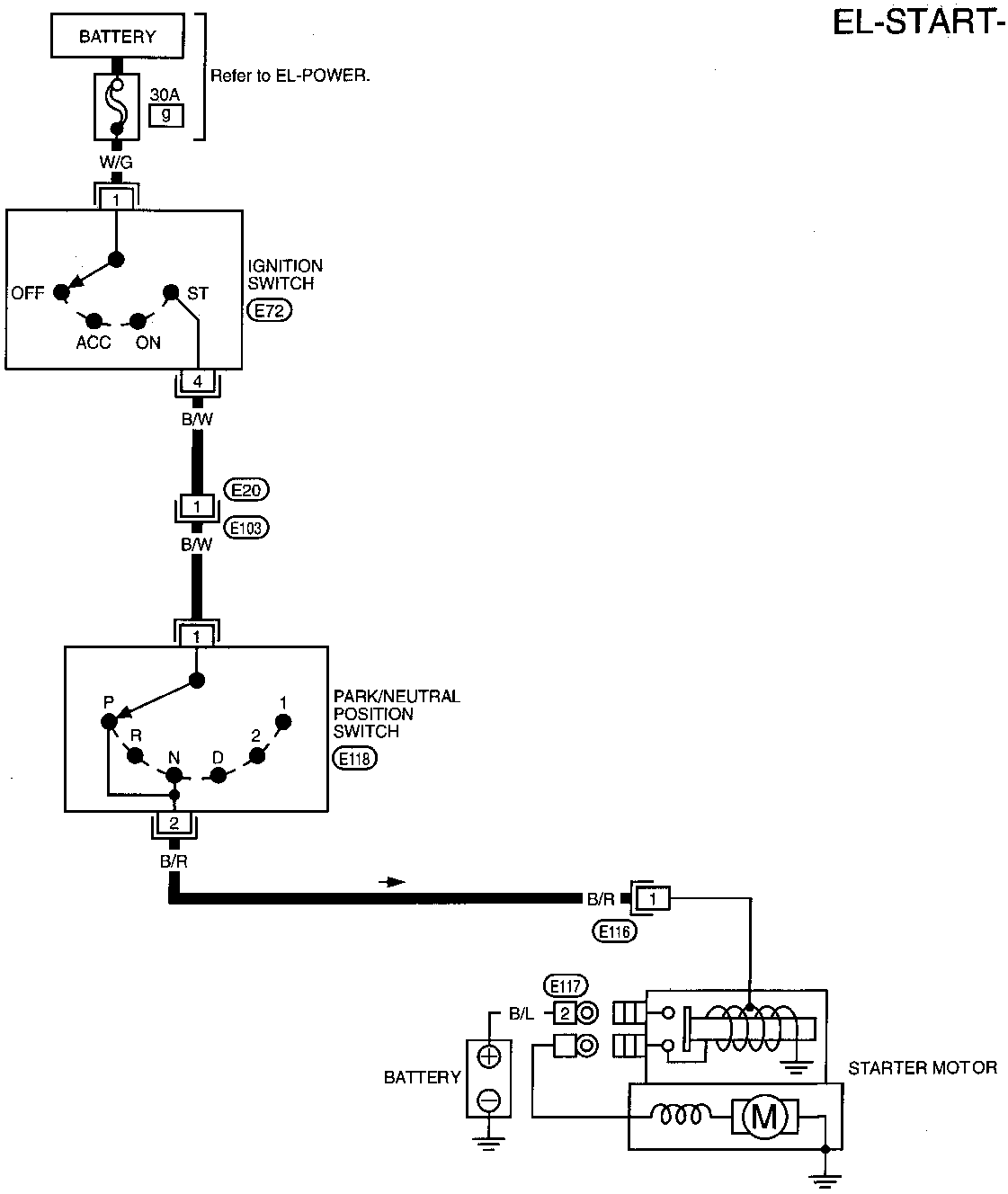
Refer to last page (Foldout page).



TEL043B

Wiring Diagram — START —

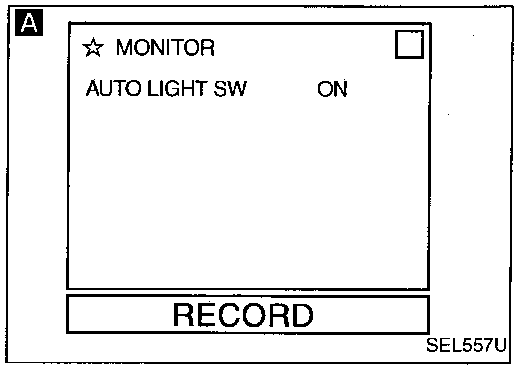
EL-START-01





TEL962A

Trouble Diagnoses/Auto Light Operation (Cont'd)



DIAGNOSTIC PROCEDURE 1

[Lighting switch (AUTO) check]

CHECK LIGHTING SWITCH (AUTO) INPUT SIGNAL.

A CONSULT

See "AUTO LIGHT SW" in DATA MONITOR mode.
When lighting switch is in AUTO:
AUTO LIGHT SW ON
When lighting switch is OFF:
AUTO LIGHT SW OFF

OR

ON BOARD

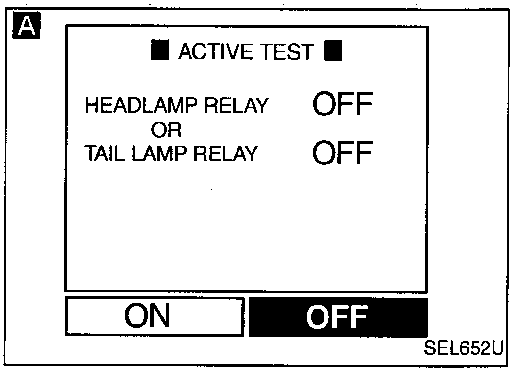
Perform On board diagnosis — Mode II (Switch monitor) for light switch. Refer to EL-270.

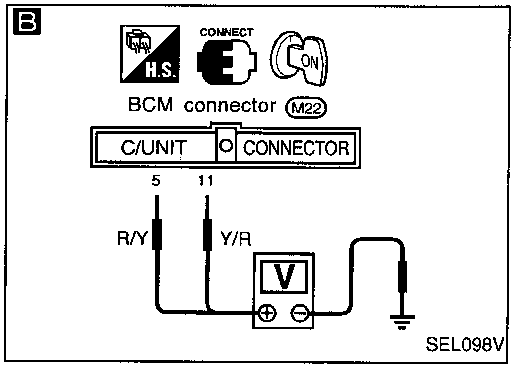
Refer to wiring diagram in EL-46.

NG → Check the following.
- Lighting switch
- Harness for open or short between BCM and lighting switch
- Ground circuit for lighting switch

OK ↓

Lighting switch (AUTO) is OK.





DIAGNOSTIC PROCEDURE 2

(Auto light output check)

CHECK AUTO LIGHT OUTPUT SIGNAL/ CIRCUIT.

A CONSULT

See "HEADLAMP RELAY" and "TAIL LAMP RELAY" in ACTIVE TEST mode, and turn lighting switch to AUTO position.
Headlamp and tail lamp should turn on.

OR

B TESTER

1. Turn the ignition switch to ON position or lighting switch to AUTO position.
2. Check voltage between BCM terminal ⑤ or ⑪ and ground.

Output condition	Voltage [V]
Sensor not struck by light (Determined to be "dark" by sensor)	0
Sensor struck by light	Approx. 12

Refer to wiring diagram in EL-47.

NG → Check harness for open or short between BCM and headlamp relay or tail lamp relay.

OK ↓

Auto light output is OK.

Daytime Light System/System Description (Cont'd)

Low beam operation

When the lighting switch is turned to 2ND and LOW ("B") positions, ground is supplied
- to terminal ① of the LH headlamp
- through daytime light control unit terminals ⑪ and ⑫
- through lighting switch terminals ⑩ and ⑧
- through body grounds E22 and E36.

Ground is also supplied
- to terminal ① of the RH headlamp
- through daytime light control unit terminals ⑧ and ⑮
- through lighting switch terminals ⑦ and ⑤
- through body grounds E22 and E36.

With power and ground supplied, the low beam headlamps illuminate.

High beam operation/flash-to-pass operation

When the lighting switch is turned to 2ND and HIGH ("A") or PASS ("C") positions, ground is supplied
- to terminal ③ of LH headlamp and combination meter terminal ㉓ for the HIGH BEAM indicator
- through daytime light control unit terminals ⑩ and ⑬
- through lighting switch terminals ⑨ and ⑧
- through body grounds E22 and E36.

Ground is also supplied
- to terminal ③ of RH headlamp
- through daytime light control unit terminals ⑨ and ⑭
- through lighting switch terminals ⑥ and ⑤
- through body grounds E22 and E36.

With power and ground supplied, the high beam headlamps illuminate.

AUTO LIGHT OPERATION

For auto light operation, refer to EL-44.

DAYTIME LIGHT OPERATION

With the engine running, the lighting switch in the OFF or 1ST position and parking brake released, power is supplied
- through daytime light control unit terminal ⑦
- to terminal ② of RH headlamp
- through terminal ③ of RH headlamp
- to daytime light control unit terminal ⑨
- through daytime light control unit terminal ⑥
- to terminal ② of LH headlamp.

Ground is supplied to terminal ③ of LH headlamp.
- through daytime light control unit terminals ⑩ and ⑯
- through body grounds E22 and E36.

Because the high beam headlamps are now wired in series, they operate at half illumination.

System Description

Power is supplied at all times
- to tail lamp relay terminals ① and ⑥
- through 15A fuse [No. 63, located in the fuse, fusible link and relay box].

Ground is supplied
- to the lighting switch terminals ⑤ and ⑧
- through body grounds E22 and E36.

SWITCH OPERATION

When the lighting switch is turned to 1ST or 2ND position, ground is supplied
- to tail lamp relay terminal ②
- from the lighting switch terminal ⑪.

Tail lamp relay is then energized, and power is supplied
- from tail lamp relay terminal ⑦
- to power terminals of parking, license and tail lamps through stop and tail lamp sensor terminal ⑧.

With power supplied, parking, license and tail lamps illuminate.

AUTO LIGHT OPERATION

BCM is connected to the optical sensor. The optical sensor sends a signal to BCM according to outside brightness.
When the lighting switch is turned to AUTO position, ground is supplied
- to BCM terminal ⑭
- from the lighting switch terminal ㊷.

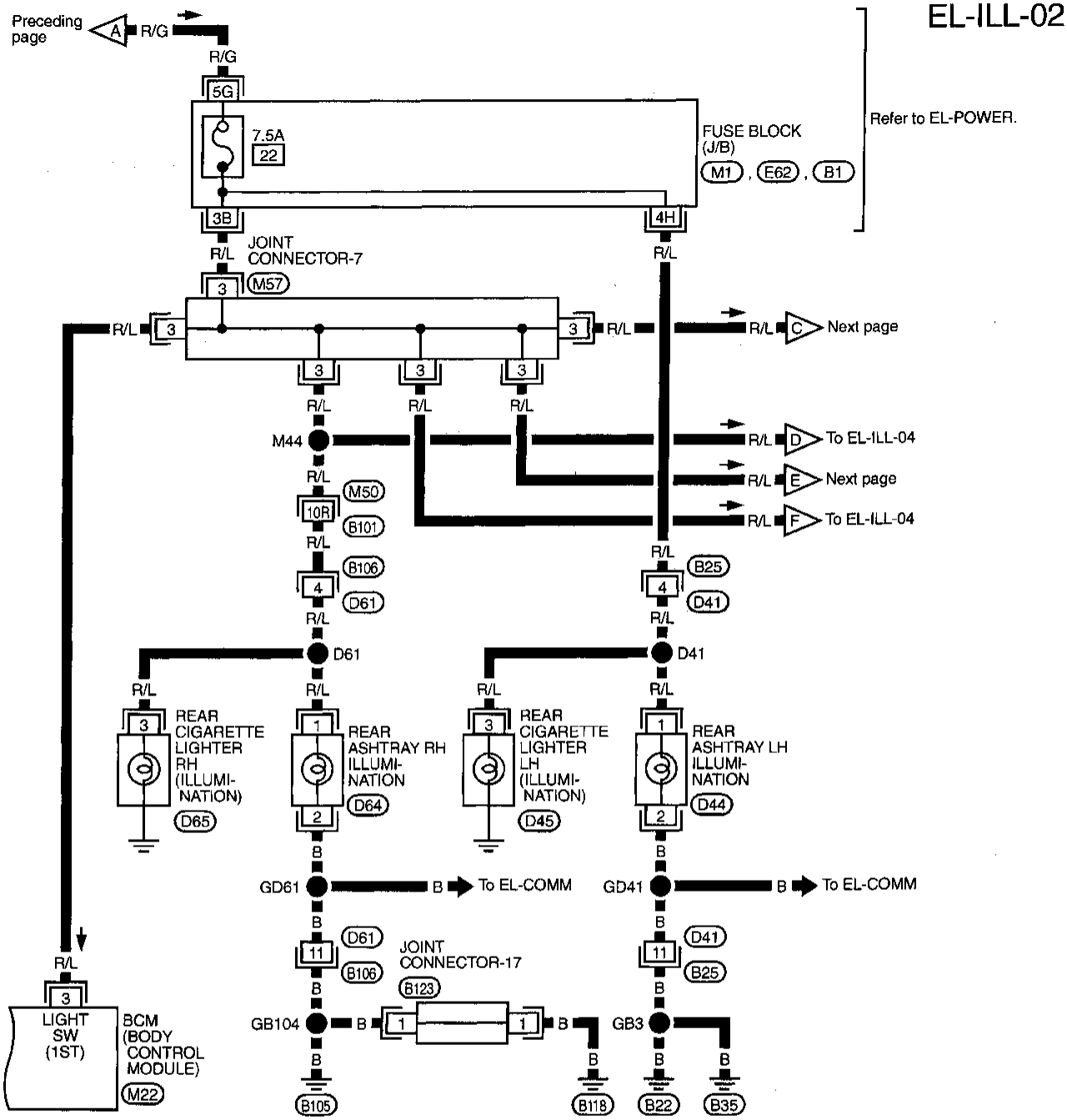
When ignition switch is set to ON or START and outside is darker than the prescribed level, ground is supplied
- to tail lamp relay terminal ②
- from the BCM terminal ⑪.

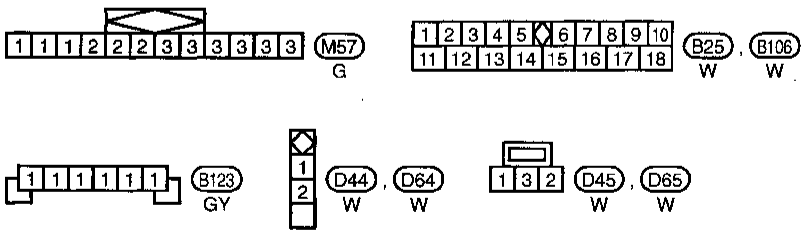
Tail lamp relay is then energized, and parking, license and tail lamps illuminate.
Auto light operation allows these lamps to turn off when outside is brighter than the prescribed level.
Or the ignition switch is turned to the OFF position.
For detailed wiring diagram of auto light, refer to "HEADLAMP".

TAIL AND STOP WARNING LAMP

When one of the stop lamp bulbs is burned out with the stop lamp switch depressed, or one of the tail bulbs is burned out with the lighting switch in the 1ST or 2ND position, the tail and stop warning lamp illuminate. For details, refer to "WARNING LAMPS" (EL-132).

Wiring Diagram — ILL — (Cont'd)





Refer to last page (Foldout page).

M50, B101

M1

M22

E62

B1

TEL986A

System Description (Cont'd)

LOW WASHER LEVEL WARNING LAMP

When the washer fluid level is low, ground is supplied
- to combination meter terminal ⑤
- from washer fluid level switch terminal ①.

With power and ground supplied, the low washer level warning lamp illuminates.

OD OFF WARNING LAMP

When an A/T system malfunction occurs, or OD control switch is in OFF position, ground is supplied
- to combination meter terminal ㊲
- from TCM (transmission control module) terminal ③.

With power and ground supplied, the OD warning lamp blinks or illuminates.
For further information, refer to AT section ("TROUBLE DIAGNOSES").

LOW FUEL LEVEL WARNING LAMP

The amount of fuel in the fuel tank is determined by the fuel level sensor in the fuel tank. A signal is sent from fuel tank gauge unit terminal ⑥ to combination meter terminal ③. The fuel level sensor will illuminate the low fuel level warning lamp when the fuel level is low.
With power and ground supplied, the low fuel level warning lamp illuminates.

ABS WARNING LAMP

When an ABS malfunction occurs, ground is supplied
- to combination meter terminal ⑨
- from ABS/TCS control unit terminal ㉒.

With power and ground supplied, the ABS warning lamp illuminates.
For further information, refer to BR section ("TROUBLE DIAGNOSES").

TCS OFF WARNING LAMP

When TCS off switch is in OFF position, or an ABS/TCS malfunction occurs, ground is supplied
- to combination meter terminal ①
- from ABS/TCS control unit terminal ⑪.

With power and ground supplied, the TCS off warning lamp illuminates.
For further information, refer to BR section ("TROUBLE DIAGNOSES").

SLIP WARNING LAMP

When TCS is in operation, or a TCS malfunction occurs, ground is supplied
- to combination meter terminal ④
- from ABS/TCS control unit terminal ⑩.

With power and ground supplied, the slip warning lamp illuminates.
For further information, refer to BR section ("TROUBLE DIAGNOSES").

SEAT BELT WARNING LAMP

When the driver's seat belt is unfastened, ground is supplied
- to air bag diagnoses sensor unit terminal ㉒
- from seat belt buckle switch terminal ㊶.

And then ground is supplied
- to combination meter terminal ㊱
- from air bag diagnoses sensor unit terminal ⑯.

With power and ground supplied, the seat belt warning lamp illuminates.

BRAKE WARNING LAMP

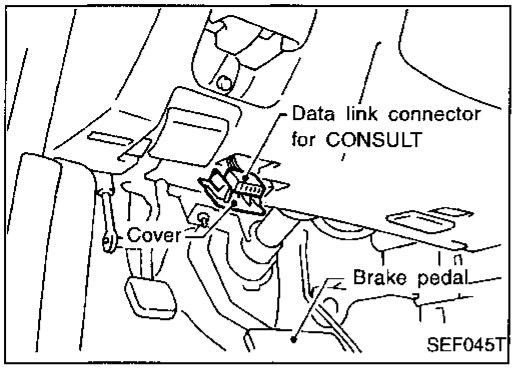
When the parking brake is applied, or the brake fluid level is low, ground is supplied
- to combination meter terminal ㉞
- from parking brake switch terminal ①, or
- brake fluid level switch terminal ①.

With power and ground supplied, the brake warning lamp illuminates.

TAIL AND STOP WARNING LAMP

When one of the stop lamp bulbs is burned out with the stop lamp switch depressed, or one of the tail lamp bulbs is burned out with the lighting switch in the 1ST or 2ND position, ground is supplied.
- to combination meter terminal ㉜
- from stop and tail lamp sensor terminal ③.

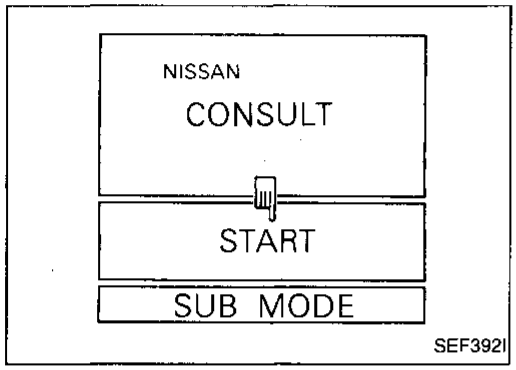
With power and ground is supplied, the tail and stop lamp warning lamp illuminates.



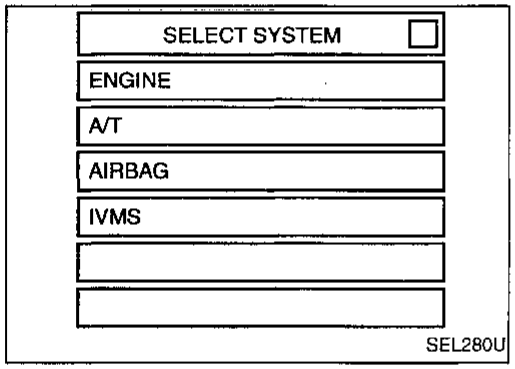
CONSULT

CONSULT INSPECTION PROCEDURE

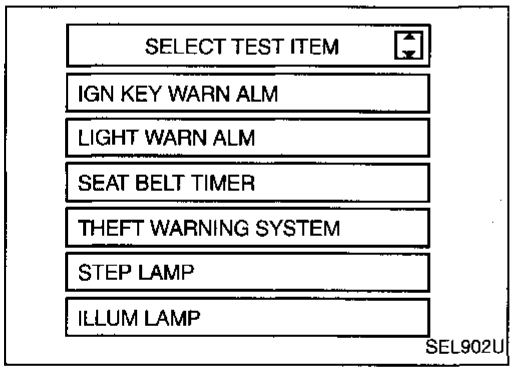
1. Turn ignition switch "OFF".
2. Connect "CONSULT" to the data link connector.



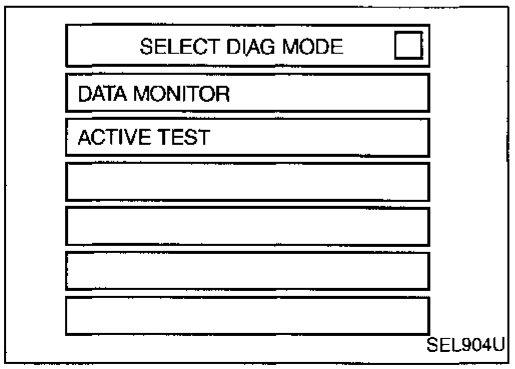
3. Turn ignition switch "ON".
4. Touch "START".



5. Touch "IVMS".



6. Touch "IGN KEY WARN ALM", "LIGHT WARN ALM" or "SEAT BELT TIMER".

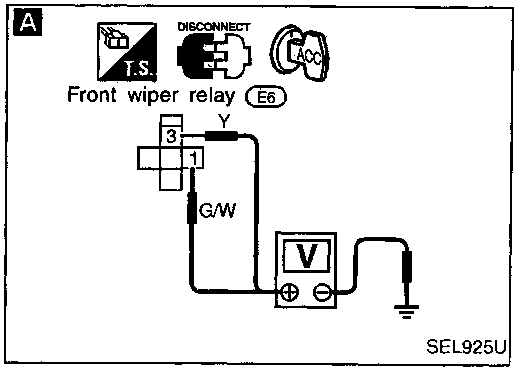


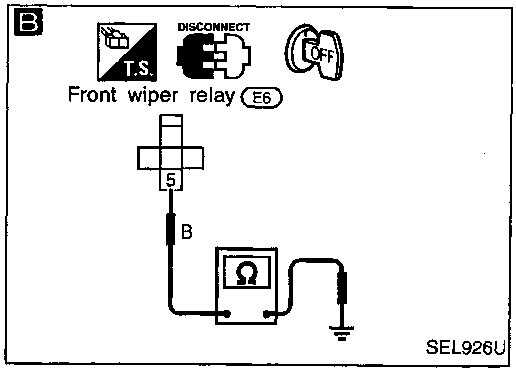
- DATA MONITOR and ACTIVE TEST are available for the warning chime.

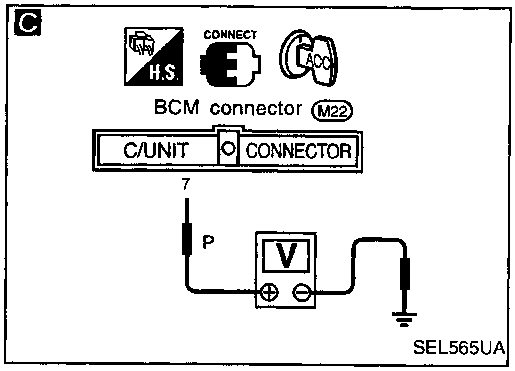
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 5

SYMPTOM: Wiper and washer activate individually but intermittent wiper and washer combination does not operate.







A

CHECK POWER SUPPLY CIRCUIT FOR FRONT WIPER RELAY.
1. Disconnect front wiper relay.
2. Turn wiper switch to OFF or INT position.
3. Turn ignition switch to ACC position.
4. Check voltage between front wiper relay connector terminal ① or ③ and ground.
   Battery voltage should exist.

Refer to wiring diagram in EL-161.

NG → Check the following.
- 20A fuse [No. 11, located in the fuse block (J/B)]
- Harness for open or short

OK ↓

B

CHECK GROUND CIRCUIT FOR FRONT WIPER RELAY.
Check continuity between front wiper connector terminal ⑤ and ground.
Continuity should exist.

NG → Repair harness.

OK ↓

Check front wiper relay.

NG → Replace relay.

OK ↓

C

CHECK BCM OUTPUT SIGNAL.
1. Connect front wiper relay.
2. Turn ignition switch to ACC.
3. Check voltage between BCM connector terminal ⑦ and ground.

Wiper switch condition	Voltage [V]
Wash	0 (for 0.7 sec.)
OFF	Approx. 12

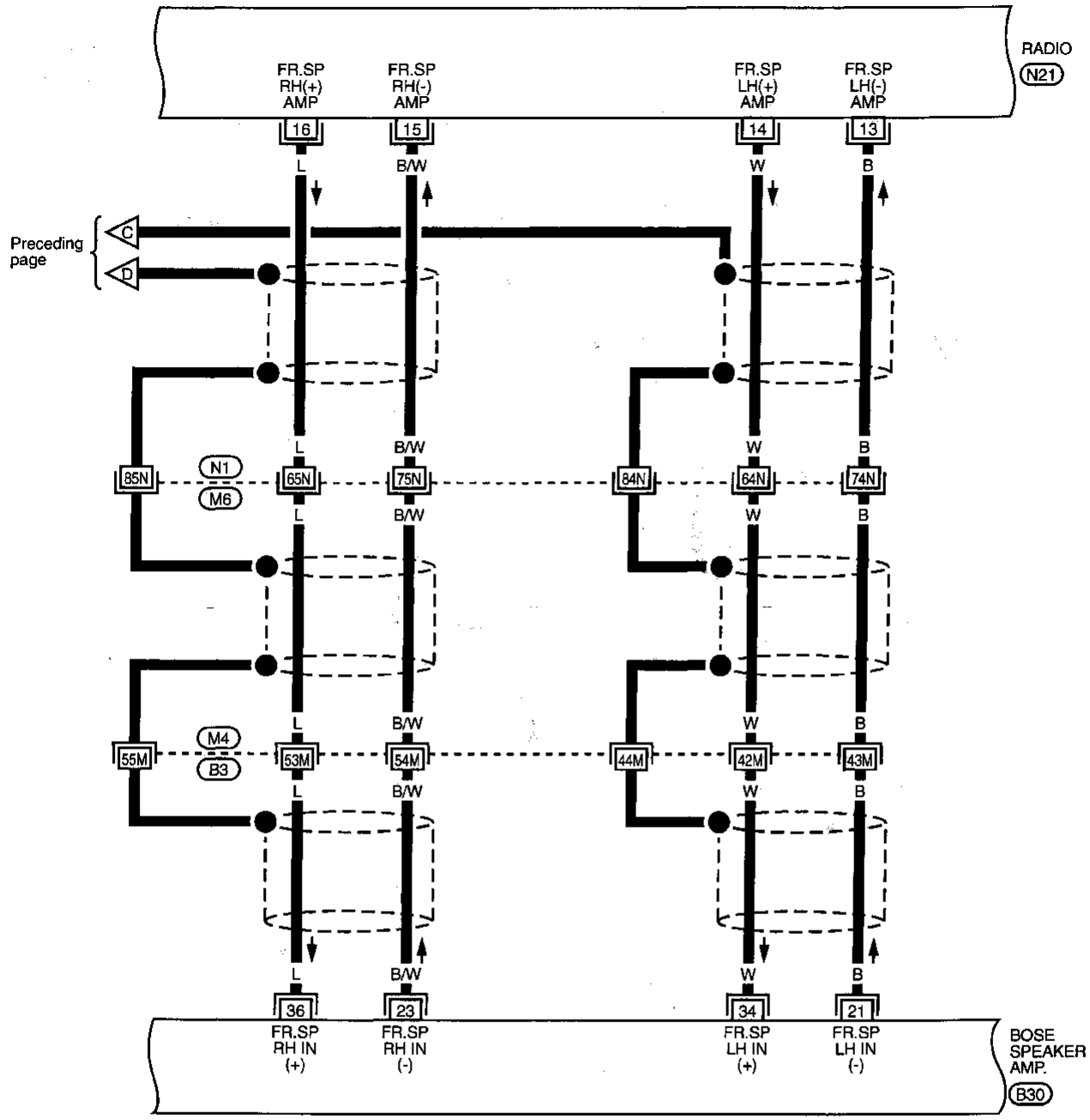
OK → Check harness for open or short between front wiper relay and BCM.

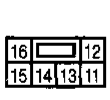
NG ↓

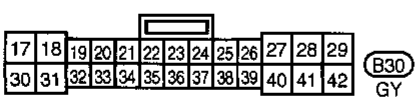
Replace BCM.

Wiring Diagram — AUDIO — (Cont'd)

EL-AUDIO-03





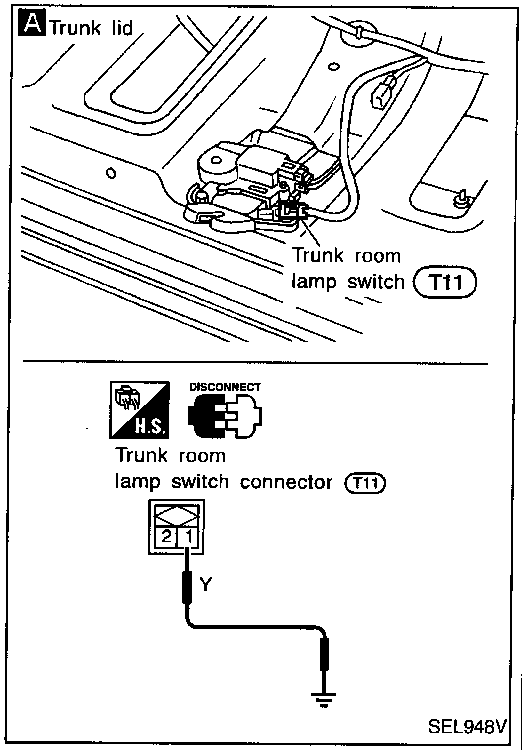


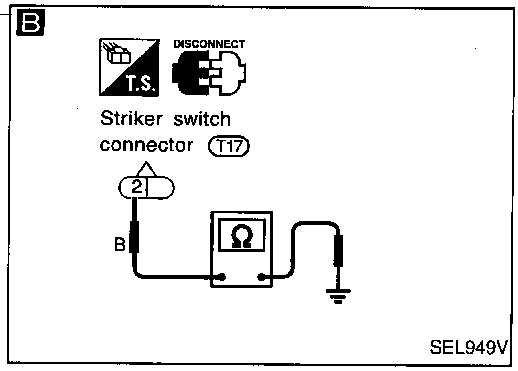
Refer to last page (Foldout page).
M4, B3
M6, N1

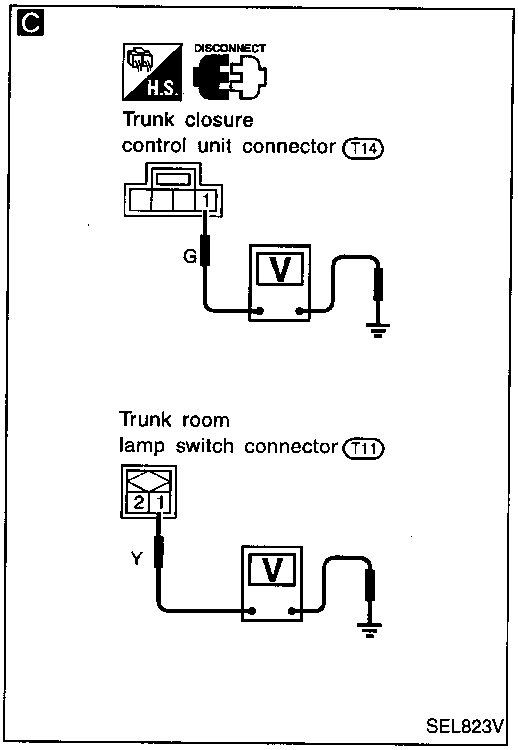
TEL207A

Trouble Diagnosis (Cont'd)

DIAGNOSTIC PROCEDURE 1







A

CHECK TRUNK CLOSURE MOTOR OPERATION

1. Open trunk lid and remove the trunk room trim.
2. Disconnect trunk room lamp switch connector and check the operation of trunk closure motor.
3. Apply ground to trunk room lamp switch harness connector terminal ①.
4. Check the operation of trunk closure motor.
   Does trunk closure motor operate when trunk room lamp switch connector is disconnected or ground is applied to trunk room lamp switch harness connector terminal ①?
   Trunk closure motor should operate.

OK → Ⓐ

NG ↓

B

CHECK GROUND CIRCUIT FOR STRIKER SWITCH

1. Disconnect striker switch harness connector.
2. Check harness continuity between striker switch harness connector terminal ② and ground.
   Continuity should exist.

NG → Check harness for open or short between striker switch and ground.

OK ↓

C

CHECK POWER SUPPLY TO TRUNK ROOM LAMP SWITCH.

1. Disconnect trunk room lamp switch harness connector and trunk closure control unit connector (T14).
2. Check voltage between trunk closure control unit and trunk room lamp switch harness connectors terminal ① and ground respectively.
   Battery voltage should exist.

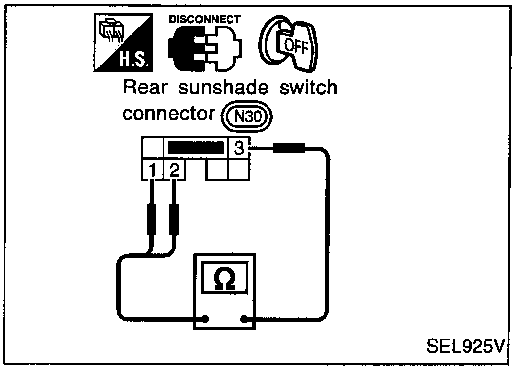
OK or NG

NG → Check power supply circuit to trunk closure control unit harness connector terminal ① and trunk room lamp switch harness connector terminal ① for open or short.

OK ↓

Replace trunk closure units.

Trouble Diagnoses (Cont'd)



REAR SUNSHADE SWITCH CHECK

1. Disconnect rear sunshade switch.
2. Check continuity between rear sunshade switch terminals.

Terminals	Switch position	Continuity
① - ③	Open	Yes
	Neutral	No
	Close	No
② - ③	Open	No
	Neutral	No
	Close	Yes

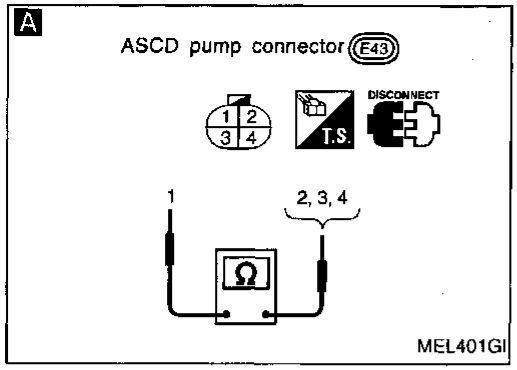
If NG, replace rear sunshade switch.

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

(ASCD PUMP CIRCUIT CHECK)

A



A

CHECK ASCD PUMP.

1. Disconnect ASCD pump connector.
2. Measure resistance between ASCD pump terminals ① and ②, ③, ④.

Terminals		Resistance [Ω]
①	④	Approx. 3
	②	Approx. 65
	③	Approx. 65

Refer to wiring diagram in EL-240.

NG → Replace ASCD pump.

OK ↓

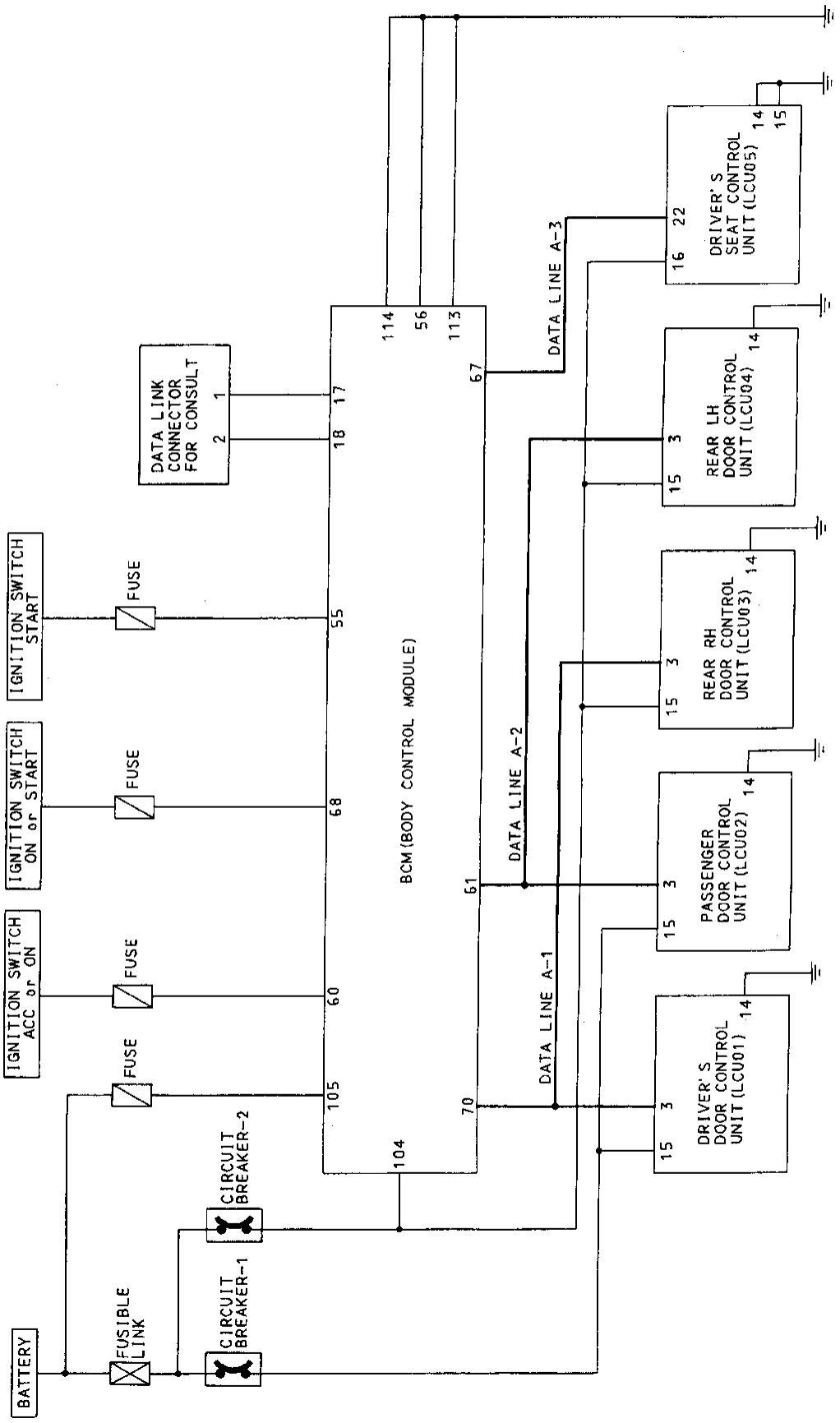
Check harness for open or short between ASCD pump and ASCD control unit.

If a self-diagnostic result has already been accomplished, check using the following table.

CONSULT self-diagnostic result	Check circuit	
	ASCD control unit terminal	ASCD pump terminal
POWER SUPPLY-VALVE	⑧	①
VACUUM PUMP	⑨	④
AIR VALVE	⑩	②
RELEASE VALVE	⑭	③

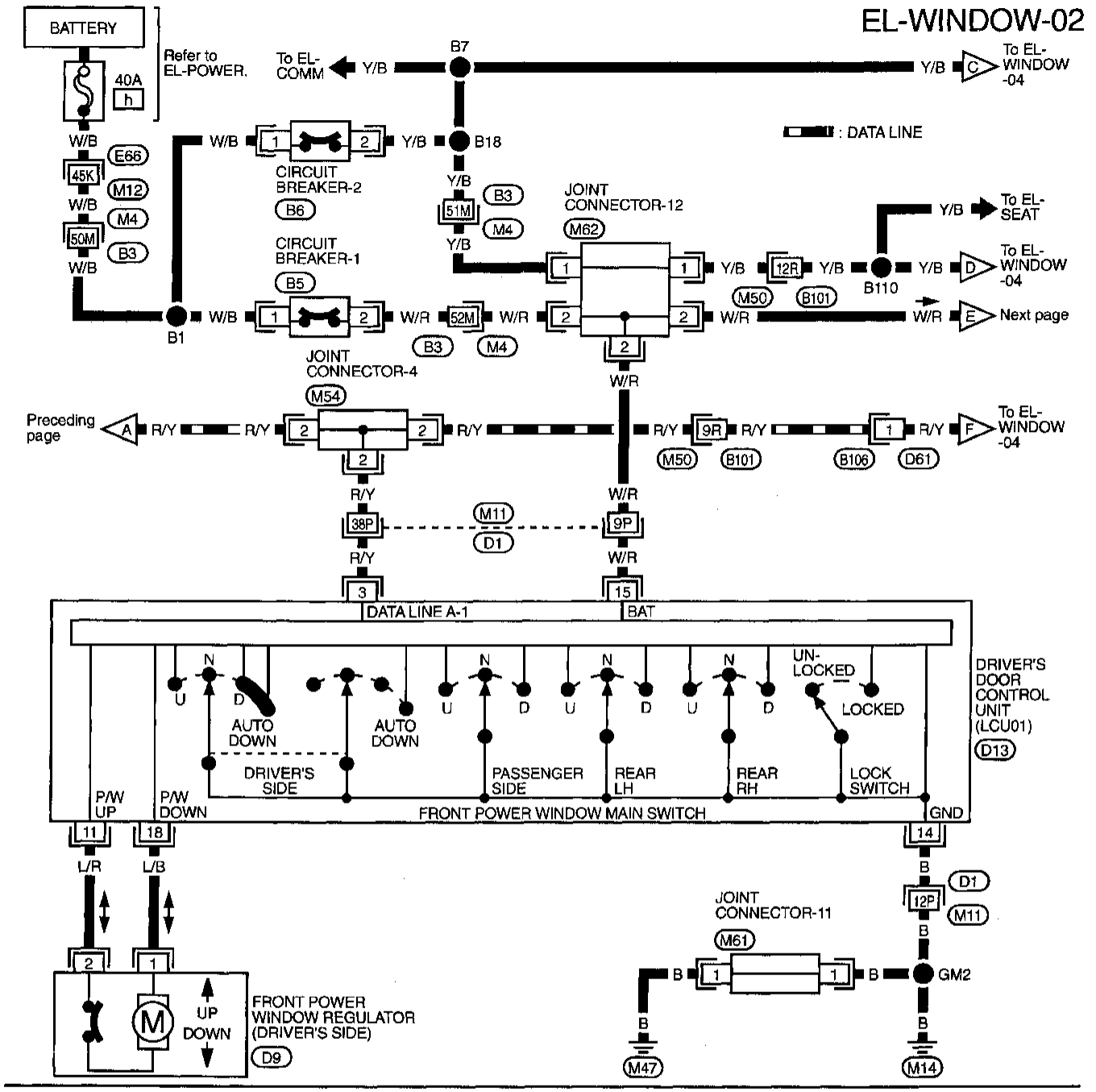
Schematic

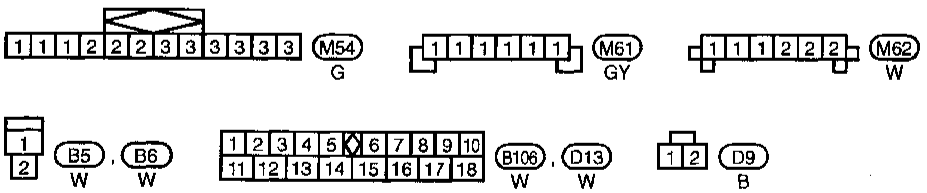
POWER SUPPLY, GROUND AND COMMUNICATION CIRCUITS



TEL828

Wiring Diagram — WINDOW — (Cont'd)

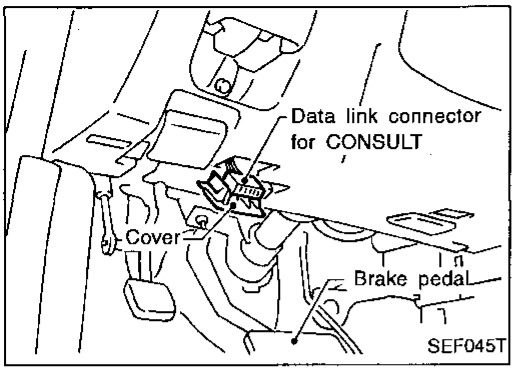




Refer to last page (Foldout page).

E66, M12
M4, B3
M11, D1
M50, B101

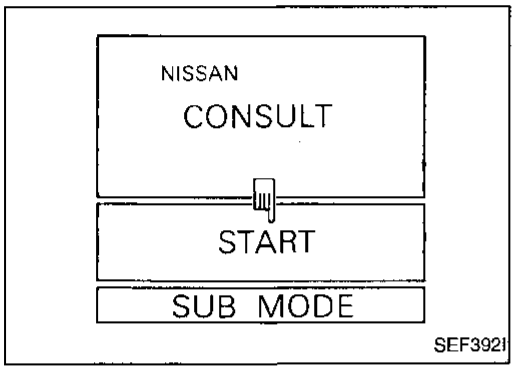
TEL835



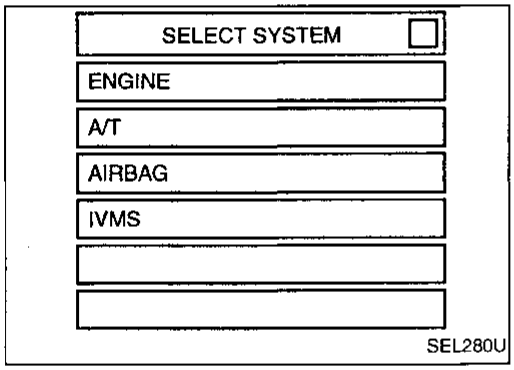
CONSULT

CONSULT INSPECTION PROCEDURE

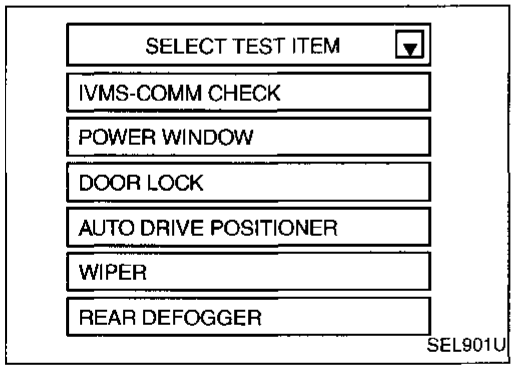
1. Turn ignition switch "OFF".
2. Connect "CONSULT" to Data link connector.



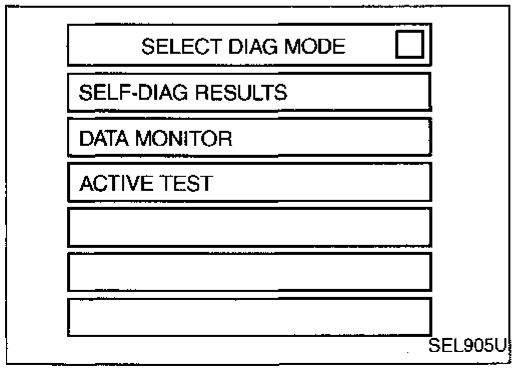
3. Turn ignition switch "ON".
4. Touch "START".



5. Touch "IVMS".



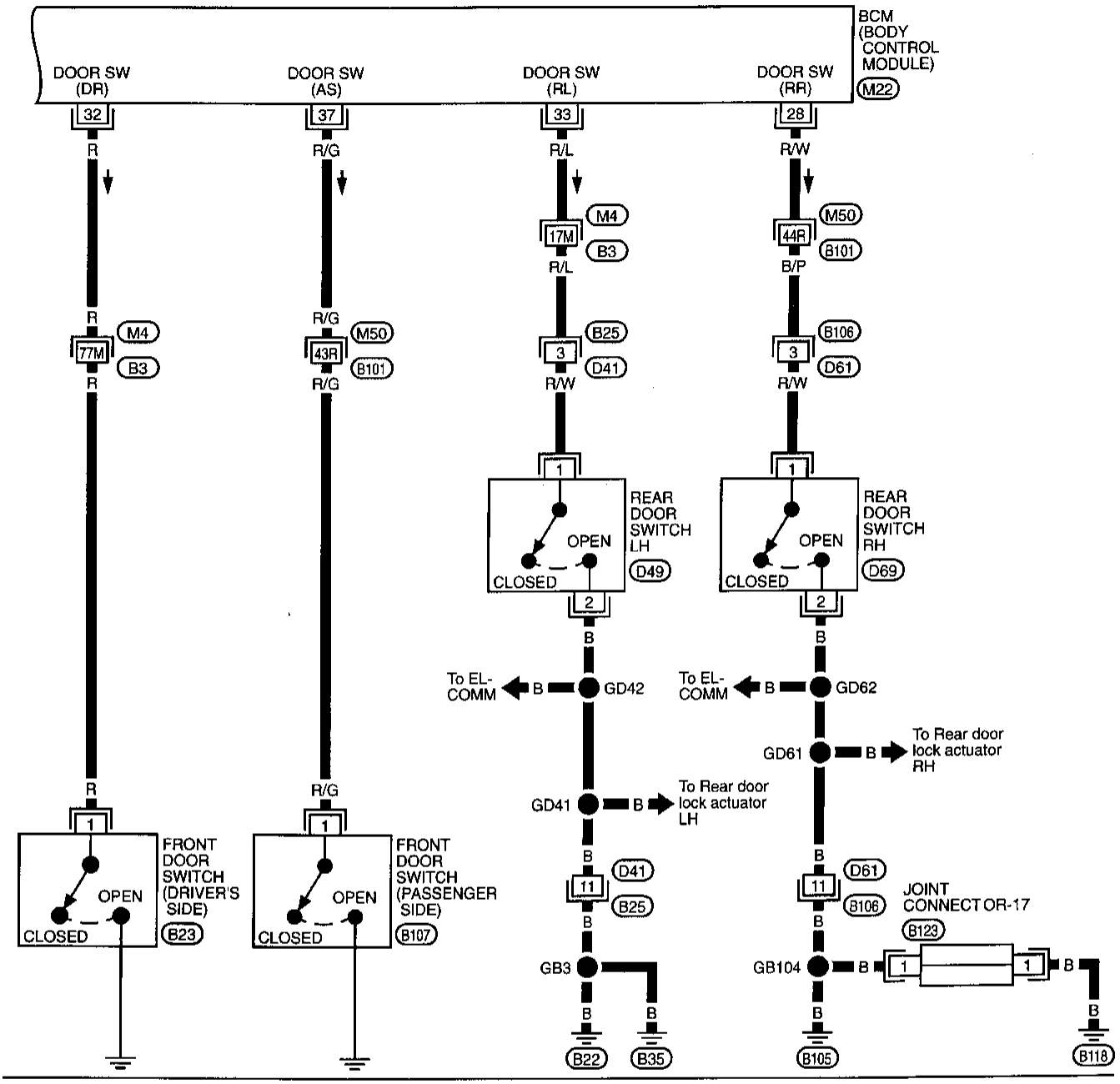
6. Touch "DOOR LOCK".

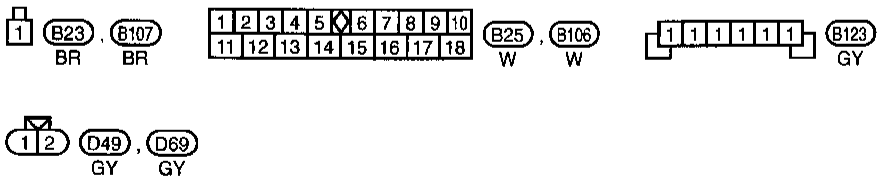


- DATA MONITOR, ACTIVE TEST, and SELF-DIAGNOSIS are available for the power door lock.

Wiring Diagram — MULTI — (Cont'd)

EL-MULTI-03





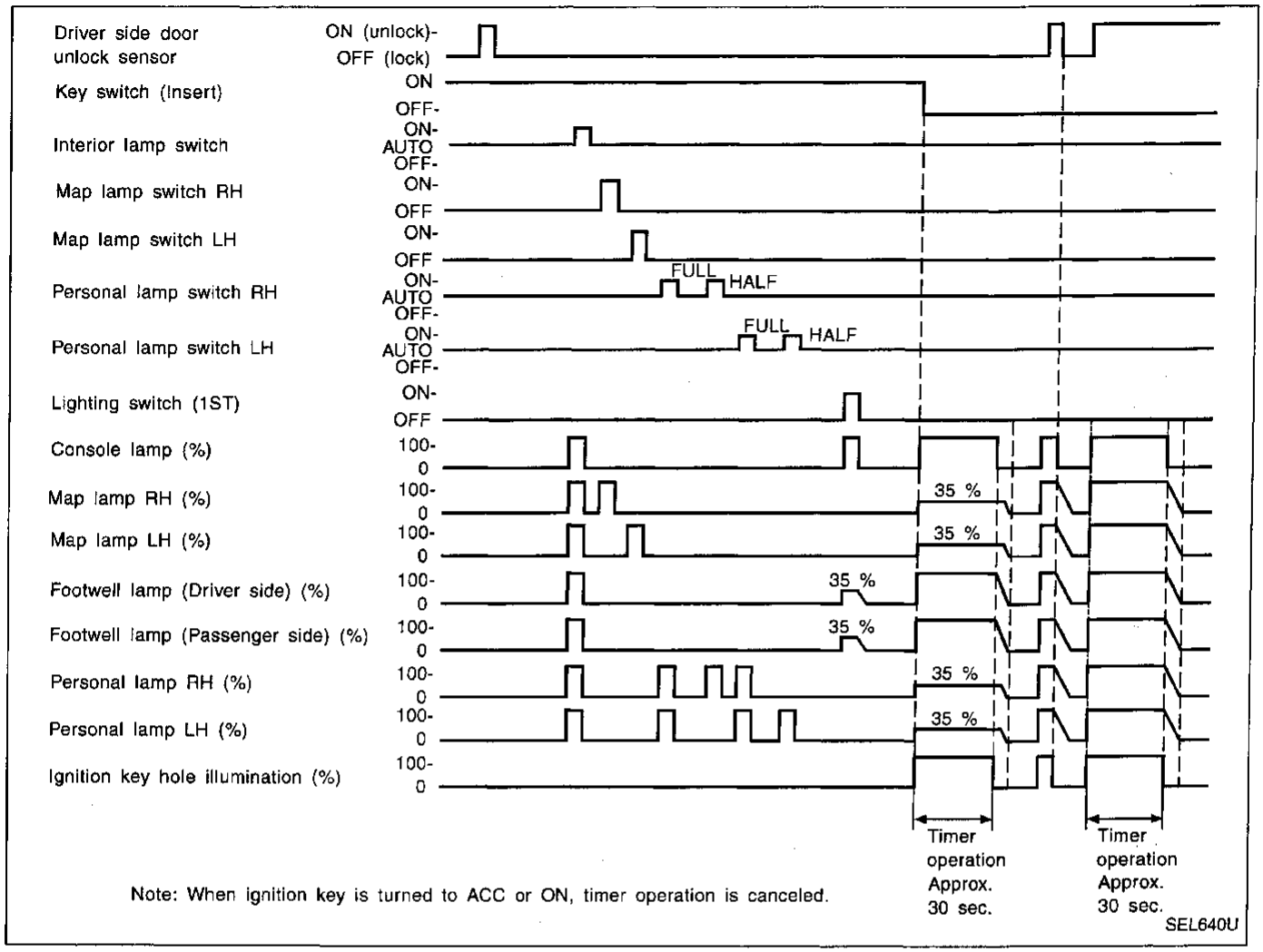
Refer to last page (Foldout page).

M4, B3
M50, B101
M22

TEL846

System Description (Cont'd)

TURN ON/OFF MODE OF EACH SWITCH CONDITION



Note: Illumination lamp lighting is available in both 100% and 35% luminosity modes.

System Description

POWER SUPPLY AND GROUND

Power is supplied at all times
- to BCM terminal (105)
- through 7.5A fuse [No. 14], located in the fuse block (J/B)].

Power is supplied at all times
- to all step lamps terminal ①
- through 10A fuse [No. 27], located in the fuse block (J/B)].

Ground is supplied to terminal ⑭ of LCU01 and LCU02 through body grounds (M14) and (M47).
Ground is also supplied to terminal ⑭ of LCU03 and LCU04 through body grounds (B105) and (B118) or (B22) and (B35).

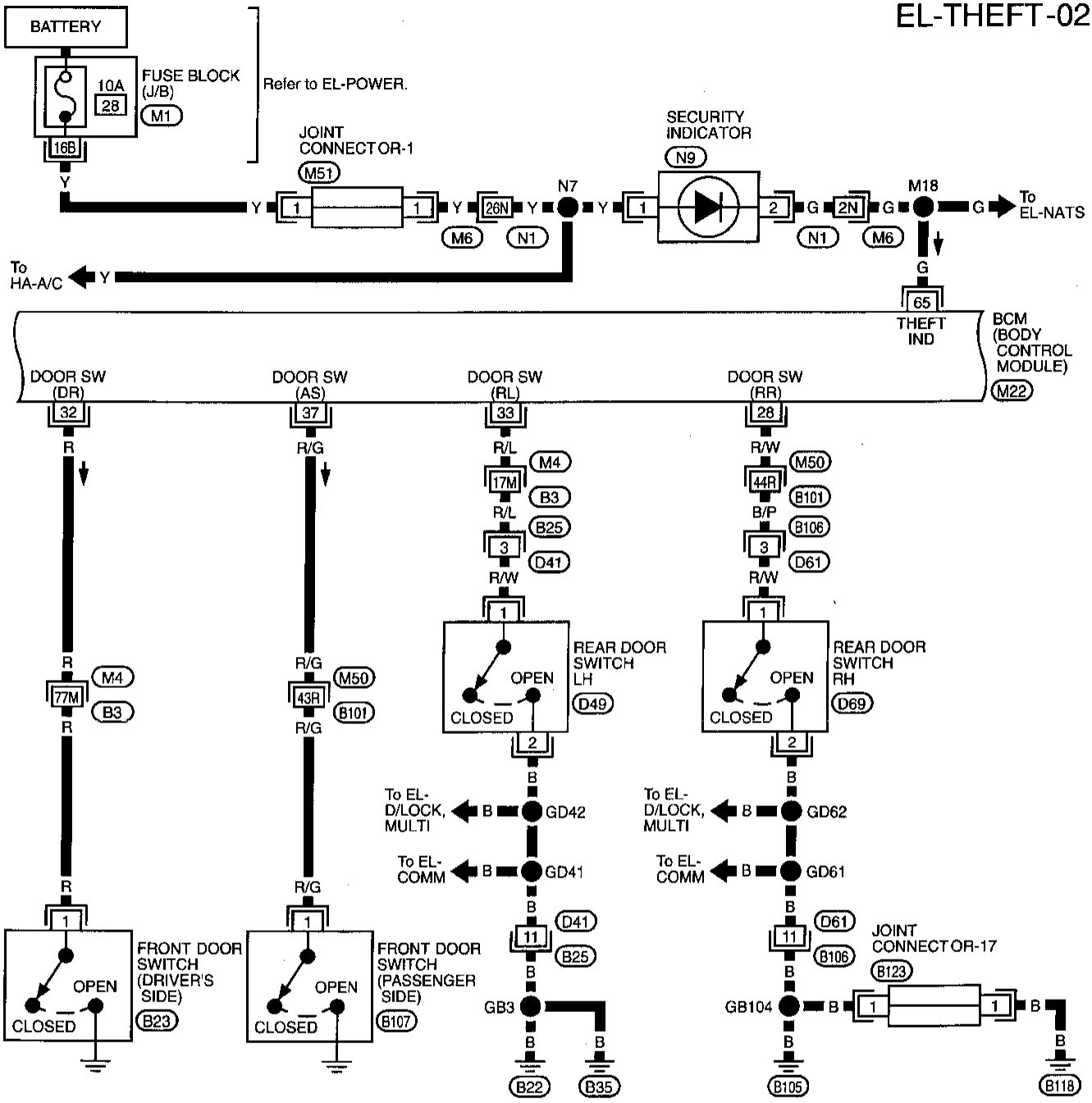
OPERATING PROCEDURE

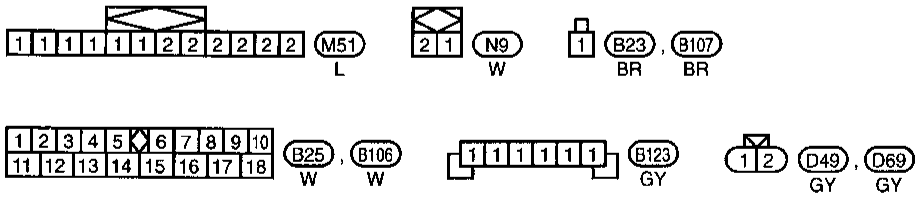
BCM is connected to LCU01, LCU02, LCU03 and LCU04 as DATA LINE A-1 or A-2.
When any door switch is in OPEN position, ground is supplied
- to BCM terminal ㉜, ㊲, ㉘, or ㉝
- through driver side, passenger side, rear LH or RH door switch.

Then BCM sends a signal to the LCU to turn on step lamp. With ground supplied, step lamp turns on.

Wiring Diagram — THEFT — (Cont'd)

EL-THEFT-02





Refer to last page (Foldout page).

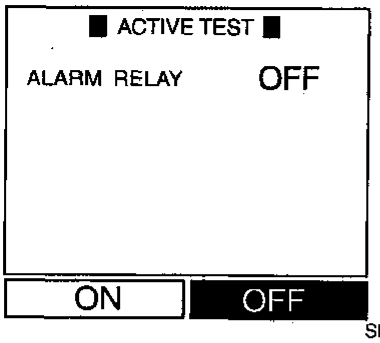
M4, B3
M6, N1
M50, B101
M1
M22

TEL014B

Trouble Diagnoses (Cont'd)

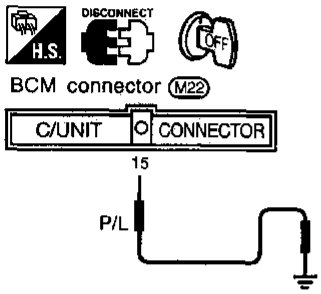
DIAGNOSTIC PROCEDURE 7
(Theft warning headlamp alarm check)

A



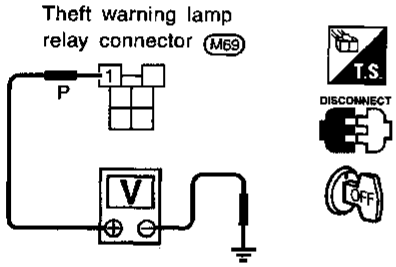
SEL027V

B



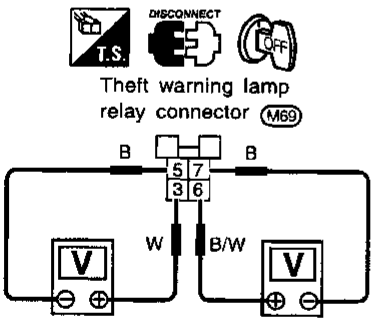
SEL933U

C



SEL757UC

D



SEL758UC

CHECK THEFT WARNING HEADLAMP ALARM OPERATION.

A CONSULT

See "ALARM RELAY" in ACTIVE TEST mode.
Perform operation shown on display.
Theft warning headlamp alarm should operate.

Yes → Headlamp alarm is OK.

OR

B

1. Disconnect BCM connector.
2. Apply ground to BCM terminal ⑮.
   Does headlamp alarm activate?

   Refer to wiring diagram in EL-398.

No ↓

Does headlamp come on when turning lighting switch "ON"?

No → Check headlamp system. Refer to "HEADLAMP".

Yes ↓

Check theft warning lamp relay.

NG → Replace.

OK ↓

C

CHECK POWER SUPPLY FOR THEFT WARNING LAMP RELAY.

1. Disconnect theft warning lamp relay connector.
2. Check voltage between terminal ① and ground.
   Battery voltage should exist.

NG → Check the following.
- 7.5A fuse [No. 14, located in the fuse block (J/B)]
- Harness for open or short between theft warning lamp relay and fuse

OK ↓

D

CHECK THEFT WARNING LAMP RELAY CIRCUIT.

1. Disconnect theft warning lamp relay connector.
2. Turn lighting switch to 2nd position.
3. Check voltage between terminals ③ and ⑤.
   Battery voltage should exist.
4. Check voltage between terminals ⑥ and ⑦.
   Battery voltage should exist.

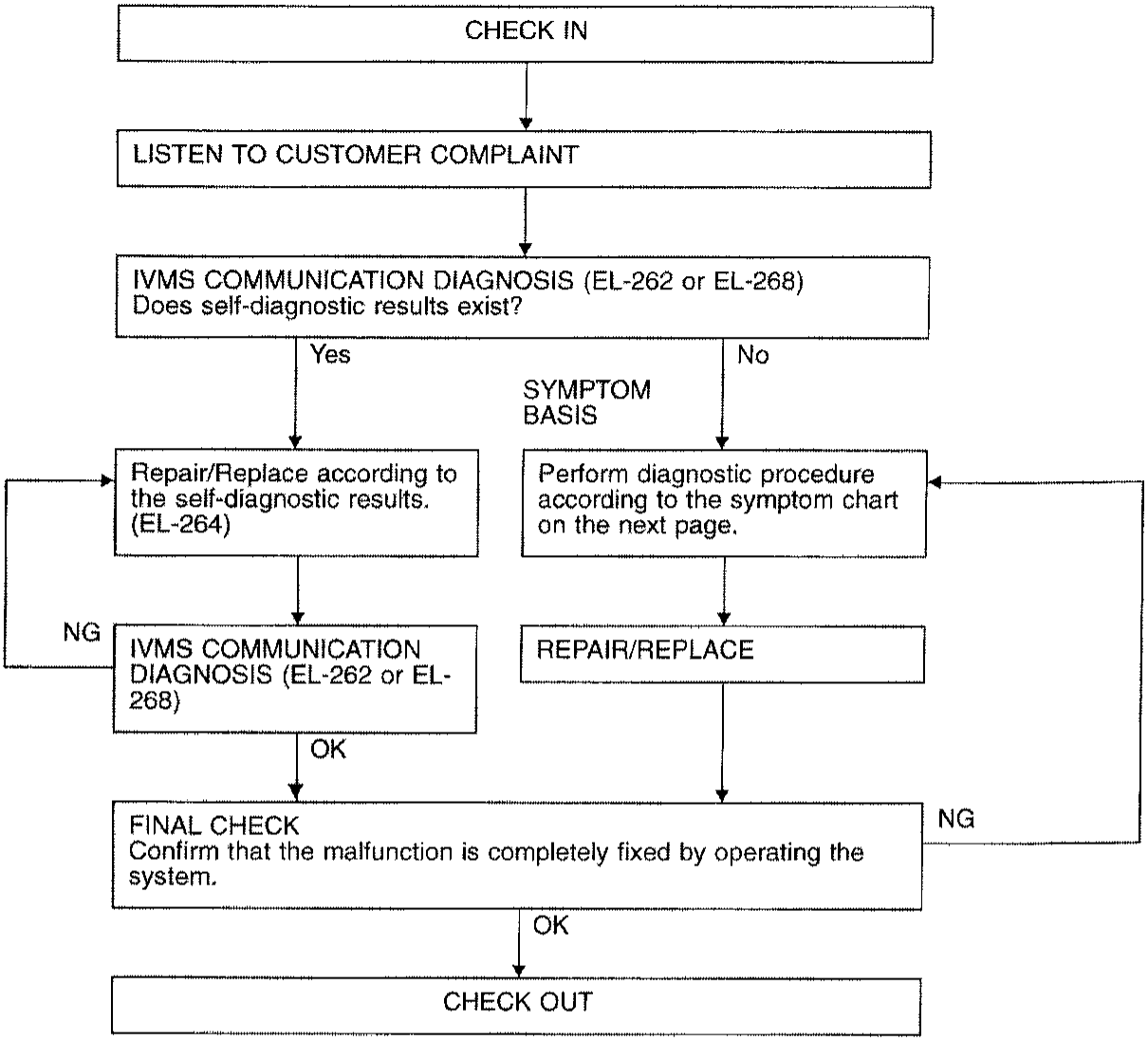
NG → Check harness for open or short.

OK ↓

Check harness for open or short between theft warning lamp relay and BCM.

Trouble Diagnoses

WORK FLOW



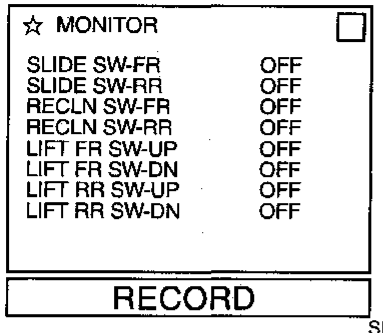
NOTICE:

- **When LCU connectors are disconnected for more than 1 minute such as during trouble diagnoses, the "disconnected" data will be memorized by the BCM. (While BCM memorizes the "disconnected" data, IVMS communication diagnosis of CONSULT will display "PAST NO RESPONSE".) 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-262.) or turn the ignition switch to "OFF" position and remove 7.5A fuse [No. 14 located in the fuse block (J/B)].

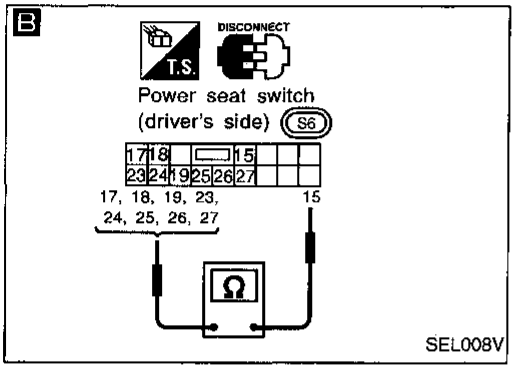
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 17
(Power seat switch check)

A



B



CHECK POWER SEAT SWITCH INPUT SIGNAL.

A CONSULT

See "SLIDE SW, RECLN SW, LIFT FR, RR" in DATA MONITOR mode.
These switches should change from "OFF" to "ON" when switch is operated.

OR

ON BOARD

Check each power seat switch operation in switch monitor (Mode II) mode.
(Refer to On board diagnosis EL-270.)

Refer to wiring diagram in EL-423.

OK → Power seat switch is OK.

NG ↓

B

CHECK POWER SEAT SWITCH.

1. Disconnect power seat switch connector.
2. Check continuity between power seat switch terminals.

Switch	Condition	Terminals ⑮	⑰	⑱	⑲	㉓	㉔	㉕	㉖	㉗
Sliding	Forward	○	○							
	Backward	○				○				
Reclining	Forward	○		○						
	Backward	○					○			
Lifting (Front)	Up	○			○					
	Down	○						○		
Lifting (Rear)	Up	○							○	
	Down	○								○

NG → Replace power seat switch.

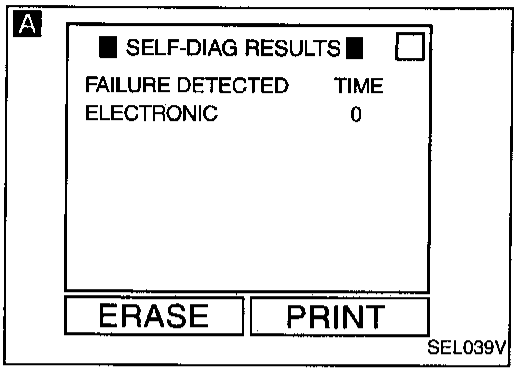
OK ↓

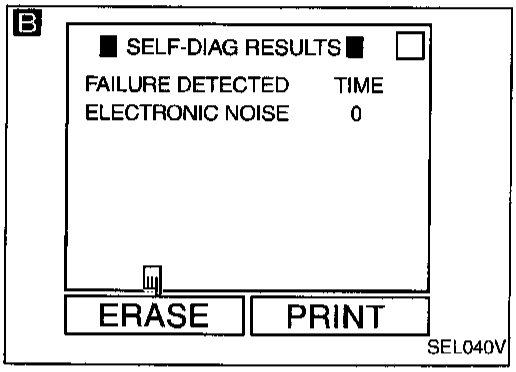
Check the following.
- Ground circuit for power seat switch
- Harness for open or short between LCU05 and power seat switch

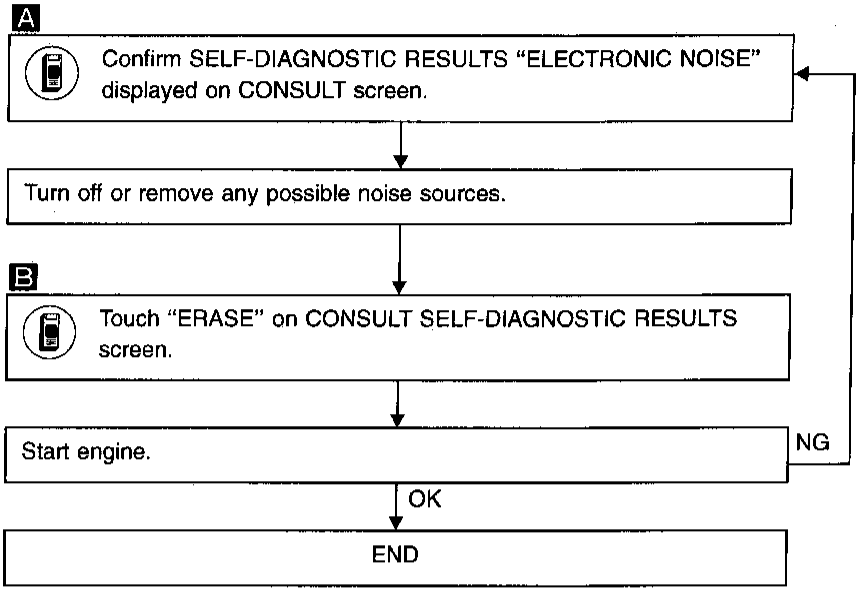
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 7

Self-diagnostic results:
"ELECTRONIC NOISE" displayed on CONSULT screen







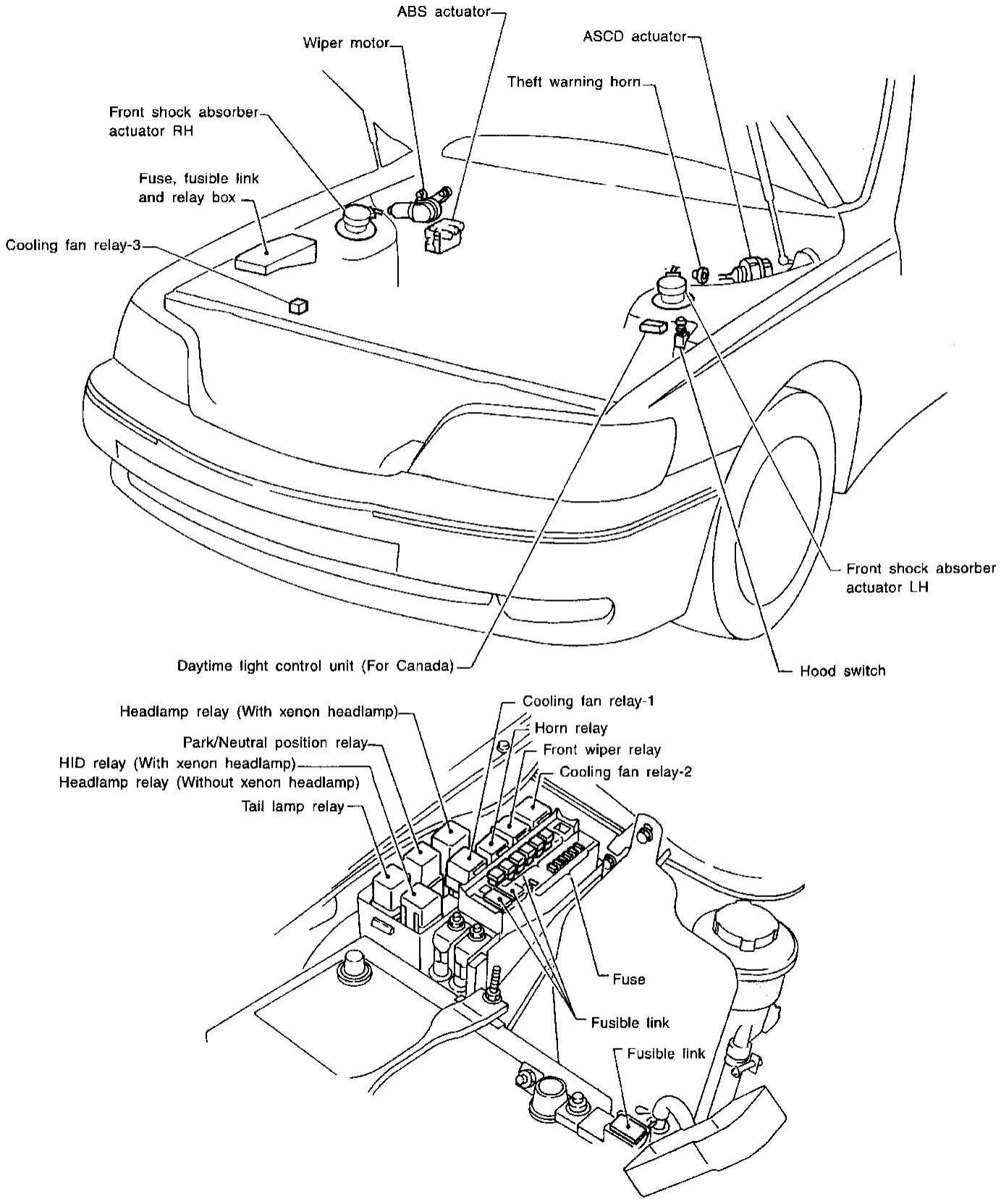
CONSULT (Cont'd)

APPLICATION ITEMS

Mode	Description	Reference page
SELF DIAG RESULTS	Displays the result of self-diagnosis.	EL-493
DATA MONITOR	Two modes, "GPS MONITOR" and "SWITCH MONITOR" can be selected in this mode. • Displays current data related to GPS in "GPS MONITOR" mode. • Displays IVCS switch and outside door handle switch condition in "SWITCH MONITOR" mode.	EL-494
FUNCTION CHECK	In this mode, "Remote door unlock function" can be checked using CONSULT. Door can be unlocked according to the commands to the door LCU by the IVCS unit. This check verifies communication circuit between LCU and IVCS unit.	EL-502
REGISTERED DATA	Displays the following data registered in the IVCS unit. In this mode the data cannot be re-written. • Unit ID • Cellular phone number • VIN (Vehicle Identification Number)	EL-494
CONFIGURATION (See Note.)	In this mode, the system can be set up in the demonstration mode to confirm system operation.	EL-506
	Various data related to both the Communicator Response Center contract and cellular provider can be written/updated in this mode. • Phone number • NAM (Number Assignment Module) • Stolen vehicle tracking setting (Default should always be on.) • Alarm notification setting (Default should always be on.)	EL-508
ECU PART NUMBER	Displays the part number of the IVCS unit.	—

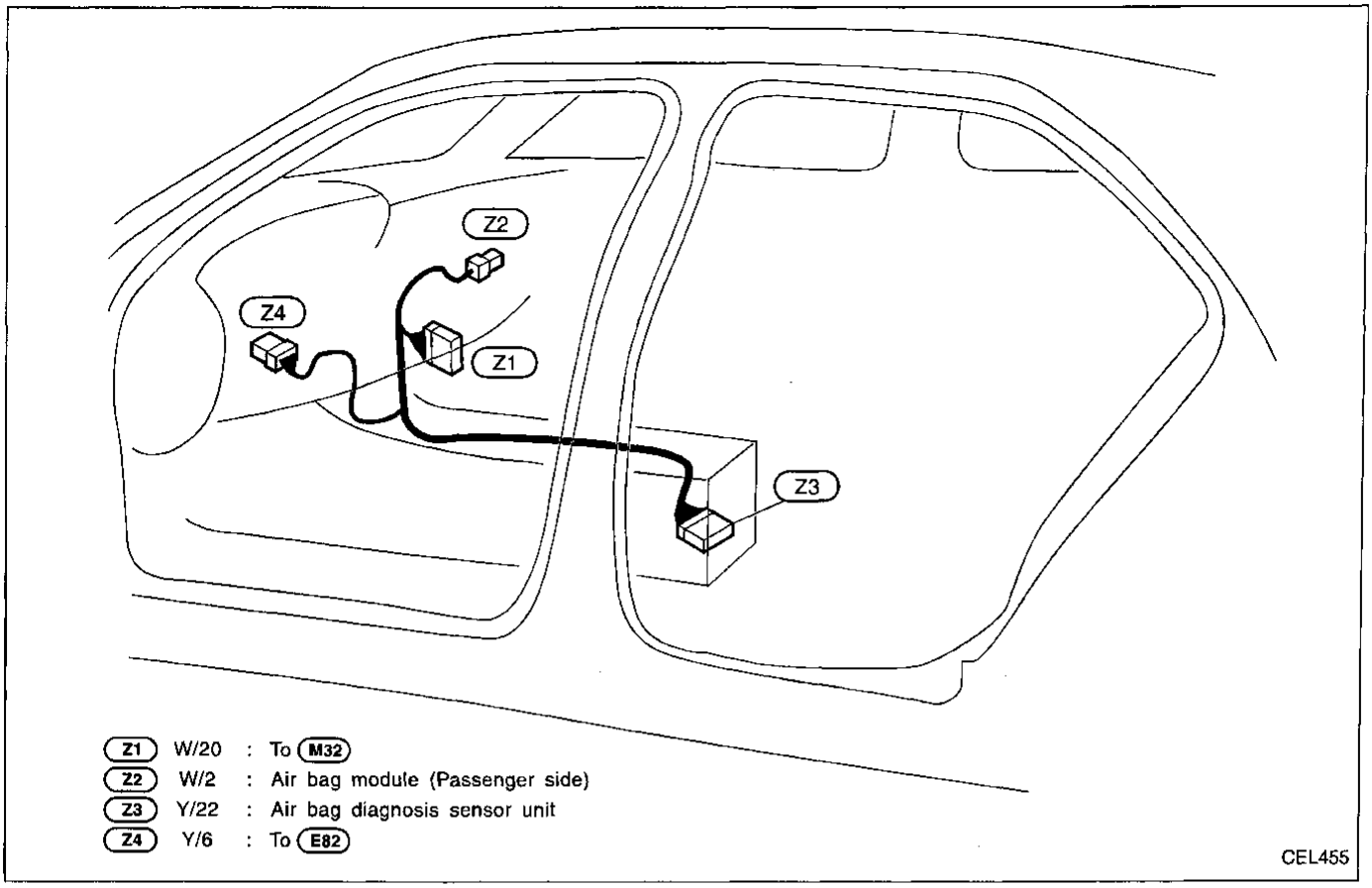
Note: Data must not be rewritten without prior approval from the customer.

Engine Compartment



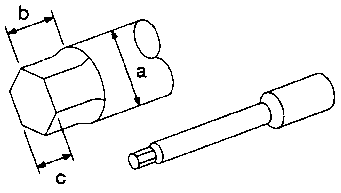
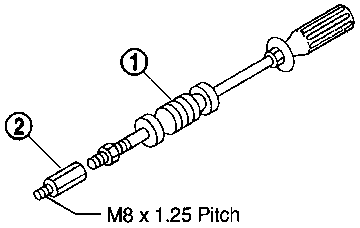
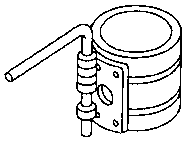
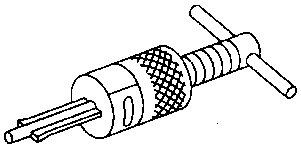
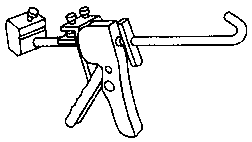
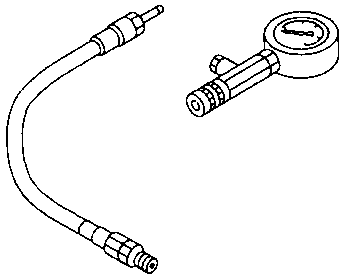
CEL997

Air Bag Harness



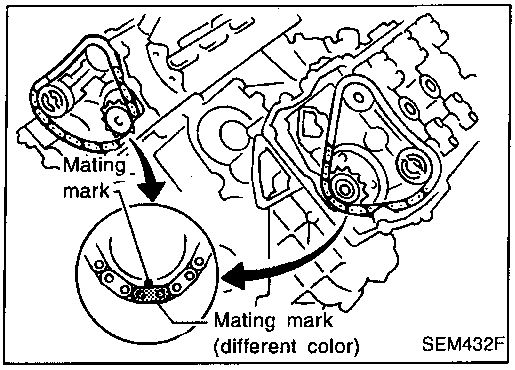
Special Service Tools

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

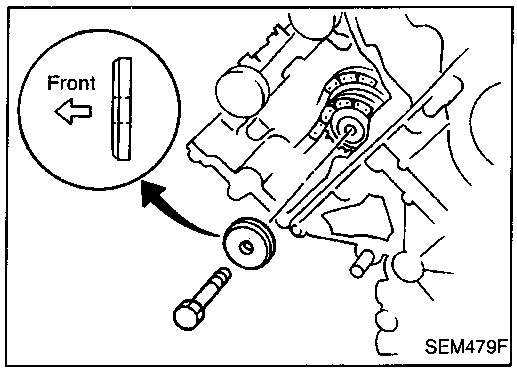
Tool number (Kent-Moore No.) Tool name	Description	
ST10120000 (J24239-01) Cylinder head bolt wrench	 NT583	Loosening and tightening cylinder head bolt **a: 13 mm (0.51 in) dia. b: 12 mm (0.47 in) c: 10 mm (0.39 in)**
① (J6125-1B) Slide hammer ② (J38139-1) Slide hammer adapter	 NT377	Removing main bearing cap
EM03470000 (J8037) Piston ring compressor	 NT044	Installing piston assembly into cylinder bore
ST16610001 (J23907) Pilot bushing puller	 NT045	Removing crankshaft pilot bushing
WS39930000 (—) Tube presser	 NT052	Pressing the tube of liquid gasket
EG15060000 (—) Compression gauge and adapter	 NT238	

Installation (Cont'd)

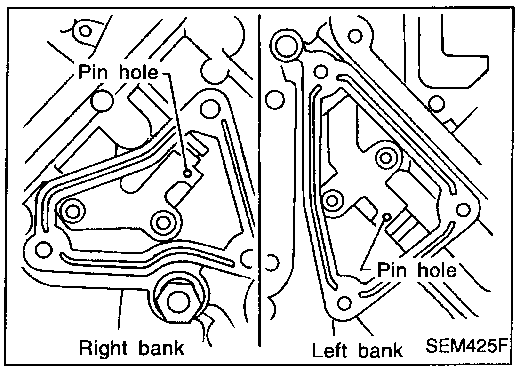
14. Install cylinder head gasket and cylinder head assembly. Refer to "CYLINDER HEAD" (EM-40).



15. Align mating marks on idler sprocket and upper timing chain. Install on camshaft without changing positioning.

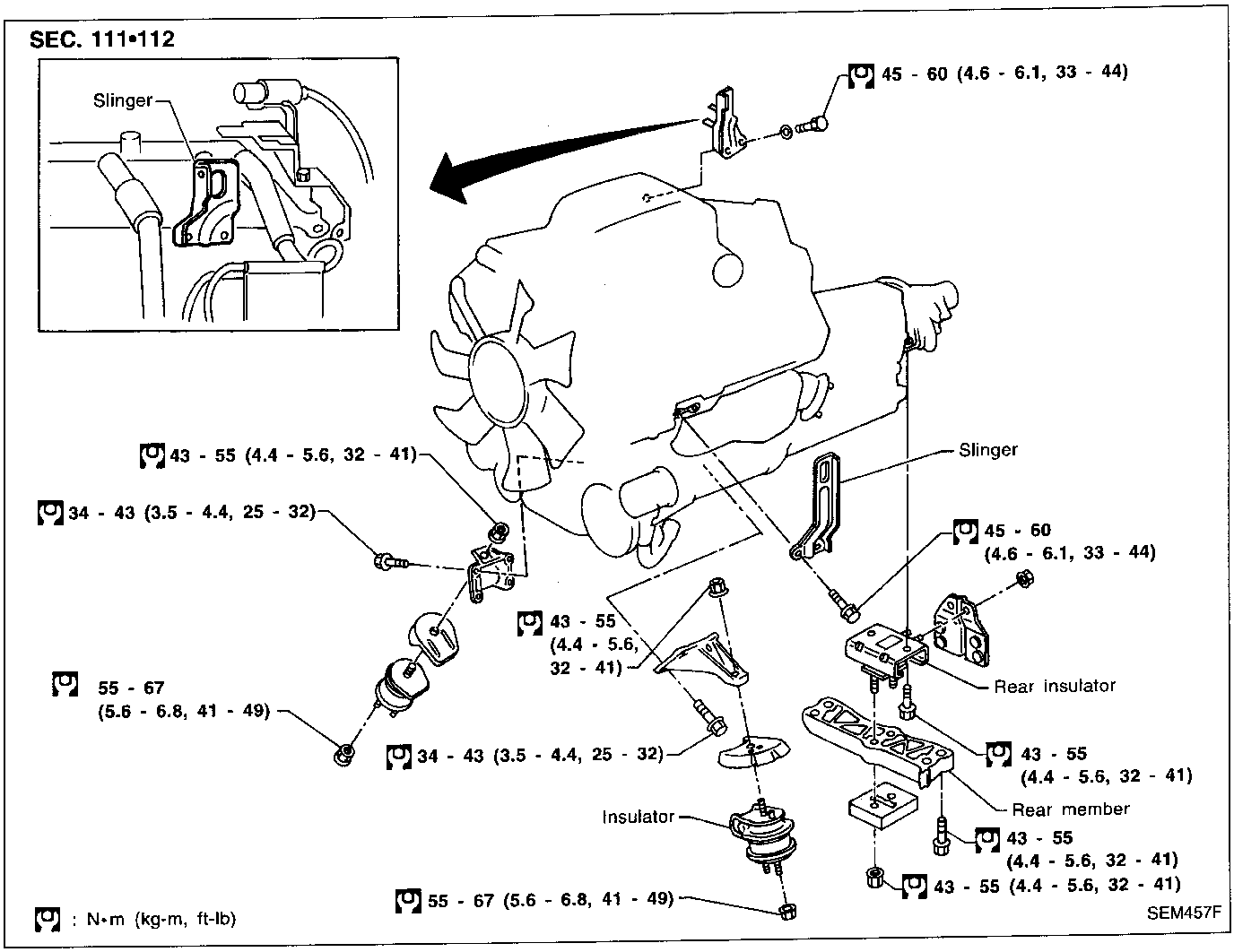


16. Install idler shaft bolts.
    : 43 - 58 N·m (4.4 - 5.9 kg-m, 32 - 43 ft-lb)
- Install washer so chamfered side faces front of engine.



17. Remove lower chain tensioner pin from tensioner cover holes on front cover.
18. Install tensioner cover.
- Apply liquid gasket to front cover. Refer to "POSITION FOR APPLYING LIQUID GASKET" (EM-14).

19. Install chain guide between No. 1 camshaft bracket.



WARNING:

- Situate vehicle on a flat and solid surface.
- Place chocks at front and back of rear wheels.
- Do not remove engine until exhaust system has completely cooled off. Otherwise, you may burn yourself and/or fire may break out in fuel line.
- Before disconnecting fuel hose, release fuel pressure from fuel line. Refer to EC section ("Fuel Pressure Release", "BASIC SERVICE PROCEDURE").
- Be sure to hoist engine and transmission in a safe manner.
- For engines not equipped with engine slingers, attach proper slingers and bolts described in PARTS CATALOG.

CAUTION:

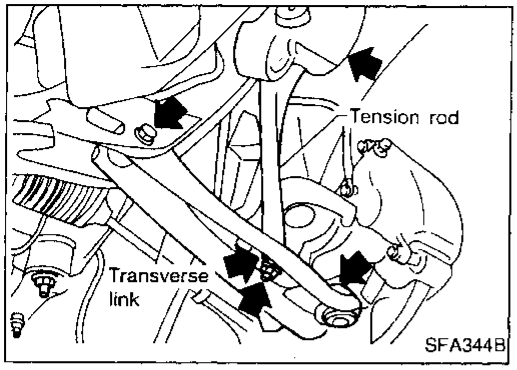
- When lifting engine, be careful not to strike adjacent parts, especially the following: Accelerator wire casing, brake lines, and brake master cylinder.
- In hoisting the engine, always use engine slingers in a safe manner.
- Before separating engine and transmission, remove the crankshaft position sensor (OBD) from the assembly.
- Always take extra care not to damage edge of crankshaft position sensor (OBD) or ring gear teeth.

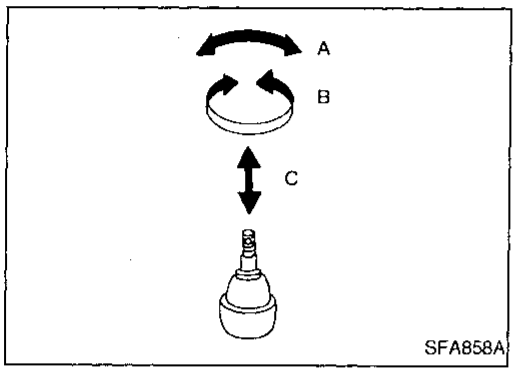
FRONT AXLE & FRONT SUSPENSION

SECTION FA

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Transverse Link Assembly

REMOVAL AND INSTALLATION

- Separate suspension ball joint from knuckle arm.
- Remove tension rod and transverse link assembly.

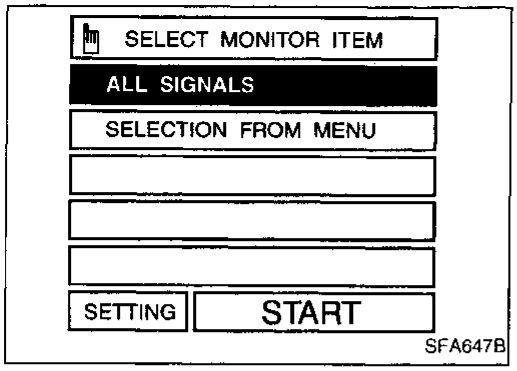
INSPECTION

- Check tension rod, stabilizer bar and transverse link for damage, cracks, deformation; replace transverse link assembly if necessary.
- Check rubber bushing for damage, cracks and deformation; replace tension rod or transverse link assembly if necessary.
- Check ball joint for excessive play. Replace transverse link assembly if any of the following exists:
  - Ball stud is worn.
  - Joint is hard to swing.
  - Play in axial direction is excessive.

  Before checking, turn ball joint at least 10 revolutions so that ball joint is properly broken in.

  Swinging force:
  Refer to SDS (FA-59).
  Turning torque:
  Refer to SDS (FA-59).
  Vertical end play:
  Refer to SDS (FA-59).
- Check dust cover for damage. Replace it and cover clamp if necessary.

CONSULT Inspection Procedure (Cont'd)



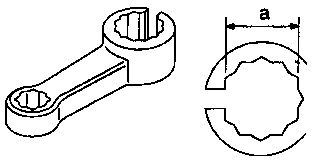
3. Select the signal to be monitored.
1) When "ALL SIGNALS" is selected, touch "START".
2) When "SELECTION FROM MENU" is to be selected, touch "SETTING". "MONITOR ITEM MENU" will then be indicated on the display. Touch the item to be monitored, then "ENTER" and "START".
3) Print out the data if necessary.

DATA MONITOR MODE

Monitored item	Display	Data item selection		Remarks
		Main item	Item menu selection	
Vehicle speed sensor	VHCL SPEED SE [km/h] or [mph]	○	○	—
Vertical G sensor front	VERTI G SE F [G]	○	○	—
Vertical G sensor rear right side	VERTI G SE RR [G]	○	○	—
Vertical G sensor rear left side	VERTI G SE RL [G]	○	○	—
Steering angle sensor (steering angle signal)	STEERING ANG [°]	○	○	When the battery is disconnected and then reconnected, an abnormal value is displayed until the straight-ahead position (0°) is set during driving.
Active damper select switch	SELECT SWITCH [AUTO-SPORT]	○	○	—
Stop lamp switch	STOP LAMP SW [ON-OFF]	○	○	—
Steering angle sensor (steering neutral signal)	NEUTRAL SIG [ON-OFF]	○	○	—
Damper motor front right	DAMP MTR F/R [Step]	○	○	—
Damper motor front left	DAMP MTR F/L [Step]	○	○	—
Damper motor rear right	DAMP MTR R/R [Step]	○	○	—
Damper motor rear left	DAMP MTR R/L [Step]	○	○	—
Power steering solenoid valve	POWER STR SOL [A]	○	○	EPS solenoid control current flow from control unit
Active damper indicator lamp (SPORT)	INDICATOR [ON-OFF]	○	○	—
Voltage	■ VOLTAGE [V]	—	○	Voltage measured by the voltage probe.
Pulse	■ PULSE [msec] or [Hz] or [%]	—	○	Pulse width, frequency or duty cycle measured by the pulse probe. Only "#" is displayed if item is unable to be measured. Figures with "#"s are temporary ones. They are the same figures as an actual piece of data which was just previously measured.

Special Service Tool

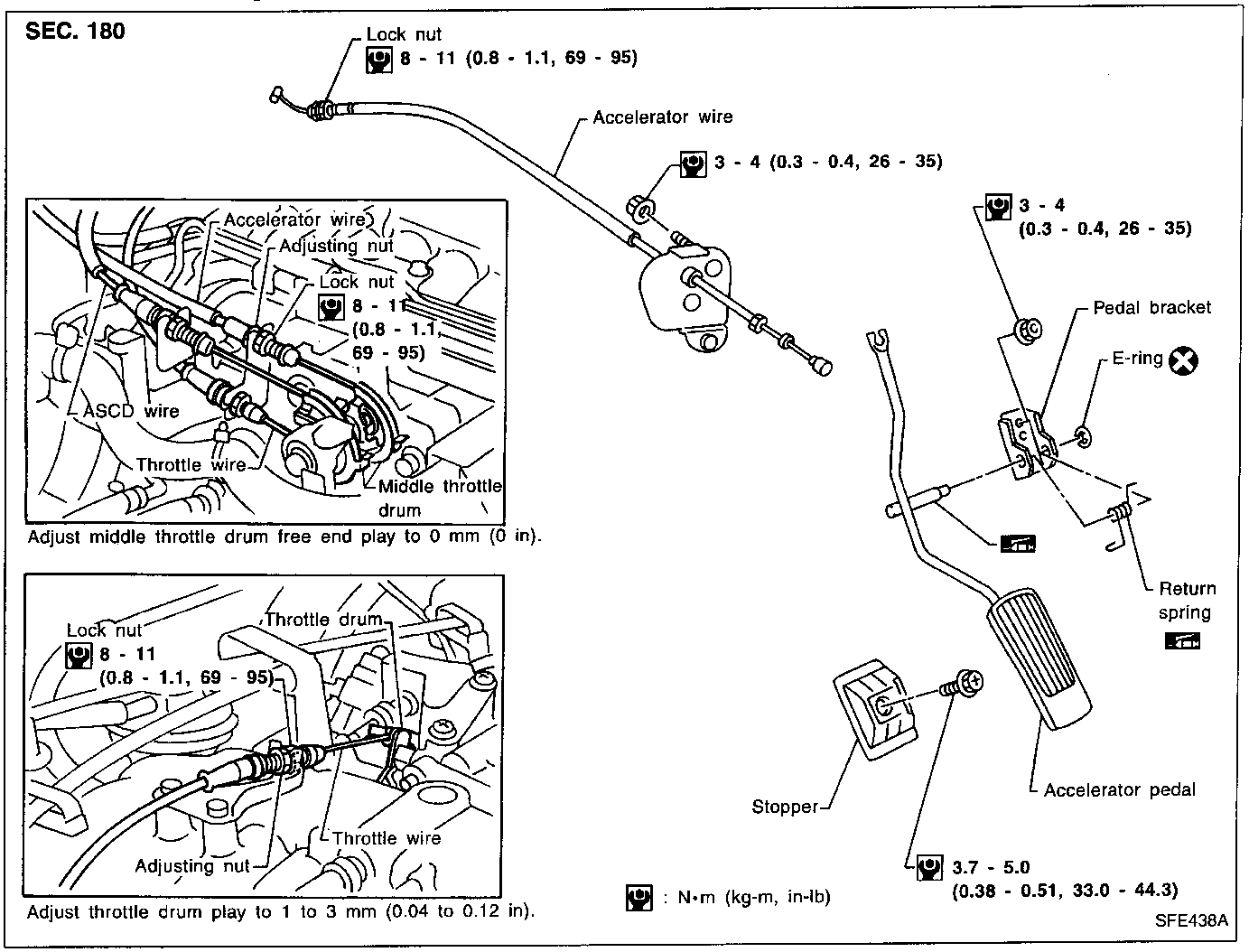
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
(J38365-A) Heated oxygen sensor wrench	 NT636	Loosening or tightening heated oxygen sensor 3/8 drive a: 22 mm (0.87 in)

CAUTION:

- **When removing accelerator wire, make a mark to indicate lock nut's initial position.**
- **Check that throttle valve opens fully when accelerator pedal is fully depressed. Also check that it returns to idle position when pedal is released.**
- **Check accelerator control parts for improper contact with any adjacent parts.**
- **When connecting accelerator wire, be careful not to twist or scratch wire.**

SEC. 180



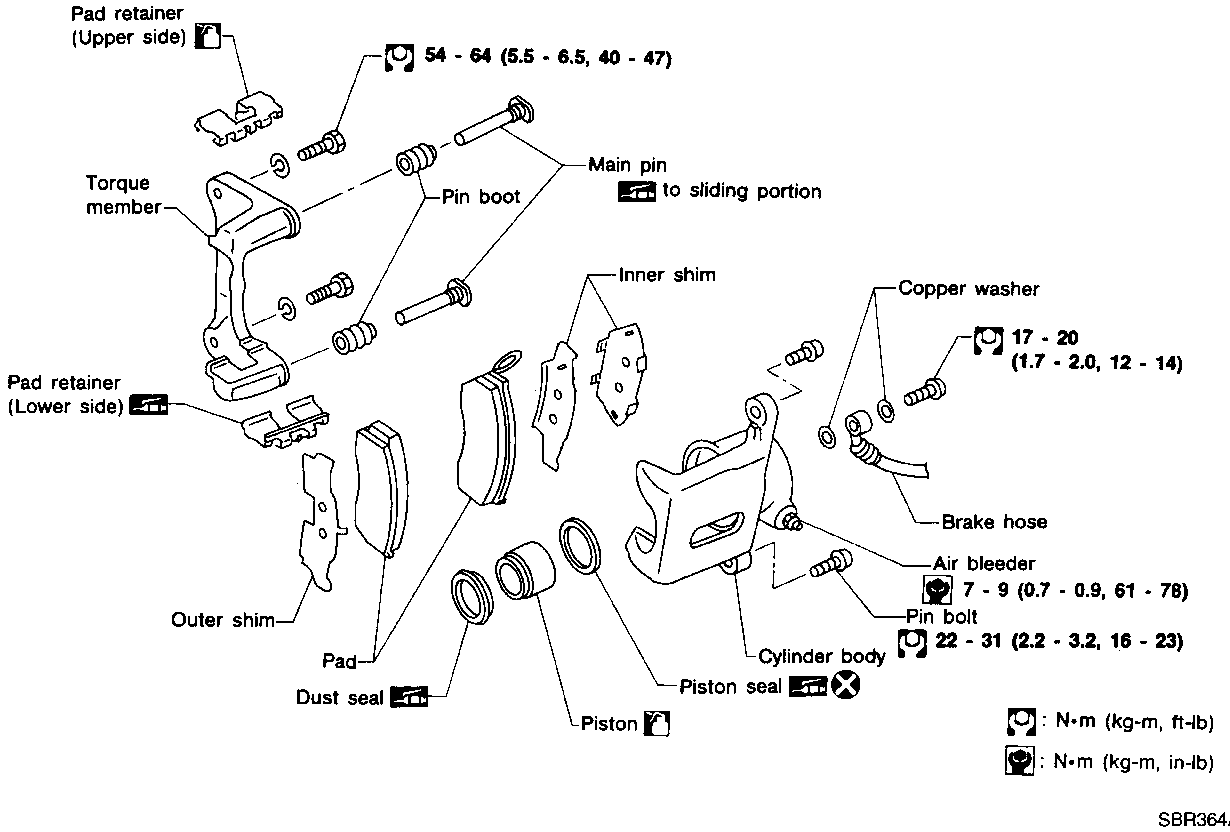
Adjust middle throttle drum free end play to 0 mm (0 in).

Adjust throttle drum play to 1 to 3 mm (0.04 to 0.12 in).

- **ALPHABETICAL INDEX** is provided at the end of this manual so that you can rapidly find the item and page you are searching for.
- **A QUICK REFERENCE INDEX,** a black tab (e.g. BR) is provided on the first page. You can quickly find the first page of each section by matching it to the section's black tab.
- **THE CONTENTS** are listed on the first page of each section.
- **THE TITLE** is indicated on the upper portion of each page and shows the part or system.
- **THE PAGE NUMBER** of each section consists of two letters which designate the particular section and a number (e.g. "BR-5").
- **THE LARGE ILLUSTRATIONS** are exploded views (See below) and contain tightening torques, lubrication points, section number of the **PARTS CATALOG** (e.g. SEC. 440) and other information necessary to perform repairs.
  The illustrations should be used in reference to service matters only. When ordering parts, refer to the appropriate **PARTS CATALOG.**

"Example"

SEC. 440



- **THE SMALL ILLUSTRATIONS** show the important steps such as inspection, use of special tools, knacks of work and hidden or tricky steps which are not shown in the previous large illustrations.
  Assembly, inspection and adjustment procedures for the complicated units such as the automatic transaxle or transmission, etc. are presented in a step-by-step format where necessary.

Circuit Inspection (Cont'd)

Continuity check method

The continuity check is used to find an open in the circuit. The Digital Multimeter (DMM) set on the resistance function will indicate an open circuit as over limit (no beep tone or no ohms symbol). Make sure to always start with the DMM at the highest resistance level.
To help in understanding the diagnosis of open circuits please refer to the schematic above.

1. Disconnect the battery negative cable.
2. Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
3. Connect one probe of the DMM to the fuse block terminal on the load side.
4. Connect the other probe to the fuse block (power) side of SW1. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
5. Connect the probes between SW1 and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
6. Connect the probes between the relay and the solenoid. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

Any circuit can be diagnosed using the approach in the above example.

Voltage check method

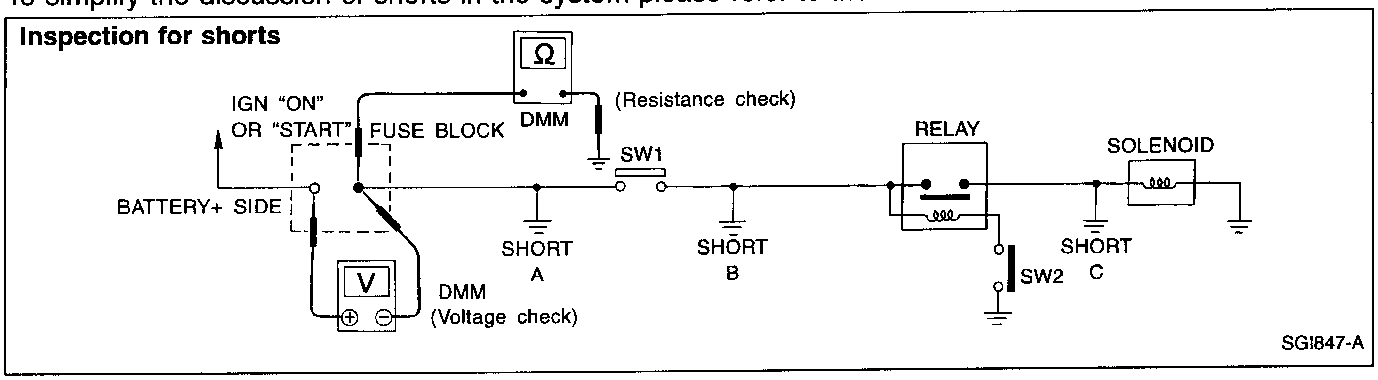
To help in understanding the diagnosis of open circuits please refer to the previous schematic.
In any powered circuit, an open can be found by methodically checking the system for the presence of voltage. This is done by switching the DMM to the voltage function.

1. Connect one probe of the DMM to a known good ground.
2. Begin probing at one end of the circuit and work your way to the other end.
3. With SW1 open, probe at SW1 to check for voltage.
   voltage; open is further down the circuit than SW1.
   no voltage; open is between fuse block and SW1 (point A).
4. Close SW1 and probe at relay.
   voltage; open is further down the circuit than the relay.
   no voltage; open is between SW1 and relay (point B).
5. Close the relay and probe at the solenoid.
   voltage; open is further down the circuit than the solenoid.
   no voltage; open is between relay and solenoid (point C).

Any powered circuit can be diagnosed using the approach in the above example.

TESTING FOR "SHORTS" IN THE CIRCUIT

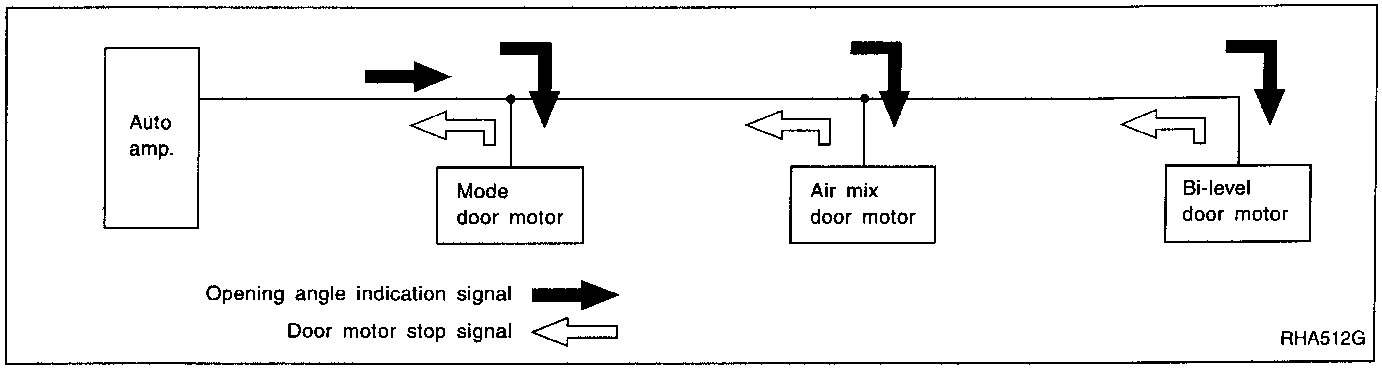
To simplify the discussion of shorts in the system please refer to the schematic below.



SAE J1930 Terminology List (Cont'd)

***: Not applicable

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Evaporative emission system	EVAP system	Evaporative emission control system
Exhaust gas recirculation valve	EGR valve	EGR valve
Exhaust gas recirculation control-BPT valve	EGRC-BPT valve	BPT valve
Exhaust gas recirculation control-solenoid valve	EGRC-solenoid valve	EGR control solenoid valve
Exhaust gas recirculation temperature sensor	EGRT sensor	Exhaust gas temperature sensor
EGR temperature sensor		
Flash electrically erasable programmable read only memory	FEEPROM	***
Flash erasable programmable read only memory	FEPROM	***
Flexible fuel sensor	FFS	***
Flexible fuel system	FF system	***
Fuel pressure regulator	***	Pressure regulator
Fuel pressure regulator control solenoid valve	***	PRVR control solenoid valve
Fuel trim	FT	***
Heated Oxygen sensor	HO2S	Exhaust gas sensor
Idle air control system	IAC system	Idle speed control
Idle air control valve-air regulator	IACV-air regulator	Air regulator
Idle air control valve-auxiliary air control valve	IACV-AAC valve	Auxiliary air control (AAC) valve
Idle air control valve-FICD solenoid valve	IACV-FICD solenoid valve	FICD solenoid valve
Idle air control valve-idle up control solenoid valve	IACV-idle up control solenoid valve	Idle up control solenoid valve
Idle speed control-FI pot	ISC-FI pot	FI pot
Idle speed control system	ISC system	***
Ignition control	IC	***
Ignition control module	ICM	***
Indirect fuel injection system	IFI system	***
Intake air	IA	Air
Intake air temperature sensor	IAT sensor	Air temperature sensor
Knock	***	Detonation
Knock sensor	KS	Detonation sensor
Malfunction indicator lamp	MIL	Check engine light
Manifold absolute pressure	MAP	***
Manifold absolute pressure sensor	MAPS	***
Manifold differential pressure	MDP	***
Manifold differential pressure sensor	MDPS	***

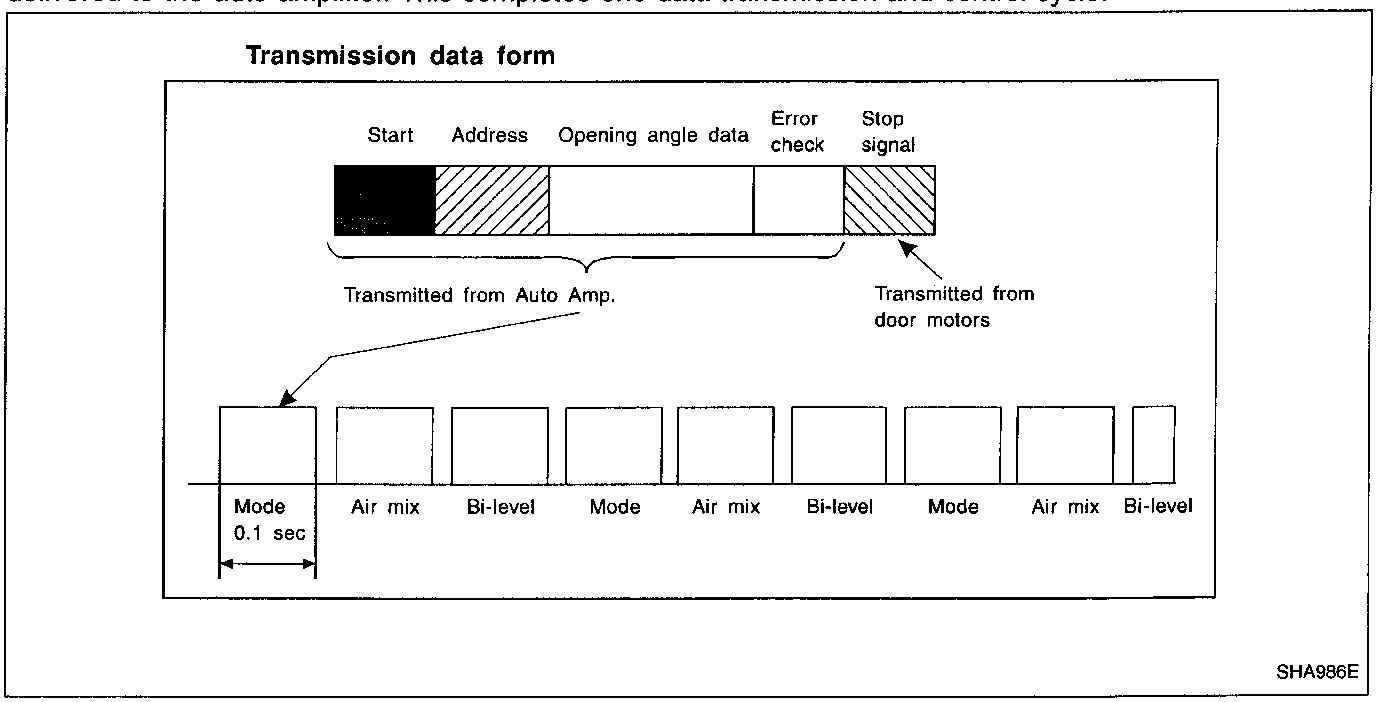


TRANSMISSION DATA AND TRANSMISSION ORDER

Amplifier data is transmitted consecutively to each of the door motors following the form shown in Figure below.
Start: Initial compulsory signal sent to each of the door motors.
Address: Data sent from the auto amplifier is selected according to data-based decisions made by the air mix door motor, mode door motor and bi-level door motor.
If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data is normal, door control begins.
If an error exists, the received data is rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.
Opening angle: Data that shows the indicated door opening angle of each door motor.
Error check: Procedure by which sent and received data is checked for errors. Error data is then compiled. The error check prevents corrupted data from being used by the air mix door motor, mode door motor and bi-level door motor. Error data can be related to the following problems.

- Abnormal electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

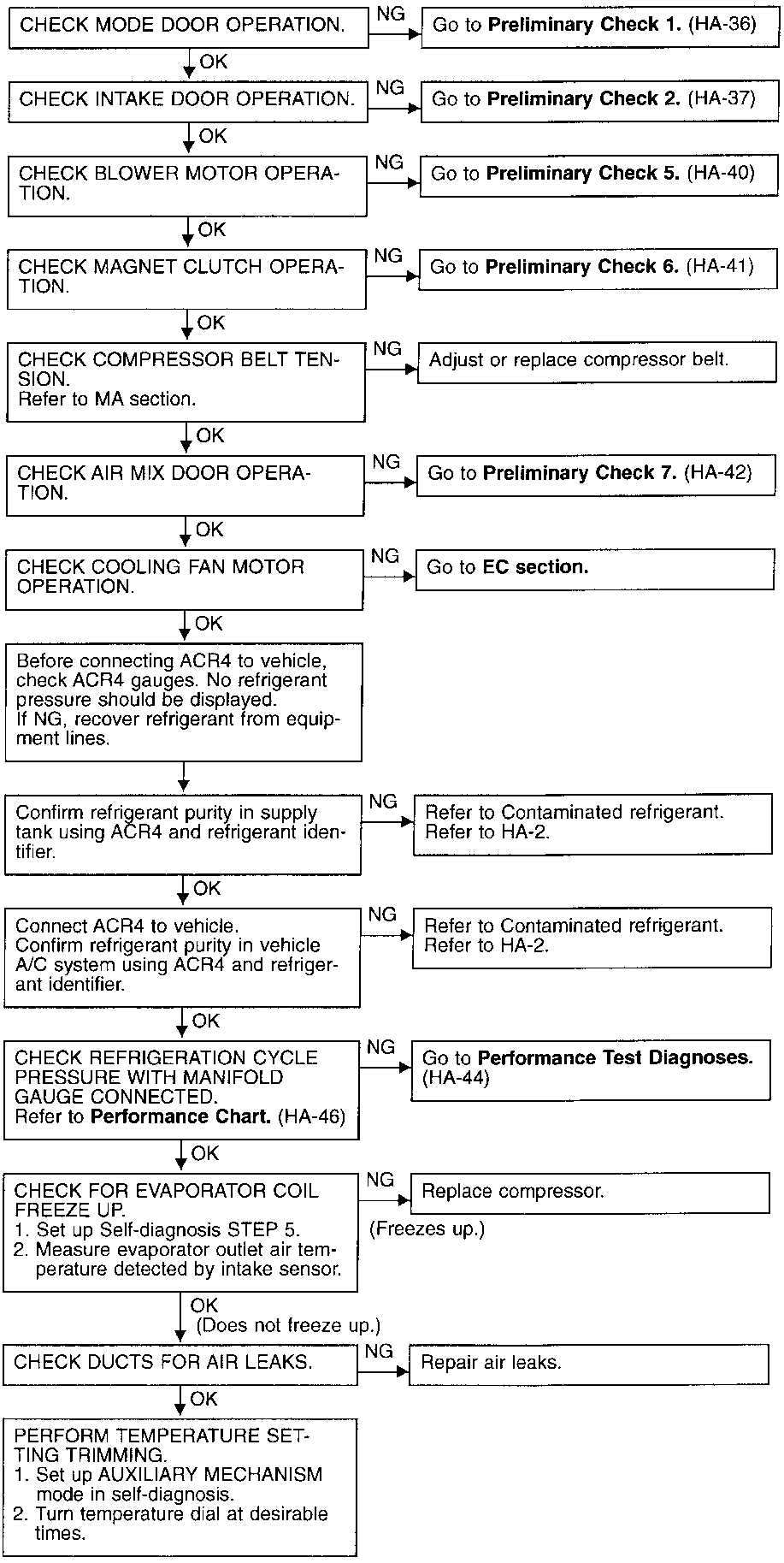
Stop signal: At the end of each transmission, a stop operation, in-operation, or internal problem message is delivered to the auto amplifier. This completes one data transmission and control cycle.

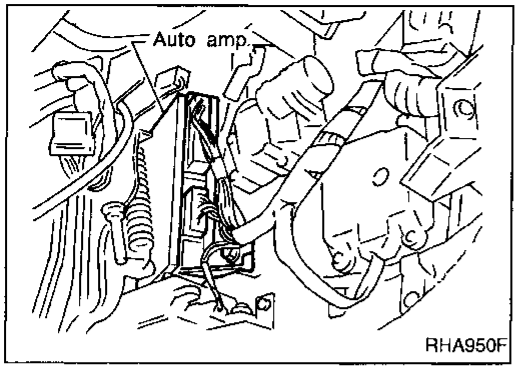


Preliminary Check (Cont'd)

PRELIMINARY CHECK 3

Insufficient cooling



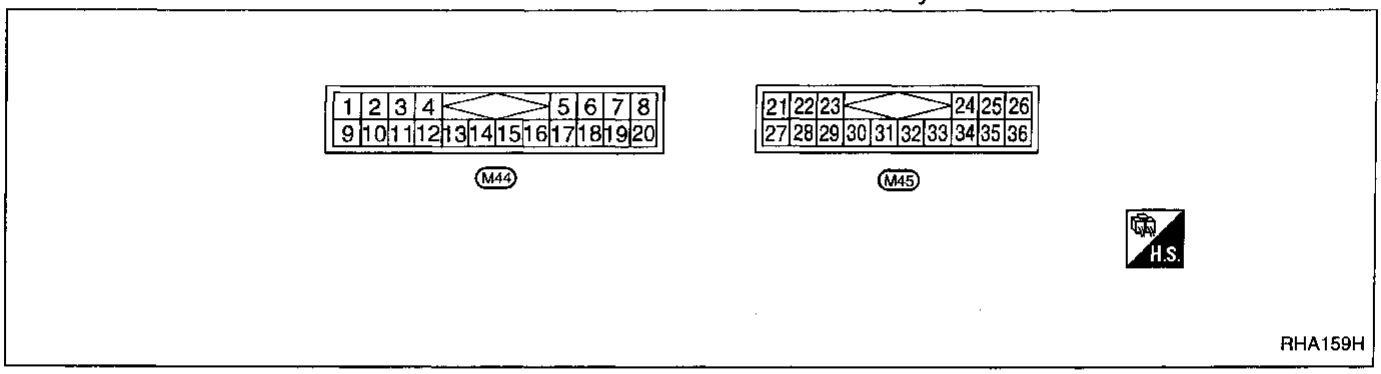


Auto Amp. Terminals and Reference Value

INSPECTION OF AUTO AMP.

- Measure voltage between each terminal and body ground by following "AUTO AMP. INSPECTION TABLE".

- Pin connector terminal layout



Bi-level Door Motor Circuit (LAN)

SYSTEM DESCRIPTION

Component parts

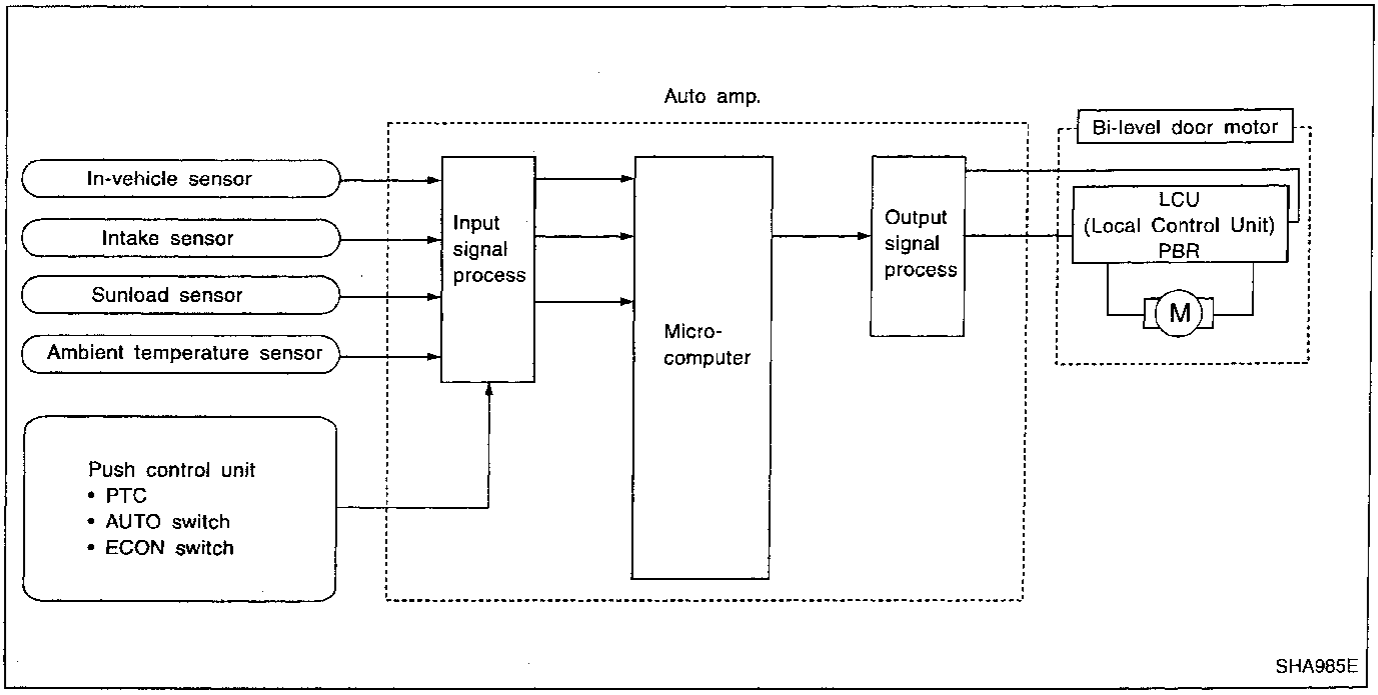
Bi-level door control system components are:

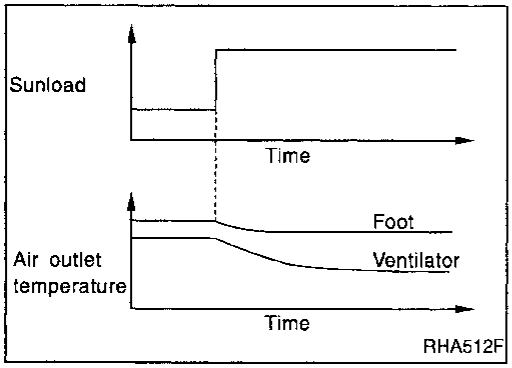
1) Auto amplifier
2) Bi-level door motor (LCU: Local Control Unit)
3) In-vehicle sensor
4) Ambient sensor
5) Sunload sensor
6) Intake sensor
7) Control unit (PTC)

System operation

The auto amplifier receives data from each of the sensors. The amplifier sends mode door, air mix door, bi-level door motor LCU opening angle data to the mode door motor LCU, air mix door motor LCU and bi-level motor LCU.

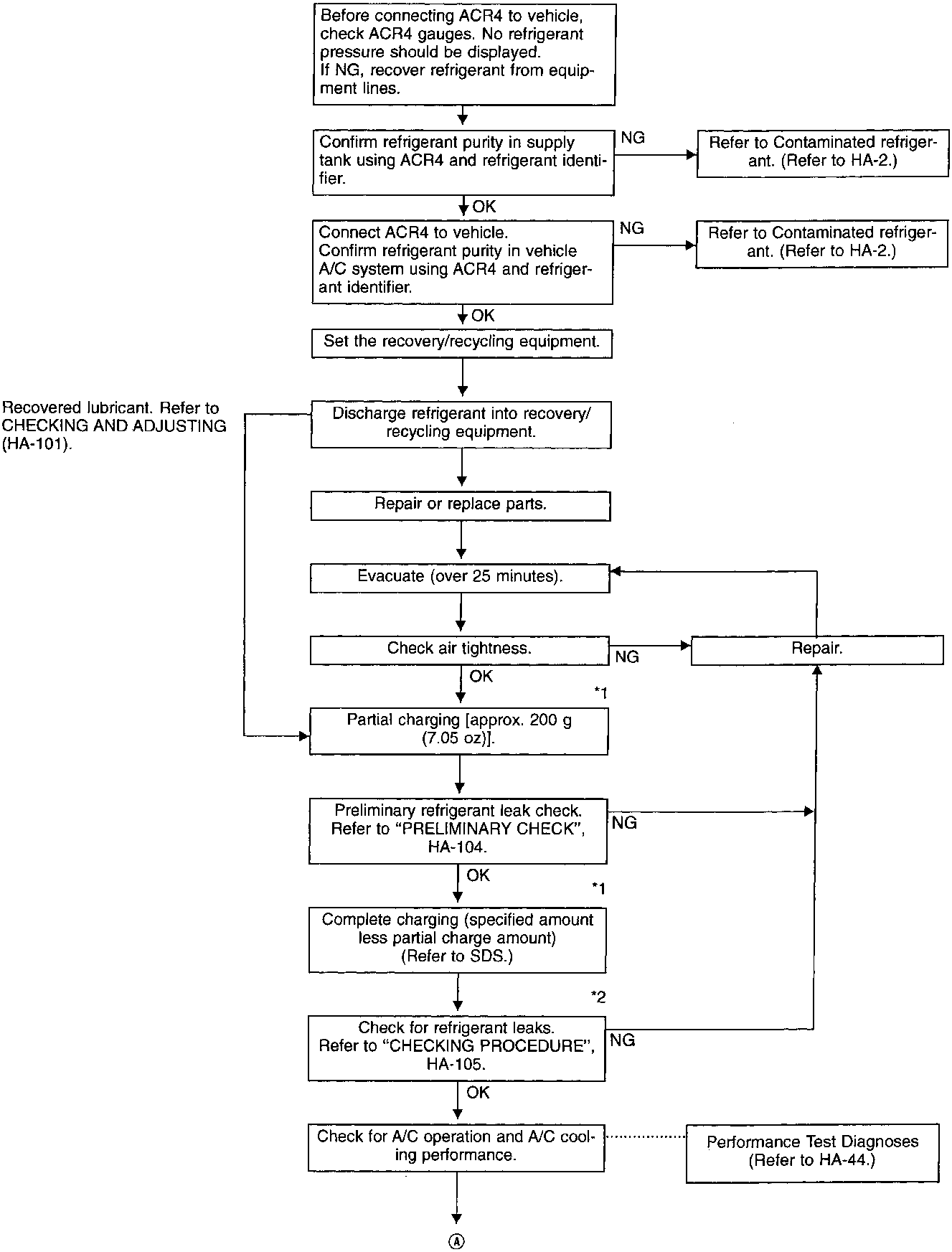
The mode door motor, air mix door motor and bi-level door motor read their respective signals according to the address signal. Opening angle indication signals received from the auto amplifier and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD or DEFROST/VENT or OPEN/CLOSE operation is selected. The new selection data is returned to the auto amplifier.





When the amount of sunload suddenly changes, the extra heat caused by sunload is counteracted by adjusting the air outlet temperature, but leaving the temperature around foot area as it is.

HFC-134a (R-134a) Service Procedure



Maintenance (engine) MA-10
MAJOR OVERHAUL AT-202
Malfunction indicator lamp (MIL) EC-54
Map lamp EL-349
MAP/BARO switch solenoid valve EC-339
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NVH troubleshooting (FA) FA-4
NVH troubleshooting (PD) PD-5
NVH troubleshooting (RA) RA-4
NVH troubleshooting (ST) ST-5

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Oil change (interval) MA-6, 7
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Oil pressure (engine) LC-4
Oil pump (A/T) AT-218
Oil pump (engine) LC-5
Oil pump regulator valve (engine) LC-7
Oil seal replacement (engine) EM-27
Oil seal replacement (front of final drive) PD-10
Oil seal replacement (side of final drive) PD-10
On board diagnostic system EC-40
Out side mirror BT-47
Overdrive control switch AT-182
Overrun clutch AT-241
Overrun clutch solenoid valve AT-114, 125, 146

P

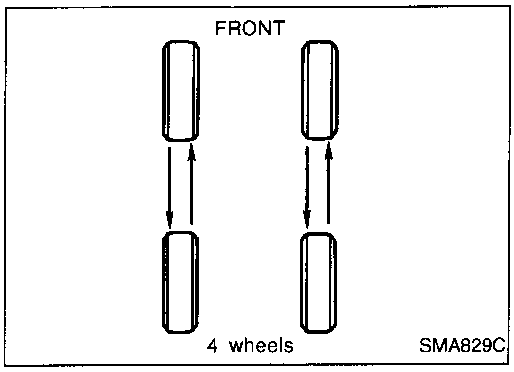
P/ANT - Wiring diagram EL-201
Park/Neutral position switch EC-476
Parking brake control BR-29
Parking drum brake BR-25
Parking lamp EL-92
PCV (positive crankcase ventilation) EC-28
Personal lamp EL-349
PGC/V - Wiring diagram EC-299, 426
PHONE - Wiring diagram EL-204
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Power steering (twin orifice) trouble diagnoses ST-33
Power steering fluid level MA-20, ST-7
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Power steering hydraulic pressure ST-9
Power steering oil pressure switch EC-509
Power steering oil pump ST-27
Power steering system (twin orifice) ST-30
Power steering system bleeding ST-8
Power supply routing EL-7
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Power transistor & ignition coil EC-381
Power window EL-288
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Propeller shaft on vehicle service PD-6
Propeller shaft vibration PD-6
PST/SW - Wiring diagram EC-509

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Radiator LC-13
Radio - See Audio EL-188
Rear air spoiler BT-25
Rear axle RA-9
Rear bumper BT-9
Rear combination lamp removal and installation BT-25
Rear disc brake BR-21
Rear door BT-13
Rear heated oxygen sensor (HO2S) EC-200, 208, 216, 223

Overheating Cause Analysis

	Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	—	
		Damaged fins	Dust contamination or paper clogging	
			Mechanical damage	
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)	
	Reduced air flow	Fan coupling does not operate.	—	—
		Cooling fan does not operate.		
		High resistance to fan rotation		
		Damaged fan blades		
	Damaged radiator shroud	—	—	
	Improper coolant mixture ratio	—	—	—
	Poor coolant quality	—	—	—
	Insufficient coolant	Coolant leaks	Cooling hose	Loose clamp
				Cracked hose
			Water pump	Poor sealing
			Radiator cap	Loose
				Poor sealing
			Radiator	O-ring for damage, deterioration or improper fitting
				Cracked radiator tank
				Cracked radiator core
			Reservoir tank	Cracked reservoir tank
		Overflowing reservoir tank	Exhaust gas leaks into cooling system	Cylinder head deterioration
				Cylinder head gasket deterioration
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load
				Driving in low gear for extended time
				Driving at extremely high speed
			Powertrain system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes	
			Improper ignition timing.	
	Blocked or restricted air flow	Blocked bumper	—	—
		Blocked radiator grille	Installed car brassiere	
			Mud contamination or paper clogging	
		Blocked radiator	—	
		Blocked condenser	—	
		Installed large fog lamp		

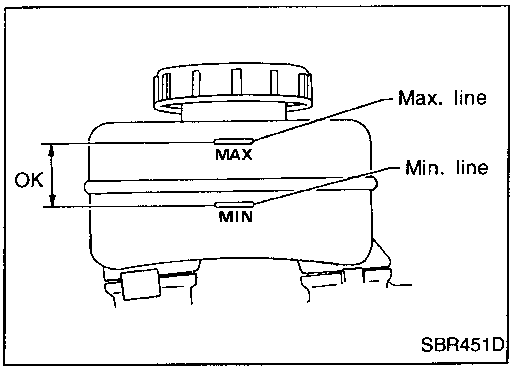


Tire Rotation

- **Do not include the T-type spare tire when rotating the tires.**

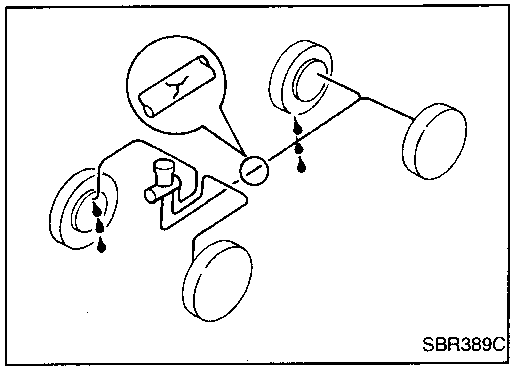
Wheel nuts:

: 98 - 118 N·m (10.0 - 12.0 kg-m, 72 - 87 ft-lb)



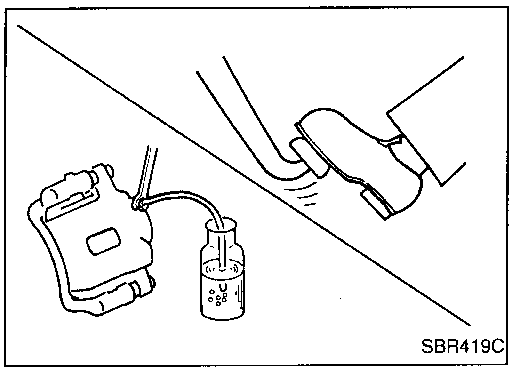
Checking Brake Fluid Level and Leaks

- If fluid level is extremely low, check brake system for leaks.



Checking Brake Lines and Cables

- Check brake fluid lines and parking brake cables for improper attachment and for leaks, chafing, abrasions, deterioration, etc.

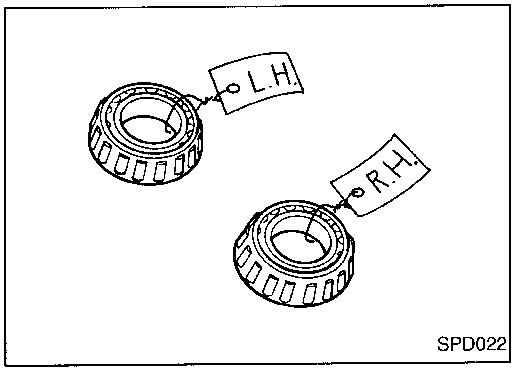


Changing Brake Fluid

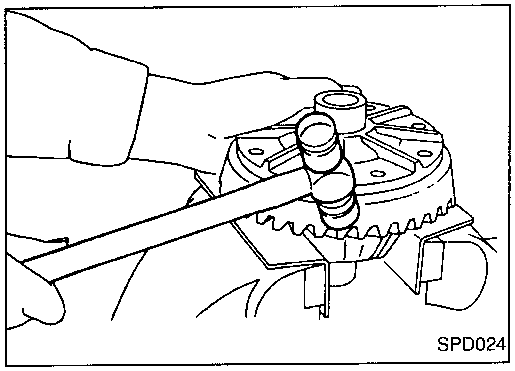
1. Drain brake fluid from each air bleeder valve.
2. Refill until new brake fluid comes out from each air bleeder valve.
   Use same procedure as in bleeding hydraulic system to refill brake fluid.
   Refer to section "CHECK AND ADJUSTMENT" in BR section.

- **Refill with recommended Genuine Brake Fluid or equivalent DOT 3 (US FMVSS No. 116).**
  Refer to "RECOMMENDED FLUIDS AND LUBRICANTS", MA-8.
- **Never reuse drained brake fluid.**
- **Be careful not to splash brake fluid on painted areas.**

Differential Case (Cont'd)

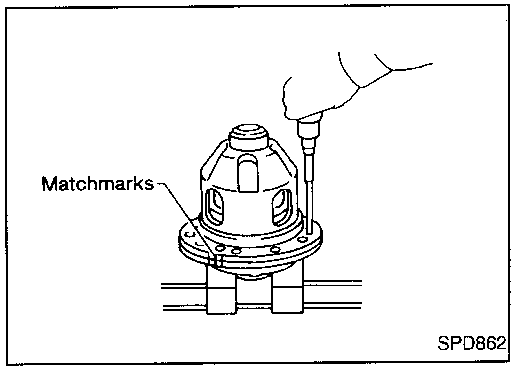


Be careful not to confuse left- and right-hand parts.

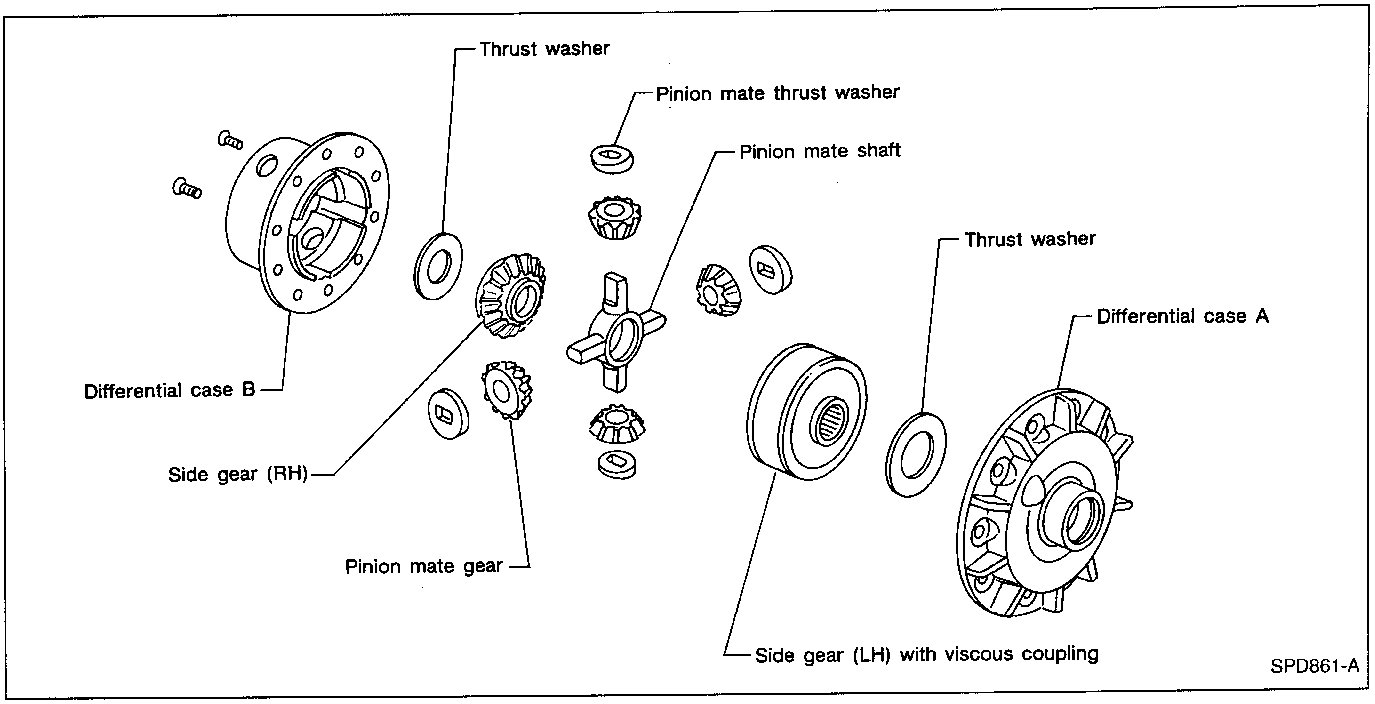


2. Loosen ring gear bolts in a criss-cross fashion.
3. Tap ring gear off the differential case with a soft hammer.

Tap evenly all around to keep ring gear from binding.

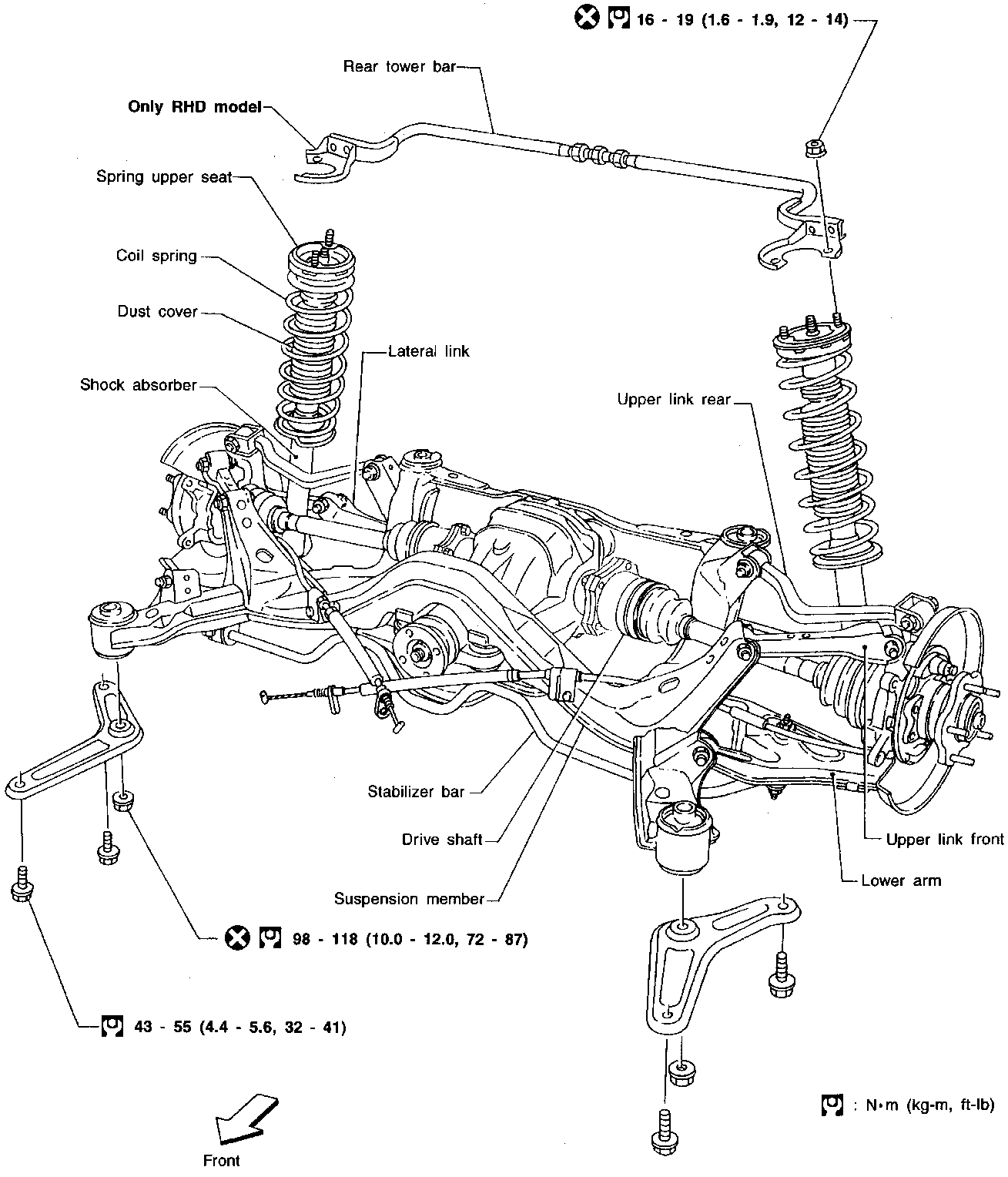


4. Loosen screws on differential cases A and B.
5. Separate differential cases A and B.

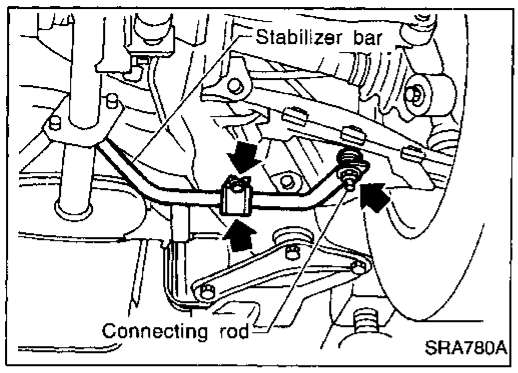


SEC. 380•396•430•431

When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.
*** Fuel, radiator coolant and engine oil full.**
Spare tire, jack, hand tools and mats in designated positions.



SRA776A



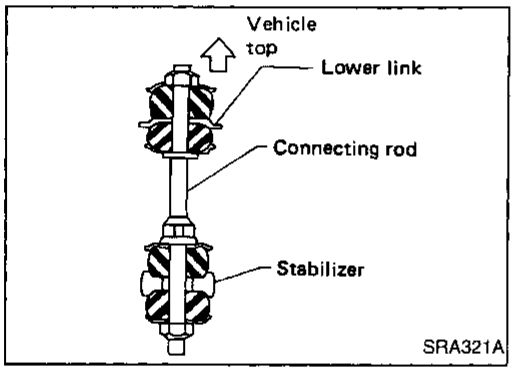
Stabilizer Bar

REMOVAL

Remove connecting rod and clamp.

INSPECTION

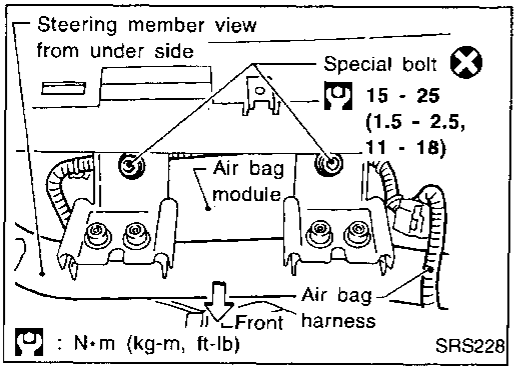
- Check stabilizer bar for deformation or cracks. Replace if necessary.
- Check rubber bushings for deterioration or cracks. Replace if necessary.



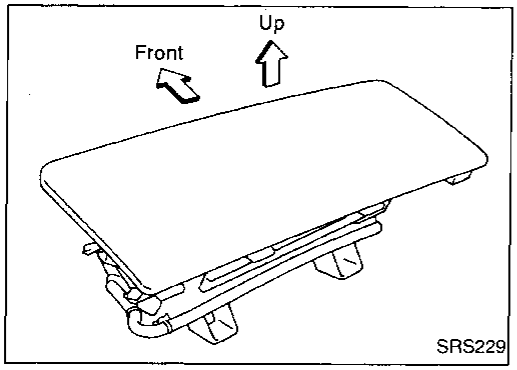
INSTALLATION

When installing connecting rod, make sure direction is correct (as shown at left).

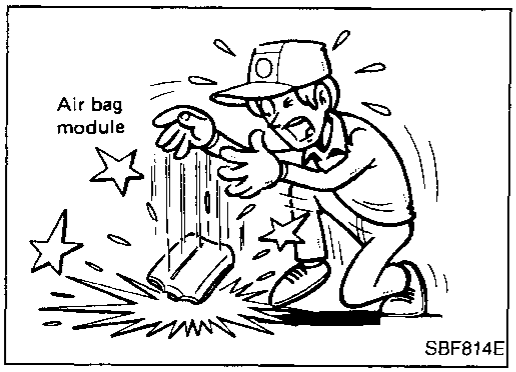
Removal — Front Passenger Air Bag Module (Cont'd)



4. Remove special bolts from air bag module using TAMPER RESISTANT TORX (Size T50).
5. Remove mounting bolts from back of instrument assembly.
6. Move air bag module upward, and remove it from instrument assembly.
   - The air bag module is heavy and should be supported using both hands during removal.

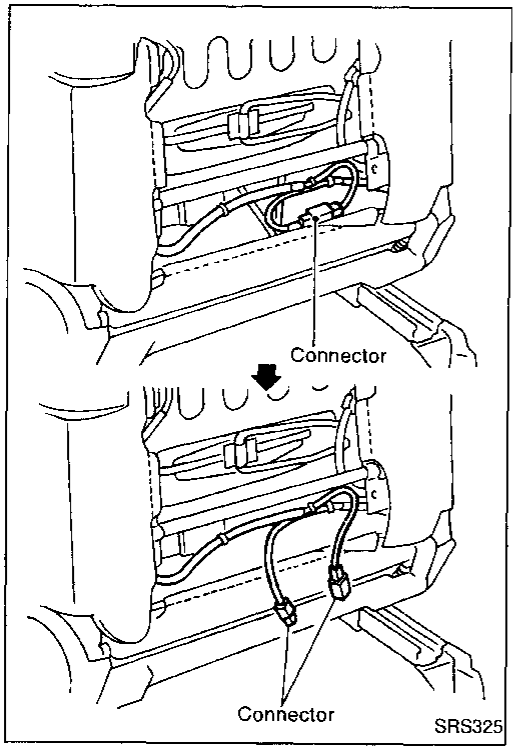


CAUTION:
- **Always place air bag module with pad side facing upward.**
- **Do not attempt to disassemble air bag module.**
- **The special bolts are coated with bonding agent. Do not use old bolts after removal; replace with new coated bolts.**
- **Do not insert any foreign objects (screwdriver, etc.) into air bag module connector.**



- **Replace air bag module if it has been dropped or sustained an impact.**
- **Do not expose the air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the air bag module.**
- **After air bag inflates, the front instrument panel assembly should be replaced if damaged.**

Removal — Side Air Bag Module (Built-in type)



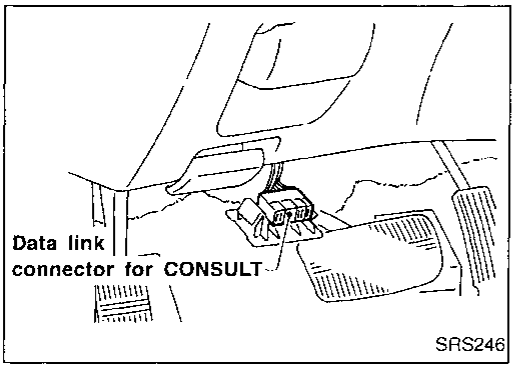
CAUTION:
- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the rear of air bag module.**

1. Remove seat back board.
   - **When using a clip removal tool to remove the seat back board, take care not to damage the air bag harness.**
2. Disconnect side air bag module connector.

Self-diagnosis (Cont'd)

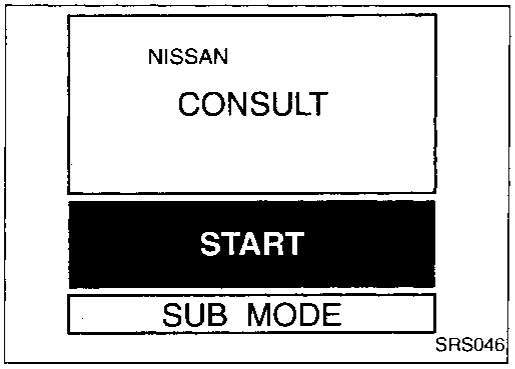
DIAGNOSTIC PROCEDURE 2 (with CONSULT)

Inspecting SRS malfunctioning parts by using CONSULT — Diagnosis mode



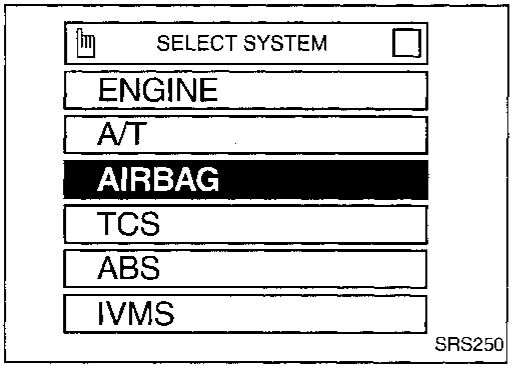
SRS246

1. Turn ignition switch "OFF".
2. Connect "CONSULT" to Data link connector.



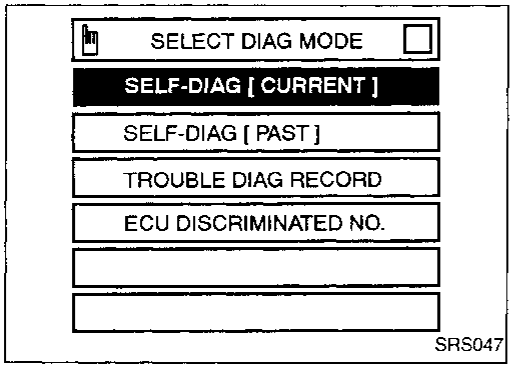
SRS046

3. Turn ignition switch "ON".
4. Touch "START".



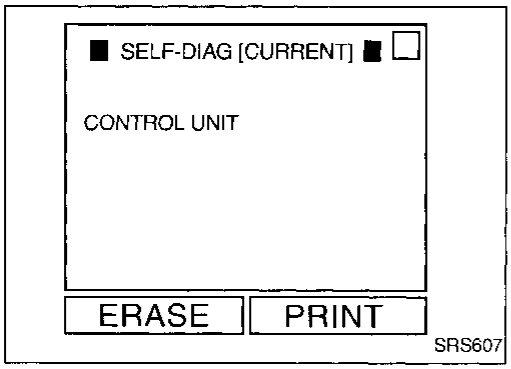
SRS250

5. Touch "AIRBAG".



SRS047

6. Touch "SELF-DIAG [CURRENT]".



SRS607

7. Diagnostic codes are displayed on "SELF-DIAG [CURRENT]".

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