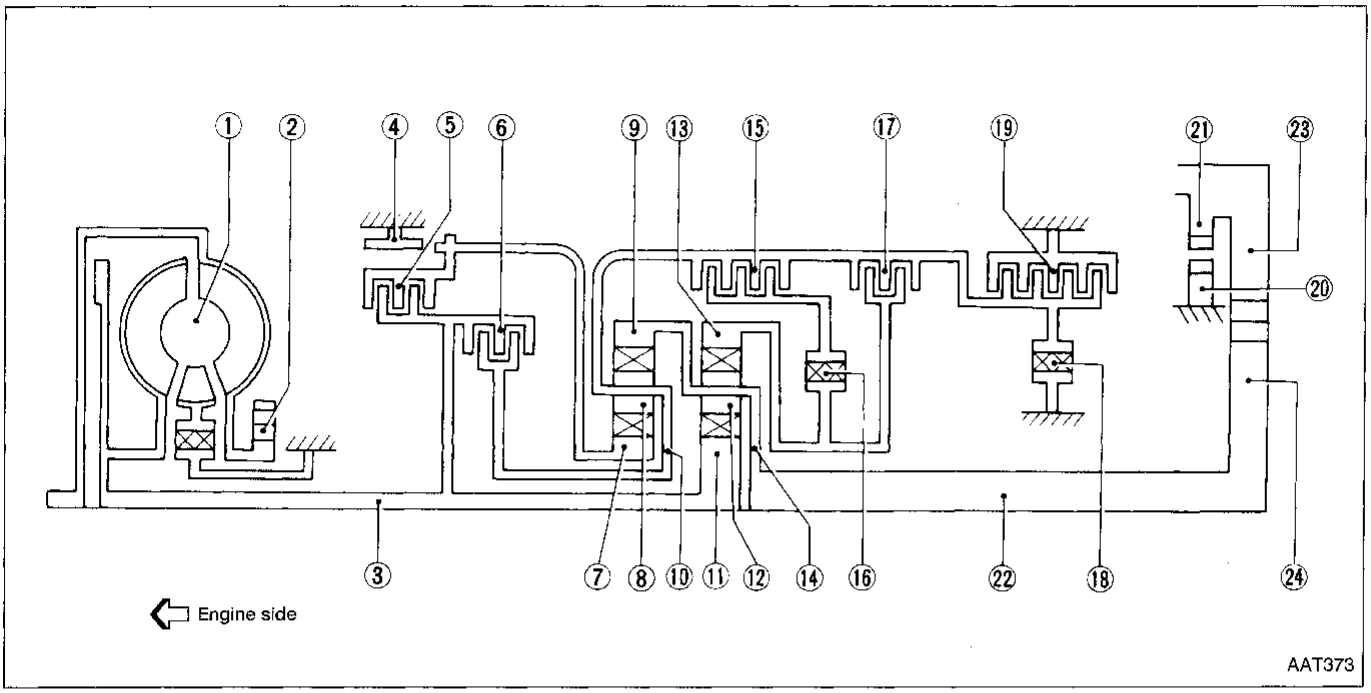
NISSAN
STANZA
ALTIMA
MODEL U13 SERIES

QUICK REFERENCE INDEX

Shift Mechanism

CONSTRUCTION



① Torque converter
② Oil pump
③ Input shaft
④ Brake band
⑤ Reverse clutch
⑥ High clutch
⑦ Front sun gear
⑧ Front pinion gear
⑨ Front internal gear
⑩ Front planetary carrier
⑪ Rear sun gear
⑫ Rear pinion gear
⑬ Rear internal gear
⑭ Rear planetary carrier
⑮ Forward clutch
⑯ Forward one-way clutch
⑰ Overrun clutch
⑱ Low one-way clutch
⑲ Low & reverse brake
⑳ Parking pawl
㉑ Parking gear
㉒ Output shaft
㉓ Idle gear
㉔ Output gear

FUNCTION OF CLUTCH AND BRAKE

Clutch and brake components	Abbr.	Function
⑤ Reverse clutch	R/C	To transmit input power to front sun gear ⑦.
⑥ High clutch	H/C	To transmit input power to front planetary carrier ⑩.
⑮ Forward clutch	F/C	To connect front planetary carrier ⑩ with forward one-way clutch ⑯.
⑰ Overrun clutch	O/C	To connect front planetary carrier ⑩ with rear internal gear ⑬.
④ Brake band	B/B	To lock front sun gear ⑦.
⑯ Forward one-way clutch	F/O.C	When forward clutch ⑮ is engaged, to stop rear internal gear ⑬ from rotating in opposite direction of engine revolution.
⑱ Low one-way clutch	L/O.C	To stop front planetary carrier ⑩ from rotating in opposite direction against engine revolution.
⑲ Low & reverse brake	L & R/B	To lock front planetary carrier ⑩.

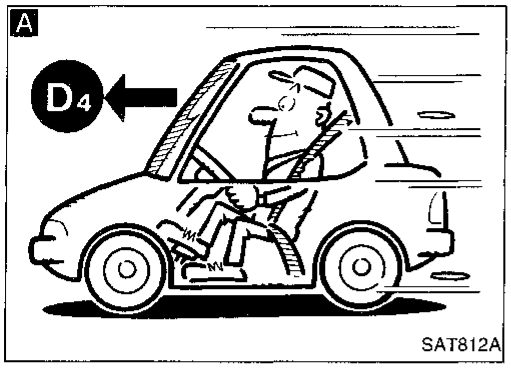
Diagnosis by CONSULT (Cont'd)

DATA MONITOR DIAGNOSTIC TEST MODE

Item	Display	Monitor item: ECU input signals	Monitor item: Main signals	Description	Remarks
Vehicle speed sensor 1 (A/T) (Revolution sensor)	VHCL/S SE·A/T [km/h] or [mph]	X	—	● Vehicle speed computed from signal of revolution sensor is displayed.	When racing engine in N or P position with vehicle stationary, CONSULT data may not indicate 0 km/h (0 MPH).
Vehicle speed sensor 2 (Meter)	VHCL/S SE·MTR [km/h] or [mph]	X	—	● Vehicle speed computed from signal of vehicle speed sensor is displayed.	Vehicle speed display may not be accurate under approx. 10 km/h (6 MPH). It may not indicate 0 km/h (0 MPH) when vehicle is stationary.
Throttle position sensor	THRTL POS SEN [V]	X	—	● Throttle position sensor signal voltage is displayed.	
Fluid temperature sensor	FLUID TEMP SEN [V]	X	—	● Fluid temperature sensor signal voltage is displayed. ● Signal voltage lowers as fluid temperature rises.	
Battery voltage	BATTERY VOLT [V]	X	—	● Source voltage of control unit is displayed.	
Engine speed	ENGINE SPEED [rpm]	X	X	● Engine speed, computed from engine speed signal, is displayed.	Engine speed display may not be accurate under approx. 800 rpm. It may not indicate 0 rpm even when engine is not running.
Overdrive switch	OVERDRIVE SW [ON/OFF]	X	—	● ON/OFF state computed from signal of overdrive SW is displayed.	
P/N position switch	P/N POSI SW [ON/OFF]	X	—	● ON/OFF state computed from signal of P/N position SW is displayed.	
R position switch	R POSITION SW [ON/OFF]	X	—	● ON/OFF state computed from signal of R position SW is displayed.	
D position switch	D POSITION SW [ON/OFF]	X	—	● ON/OFF state computed from signal of D position SW is displayed.	
2 position switch	2 POSITION SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of 2 position SW, is displayed.	
1 position switch	1 POSITION SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of 1 position SW, is displayed.	
ASCD-cruise signal	ASCD·CRUISE [ON/OFF]	X	—	● Status of ASCD cruise signal is displayed. ON ... Cruising state OFF ... Normal running state	● This is displayed even when no ASCD is mounted.
ASCD-OD cut signal	ASCD·OD CUT [ON/OFF]	X	—	● Status of ASCD·OD release signal is displayed. ON ... OD released OFF ... OD not released	● This is displayed even when no ASCD is mounted.
Closed throttle position switch	CLOSED THL/SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of closed throttle position SW, is displayed.	
Wide open throttle position switch	W/O THRL/P-SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of wide open throttle position SW, is displayed.	
Hold switch	HOLD SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of hold SW, is displayed.	
Gear position	GEAR	—	X	● Gear position data used for computation by control unit, is displayed.	

Preliminary Check (Cont'd)

Cruise test — Part 3



1. Confirm overdrive switch is in "ON" position.
2. Confirm selector lever is in "D" position.

A

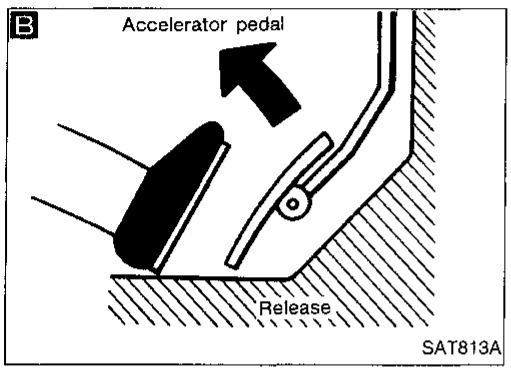
Accelerate vehicle using half-throttle to D_4.

B

Release accelerator pedal.

C

Set overdrive switch to "OFF" position while driving in D_4.



D

Does A/T shift from D_4 to D_3?
Read gear position and vehicle speed.

No → Mark the box on the DIAGNOSTIC WORKSHEET (AT-16) to perform Diagnostic Procedure 17. Continue ROAD TEST.

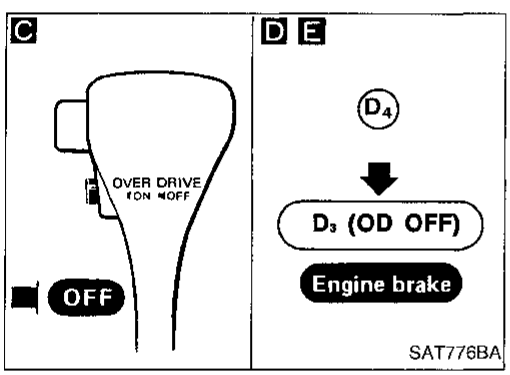
Yes

E

Does vehicle decelerate by engine brake?

No → Mark the box on the DIAGNOSTIC WORKSHEET (AT-16) to perform Diagnostic Procedure 15. Continue ROAD TEST.

Yes



F

Move selector lever from "D" to "2" position while driving in D_3.

G

Does A/T shift from D_3 to 2_2?
Read gear position.

No → Mark the box on the DIAGNOSTIC WORKSHEET (AT-16) to perform Diagnostic Procedure 18. Continue ROAD TEST.

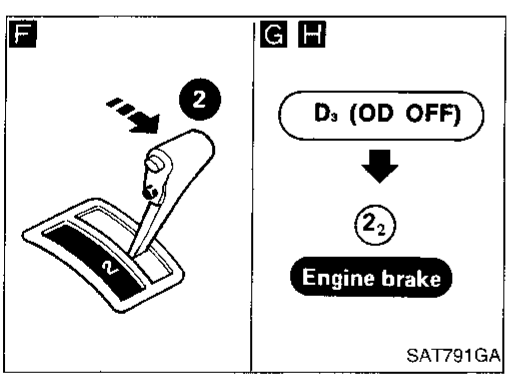
Yes

H

Does vehicle decelerate by engine brake?

No → Mark the box on the DIAGNOSTIC WORKSHEET (AT-16) to perform Diagnostic Procedure 15. Continue ROAD TEST.

Yes



I J

1. Move selector lever from "2" to "1" position while driving in 2_2.
2. Does A/T shift from 2_2 to 1_1 position?
Read gear position.

No → Mark the box on the DIAGNOSTIC WORKSHEET (AT-16) to perform Diagnostic Procedure 19. Continue ROAD TEST.

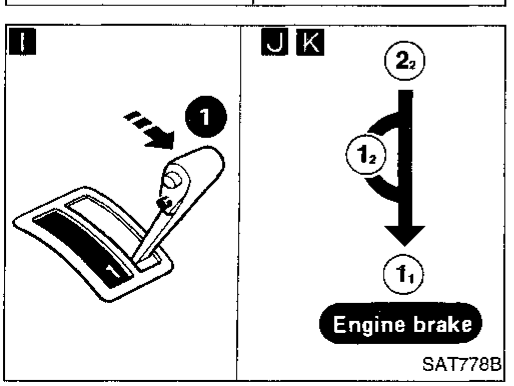
Yes

K

Does vehicle decelerate by engine brake?

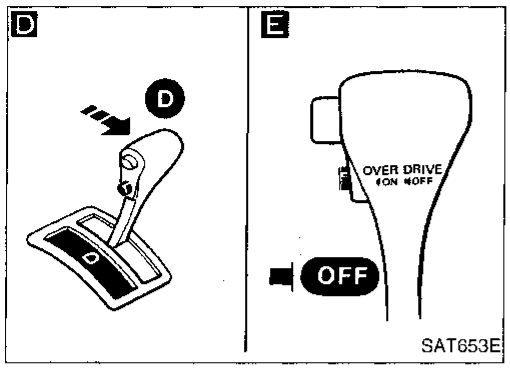
No → Mark the box on the DIAGNOSTIC WORKSHEET (AT-16) to perform Diagnostic Procedure 20. Continue ROAD TEST.

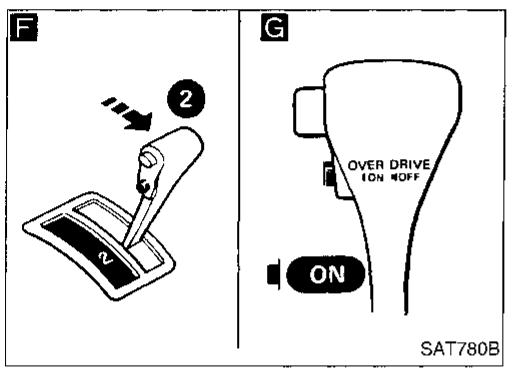
Yes

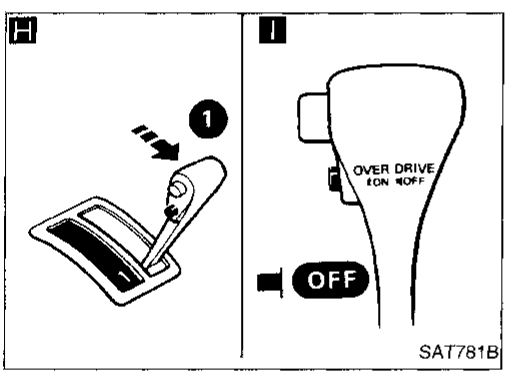


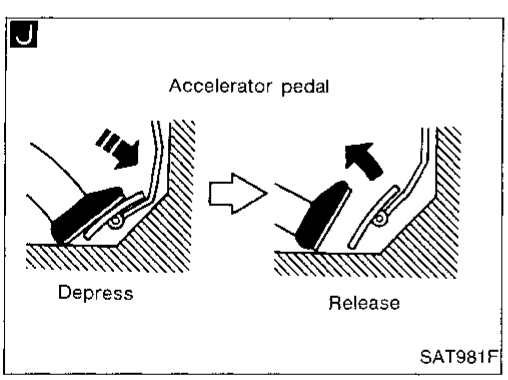
1. Stop vehicle.
2. Perform self-diagnosis. Refer to SELF-DIAGNOSTIC PROCEDURE, AT-47.

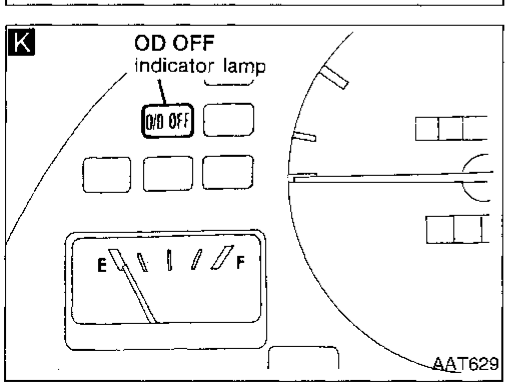
Self-diagnosis (Cont'd)











Ⓐ

D E

1. Turn ignition switch to "OFF" position.
2. Turn ignition switch to "ON" position. (Do not start engine.)
3. Move selector lever to "D" position.
4. Turn ignition switch to "OFF" position.
5. Set overdrive switch to "OFF" position.
6. Turn ignition switch to "ON" position (Do not start engine.)

● Wait for more than 2 seconds after ignition switch "ON".

↓

F G

1. Move selector lever to "2" position.
2. Set overdrive switch in "ON" position.

↓

H I

Move selector lever to "1" position.
Set overdrive switch in "OFF" position.

↓

J

Depress accelerator pedal fully and release it.

↓

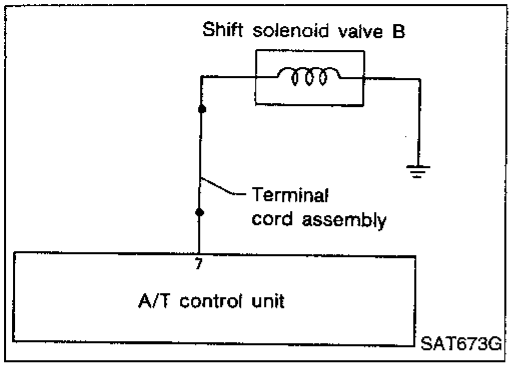
K

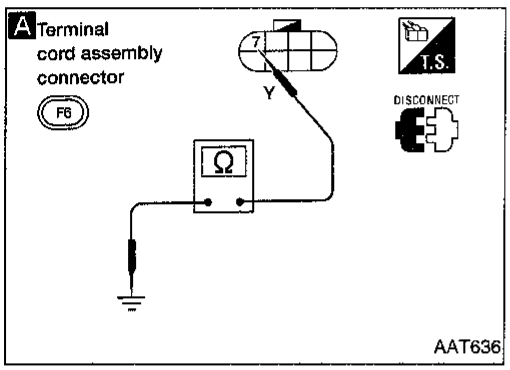
Check OD OFF indicator lamp.
Refer to JUDGEMENT OF SELF-DIAGNOSIS CODE on next page.

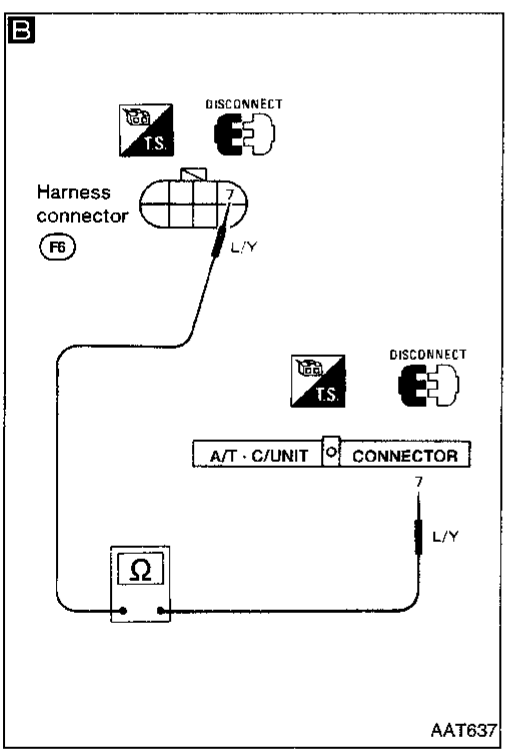
↓

DIAGNOSIS END

Self-diagnosis (Cont'd)







A

CHECK GROUND CIRCUIT.
1. Turn ignition switch to "OFF" position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal ⑦ and ground.
   Resistance: 20 - 30Ω

NG →
1. Remove control valve assembly. Refer to "ON-VEHICLE SERVICE", AT-125.
2. Check the following items:
   - Shift solenoid valve B (Refer to "Electrical Components Inspection", AT-107.)
   - Harness of terminal cord assembly for short or open

OK ↓

B

CHECK POWER SOURCE CIRCUIT.
1. Turn ignition switch to "OFF" position.
2. Disconnect A/T control unit harness connector.
3. Check resistance between terminal ⑦ and A/T control unit harness connector terminal ⑦.
   Resistance:
   Approximately 0Ω
4. Reinstall any part removed.

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

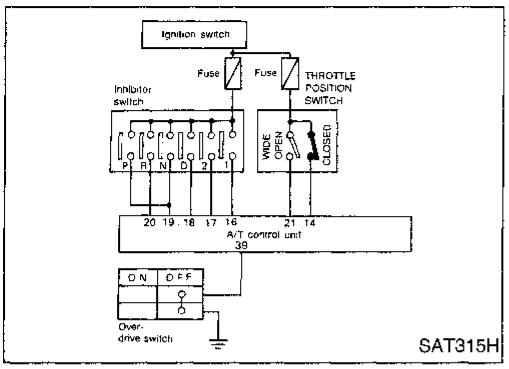
OK ↓

Perform Diagnostic Trouble Code (DTC) confirmation procedure, AT-61.

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

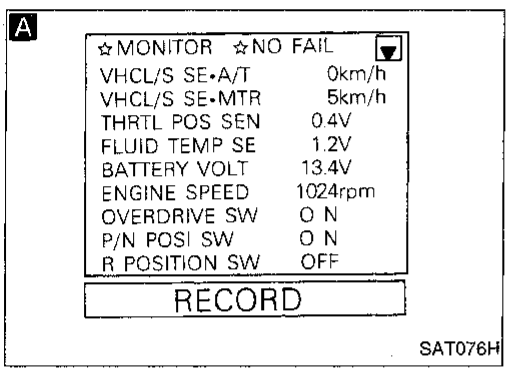
OK ↓

INSPECTION END



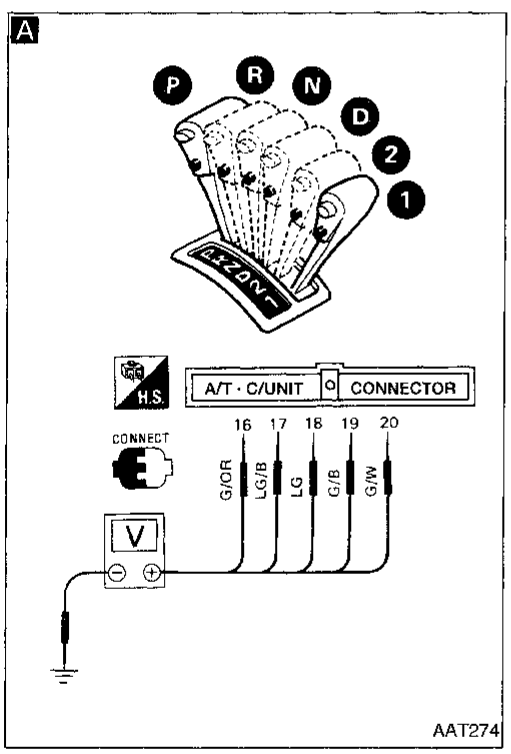
SAT315H

A



SAT076H

A



AAT274

A

CHECK INHIBITOR SWITCH CIRCUIT.

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "ECU INPUT SIGNALS" in Data Monitor.
3. Read out "R, N, D, 1 and 2 position switches" moving selector lever to each position. Check the signal of the selector lever position is indicated properly.

NG → Check the following items:
- Inhibitor switch (Refer to "Electrical Components Inspection", AT-108.)
- Harness for short or open between ignition switch and inhibitor switch (Main harness)
- Harness for short or open between inhibitor switch and A/T control unit (Main harness)

OR

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Check voltage between A/T control unit terminals ⑯, ⑰, ⑱, ⑲, ⑳ and ground while moving selector lever through each position.

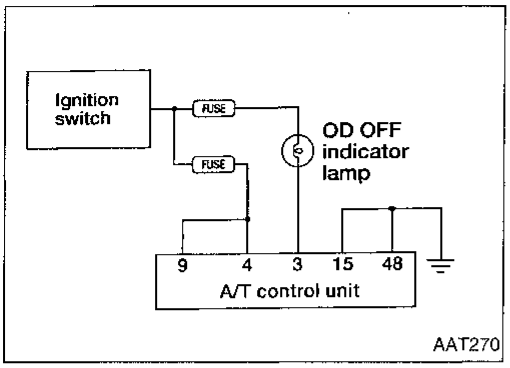
Voltage:
B: Battery voltage
0: 0V

Lever position	Terminal No.				
	⑲	⑳	⑱	⑰	⑯
P, N	**B**	0	0	0	0
R	0	**B**	0	0	0
D	0	0	**B**	0	0
2	0	0	0	**B**	0
1	0	0	0	0	**B**

OK

Ⓐ

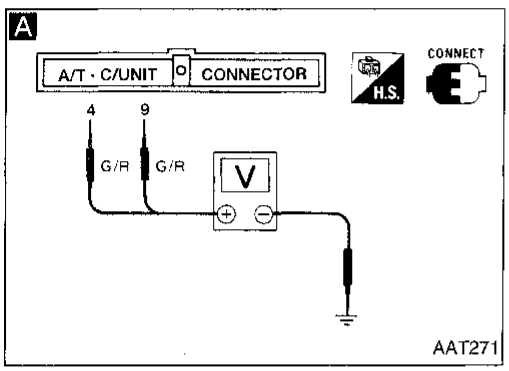
(Go to next page.)

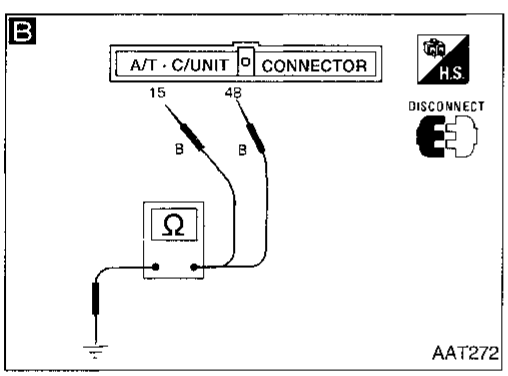


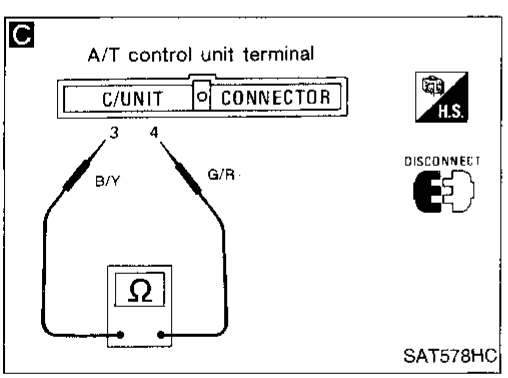
Diagnostic Procedure 1

SYMPTOM:

OD OFF indicator lamp does not come on for about 2 seconds when turning ignition switch to "ON".







A

CHECK A/T CONTROL UNIT POWER SOURCE.

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Check voltage between A/T control unit terminals ④, ⑨ and ground.

Battery voltage should exist.

NG → Check the following items:
- Harness for short or open between ignition switch and A/T control unit (Main harness)
- Ignition switch and fuse Refer to EL section ("POWER SUPPLY ROUTING").

OK ↓

B

CHECK A/T CONTROL UNIT GROUND CIRCUIT.

1. Turn ignition switch to "OFF" position.
2. Disconnect A/T control unit harness connector.
3. Check resistance between A/T control unit harness connector terminals ⑮, ㊽ and ground.

Resistance:

Approximately 0Ω

NG → Check harness for short or open between A/T control unit and ground.

OK ↓

C

CHECK LAMP CIRCUIT.

1. Turn ignition switch to "OFF" position.
2. Check resistance between A/T control unit harness connector terminals ③ and ④.

Resistance: 50 - 100Ω

3. Reinstall any part removed.

NG → Check the following items:
- OD OFF indicator lamp (Refer to EL section.)
- Harness for short or open between ignition switch and OD OFF indicator lamp (Main harness)
- Harness for short or open between OD OFF indicator lamp and A/T control unit

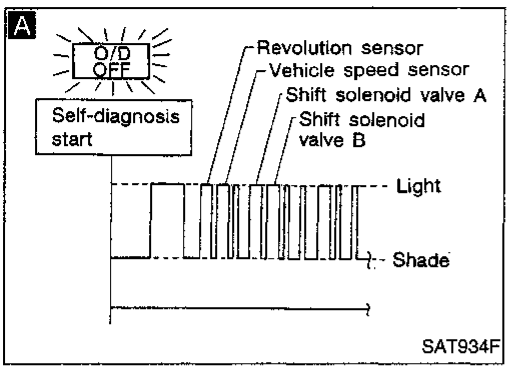
OK ↓

Check again.

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

OK ↓

INSPECTION END



Diagnostic Procedure 16

SYMPTOM:

Vehicle does not start from D_1 on Cruise test — Part 2.

A

Does self-diagnosis show damage to revolution sensor, vehicle speed sensor, shift solenoid valve A or B after cruise test?

Yes → Check damaged circuit. Refer to "Self- diagnosis", AT-53.

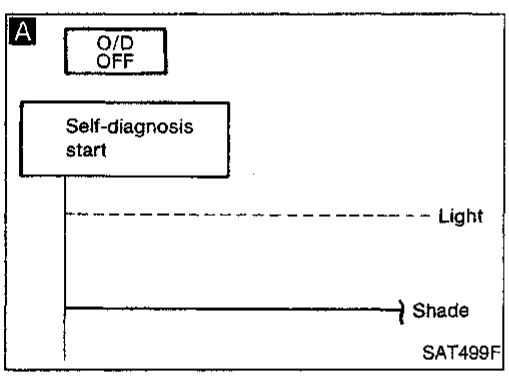
No ↓

Check again.

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

OK ↓

Go to Diagnostic Procedure 8, AT-94.



Diagnostic Procedure 17

SYMPTOM:

A/T does not shift from D_4 to D_3 when changing overdrive switch to "OFF" position.

Does "ECU INPUT SIGNALS" in Data Monitor show damage to overdrive switch circuit?

Yes → Check overdrive switch circuit. Refer to "Self-diagnosis", AT-74.

OR

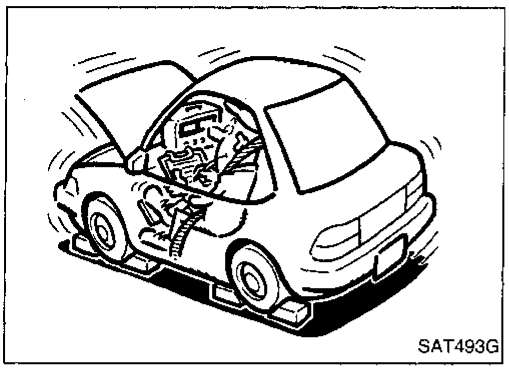
A

Does self-diagnosis show damage to overdrive switch circuit?

No ↓

Go to Diagnostic Procedure 10, AT-96.

Final Check (Cont'd)


SAT493G

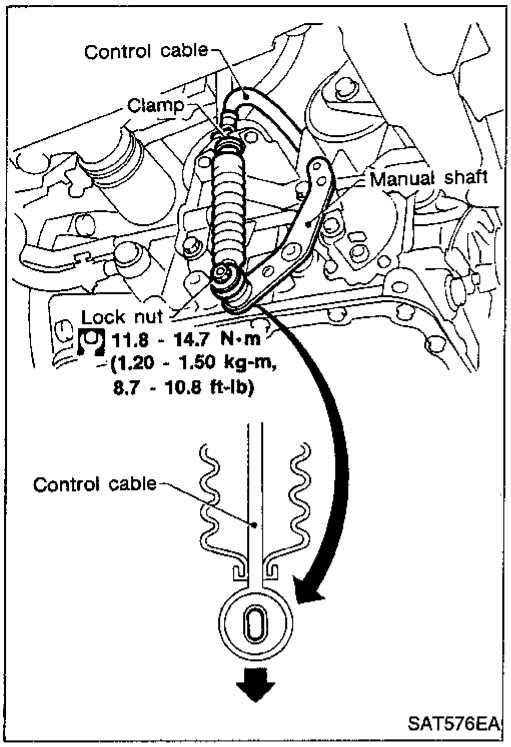
5. Start engine and measure line pressure at idle and stall speed.

- **When measuring line pressure at stall speed, follow the stall test procedure.**

Line pressure: Refer to SDS, AT-227.

JUDGEMENT OF LINE PRESSURE TEST

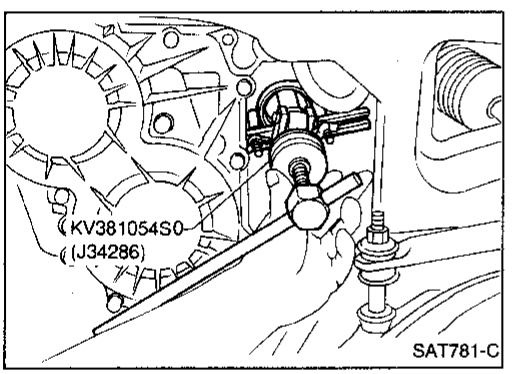
Judgement		Suspected parts
At idle	Line pressure is low in all positions.	● Oil pump wear ● Control piston damage ● Pressure regulator valve or plug sticking ● Spring for pressure regulator valve damaged ● Fluid pressure leakage between oil strainer and pressure regulator valve ● Clogged strainer
	Line pressure is low in particular position.	● Fluid pressure leakage between manual valve and particular clutch ● For example, line pressure is: – Low in "R" and "1" positions, but – Normal in "D" and "2" positions. Therefore, fluid leakage exists at or around low and reverse brake circuit. Refer to "OPERATION OF CLUTCH AND BRAKE", AT-11.
	Line pressure is high.	● Maladjustment of throttle position sensor ● Fluid temperature sensor damaged ● Line pressure solenoid valve sticking ● Short circuit of line pressure solenoid valve circuit ● Pressure modifier valve sticking ● Pressure regulator valve or plug sticking ● Open in dropping resistor circuit
At stall speed	Line pressure is low.	● Maladjustment of throttle position sensor ● Line pressure solenoid valve sticking ● Short circuit of line pressure solenoid valve circuit ● Pressure regulator valve or plug sticking ● Pressure modifier valve sticking ● Pilot valve sticking



Control Cable Adjustment

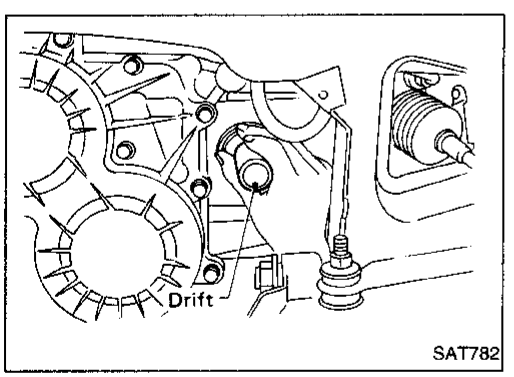
Move selector lever from the "P" position to the "1" position. You should be able to feel the detents in each position. If the detents cannot be felt or the pointer indicating the position is improperly aligned, the control cable needs adjustment.

1. Place selector lever in "P" position.
2. Loosen control cable lock nut and place manual shaft in "P" position.
3. Pull control cable in the direction of the arrow shown in the illustration by specified force.
   Specified force: 6.9 N (0.7 kg, 1.5 lb)
4. Return control cable in the opposite direction of the arrow for 1.0 mm (0.039 in).
5. Tighten control cable lock nut.
6. Move selector lever from "P" to "1" position again. Make sure that selector lever moves smoothly.
7. Apply grease to contacting areas of selector lever and control cable. Install any part removed.

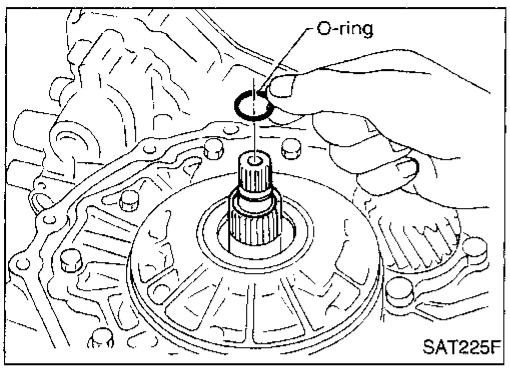


Differential Side Oil Seal Replacement

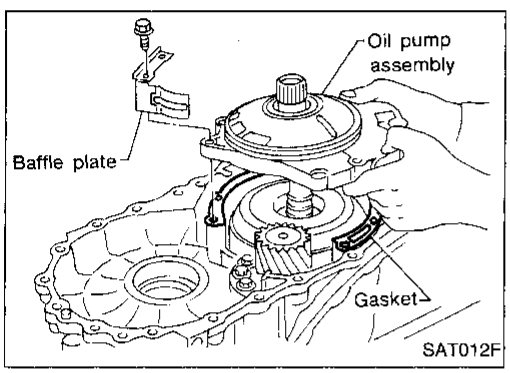
1. Remove drive shaft assembly. Refer to FA section ("Removal", "FRONT AXLE — Drive Shaft").
2. Remove oil seal.



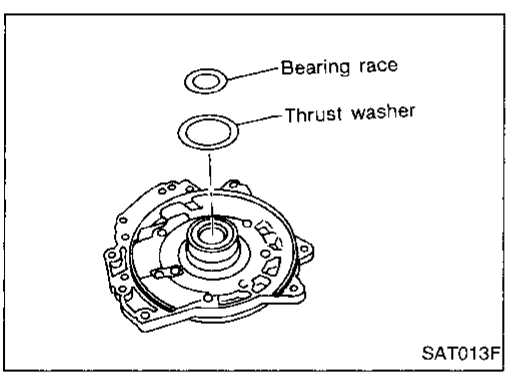
3. Install oil seal.
- **Apply ATF before installing.**
4. Reinstall any part removed.



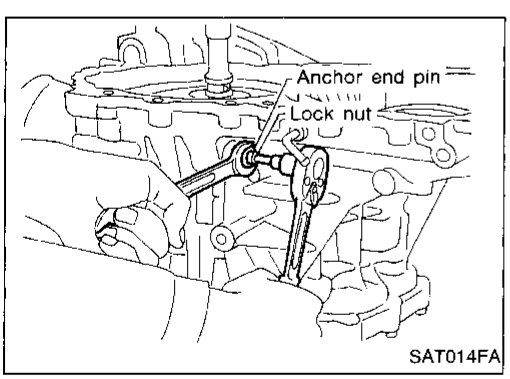
27. Remove oil pump according to the following procedures.
a. Remove O-ring from input shaft.



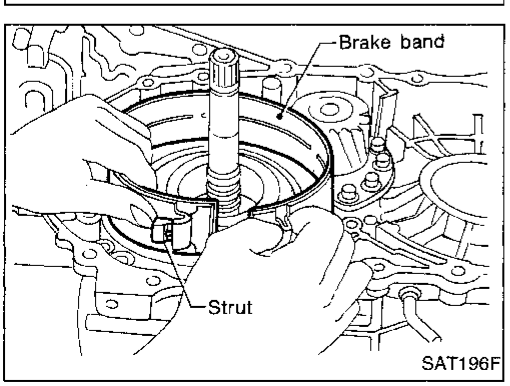
b. Remove oil pump assembly, baffle plate and gasket from transmission case.



c. Remove thrust washer and bearing race from oil pump assembly.



28. Remove brake band according to the following procedures.
a. Loosen lock nut, then back off anchor end pin.
- **Do not reuse anchor end pin.**



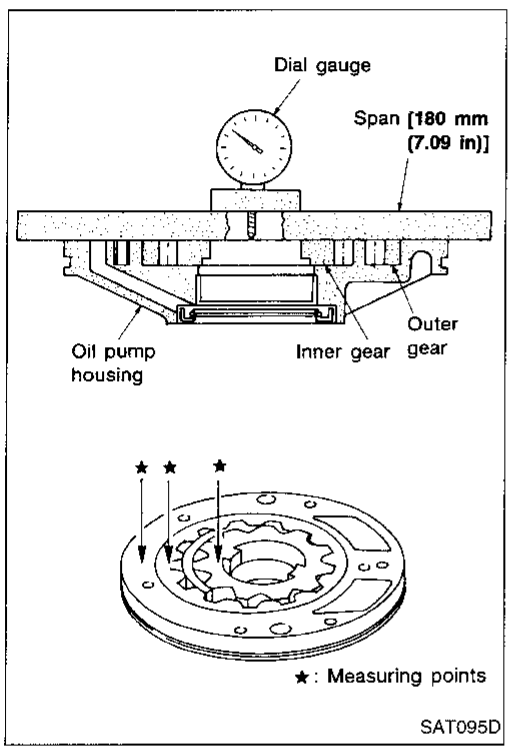
b. Remove brake band and strut from transmission case.

Oil Pump (Cont'd)

INSPECTION

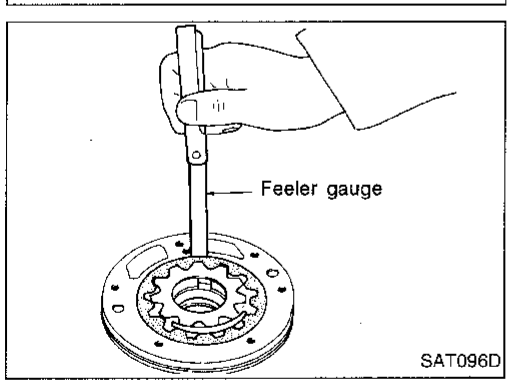
Oil pump housing, oil pump cover, inner gear and outer gear

- Check for wear or damage.

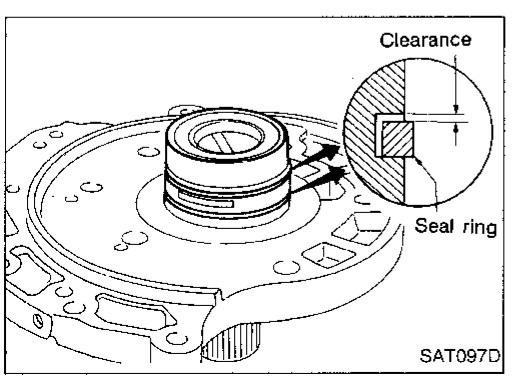


Side clearance

- Measure side clearance of inner and outer gears in at least four places around each outside edge. Maximum measured values should be within specified positions.
  Standard clearance:
  0.030 - 0.050 mm (0.0012 - 0.0020 in)
- If clearance is less than standard, select inner and outer gear as a set so that clearance is within specifications.
  Inner and outer gear:
  Refer to SDS, AT-231.
- If clearance is more than standard, replace whole oil pump assembly except oil pump cover.



- Measure clearance between outer gear and oil pump housing.
  Standard clearance:
  0.111 - 0.181 mm (0.0044 - 0.0071 in)
  Allowable limit:
  0.181 mm (0.0071 in)
- If not within allowable limit, replace whole oil pump assembly except oil pump cover.

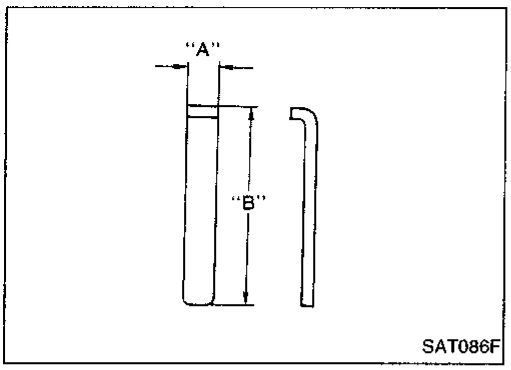


Seal ring clearance

- Measure clearance between seal ring and ring groove.
  Standard clearance:
  0.1 - 0.25 mm (0.0039 - 0.0098 in)
  Allowable limit:
  0.25 mm (0.0098 in)
- If not within allowable limit, replace oil pump cover assembly.

Control Valve Upper Body (Cont'd)

Retainer plate

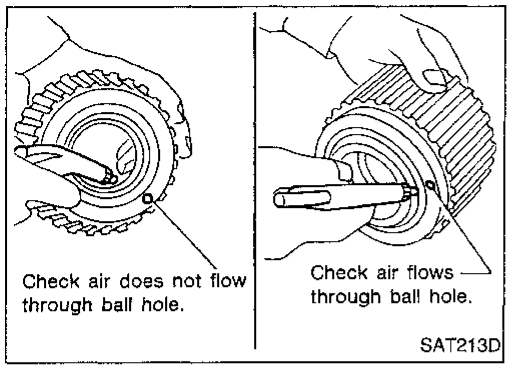


Unit: mm (in)

Name of control valve	Length A	Length B
Pilot valve	6.0 (0.236)	21.5 (0.846)
1st reducing valve		
Torque converter relief valve		
2-3 timing valve		
1-2 accumulator valve		38.5 (1.516)
1-2 accumulator piston valve		
Overrun clutch reducing valve		24.0 (0.945)
Lock-up control valve		28.0 (1.102)

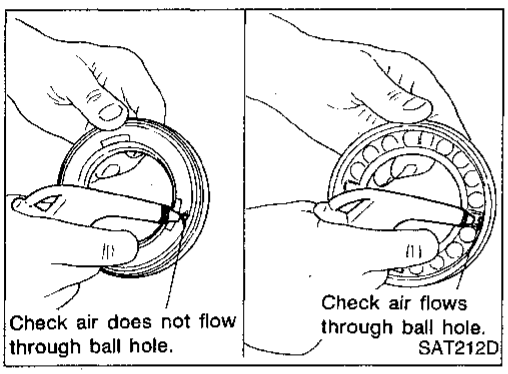
- Install proper retainer plates.

Forward Clutch and Overrun Clutch (Cont'd)



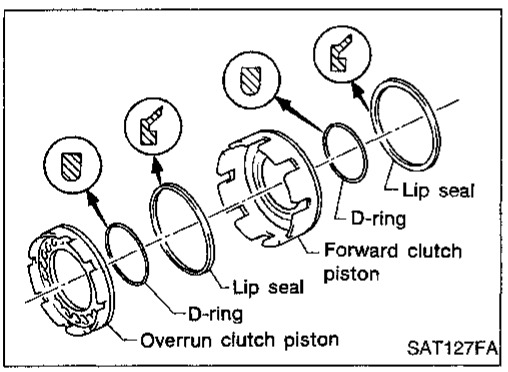
Forward clutch drum

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole from outside of forward clutch drum. Make sure air leaks past ball.
- Apply compressed air to oil hole from inside of forward clutch drum. Make sure there is no air leakage.



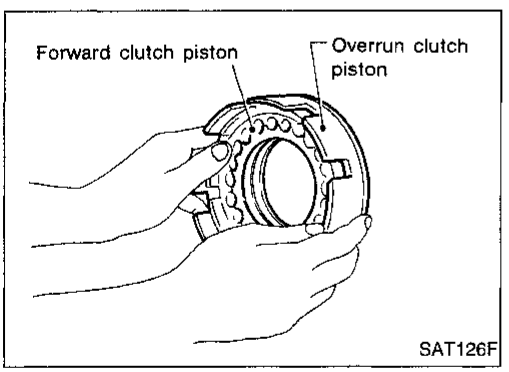
Overrun clutch piston

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side. Make sure that air leaks past ball.

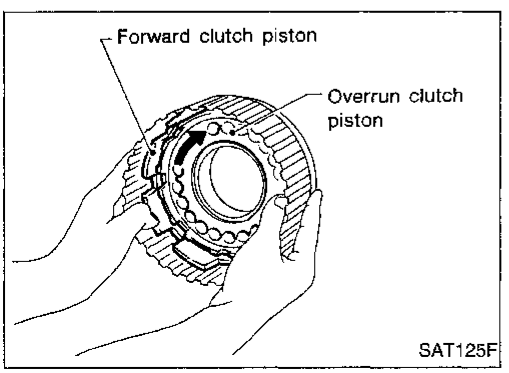


ASSEMBLY

1. Install D-rings and lip seals on forward clutch piston and overrun clutch piston.
- **Take care with direction of lip seal.**
- **Apply ATF to both parts.**

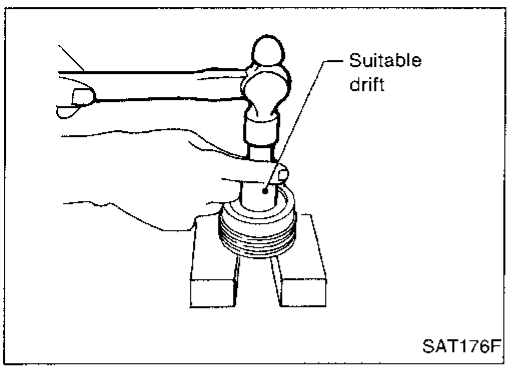


2. Install overrun clutch piston assembly on forward clutch piston by turning it slowly.
- **Apply ATF to inner surface of forward clutch piston.**

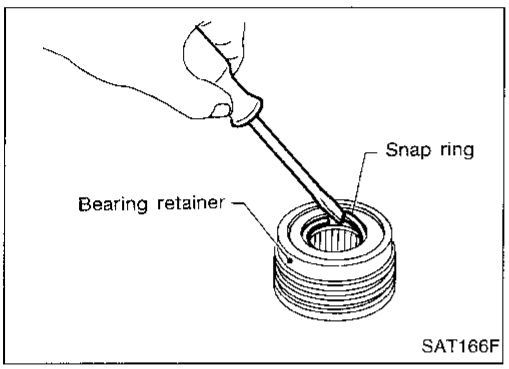


3. Install forward clutch piston assembly on forward clutch drum by turning it slowly.
- **Apply ATF to inner surface of drum.**

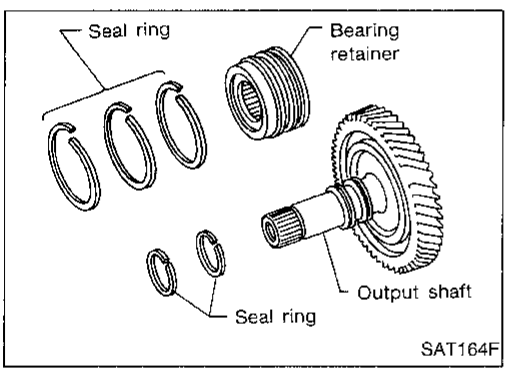
Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer (Cont'd)



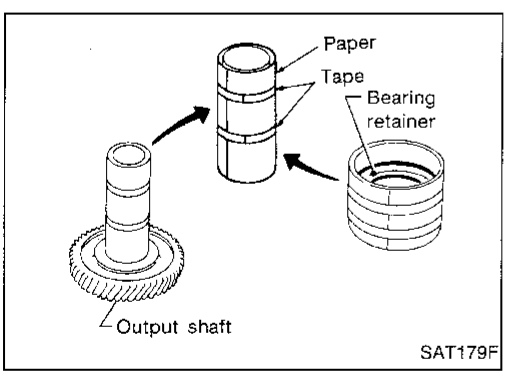
6. Press needle bearing on bearing retainer.



7. Install snap ring to bearing retainer.

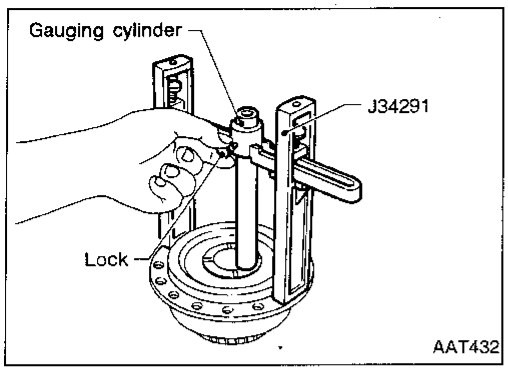


8. After packing ring grooves with petroleum jelly, carefully install new seal rings on output shaft and bearing retainer.



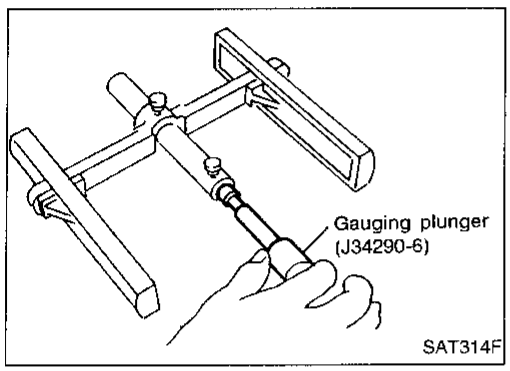
- **Roll paper around seal rings to prevent seal rings from spreading.**

Final Drive — RE4F04V (Cont'd)

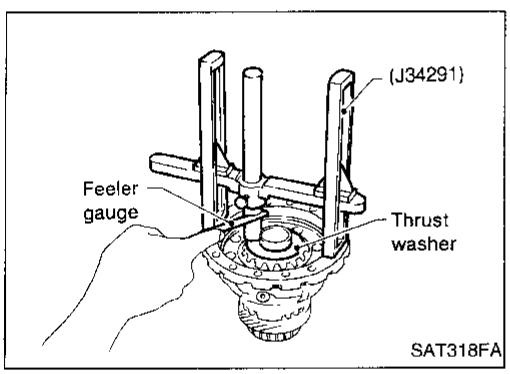


Viscous coupling side

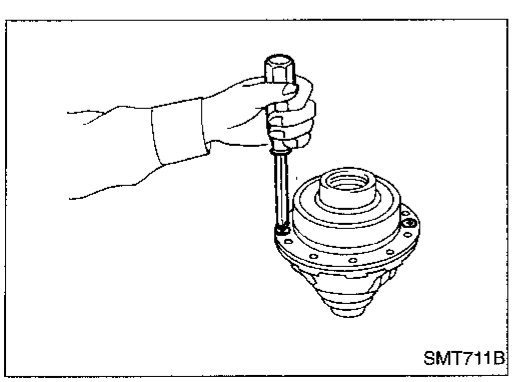
a. Set tool on viscous coupling and lock gauging cylinder in place with set screw.



b. Install gauging plunger into cylinder.

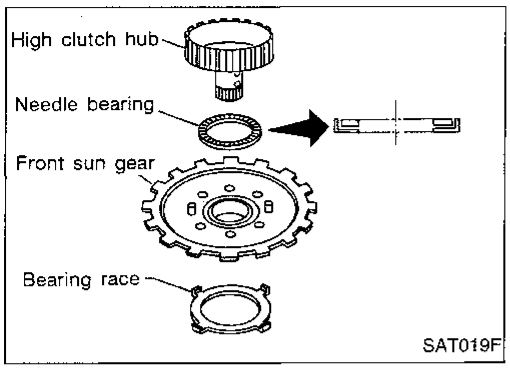


c. Install pinion mate gears and side gears with original washers on differential cases.
   Align paint marks.
d. Tighten differential case bolts.
e. Set tool and allow plunger to rest on side gear thrust washer.
f. Measure gap between plunger and cylinder.
   This measurement should give exact clearance between side gear and differential case with washers.
   Standard clearance:
   0.1 - 0.2 mm (0.004 - 0.008 in)
g. If not within specification, adjust clearance by changing thickness of side gear thrust washer.
   Side gear thrust washers for viscous coupling side:
   Refer to SDS, AT-230.

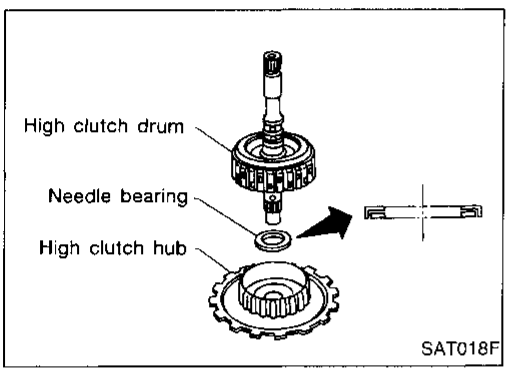


2. Install viscous coupling.

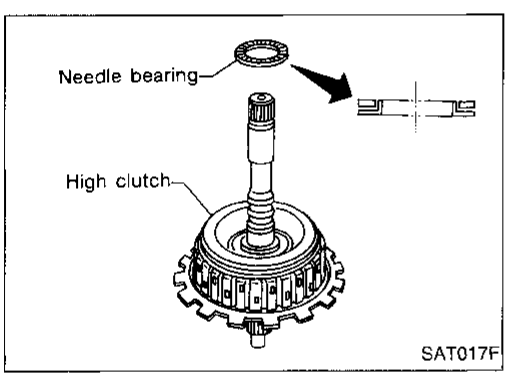
Assembly 2 (Cont'd)



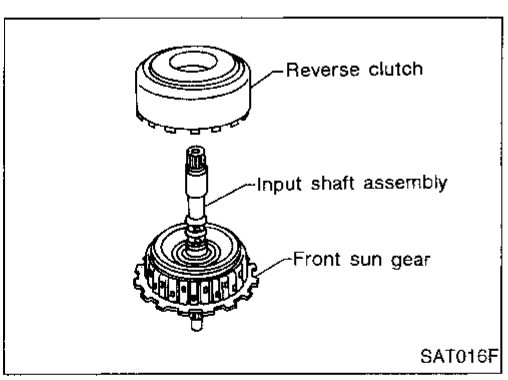
17. Install bearing race, needle bearing and high clutch hub on front sun gear.
- **Apply petroleum jelly to needle bearing.**
- **Pay attention to direction of needle bearing.**



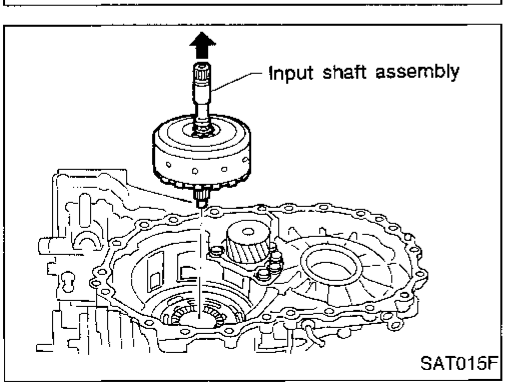
18. Install needle bearing and high clutch drum on high clutch hub.



19. Install needle bearing on high clutch drum.
- **Apply petroleum jelly to needle bearing.**
- **Pay attention to direction of needle bearing.**



20. Remove paper rolled around input shaft.
21. Install input shaft assembly in reverse clutch.
- **Align teeth of reverse clutch drive plates before installing.**



22. Install reverse clutch assembly on transmission case.
- **Align teeth of high clutch drive plates before installing.**

Specifications and Adjustments (Cont'd)

RE4F04V

Thickness mm (in)	Part number
0.36 (0.0142)	38753-56E00
0.40 (0.0157)	38753-56E01
0.44 (0.0173)	38753-56E02
0.48 (0.0189)	38753-56E03
0.52 (0.0205)	38753-56E04
0.56 (0.0220)	38753-56E05
0.60 (0.0236)	38753-56E06
0.64 (0.0252)	38753-56E07
0.68 (0.0268)	38753-56E08
0.72 (0.0283)	38753-56E09
0.76 (0.0299)	38753-56E10
0.80 (0.0315)	38753-56E11
0.84 (0.0331)	38753-56E12
0.88 (0.0346)	38753-56E13
0.92 (0.0362)	38753-56E14
0.12 (0.0047)	38753-56E15
0.16 (0.0063)	38753-56E16
0.20 (0.0079)	38753-56E17
0.24 (0.0094)	38753-56E18
0.28 (0.0110)	38753-56E19
0.32 (0.0126)	38753-56E20

Bearing preload

Differential side bearing preload mm (in)	0.05 - 0.09 (0.0020 - 0.0035)

Turning torque

Turning torque of final drive assembly N·m (kg-cm, in-lb)	0.78 - 1.37 (8.0 - 14.0, 6.9 - 12.2)

Clutch and brake return springs

Unit: mm (in)

Parts	Free length	Outer diameter
Forward clutch (Overrun clutch) (22 pcs)	21.4 (0.843)	10.3 (0.406)
High clutch (12 pcs)	22.5 (0.886)	10.8 (0.425)
Low & Reverse brake (24 pcs)	24.1 (0.949)	6.6 (0.260)

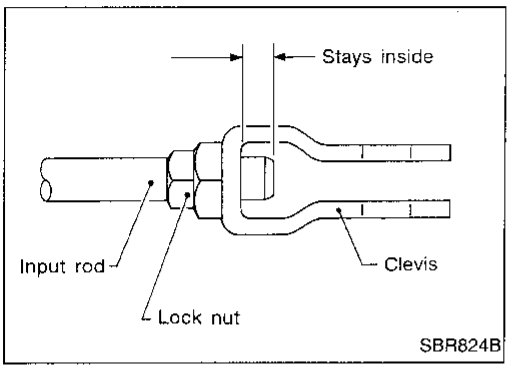
PLANETARY CARRIER AND OIL PUMP

Planetary carrier		
Clearance between planetary carrier and pinion washer mm (in)		
Standard	0.20 - 0.70 (0.0079 - 0.0276)	
Allowable limit	0.80 (0.0315)	
Oil pump		
Oil pump side clearance mm (in)	0.030 - 0.050 (0.0012 - 0.0020)	
Thickness of inner gears and outer gears	Inner gear	
	Thickness mm (in)	Part number
	11.99 - 12.0 (0.4720 - 0.4724)	31346-80X00
	11.98 - 11.99 (0.4717 - 0.4720)	31346-80X01
	11.97 - 11.98 (0.4713 - 0.4717)	31346-80X02
	Outer gear	
	Thickness mm (in)	Part number
	11.99 - 12.0 (0.4720 - 0.4724)	31347-80X00
	11.98 - 11.99 (0.4717 - 0.4720)	31347-80X01
	11.97 - 11.98 (0.4713 - 0.4717)	31347-80X02
Clearance between oil pump housing and outer gear mm (in)		
Standard	0.111 - 0.181 (0.0044 - 0.0071)	
Allowable limit	0.181 (0.0071)	
Oil pump cover seal ring clearance mm (in)		
Standard	0.1 - 0.25 (0.0039 - 0.0098)	
Allowable limit	0.25 (0.0098)	

INPUT SHAFT

Input shaft seal ring clearance mm (in)	
Standard	0.08 - 0.23 (0.0031 - 0.0091)
Allowable limit	0.23 (0.0091)

Adjustment (Cont'd)



If necessary, adjust brake pedal free height.

1. Loosen lock nut and adjust pedal free height by turning brake booster input rod. Tighten lock nut.

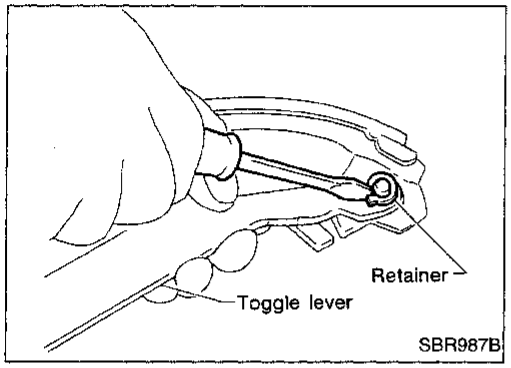
- **Make sure that tip of input rod stays inside of clevis.**

2. Loosen lock nut and adjust clearance "C_1" and "C_2" with stop lamp switch and ASCD cancel switch (or A/T shift lock switch) respectively. Then tighten lock nuts.
3. Check pedal free play.

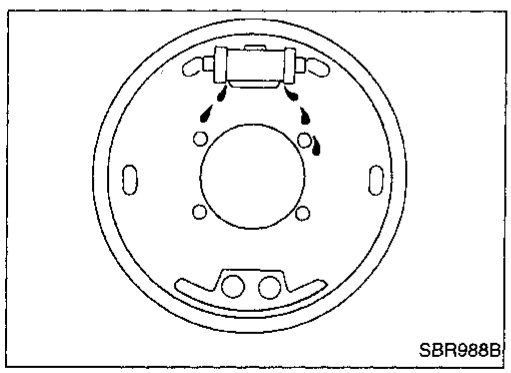
- **Make sure that stop lamps go off when pedal is released.**

4. Check brake pedal depressed height while engine is running. If lower than specification, check for leaks, air in system, or damage to components (master cylinder, wheel cylinder, etc.). Then make necessary repairs.

Removal (Cont'd)

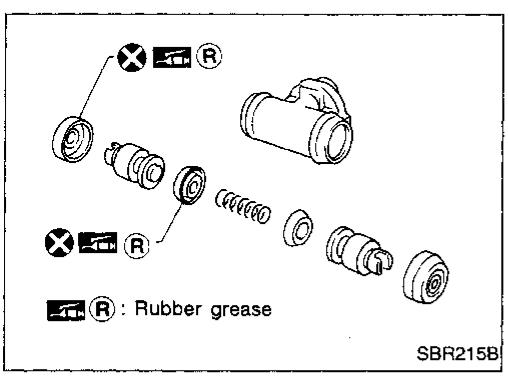


8. Remove retainer ring with a suitable tool. Then separate toggle lever and brake shoe.



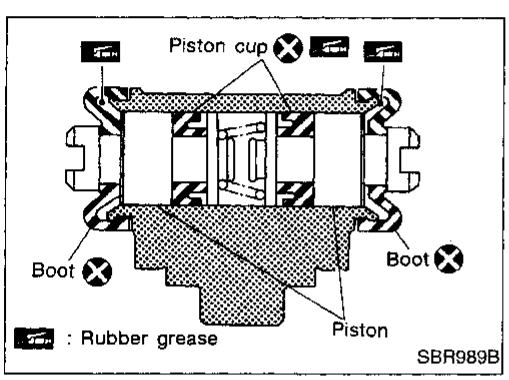
Inspection — Wheel Cylinder

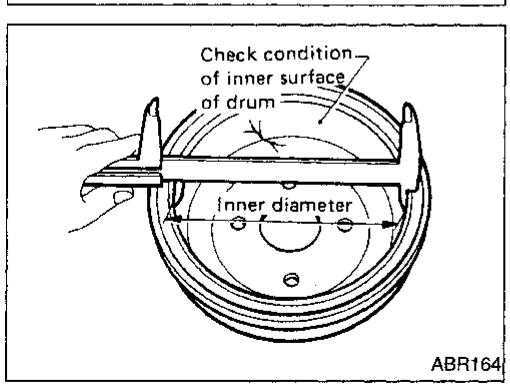
- Check wheel cylinder for leakage.
- Check for wear, damage and loose conditions. Replace if any such condition exists.



Wheel Cylinder Overhaul

- Check all internal parts for wear, rust and damage. Replace if necessary.
- Pay attention so as not to scratch cylinder when installing pistons.



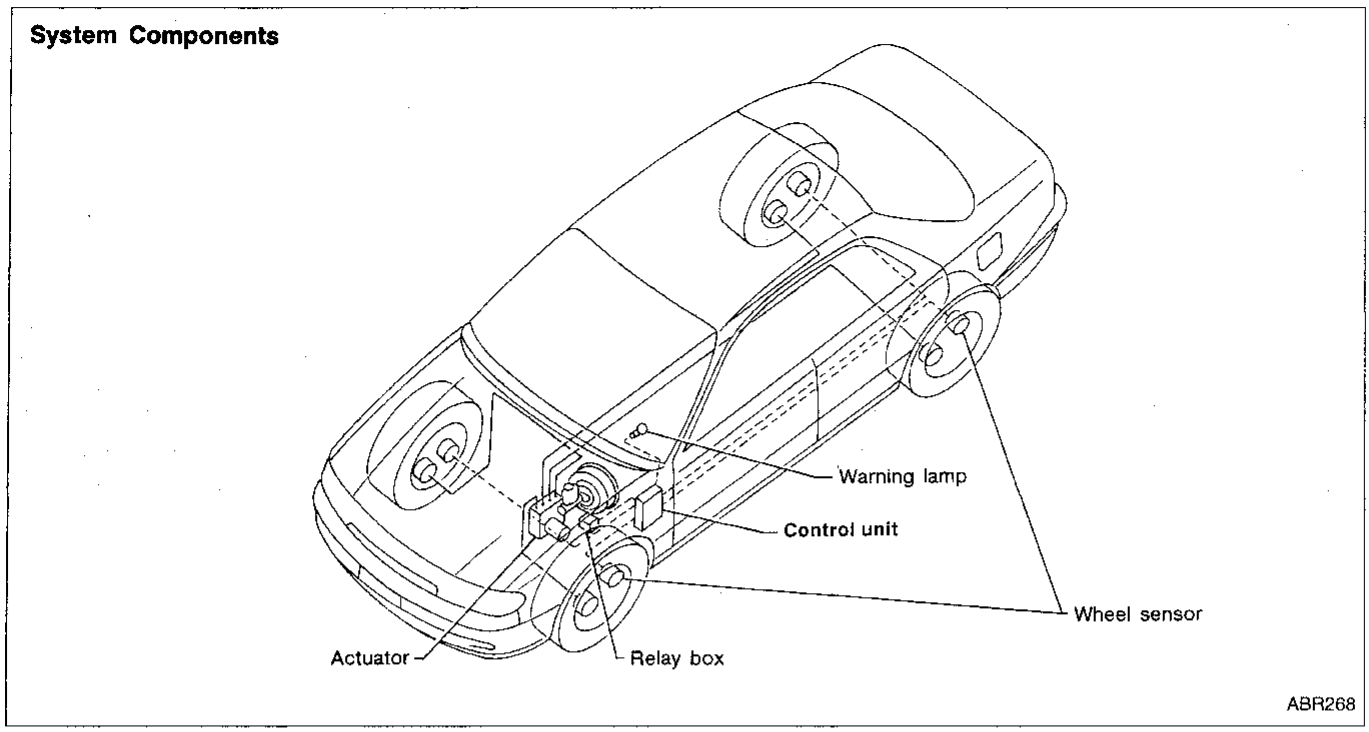


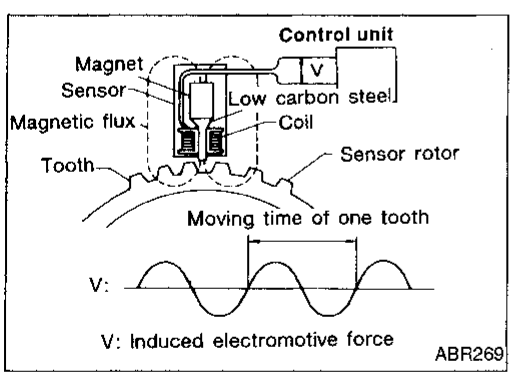
Inspection — Drum

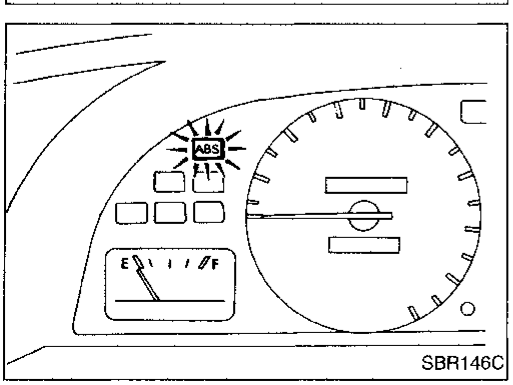
Maximum inner diameter:
230 mm (9.06 in)
Out-of-roundness:
0.03 mm (0.0012 in) or less

- Contact surface should be fine finished with No. 120 to 150 emery paper.
- Using a drum lathe, lathe brake drum if it shows scoring, partial wear or stepped wear.
- After brake drum has been completely reconditioned or replaced, check drum and shoes for proper contact pattern.

System Components







System Description

SENSOR

The sensor unit consists of a gear-shaped sensor rotor and a sensor element. The element contains a bar magnet around which a coil is wound. The sensor is installed on the back side of the brake rotor. Sine-wave current is generated by the sensor as the wheel rotates. The frequency and voltage increase(s) as the rotating speed increases.

CONTROL UNIT

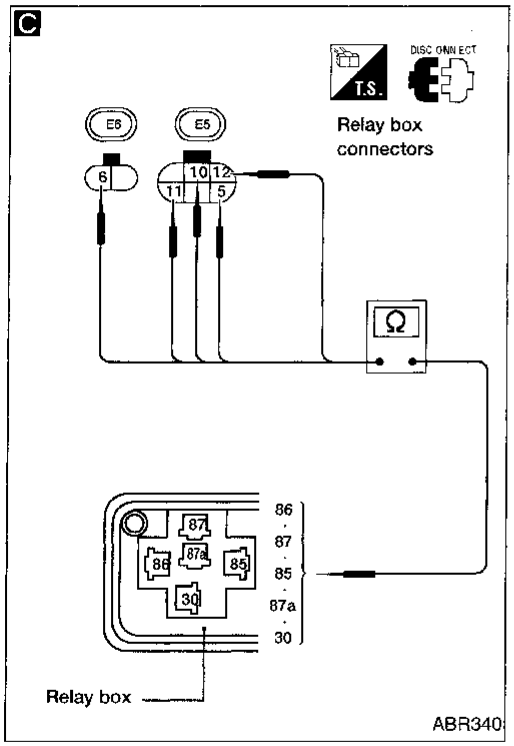
The control unit computes the wheel rotating speed by the signal current sent from the sensor. Then it supplies a DC current to the actuator solenoid valve. It also controls ON-OFF operation of the valve relay and pump relay. If any electrical malfunction should be detected in the system, the control unit causes the warning lamp to light up. In this condition, the ABS will be deactivated by the control unit, and the vehicle's braking system reverts to normal operation.

Self-diagnosis (Cont'd)

MALFUNCTION CODE/SYMPTOM CHART

Code No. or symptom	Malfunctioning part	Diagnostic procedure
45	Front left actuator solenoid valve	3
41	Front right actuator solenoid valve	3
55	Rear actuator solenoid valve	3
25	Front left sensor (open-circuit)	4
26	Front left sensor (short-circuit)	4
21	Front right sensor (open-circuit)	4
22	Front right sensor (short-circuit)	4
35	Rear left sensor (open-circuit)	4
36	Rear left sensor (short-circuit)	4
31	Rear right sensor (open-circuit)	4
32	Rear right sensor (short-circuit)	4
18	Sensor rotor	4
61	Actuator motor or motor relay	5
63	Solenoid valve relay circuit (except power supply for relay coil)	6
57	Power supply (Low voltage)	7
16	Stop lamp switch circuit	8
71	Control unit	9
Warning lamp stays on when ignition switch is turned on	Control unit power supply circuit Warning lamp bulb circuit Control unit or control unit connector Solenoid valve relay stuck Power supply for solenoid valve relay coil	2
Warning lamp stays on, during self-diagnosis	Control unit	–
Warning lamp does not come on when ignition switch is turned on	Fuse, warning lamp bulb or warning lamp circuit Control unit	1
Warning lamp does not come on during self-diagnosis	Control unit	–
Pedal vibration and noise	–	10
Long stopping distance	–	11
Unexpected pedal action	–	12
ABS does not work	–	13
ABS works frequently	–	14

Diagnostic Procedure 6 (Cont'd)



(B)

C

SOLENOID VALVE RELAY CIRCUIT CHECK	No	● Replace ABS relay box.

Check continuity between ABS relay terminals and ABS actuator connector and ABS relay box connector (ABS relay box side) terminals.

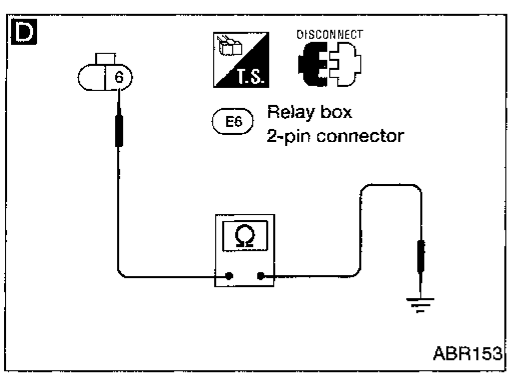
ABS relay terminals	ABS actuator connector
(87)	(6)
(87a)	(5)
(85)	(11)
(86)	(10)
(30)	(12)

Continuity should exist.

OK ↓

Go to diagnostic procedure 3, BR-55.

(A)



Replace fusible link.
Does the fusible link blow out when ignition switch is turned "ON"?

No → Inspection end

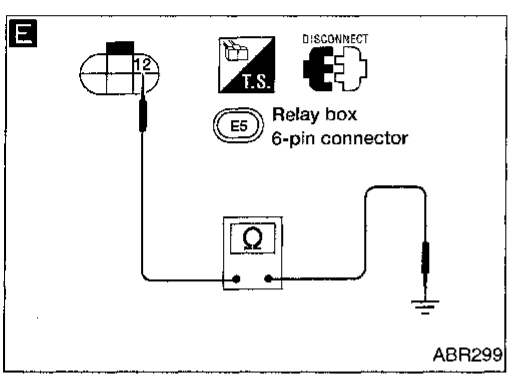
Yes ↓

D

RELAY UNIT POWER SUPPLY CIRCUIT — NG → Repair harness and connector.

1. Disconnect ABS relay box 2-pin connector.
2. Check continuity between ABS relay box 2-pin connector (body side) terminal (6) and ground.
   Continuity should not exist.

OK ↓

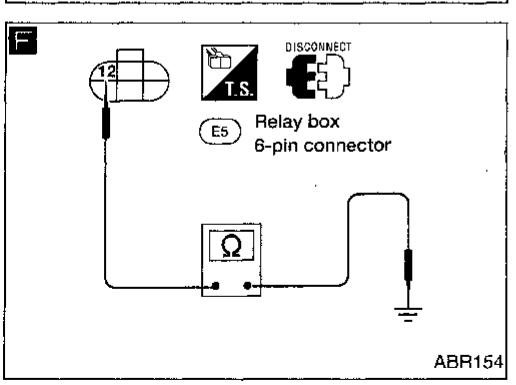


E

1. Disconnect ABS relay box connectors and control unit connector.
2. Check continuity between ABS actuator 2-pin connector (ABS relay box side) terminal (12) and ground.
   Continuity should not exist.

NG → Replace ABS relay box.

OK ↓



F

Check continuity between ABS actuator 2-pin connector (ABS actuator side) terminal (12) and ground.
Continuity should not exist.

NG → Replace ABS actuator.

OK ↓

Go to diagnostic procedure 3, BR-55.

Body Front End

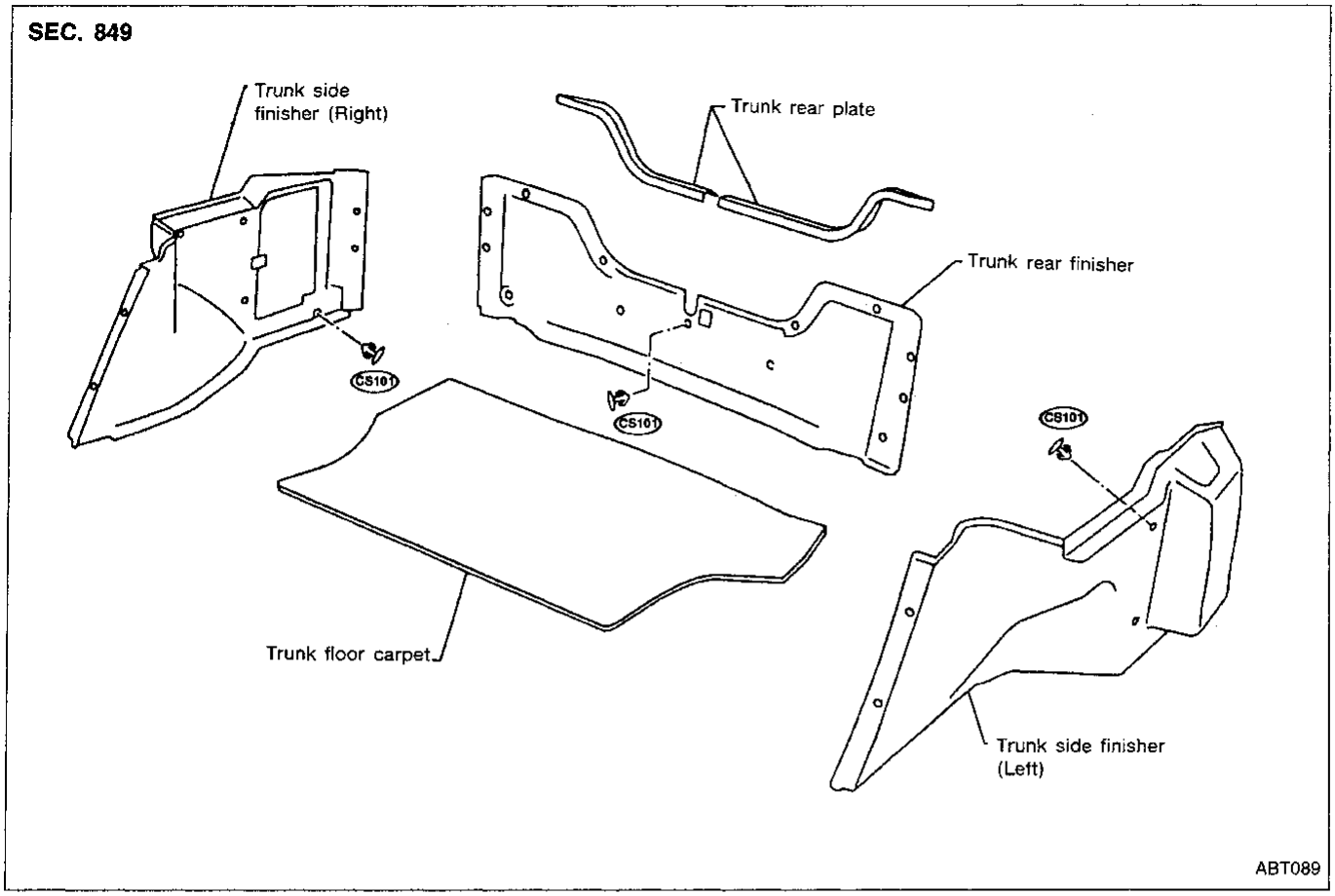
- Bumper fascia: It is made of plastic. Do not use excessive force and keep oil away from it.
- Hood: When removing or installing hood, place a cloth or other padding on front fender panels and cowl top. This prevents vehicle body from being scratched.
- Hood adjustment: Adjust at hinge portion.
- Hood lock adjustment: After adjusting, check hood lock operation. Apply a coat of grease to engaging mechanism.
- Hood opener: Do not attempt to bend cable forcibly. This will increase the effort required to unlock hood.

REMOVAL — Front bumper assembly

① Remove four bolts securing left and right fog lamps and remove fog lamps.
② Remove clips (CG101), then remove the front grill.
③ Remove six screws and two clips (C203) securing left and right fender protectors to bumper fascia.
④ Remove six nuts securing left and right fenders to bumper fascia.
⑤ Remove screws and clips (C205) securing bumper fascia to bumper reinforcement.
⑥ Pull out front bumper fascia.
⑦ Remove two bolts securing bumper reinforcement, then remove bumper reinforcement and energy absorber.
⑧ Remove eight bolts securing front bumper side stays.
⑨ Remove front bumper side stays.

Luggage Room Trim

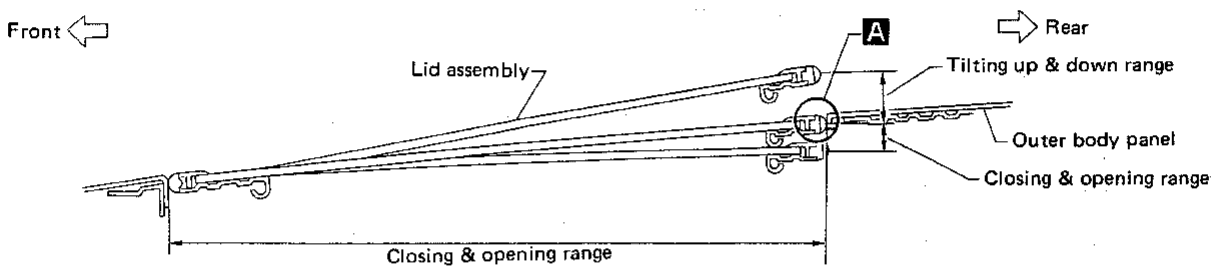
SEC. 849



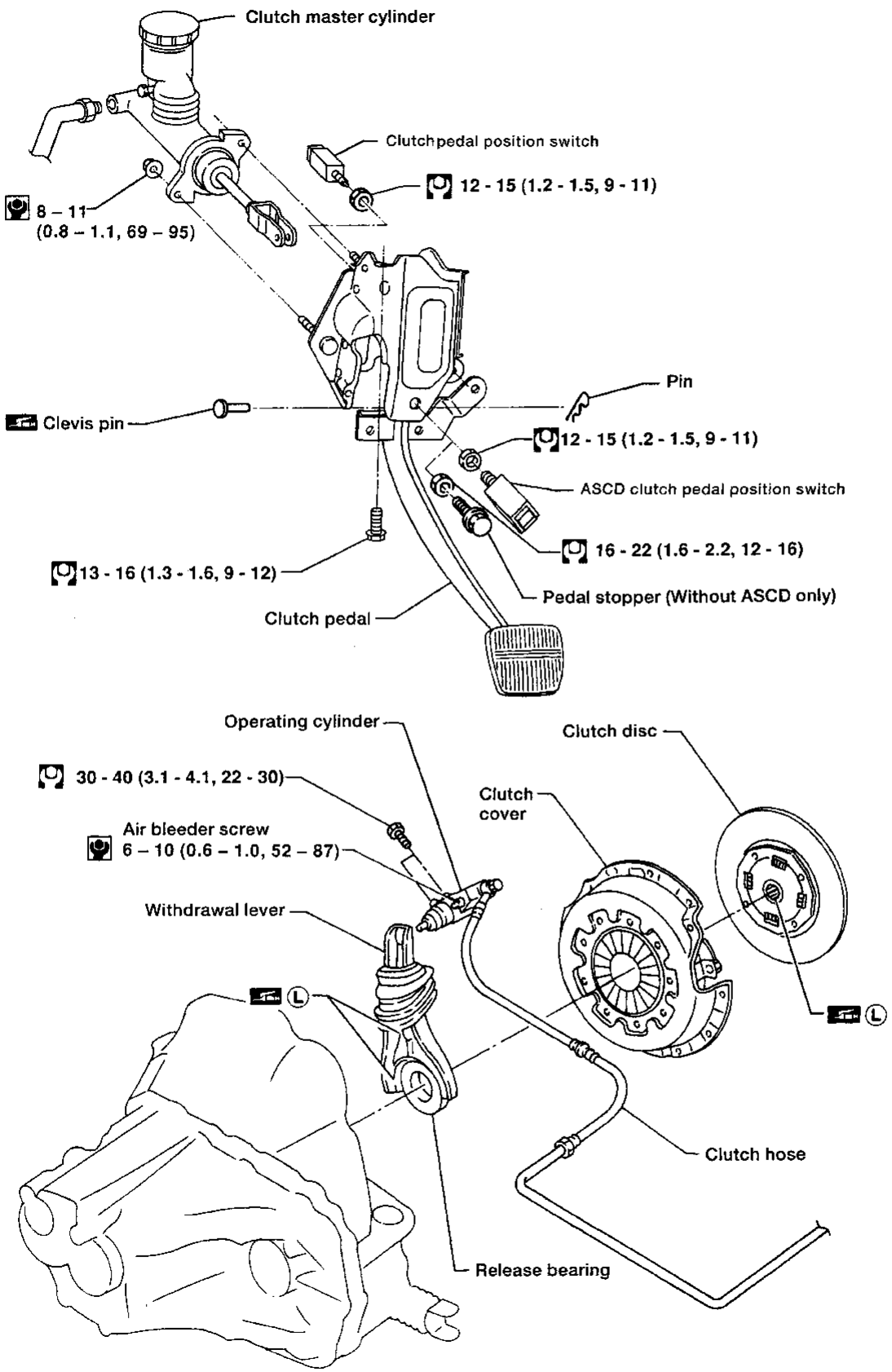
Adjustment

Install motor & limit SW assembly and sunroof rail assembly in the following sequence:

1. Arrange equal lengths of link and wire assemblies on both sides of sunroof opening.
2. Connect sunroof connector to sunroof switch and positive (+) power supply.
3. Set lid assembly to fully closed position A by operating CLOSE switch and TILT switch.
4. Fit outer side of lid assembly to the surface of roof on body outer panel.
5. Remove motor, and keep CLOSE switch pressed until motor pinion gear reaches the end of its rotating range.
6. Install motor.
7. Check that motor drive gear fits properly in wires.
8. Press TILT-UP switch to check lid assembly for normal tilting.
9. Check sunroof lid assembly for normal operations (tilt-up, tilt-down, open, and close).



SEC. 300•305•306•465



: Apply lithium-based grease including molybdenum disulphide.

: N•m (kg-m, ft-lb)

: N•m (kg-m, in-lb)

ACL023

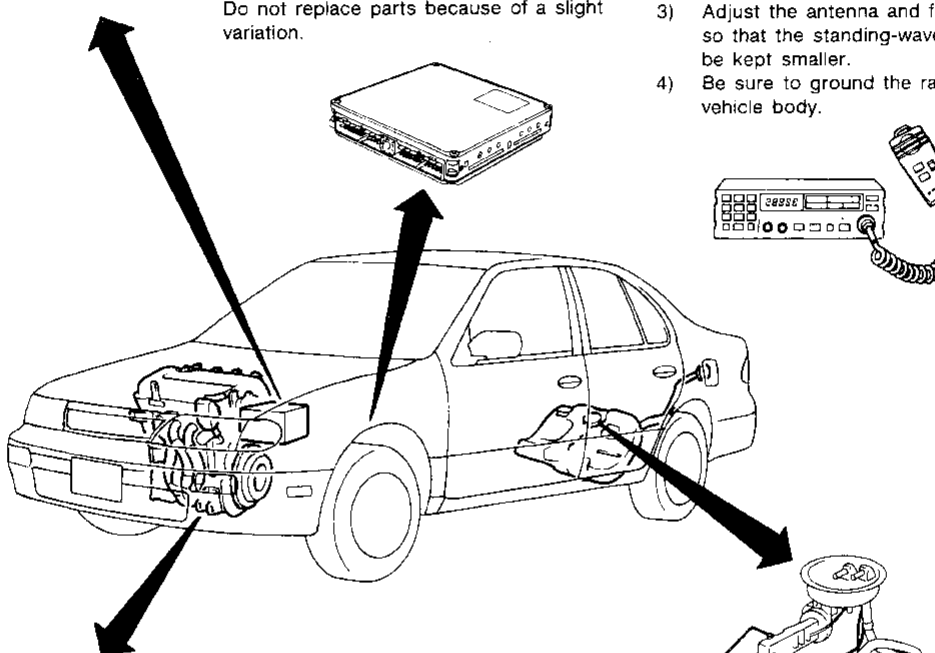
Engine Fuel & Emission Control System

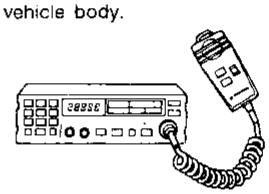
BATTERY
- Always use a 12 volt battery as power source.
- Do not attempt to disconnect battery cables while engine is running.

ECM
- Do not disassemble ECM (ECCS control module).
- Do not turn on-board diagnostic test mode selector forcibly.
- If a battery terminal is disconnected, the memory will return to the ECM value. The ECM will now start to self-control at its initial value. Engine operation can vary slightly when the terminal is disconnected. However, this is not an indication of a problem.
  Do not replace parts because of a slight variation.

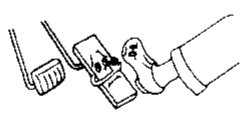
WIRELESS EQUIPMENT
- When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on its installation location.

1) Keep the antenna as far as possible away from the electronic control units.
2) Keep the antenna feeder line more the 20 cm (7.9 in) away from the harness of electronic controls. Do not let them run parallel for a long distance.
3) Adjust the antenna and feeder line so that the standing-wave ratio can be kept smaller.
4) Be sure to ground the radio to vehicle body.

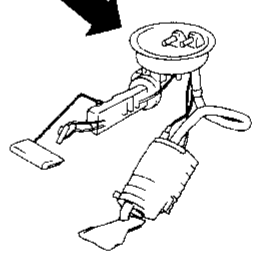




ECCS PARTS HANDLING
- Handle mass air flow sensor carefully to avoid damage.
- Do not disassemble mass air flow sensor.
- Do not clean mass air flow sensor with any type of detergent.
- Do not disassemble IAC valve-AAC valve.
- Even a slight leak in the air intake system can cause serious problems.
- Do not shock or jar the camshaft position sensor.



WHEN STARTING
- Do not depress accelerator pedal when starting.
- Immediately after starting, do not rev up engine unnecessarily.
- Do not rev up engine just prior to shutdown.

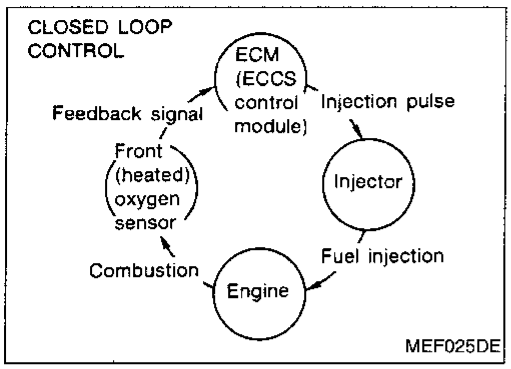


FUEL PUMP
- Do not operate fuel pump when there is no fuel in lines.
- Tighten fuel hose clamps to the specified torque.

ECM HARNESS HANDLING
- Securely connect ECM harness connectors.
  A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to ICs.
- Keep ECM harness at least 10 cm (3.9 in) away from adjacent harnesses, to prevent an ECM system malfunction due to receiving external noise, degraded operation of ICs, etc.
- Keep ECM parts and harnesses dry.
- Before removing parts, turn off ignition switch and then disconnect battery ground cable.

AEC486

Multiport Fuel Injection (MFI) System (Cont'd)



MIXTURE RATIO FEEDBACK CONTROL

The mixture ratio feedback system provides the best air-fuel mixture ratio for driveability and emission control. The three way catalyst can then better reduce CO, HC and NOx emissions. This system uses a front oxygen sensor*1 in the exhaust manifold to monitor if the engine is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about the front oxygen sensor*1, refer to EC-122. This maintains the mixture ratio within the range of stoichiometric (ideal air-fuel mixture).
This stage is referred to as the closed loop control condition.
Rear heated oxygen sensor is located downstream of the three way catalyst*2. Even if the switching characteristics of the front heated oxygen sensor shift, the air-fuel ratio is controlled to stoichiometric by the signal from the rear heated oxygen sensor.

OPEN LOOP CONTROL

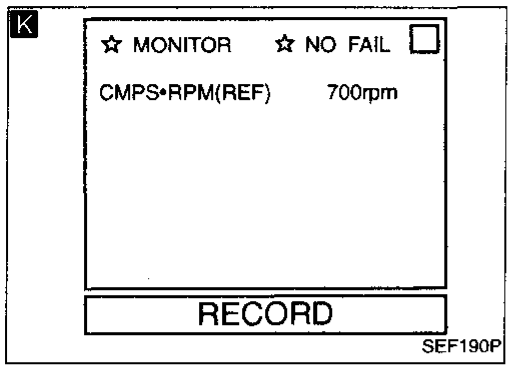
The open loop system condition refers to when the ECM detects any of the following conditions. Feedback control stops in order to maintain stabilized fuel combustion.

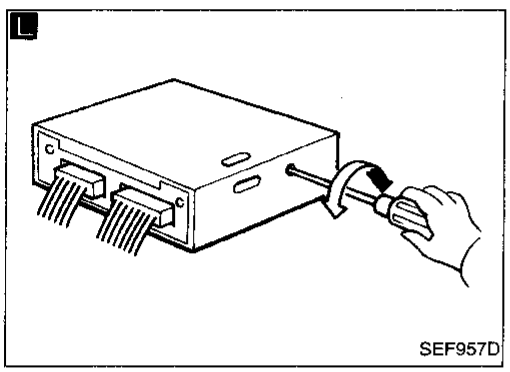
- Deceleration and acceleration
- High-load, high-speed operation
- Engine idling
- Malfunction of front oxygen sensor*1 or its circuit
- Insufficient activation of front oxygen sensor*1 at low engine coolant temperature
- High-engine coolant temperature
- After shifting from "N" to "D"
- During warm-up
- When starting the engine

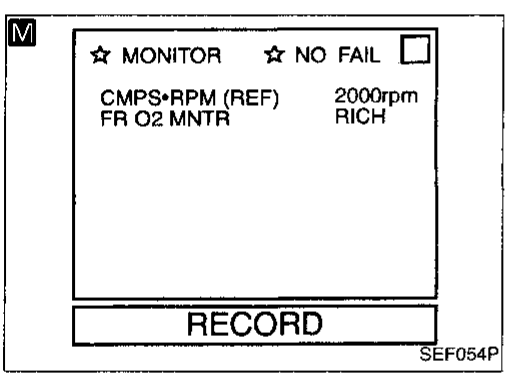
MIXTURE RATIO SELF-LEARNING CONTROL

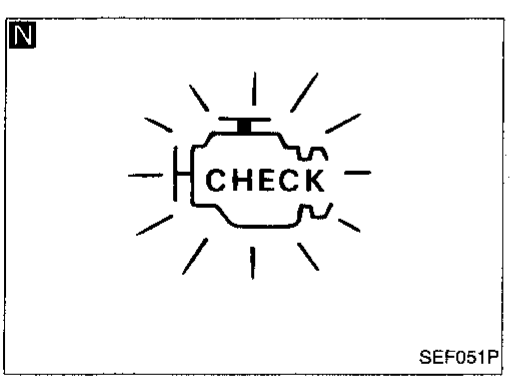
The mixture ratio feedback control system monitors the mixture ratio signal transmitted from the front oxygen sensor*1. This feedback signal is then sent to the ECM. The ECM controls the basic mixture ratio as close to the theoretical mixture ratio as possible. However, the basic mixture ratio is not necessarily controlled as originally designed. Both manufacturing differences (i.e. mass air flow sensor hot film) and characteristic changes during operation (i.e. injector clogging) directly affect mixture ratio.
Accordingly, the difference between the basic and theoretical mixture ratios is monitored in this system. This is then computed in terms of "injection pulse duration" to automatically compensate for the difference between the two ratios.
"Fuel trim" refers to the feedback compensation value compared against the basic injection duration. Fuel trim includes short-term fuel trim and long-term fuel trim.
"Short-term fuel trim" is the short-term fuel compensation used to maintain the mixture ratio at its theoretical value. The signal from the front oxygen sensor*1 indicates whether the mixture ratio is RICH or LEAN compared to the theoretical value. The signal then triggers a reduction in fuel volume if the mixture ratio is rich, and an increase in fuel volume if it is lean.

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









Ⓒ

K

Check idle speed.

Read idle speed in "DATA MONITOR" mode with CONSULT.

OR

Check idle speed.

700±50 rpm (A/T in "N" position)

OK ↓ / NG →

Check IACV-AAC valve and replace if necessary.

↓

Check IACV-AAC valve harness and repair if necessary.

↓

Check ECM function*1 by substituting another known good ECM.

*1: ECM may be the cause of a problem, but this is rarely the case.
*2: Front heated oxygen sensor (California models)
Front oxygen sensor (Non-California models)

L

Set the diagnostic test mode II (front oxygen sensor*2 monitor).

↓

Run engine at about 2,000 rpm for about 2 minutes under no-load.

↓

M N

Check front oxygen sensor*2 signal.

1. See "FR O2 MNTR" in "DATA MONITOR" mode.
2. Maintaining engine at 2,000 rpm under no-load (engine is warmed up sufficiently.), check that the monitor fluctuates between "LEAN" and "RICH" more than 5 times during 10 seconds.
   1 cycle: RICH → LEAN → RICH
   2 cycles: RICH → LEAN → RICH → LEAN → RICH

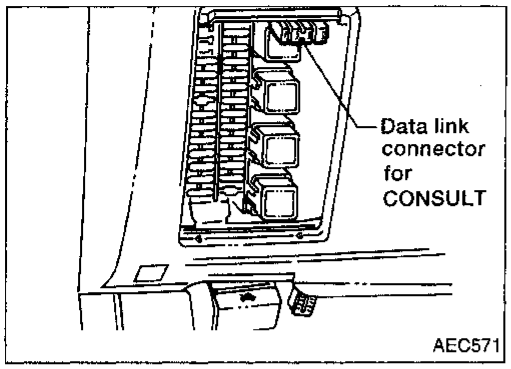
NG → Ⓓ

OR

Make sure that malfunction indicator lamp goes on more than 5 times during 10 seconds at 2,000 rpm.

↓ OK

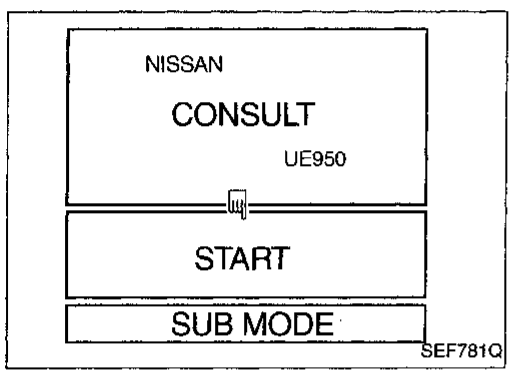
INSPECTION END



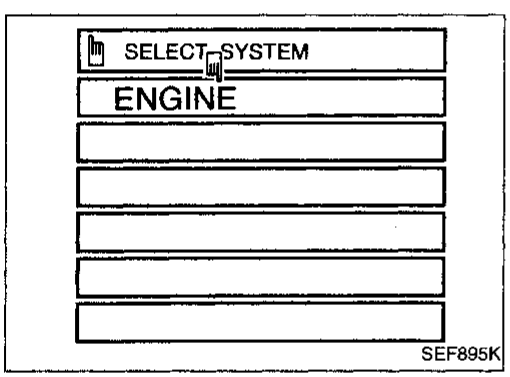
CONSULT

CONSULT INSPECTION PROCEDURE

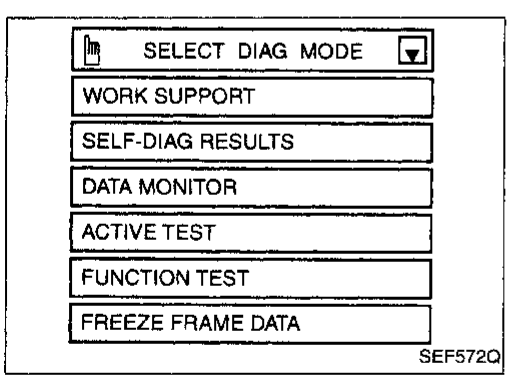
1. Turn off ignition switch.
2. Connect "CONSULT" to data link connector for CONSULT. (Data link connector for CONSULT is located behind the fuse box cover.)



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

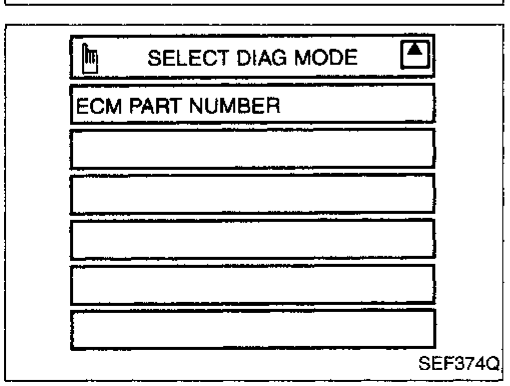


5. Touch "ENGINE".



6. Perform each diagnostic test mode according to each service procedure.

For further information, see the CONSULT Operation Manual.



Generic Scan Tool (GST) (Cont'd)

FUNCTION

Diagnostic test mode		Function
MODE 1	(CURRENT DATA)	This mode gains access to current emission-related data values, including analog inputs and outputs, digital inputs and outputs, and system status information.
MODE 2	(FREEZE DATA)	This mode gains access to emission-related data value which were stored by ECM during the freeze frame. [For details, refer to "Freeze Frame Data" (EC-53).]
MODE 3	(TROUBLE CODES)	This mode gains access to emission-related power train trouble codes which were stored by ECM.
MODE 4	(CLEAR CODES)	This mode can clear all emission-related diagnostic information. This includes: ● Clear number of diagnostic trouble codes (MODE 1) ● Clear diagnostic trouble codes (MODE 3) ● Clear trouble code for freeze frame data (MODE 1) ● Clear freeze frame data (MODE 2) ● Clear (heated) oxygen sensor test data (MODE 5) ● Reset status of system monitoring test (MODE 1)
MODE 5	(O2 TEST RESULTS)	This mode gains access to the on-board (heated) oxygen sensor monitoring test results.

Diagnostic Trouble Code (DTC) Chart (Cont'd)

X: Applicable
—: Not applicable

Check Items(Possible Cause)	"DTC CONFIRMATION PROCEDURE" Quick Ref. *1	"OVERALL FUNCTION CHECK" Quick Ref. *2	Fail Safe System	MIL Illumination	Reference Page
● Harness or connectors (The sensor circuit is open or shorted.) ● Camshaft position sensor ● Starter motor ● Starting system circuit (EL section) ● Dead (Weak) battery	RUNNING	—	—	2 trip	EC-171
● EGR valve stuck closed, open or leaking ● Passage blocked ● EGR valve and EVAP canister purge control solenoid valve ● Tube leaking for EGR valve vacuum ● EGRC-BPT valve leaking ● EGR temperature sensor	—	RUNNING	—	2 trip	EC-176
● EGRC-BPT valve ● Rubber tube (blocked or misconnected)	—	RUNNING	—	2 trip	EC-185
● Three way catalyst*6 ● Exhaust tube ● Intake air leak ● Injectors ● Injector leak	—	RUNNING	—	1 trip	EC-187
● Harness or connectors (The sensor circuit is open or shorted.) ● Vehicle speed sensor	DRIVING	LIFTING	—	2 trip	EC-190
● Harness or connectors (The valve circuit is open.) ● IACV-AAC valve ● Harness or connectors (The valve circuit is shorted.) ● IACV-AAC valve	RUNNING RUNNING	—	—	2 trip	EC-194
● Harness or connectors (The circuit between ECM and A/T control unit is open or shorted.)	RUNNING	RUNNING	—	—	EC-198
● ECM (ECCS control module)	RUNNING	—	X	2 trip	EC-201
● Harness or connectors (The switch circuit is open or shorted.) ● Neutral position switch ● Inhibitor switch	—	IGN: ON	—	2 trip	EC-203

*1: ● This is Quick Reference of "DTC CONFIRMATION PROCEDURE".
Details are described in each TROUBLE DIAGNOSIS FOR DTC XXXXX.

*2: ● The "OVERALL FUNCTION CHECK" is a simplified and effective way to inspect a component or circuit.
In some cases, the "OVERALL FUNCTION CHECK" is used rather than a "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE".
When no DTC CONFIRMATION PROCEDURE is available, the "NG" result of the OVERALL FUNCTION CHECK can be considered to mean the same as a DTC detection.
● During an "NG" OVERALL FUNCTION CHECK, the DTC might not be confirmed.
● This is Quick Reference of "OVERALL FUNCTION CHECK".
Details are described in each TROUBLE DIAGNOSIS FOR DTC XXXXX.

*6: Warm-up three way catalyst (California models)
Three way catalyst (Non-California models)

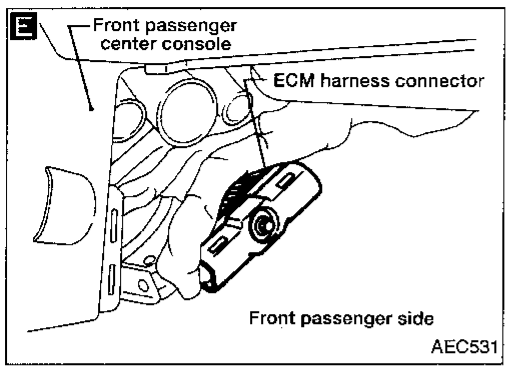
CONSULT Reference Value in Data Monitor Mode

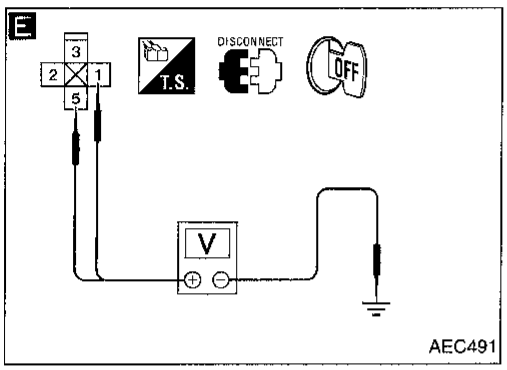
Remarks:

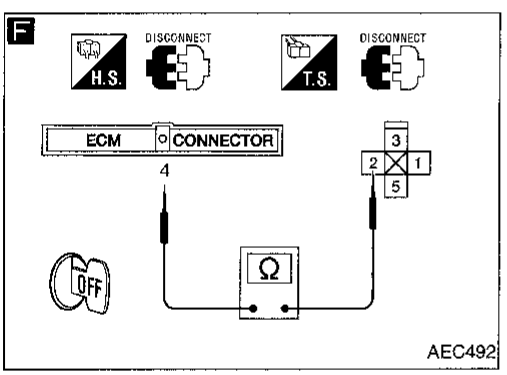
- Specification data are reference values.
- Specification data are output/input values which are detected or supplied by the ECM at the connector.
  * Specification data may not be directly related to their components signals/values/operations.
  i.e. Adjust ignition timing with a timing light before monitoring IGN TIMING, because the monitor may show the specification data in spite of the ignition timing not being adjusted to the specification data. This IGN TIMING monitors the data calculated by the ECM according to the signals input from the camshaft position sensor and other ignition timing related sensors.
- If the real-time diagnosis results are NG and the on-board diagnostic system results are OK when diagnosing the mass air flow sensor, first check to see if the fuel pump control circuit is normal.

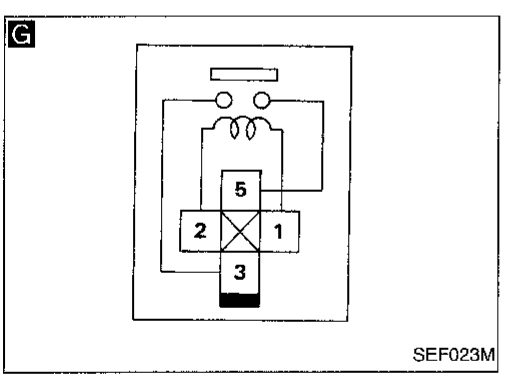
MONITOR ITEM	CONDITION		SPECIFICATION
CMPS·RPM (REF)	● Tachometer: Connect ● Run engine and compare tachometer indication with the CONSULT value.		Almost the same speed as the CONSULT value.
MAS AIR/FL SE	● Engine: After warming up ● A/C switch "OFF" ● Shift lever "N" ● No-load	Idle	1.0 - 1.7V
		2,000 rpm	1.5 - 2.1V
COOLAN TEMP/S	● Engine: After warming up		More than 70°C (158°F)
FR O2 SENSOR	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	0 - 0.3V ↔ Approx. 0.6 - 1.0V
FR O2 MNTR			LEAN ↔ RICH Changes more than 5 times during 10 seconds.
RR O2 SENSOR	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	California models 0 ↔ Approx. 1.0V Non-California models 0 ↔ Approx. 2.2V
RR O2 MNTR			LEAN ↔ RICH
VHCL SPEED SE	● Turn drive wheels and compare speedometer indication with the CONSULT value		Almost the same speed as the CONSULT value
BATTERY VOLT	● Ignition switch: ON (Engine stopped)		11 - 14V
THRTL POS SEN	● Ignition switch: ON (Engine stopped)	Throttle valve fully closed	0.3 - 0.7V
		Throttle valve fully opened	Approx. 4.0V
EGR TEMP SEN	● Engine: After warming up		Less than 4.5V
START SIGNAL	● Ignition switch: ON → START		OFF → ON
CLSD THL/P SW	● Ignition switch: ON (Engine stopped)	Throttle valve: Idle position	ON
		Throttle valve: Slightly open	OFF
AIR COND SIG	● Engine: After warming up, idle the engine	Air conditioner switch "OFF"	OFF
		Air conditioner switch "ON" (Compressor operates.)	ON
P/N POSI SW	● Ignition switch: ON	Shift lever "P" or "N"	ON
		Except above	OFF

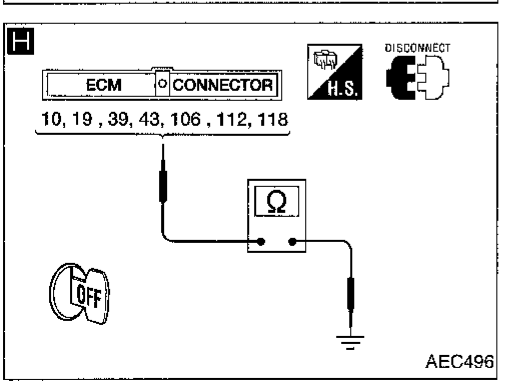
Main Power Supply and Ground Circuit (Cont'd)











Ⓐ

D

CHECK HARNESS CONTINUITY BETWEEN ECCS RELAY AND ECM
1. Disconnect ECM harness connector.
2. Disconnect ECCS relay.
3. Check harness continuity between ECM terminals ⑯, ⑥① and terminal ③.
   Continuity should exist.
   If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

E

CHECK VOLTAGE BETWEEN ECCS RELAY AND GROUND.
Check voltage between terminals ①, ⑤ and ground with CONSULT or tester.
Voltage: Battery voltage

NG → Check the following.
- Harness for open or short between ECCS relay and battery

If NG, repair harness or connectors.

OK ↓

F

CHECK OUTPUT SIGNAL CIRCUIT.
Check harness continuity between ECM terminal ④ and terminal ②.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

G

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

NG → Replace ECCS relay.

OK ↓

H

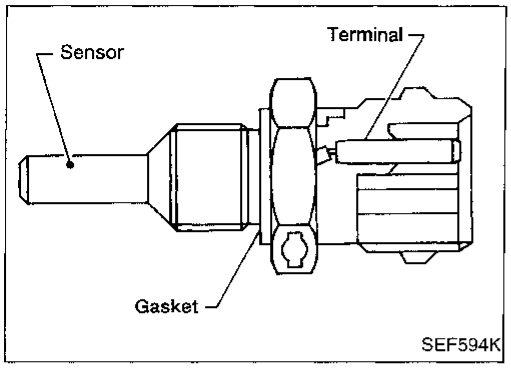
CHECK GROUND CIRCUIT.
1. Turn ignition switch "OFF".
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminals ⑩, ⑲, ㊴, ㊸, ⑯⑥, ⑪②, ⑪⑧ and engine ground.
   Continuity should exist.
   If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

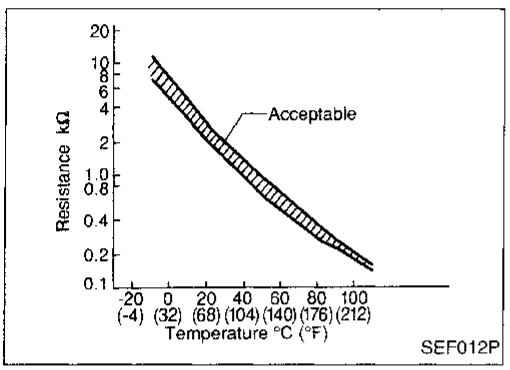
Check ECM pin terminals for damage and check the connection of ECM harness connector.

INSPECTION END



Engine Coolant Temperature Sensor (ECTS) (DTC: 0103)

The engine coolant temperature 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	9.2
20 (68)	3.5	2.5
50 (122)	2.2	0.8
90 (194)	0.9	0.2

Diagnostic Trouble Code No.	Malfunction is detected when ...	Check Items (Possible Cause)
P0115 0103	• An excessively high or low voltage from the sensor is sent to ECM.	• Harness or connectors (The sensor circuit is open or shorted.) • Engine coolant temperature sensor

DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE

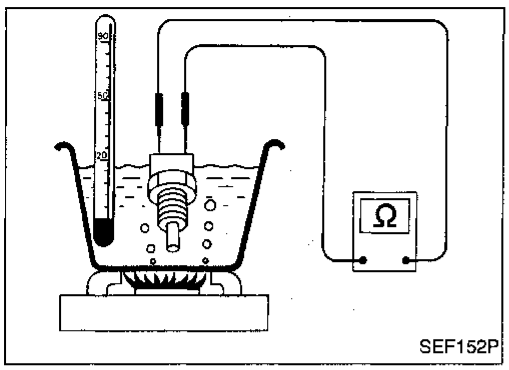
1) Turn ignition switch "ON".
2) Select "DATA MONITOR" mode with CONSULT.
3) Wait at least 5 seconds.

OR

1) Turn ignition switch "ON" and wait at least 5 seconds.
2) Select "MODE 3" with GST.

OR

1) Turn ignition switch "ON" and wait at least 5 seconds.
2) Turn ignition switch "OFF", wait at least 5 seconds and then turn "ON".
3) Perform diagnostic test mode II (Self-diagnostic results) with ECM.



Engine Coolant Temperature (ECT) Sensor (DTC: 0908) (Cont'd)

COMPONENT INSPECTION

Engine coolant temperature sensor

Check resistance as shown in the figure.

Temperature °C (°F)	Resistance
20 (68)	2.1 - 2.9 kΩ
50 (122)	0.68 - 1.0 kΩ
90 (194)	0.236 - 0.260 kΩ

If NG, replace engine coolant temperature sensor.

Rear Heated Oxygen Sensor (Rear HO2S) (DTC: 0707) (Cont'd)

ON-BOARD DIAGNOSIS LOGIC

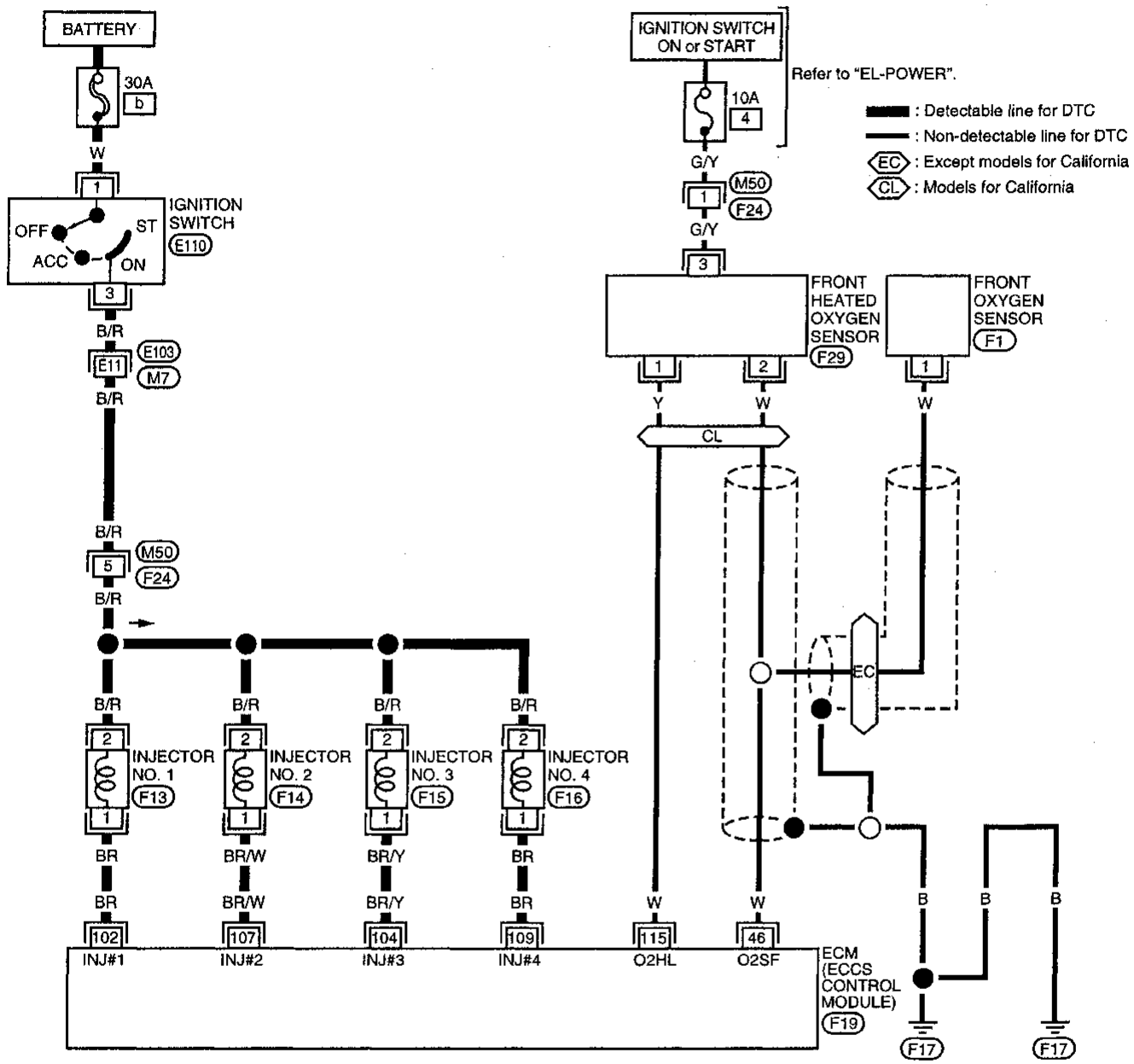
The rear heated oxygen sensor has a much longer switching time between rich and lean than the front oxygen sensor*1. The oxygen storage capacity before the three way catalyst causes the longer switching time. To judge the malfunctions of rear heated oxygen sensor, ECM monitors the sensor's voltage value and the switching response during the various driving condition such as fuel-cut.

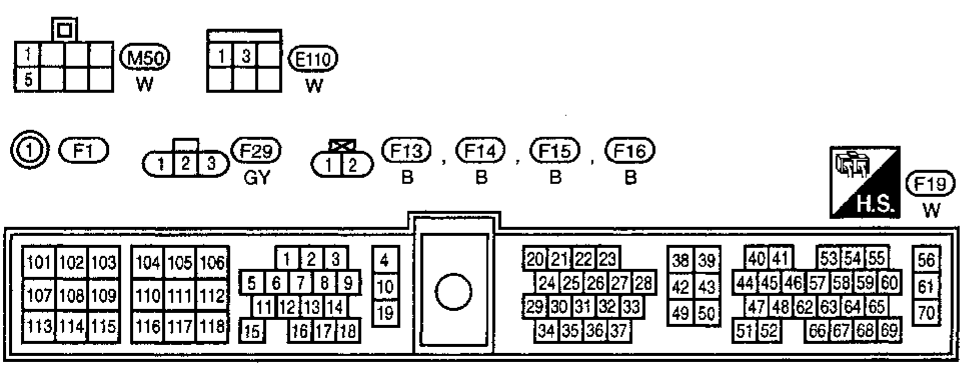
Diagnostic Trouble Code No.	Malfunction is detected when ...	Check Items (Possible Cause)
P0136 0707	● An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open.) ● Rear heated oxygen sensor
	● The specified maximum and minimum voltages from the sensor are not reached. ● It takes more than the specified time for the sensor to respond between rich and lean.	● Harness or connectors (The sensor circuit is shorted.) ● Rear heated oxygen sensor ● Fuel pressure ● Injectors ● Intake air leaks

*1: Front heated oxygen sensor (California models)
Front oxygen sensor (Non-California models)

Fuel Injection System Function (DTC: 0706)
(For Non-California models) (Cont'd)

EC-FUEL-01





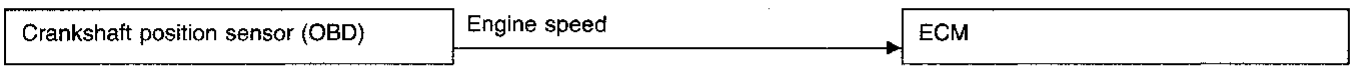
Refer to last page (Foldout page).
M7 , E103

AEC960

No. 4 - 1 Cylinder Misfire, Multiple Cylinder Misfire (DTC: 0701 - 0605)

ON-BOARD DIAGNOSIS LOGIC

If a misfire occurs, the engine speed will fluctuate. If the fluctuation is detected by the crankshaft position sensor (OBD), the misfire is diagnosed.
The misfire detection logic consists of the following two conditions.



1. One Trip Detection Logic (Three Way Catalyst Damage)
   When a misfire is detected which will overheat and damage the three way catalyst, the malfunction indicator lamp (MIL) will start blinking; even during the first trip. In this condition, ECM monitors the misfire every 200 revolutions.
   If the misfire frequency decreases to a level that will not damage the three way catalyst, the MIL will change from blinking to lighting up.
   (After the first trip detection, the MIL will light up from engine starting. If a misfire is detected that will cause three way catalyst damage, the MIL will start blinking.)
2. Two Trip Detection Logic (Exhaust quality deterioration)
   When a misfire that will not damage the three way catalyst (but will affect exhaust emission) occurs, the malfunction indicator lamp will light up based on the second consecutive trip detection logic. In this condition, ECM monitors the misfire for every 1,000 revolutions of the engine.

Diagnostic Trouble Code Nos.	Malfunction is detected when ...	Check Items (Possible Cause)
P0300 (0701)	● Multiple cylinders misfire.	● Improper spark plug ● Insufficient compression ● Incorrect fuel pressure ● EGR valve ● The injector circuit is open or shorted. ● Injectors ● Intake air leak ● The ignition secondary circuit is open or shorted. ● Lack of fuel ● Magnetized flywheel (drive plate)
P0301 (0608)	● No. 1 cylinder misfires.	
P0302 (0607)	● No. 2 cylinder misfires.	
P0303 (0606)	● No. 3 cylinder misfires.	
P0304 (0605)	● No. 4 cylinder misfires.	

DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE (Overall)

1) Turn ignition switch "ON", and select "DATA MONITOR" mode with CONSULT.
2) Start engine and warm it up sufficiently.
3) Turn ignition switch "OFF" and wait at least 3 seconds.
4) Start engine again and drive at 1,500 - 3,000 rpm for at least 8 minutes.

OR

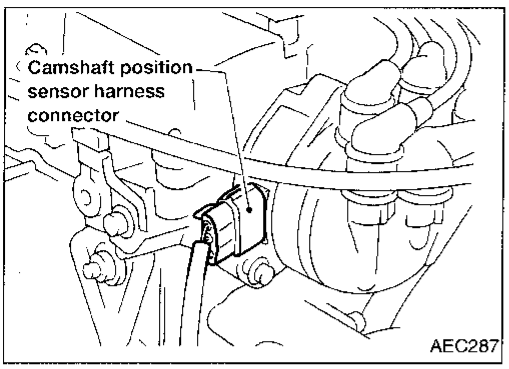
1) Start engine and warm it up sufficiently.
2) Turn ignition switch "OFF" and wait at least 3 seconds.
3) Start engine again and drive at 1,500 - 3,000 rpm for at least 8 minutes.
4) Select "MODE 3" with GST.

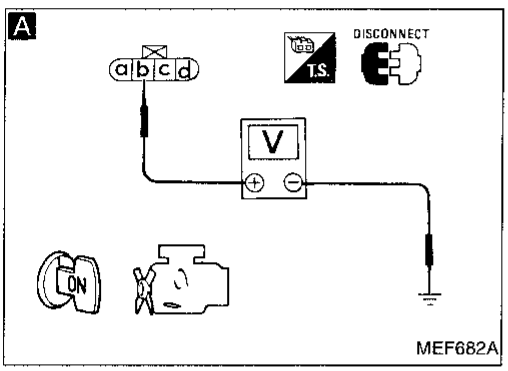
OR

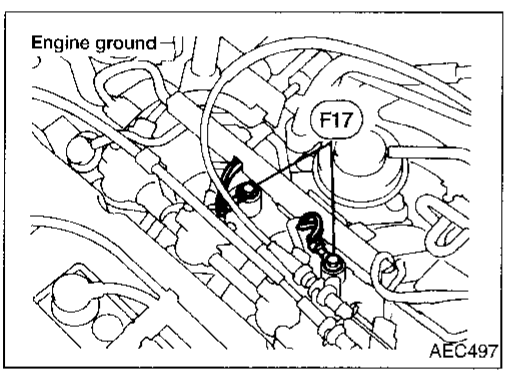
1) Start engine and warm it up sufficiently.
2) Turn ignition switch "OFF" and wait at least 3 seconds.
3) Start engine again and drive at 1,500 - 3,000 rpm for at least 8 minutes.
4) Perform "Diagnostic Test Mode II (Self-diagnostic results)" with ECM.

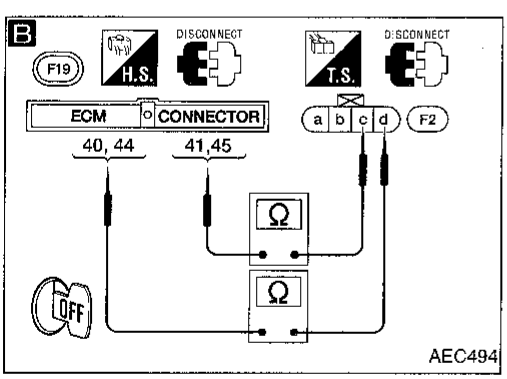
Camshaft Position Sensor (CMPS)(DTC: 0101) (Cont'd)

DIAGNOSTIC PROCEDURE (DETECTABLE CIRCUIT)









INSPECTION START

A

CHECK POWER SUPPLY.
1. Turn ignition switch "OFF".
2. Disconnect camshaft position sensor harness connector.
3. Turn ignition switch "ON".
4. Check voltage between terminal (b) and ground with CONSULT or tester.
   Voltage: Battery voltage

NG → Check the following.
- Harness for open or short between camshaft position sensor and ECCS relay

If NG, repair harness or connectors.

OK ↓

Loosen and retighten engine ground screws.

B

CHECK INPUT SIGNAL CIRCUIT.
1. Turn ignition switch "OFF".
2. Disconnect ECM harness connector.
3. Check harness continuity between terminal (c) and ECM terminals (41), (45) (180° signal), terminal (d) and ECM terminals (40), (44) (1° signal).
   Continuity should exist.
   If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

CHECK COMPONENT (Camshaft position sensor).
Refer to "COMPONENTS INSPECTION" on next page.

NG → Replace camshaft position sensor.

OK ↓

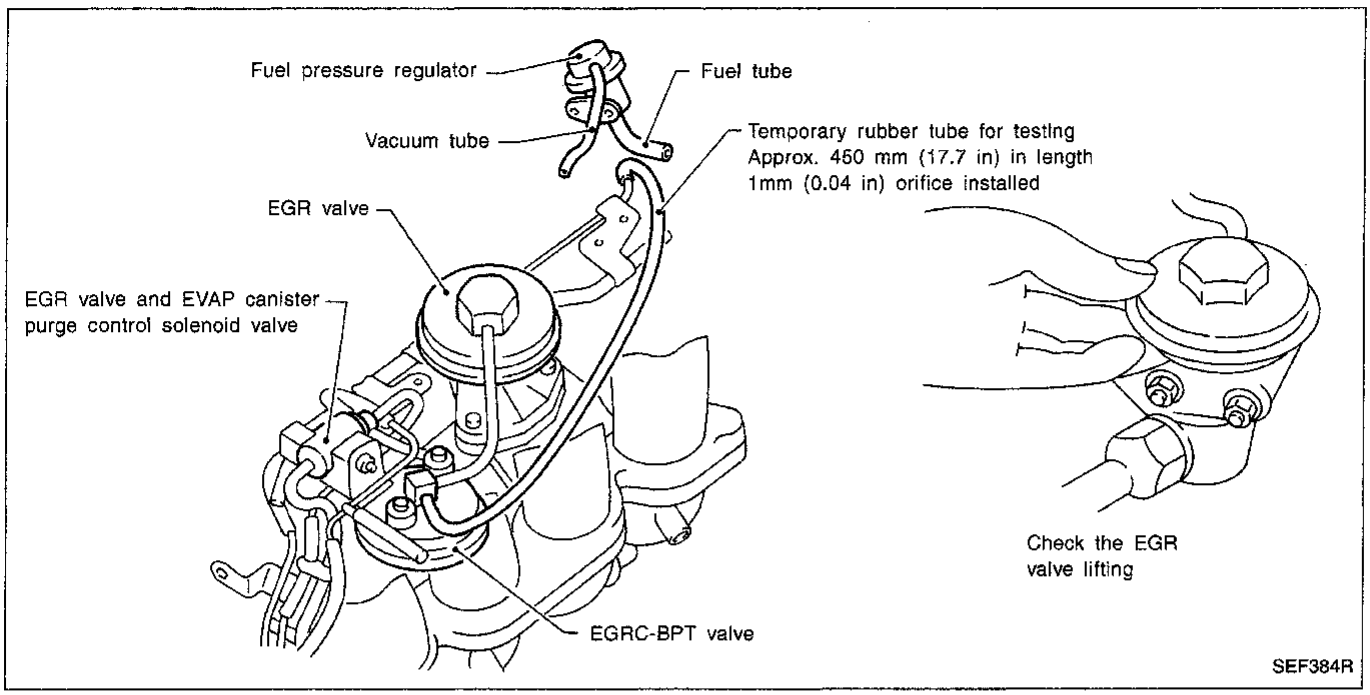
Disconnect and reconnect harness connectors in the circuit. Then retest.

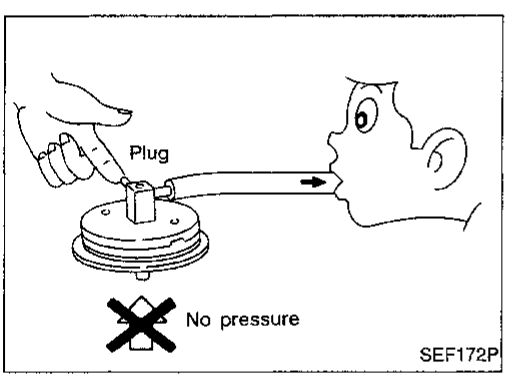
Trouble is not fixed. ↓

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

INSPECTION END

EGRC-BPT Valve Function (DTC: 0306) (Cont'd)



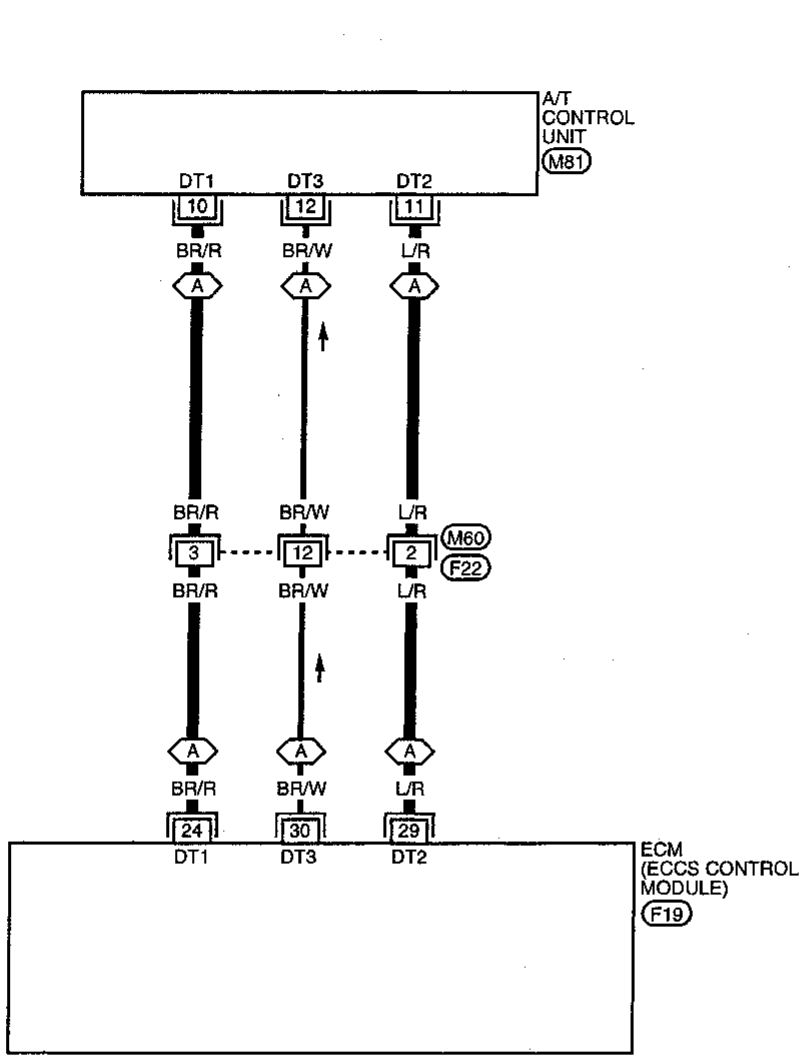


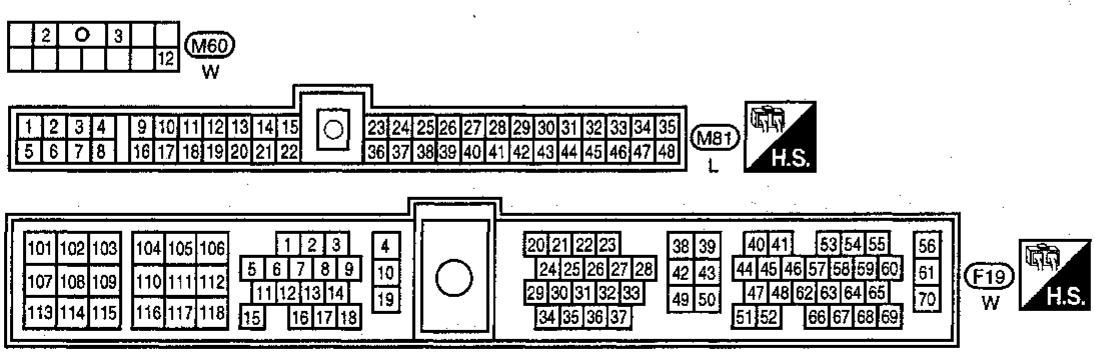
COMPONENT INSPECTION

EGRC-BPT valve

1. Plug one of two ports of EGRC-BPT valve.
2. Vacuum from the other port and check leakage without applying any pressure from under EGR-BPT valve.
   Leakage should exist.

EC-AT/C-01

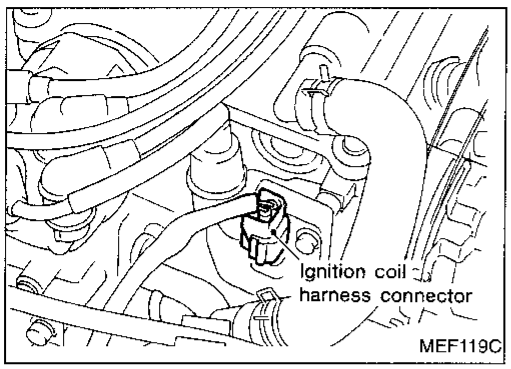


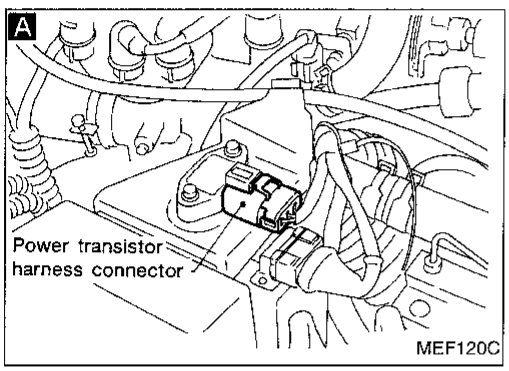


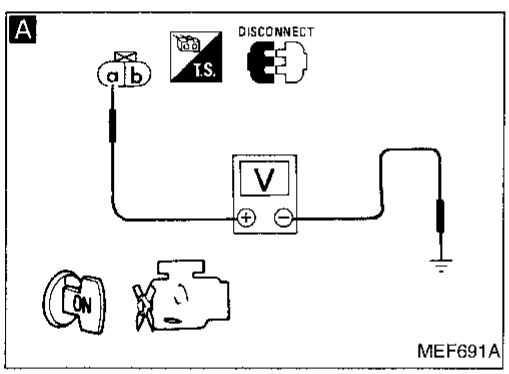
AEC971

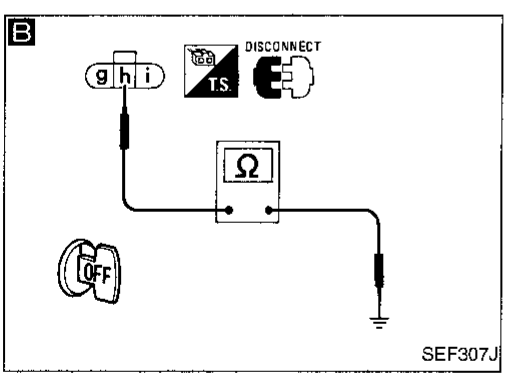
Ignition Signal (DTC: 0201) (Cont'd)

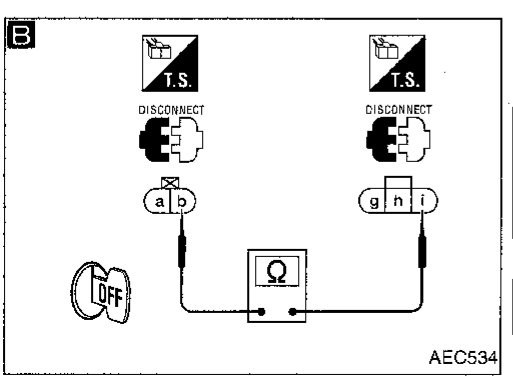
DIAGNOSTIC PROCEDURE











INSPECTION START

Turn ignition switch "OFF", and restart engine.
Is engine running?

Yes → Ⓐ (Go to next page.)

No

A

CHECK POWER SUPPLY.
1. Turn ignition switch "OFF".
2. Disconnect ignition coil harness connector.
3. Turn ignition switch "ON".
4. Check voltage between terminal ⓐ and ground with CONSULT or tester.
   Voltage: Battery voltage

NG → Check the following.
- Harness connectors (E103), (M7)
- Harness connectors (M50), (F24)
- Harness for open or short between ignition coil and ignition switch

If NG, repair harness or connectors.

OK

B

CHECK GROUND CIRCUIT.
1. Turn ignition switch "OFF".
2. Disconnect power transistor harness connector.
3. Check harness continuity between terminal ⓗ and engine ground.
   Continuity should exist.
   If OK, check harness for short.
4. Check harness continuity between terminal ⓑ and terminal ⓘ.
   Continuity should exist.
   If OK, check harness for short.

NG → Repair harness or connectors.

OK

C

CHECK INPUT SIGNAL CIRCUIT.
1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal ① and terminal ⓖ.
   Continuity should exist.
   If OK, check harness for short.

NG → Repair harness or connectors.

OK

CHECK COMPONENTS
(Ignition coil, power transistor).
Refer to "COMPONENT INSPECTION", EC-214.

NG → Replace malfunctioning component(s).

OK

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

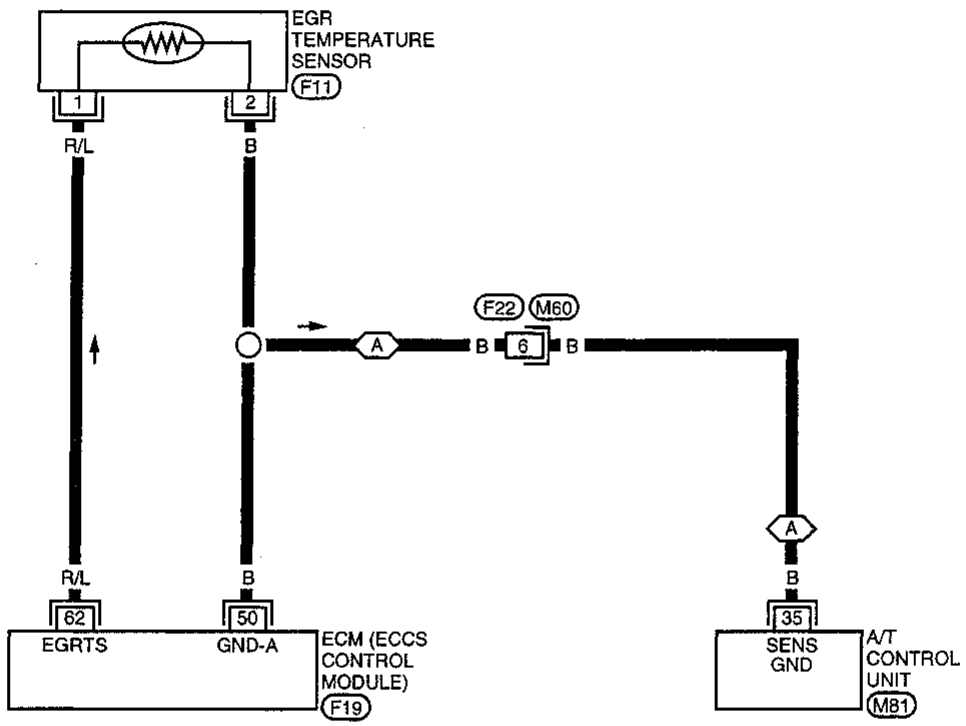
Trouble is not fixed.

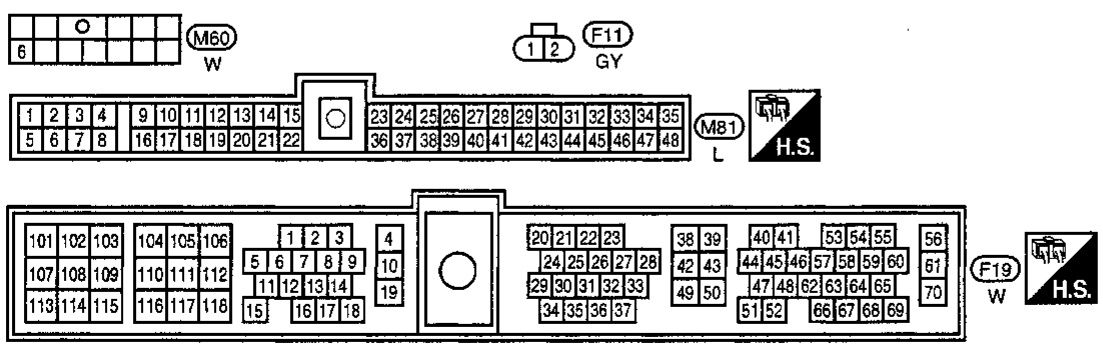
Check ECM pin terminals for damage and check the connection of ECM harness connector. Reconnect ECM harness connector and retest.

INSPECTION END

EC-EGR/TS-01

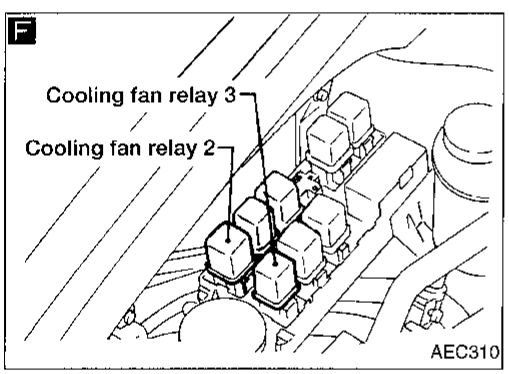
: Detectable line for DTC
: Non-detectable line for DTC
(A) : A/T models

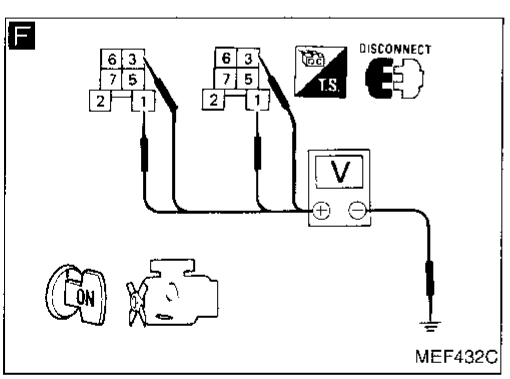




AEC968

Cooling Fan (DTC: 1308 ... California models, 0208 ... Non-California models) (Cont'd)





Ⓒ

CHECK COMPONENTS
(Cooling fan motors-1 and -2).
Refer to "COMPONENT INSPECTION", EC-242.

NG → Replace cooling fan motors.

OK

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

Trouble is not fixed.

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

INSPECTION END

PROCEDURE B

INSPECTION START

F

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

NG → Check the following.
- Harness connectors (M7), (E103)
- 10A fuse
- 30A fusible link
- Joint connector-1
- Joint connector-2
- Harness for open or short between cooling fan relays-2 and -3 and fuse
- Harness for open or short between cooling fan relays-2 and -3 and battery

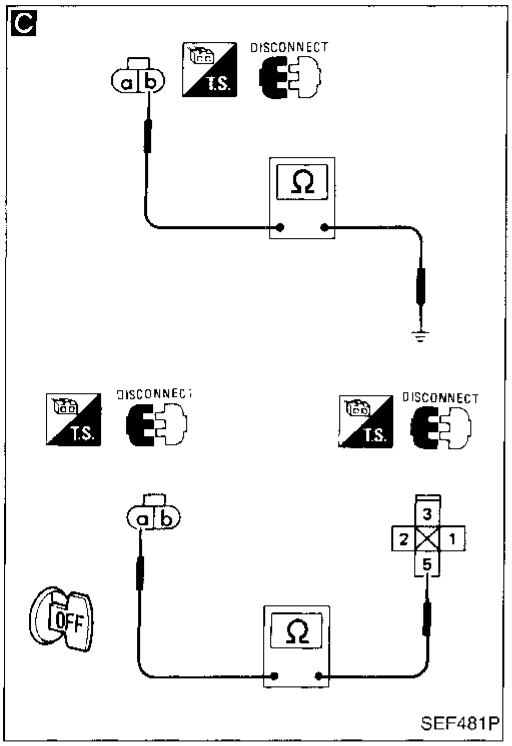
If NG, repair harness or connectors.

OK

(Go to Ⓓ on next page.)

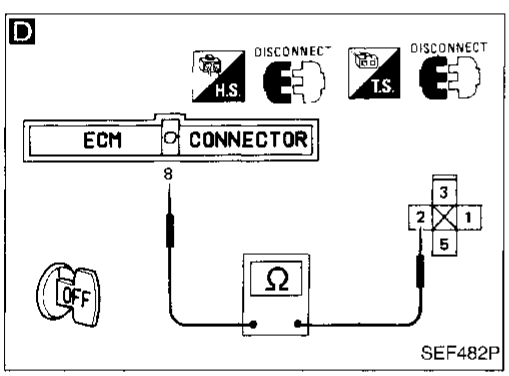
Fuel Pump (Cont'd)

C



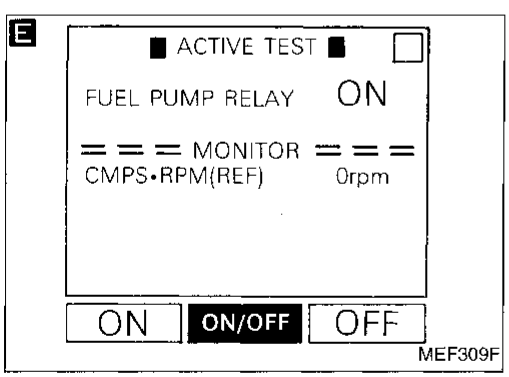
SEF481P

D



SEF482P

E



MEF309F

Ⓐ

E

CHECK COMPONENT
(Fuel pump relay).

1. Reconnect fuel pump relay, fuel pump harness connector and ECM harness connector.
2. Turn ignition switch "ON".
3. Turn fuel pump relay "ON" and "OFF" in "ACTIVE TEST" mode with CONSULT and check operating sound.

OR

Refer to "COMPONENT INSPECTION" on next page.

NG → Replace fuel pump relay.

OK ↓

CHECK COMPONENT
(Fuel pump).
Refer to "COMPONENT INSPECTION" on next page.

NG → Replace fuel pump.

OK ↓

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

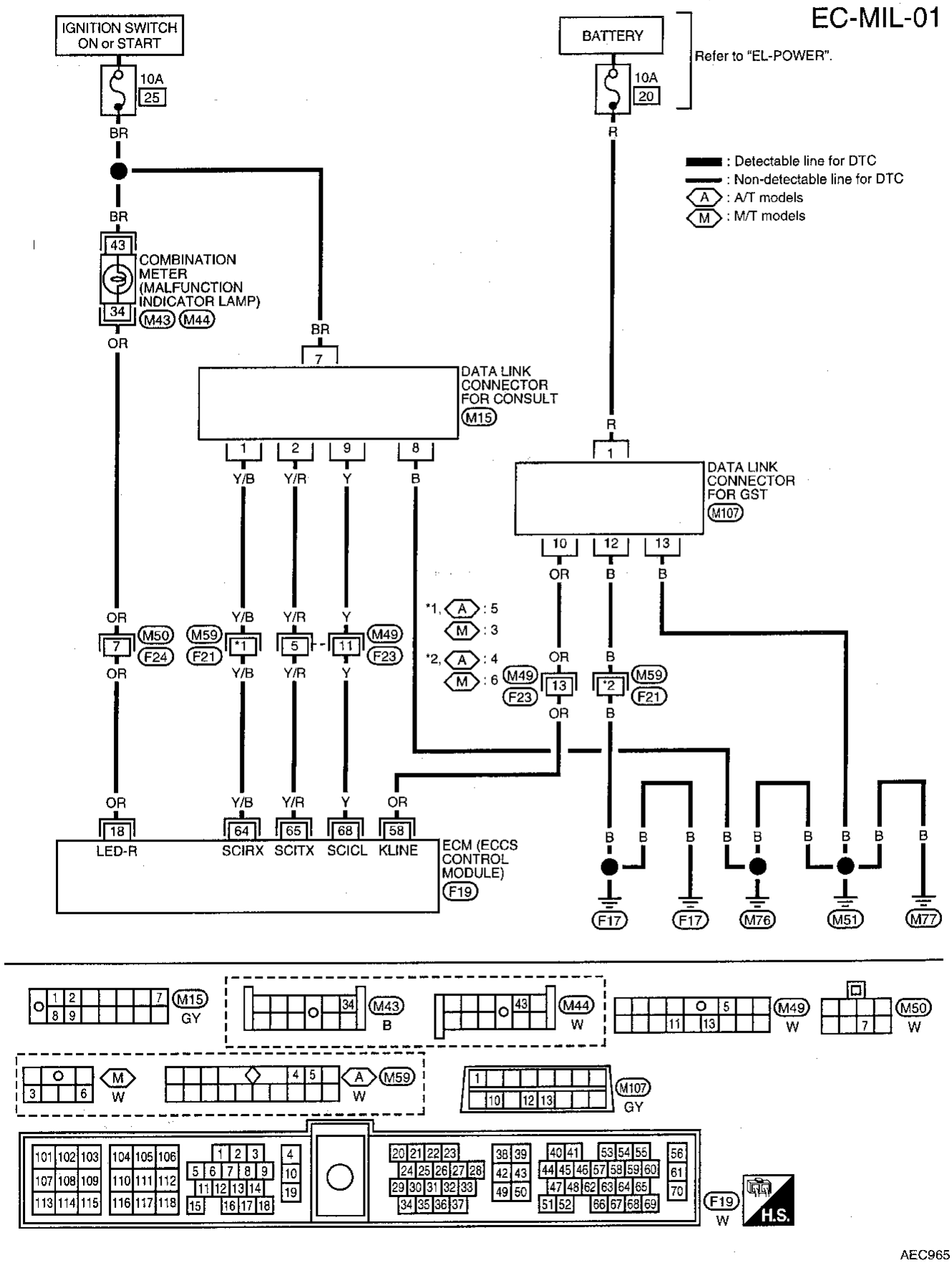
Trouble is not fixed. ↓

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

↓

INSPECTION END

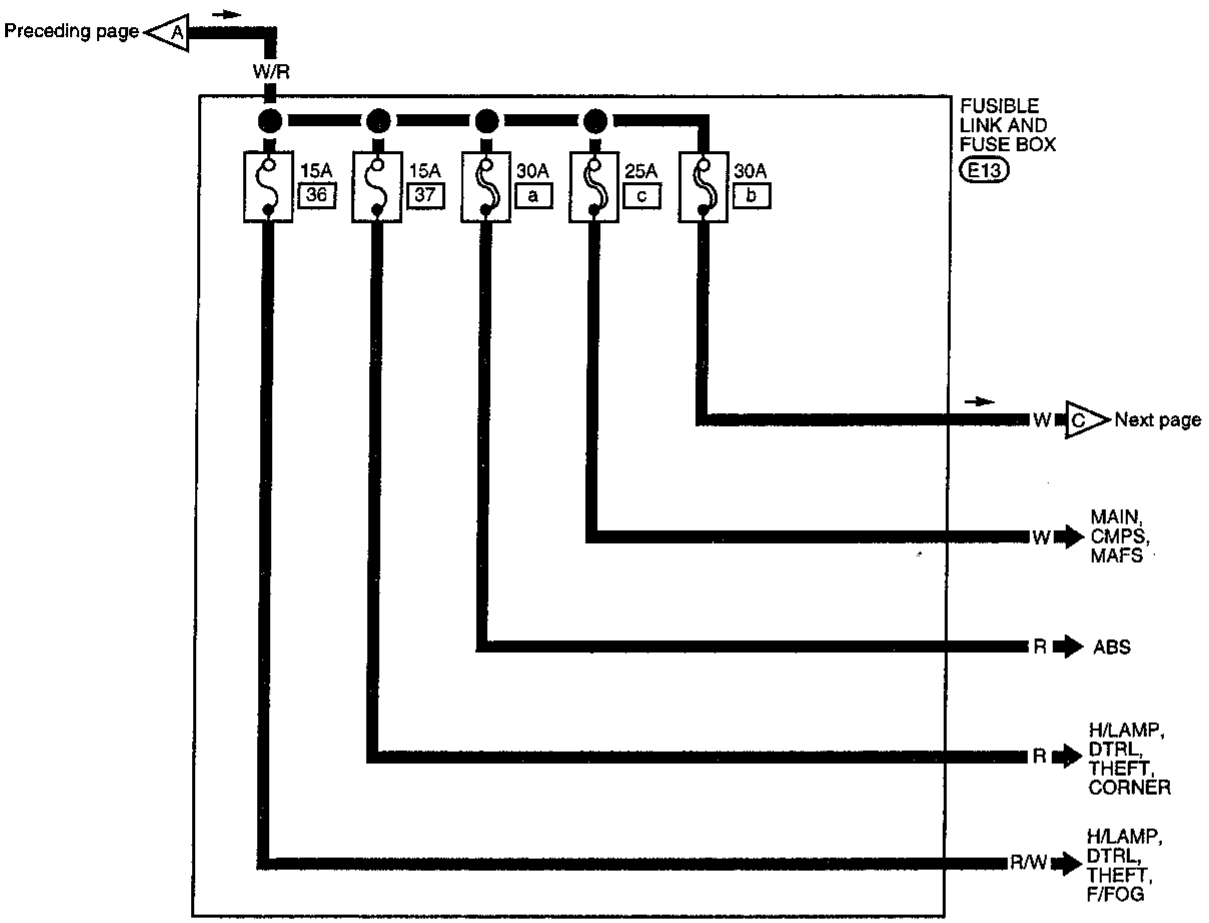
MIL & Data Link Connectors

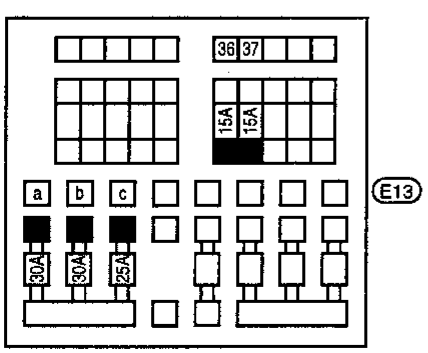


AEC965

Wiring Diagram –POWER– (Cont'd)

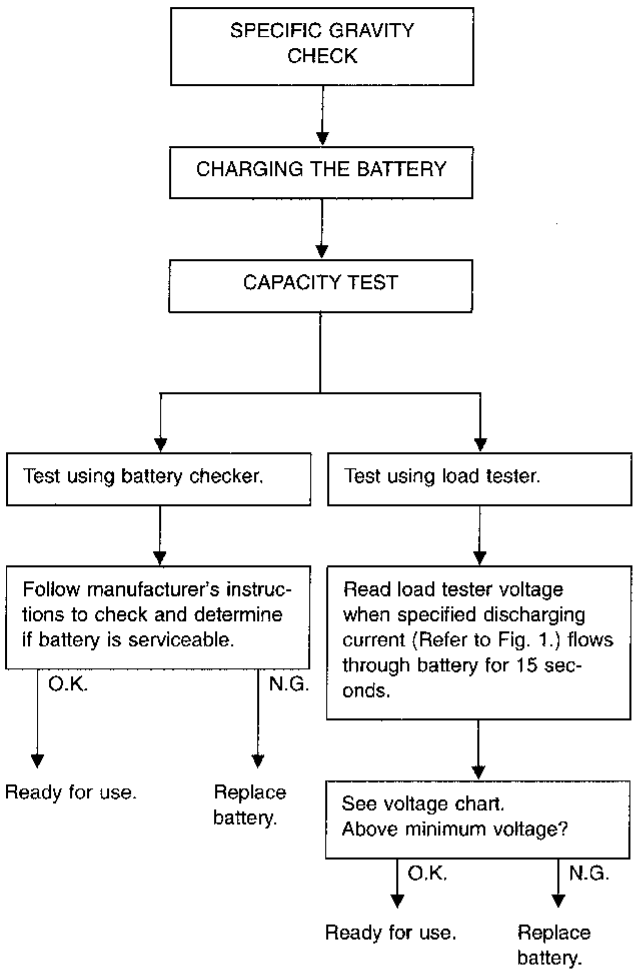
EL-POWER-02





AEL899-B

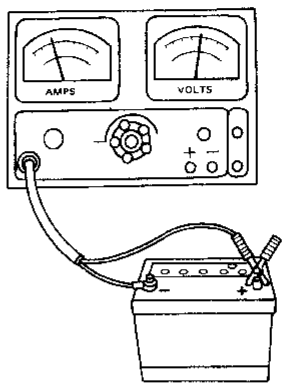
How to Handle Battery (Cont'd)



- Check battery type and determine the specified current using the following table.

Fig. 1 DISCHARGING CURRENT (Load tester)

Group size	Current (A)
24F	275



SEL008Z

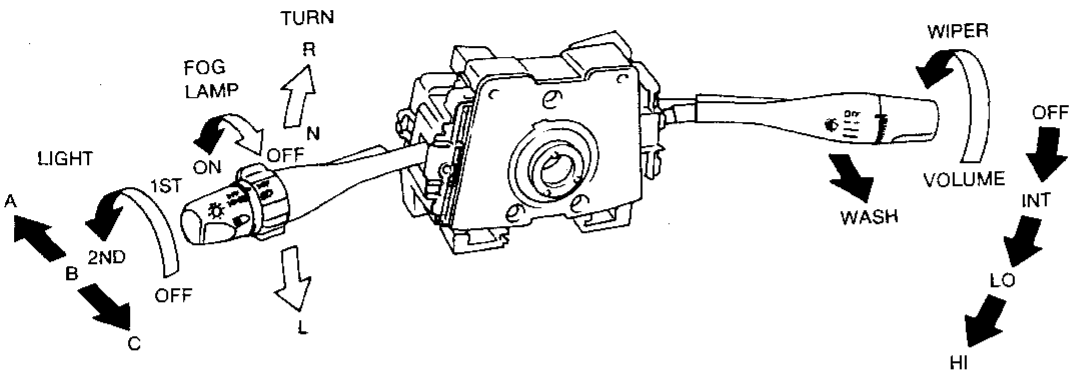
Voltage chart

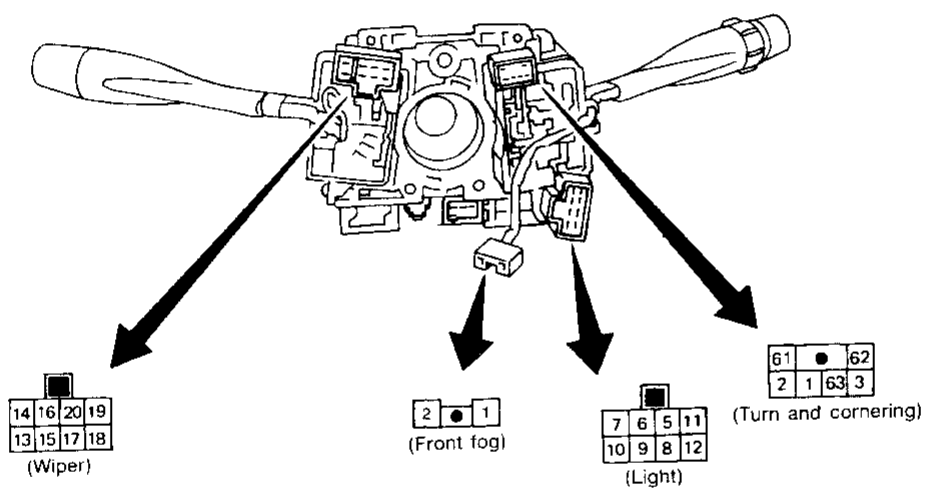
Estimated electrolyte temperature °C (°F)	Minimum voltage under 15 second load
21 (70)	9.6
16 (60)	9.5
10 (50)	9.4
4 (40)	9.3
–1 (30)	9.1
–7 (20)	8.9
–12 (10)	8.7
–18 (0)	8.5

Service Data and Specifications (SDS)

Applied area		USA and Canada
Group size		24F
Capacity	V-AH	12-65
Cold cranking current	A	550
Reserve capacity	minutes	113

Combination Switch/Check





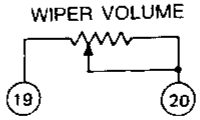
LIGHTING SWITCH

	OFF			1ST			2ND		
	A	B	C	A	B	C	A	B	C
5			○			○	○	○	○
6			○			○	○		○
7								○	
8			○			○	○	○	○
9			○			○	○		○
10								○	
11				○	○	○	○	○	○
12				○	○	○	○	○	○

WIPER SWITCH

	OFF	INT	LO	HI	WASH
13	○	○			
14	○	○	○		
15		○			
16				○	
17		○	○	○	○
18					○

INTERMITTENT WIPER VOLUME



TURN SIGNAL SWITCH

	R	N	L
1	○		○
2	○		
3			○

CORNERING LAMP SWITCH

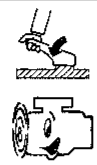
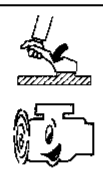
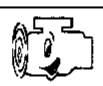
	R	N	L
61	○		○
62	○		
63			○

FRONT FOG LAMP SWITCH

	OFF	ON
2		○
1		○

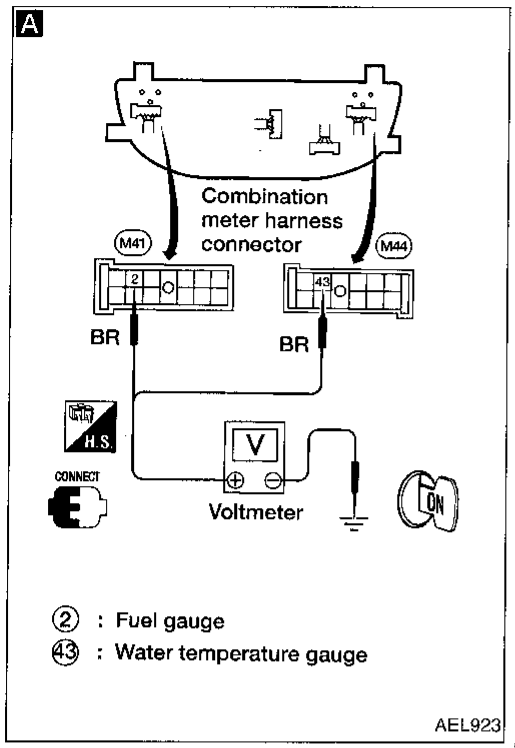
AEL270

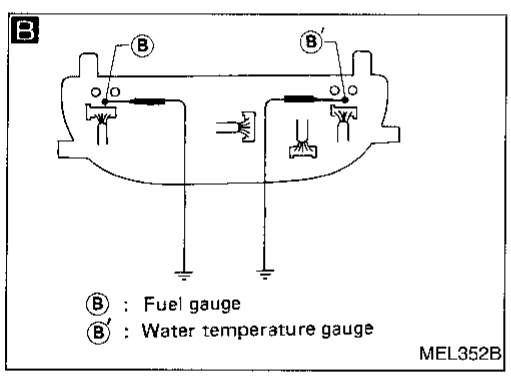
Trouble Diagnoses (For Canada) (Cont'd)

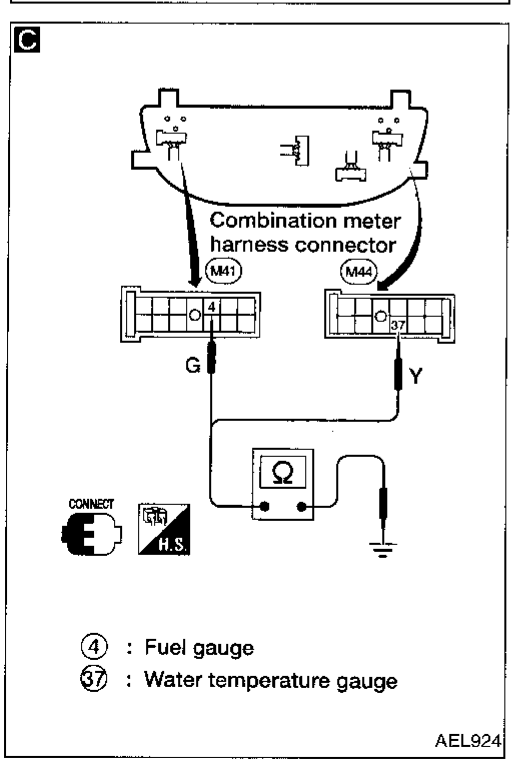
Terminal No.	Item	Condition		Judgement standard
8	LH headlamp control (ground)		When lighting switch is turned to 2nd position and placed in LOW ("B") position.	1V or less
			When releasing parking brake with engine running and turning lighting switch to "OFF" (daytime light operation). **CAUTION: Block wheels and ensure selector lever is in N or P position.**	Approx. half battery voltage
9	RH hi beam out		When turning lighting switch to 2nd position and placed in HIGH ("A") position.	Battery positive voltage
			When releasing parking brake with engine running and turning lighting switch to "OFF" (daytime light operation). **CAUTION: Block wheels and ensure selector lever is in N or P position.**	Approx. half battery voltage
10	Ground		—	—
11	Generator		When turning ignition switch to "ON".	1V or less
			When engine is running.	Battery positive voltage
			When turning ignition switch to "OFF".	1V or less
12	—		—	—

Turn Signal and Hazard Warning Lamps/Trouble Diagnoses

Symptom	Possible cause	Repair order
Turn signal and hazard warning lamps do not operate.	1. Hazard switch 2. Combination flasher unit 3. Open in combination flasher unit circuit	1. Check hazard switch. 2. Refer to combination flasher unit check. 3. Check wiring to combination flasher unit for open circuit.
Turn signal lamps do not operate but hazard warning lamps operate.	1. 10A fuse 2. Hazard switch 3. Turn signal switch 4. Open in turn signal switch circuit	1. Check 10A fuse (No. 24 , located in fuse block). Turn ignition switch ON and verify battery positive voltage is present at terminal ② of hazard switch. 2. Check hazard switch. 3. Check turn signal switch. 4 Check LG/B wire between combination flasher unit and turn signal switch for open circuit.
Hazard warning lamps do not operate but turn signal lamps operate.	1. 10A fuse 2. Hazard switch 3. Open in hazard switch circuit	1. Check 10A fuse (No. 22 , located in fuse block). Verify battery positive voltage is present at terminal ③ of hazard switch. 2. Check hazard switch. 3. Check LG/B wire between combination flasher unit and hazard switch for open circuit.
Front turn signal lamp LH or RH does not operate.	1. Bulb 2. Grounds (E12) and (E37)	1. Check bulb. 2. Check grounds (E12) and (E37).
Rear turn signal lamp LH or RH does not operate.	1. Bulb 2. Ground (T7)	1. Check bulb. 2. Check ground (T7).
LH and RH turn indicators do not operate.	1. Ground	1. Check grounds (M51), (M76) and (M77).
LH or RH turn indicator does not operate.	1. Bulb	1. Check bulb in combination meter.







Inspection/Fuel Gauge and Water Temperature Gauge

INSPECTION START

A

CHECK POWER SOURCE.
1. Turn ignition switch "ON".
2. Check voltage between terminal ②, ㊸ and ground.
Battery positive voltage should exist.

NG → Check the following items:
- Harness continuity between battery terminal and combination meter
- Ignition relay
- Fusible link and fuse
- Ignition switch

OK

B

CHECK GAUGE OPERATION.
1. Turn ignition switch "ON".
2. Connect terminal Ⓑ, Ⓑ′ and ground with wire for **less than 10 seconds.**
3. Check operation of gauge.
Gauge should move smoothly to full scale.

NG → Repair or replace gauge.

OK

C

CHECK HARNESS CONTINUITY.
Check harness continuity between component and combination meter ④, ㊲.

NG → Repair or replace.

OK

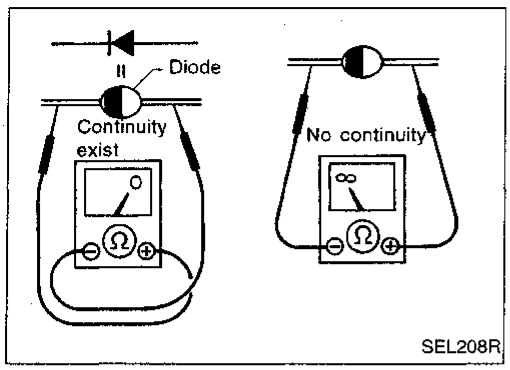
Check component.
Check gauge units and harness.
Perform "Fuel Tank Gauge Unit Check" and "Thermal Transmitter Check".
Refer to EL-77.

NG → Repair or replace.
Refer to FE section ("Fuel Pump and Gauge", "FUEL SYSTEM").

OK

Reinstall any part removed.

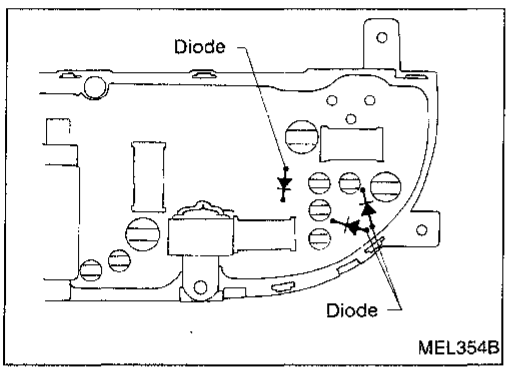
INSPECTION END



Diode Check

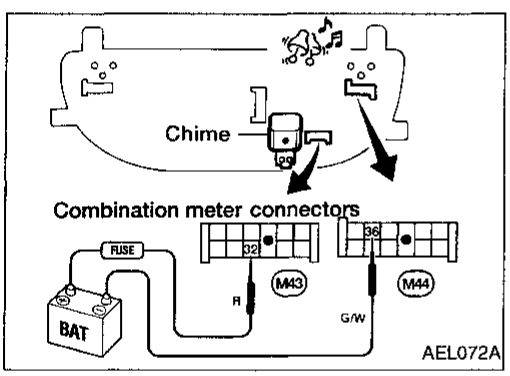
- Check continuity using an ohmmeter.
- Diode is functioning properly if test results are as shown in the figure at left.

NOTE: Specifications may vary depending on the type of tester. Before performing this inspection, be sure to refer to the instruction manual for the tester to be used.



- Diodes for warning lamps are built into the combination meter printed circuit.

Refer to EL-71.



Warning Chime Check

Supply battery voltage to warning chime as shown in the illustration.

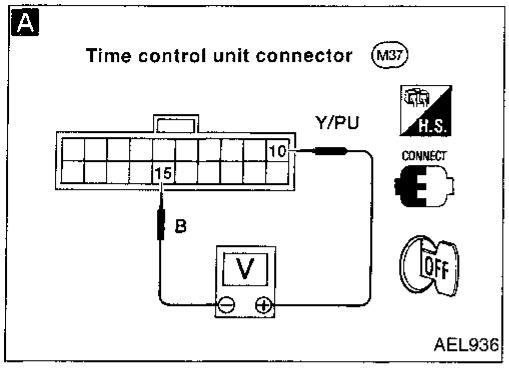
Warning chime should operate.

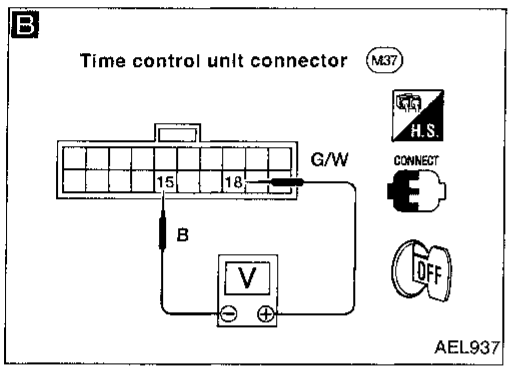
Trouble Diagnoses (Cont'd)

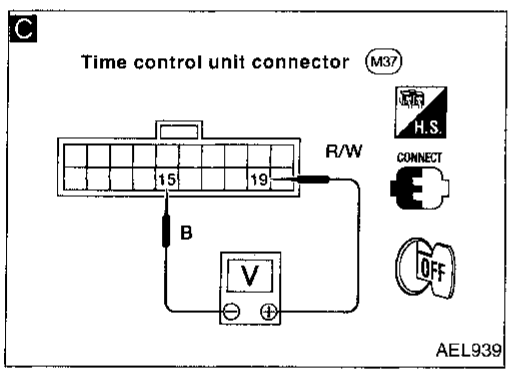
DIAGNOSTIC PROCEDURE 5

SYMPTOM: Ignition key warning chime does not activate.

- Perform "PRELIMINARY CHECK — Procedure 2" before referring to the following flow chart.







A — Step 3

DOOR SWITCH INPUT SIGNAL CHECK
Measure voltage between time control unit harness terminals ⑩ and ⑮.

Condition of driver's door	Voltage [V]
Door is closed	Approx. 12
Door is open	0

NG → Check the following:
- Door switch.
- Harness continuity between time control unit and door switch.

OK ↓

B — Step 2

CHIME OUTPUT SIGNAL CHECK
Measure voltage between time control unit harness terminals ⑱ and ⑮.

Condition of driver's door	Voltage [V]
Door is closed	Approx. 12
Door is open	Pointer deflects intermittently

OK → Check the following:
- Chime.
- Harness continuity between time control unit and chime.

NG ↓

C — Step 1

IGNITION KEY SWITCH INPUT SIGNAL CHECK
Measure voltage between time control unit harness terminals ⑲ and ⑮.

Condition	Voltage [V]
Key is inserted	Approx. 12
Key is pulled	0

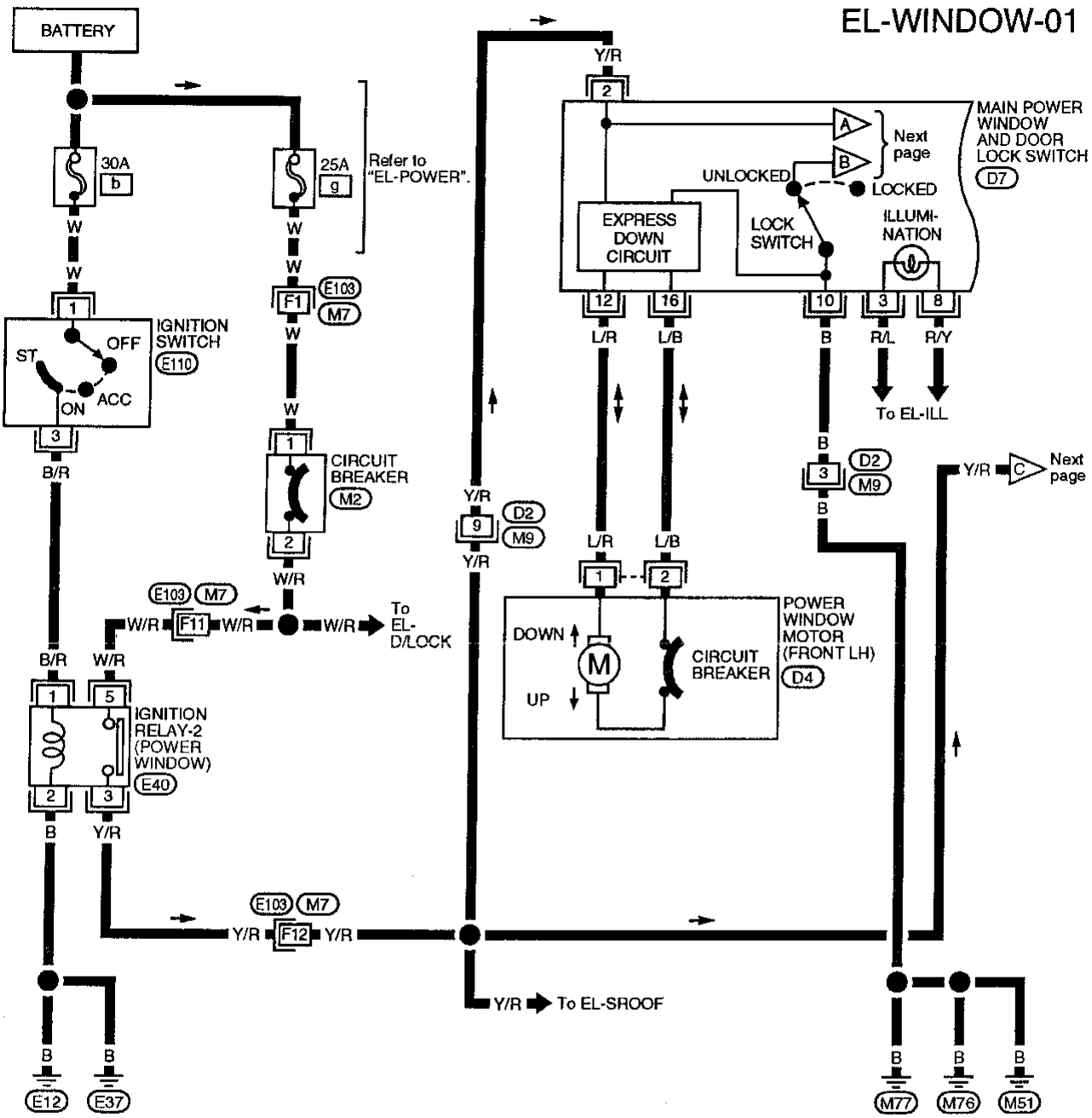
NG → Check the following:
- Ignition key switch.
- Harness continuity between time control unit and ignition key switch.

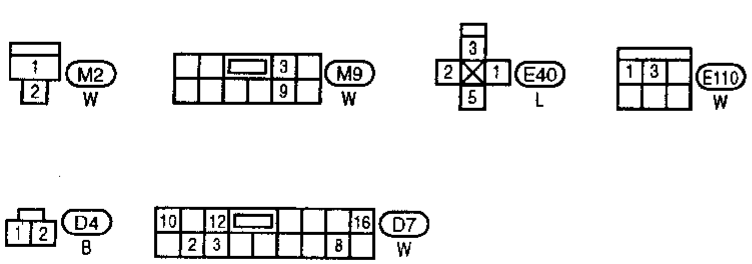
OK ↓

TRY A KNOWN GOOD TIME CONTROL UNIT.*

*: Time control unit may be the cause of a problem, but this is rarely the case.

Wiring Diagram –WINDOW–



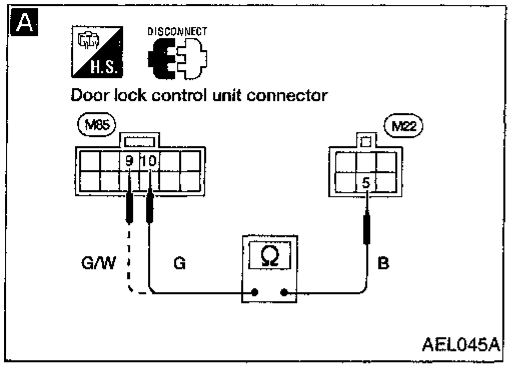


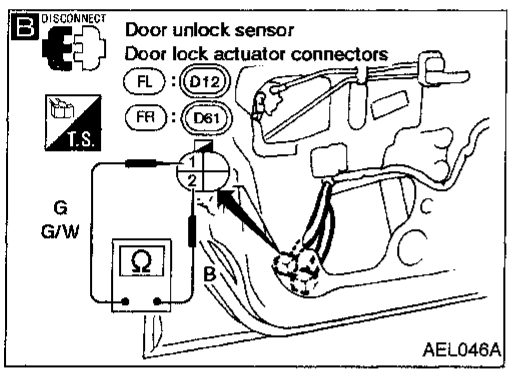
Refer to last page (Foldout page).
(M7), (E103)

AEL900-A

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 5 — Front door unlock sensor





A

FRONT DOOR UNLOCK SENSOR INPUT SIGNAL CHECK.

Check continuity between door lock control unit harness terminals ⑨, ⑩ and ⑤.

Condition	Terminals	Continuity
Driver door		
Locked	⑩ - ⑤	No
Unlocked		Yes
Passenger door		
Locked	⑨ - ⑤	No
Unlocked		Yes

OK → Front door unlock sensor is OK.

NG ↓

B

CHECK FRONT DOOR UNLOCK SENSOR.

Check continuity between sensor terminals.

Operation	Terminals	Continuity
Lock	① - ②	No
Unlock	① - ②	Yes

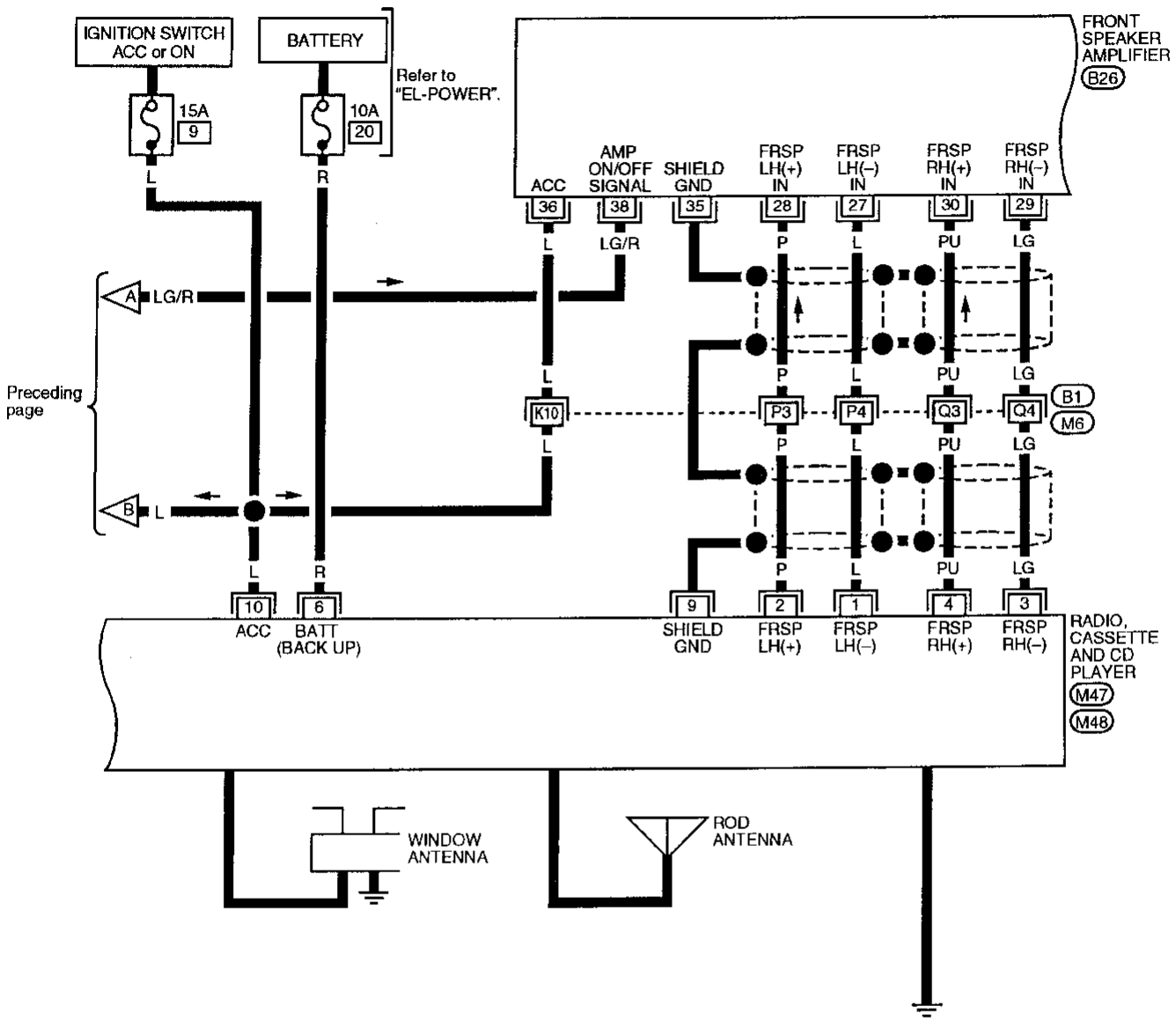
NG → Replace front door lock actuator.

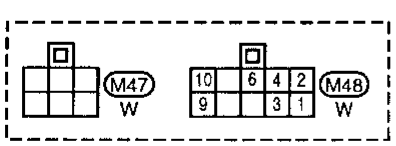
OK ↓

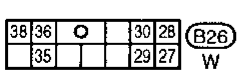
Check the following:
- Ground circuit for door unlock sensor.
- Connection at each connector.
- Harness for open or short between front door unlock sensor and control unit.

Audio/Wiring Diagram –AUDIO– (Cont'd)

EL-AUDIO-02





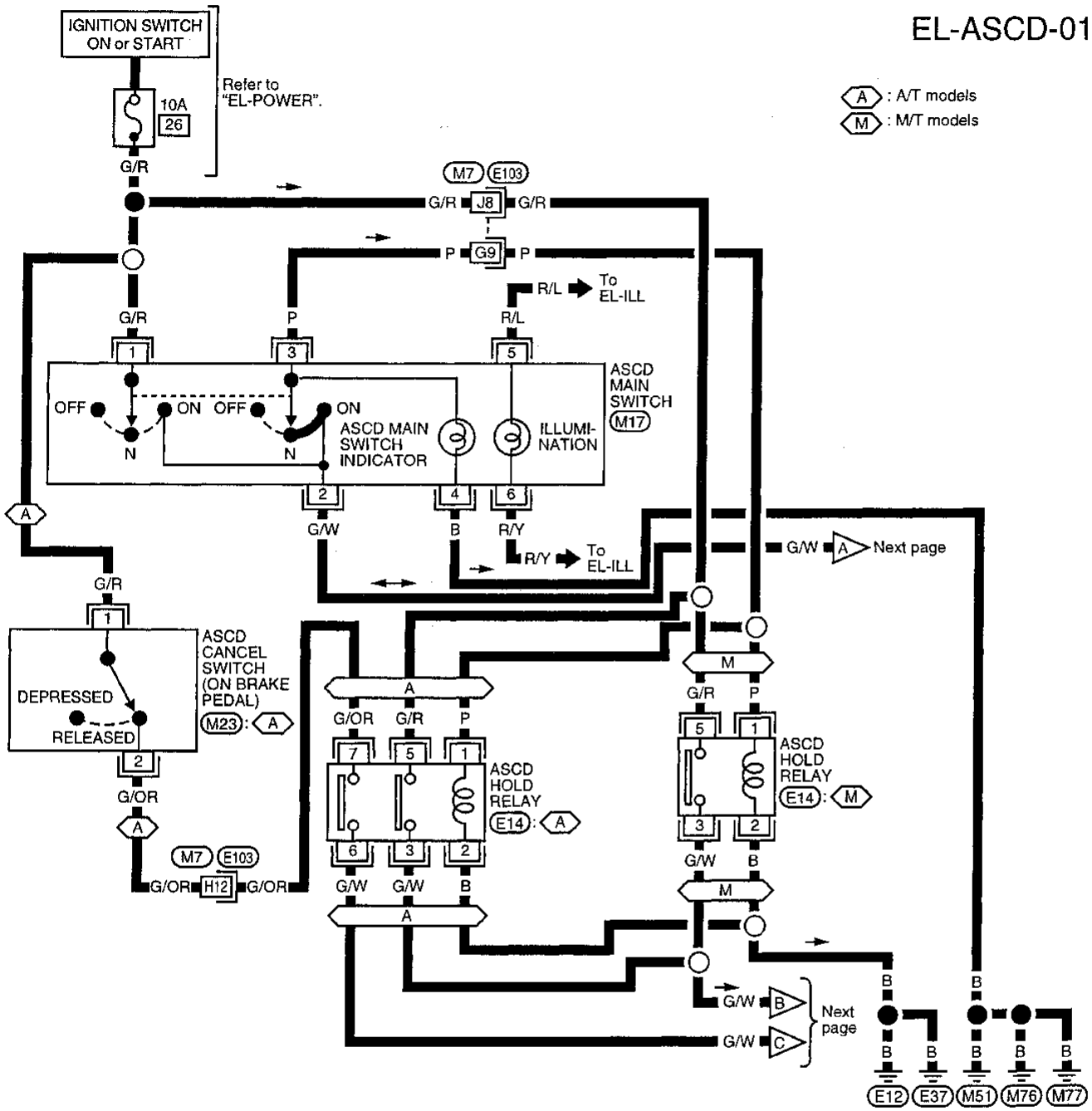


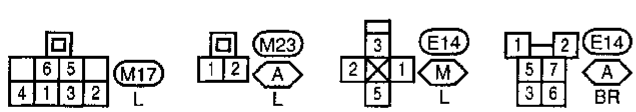
Refer to last page (Foldout page).
M6, B1

AEL865-B

Wiring Diagram –ASCD–

EL-ASCD-01



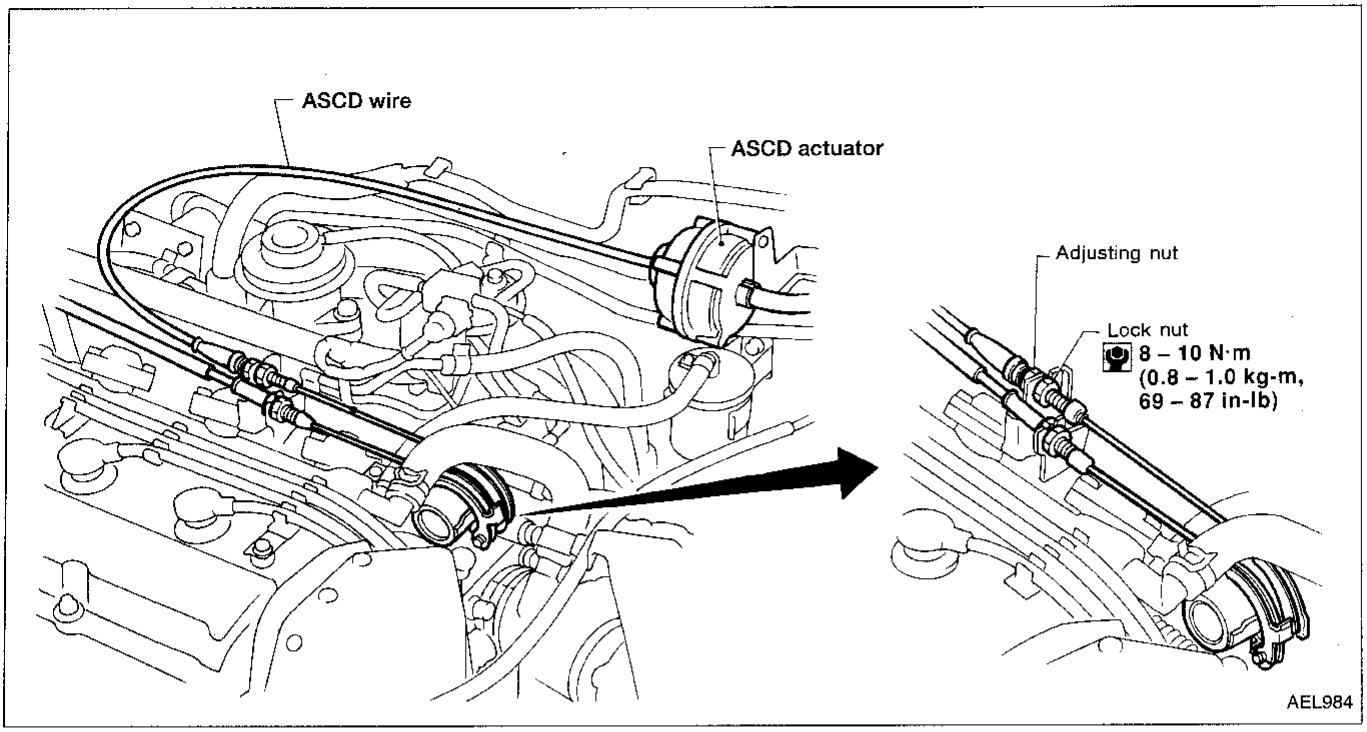


Refer to last page (Foldout page).
M7 , E103

AEL867-A

Trouble Diagnoses (Cont'd)

ASCD WIRE ADJUSTMENT



CAUTION:

- **Be careful not to twist ASCD wire when removing it.**
- **Do not over tighten ASCD wire during adjustment.**

Confirm that accelerator wire is properly adjusted.

- **For accelerator cable adjustment, refer to FE section ("Adjusting Accelerator Cable", "ACCELERATOR CONTROL SYSTEM").**

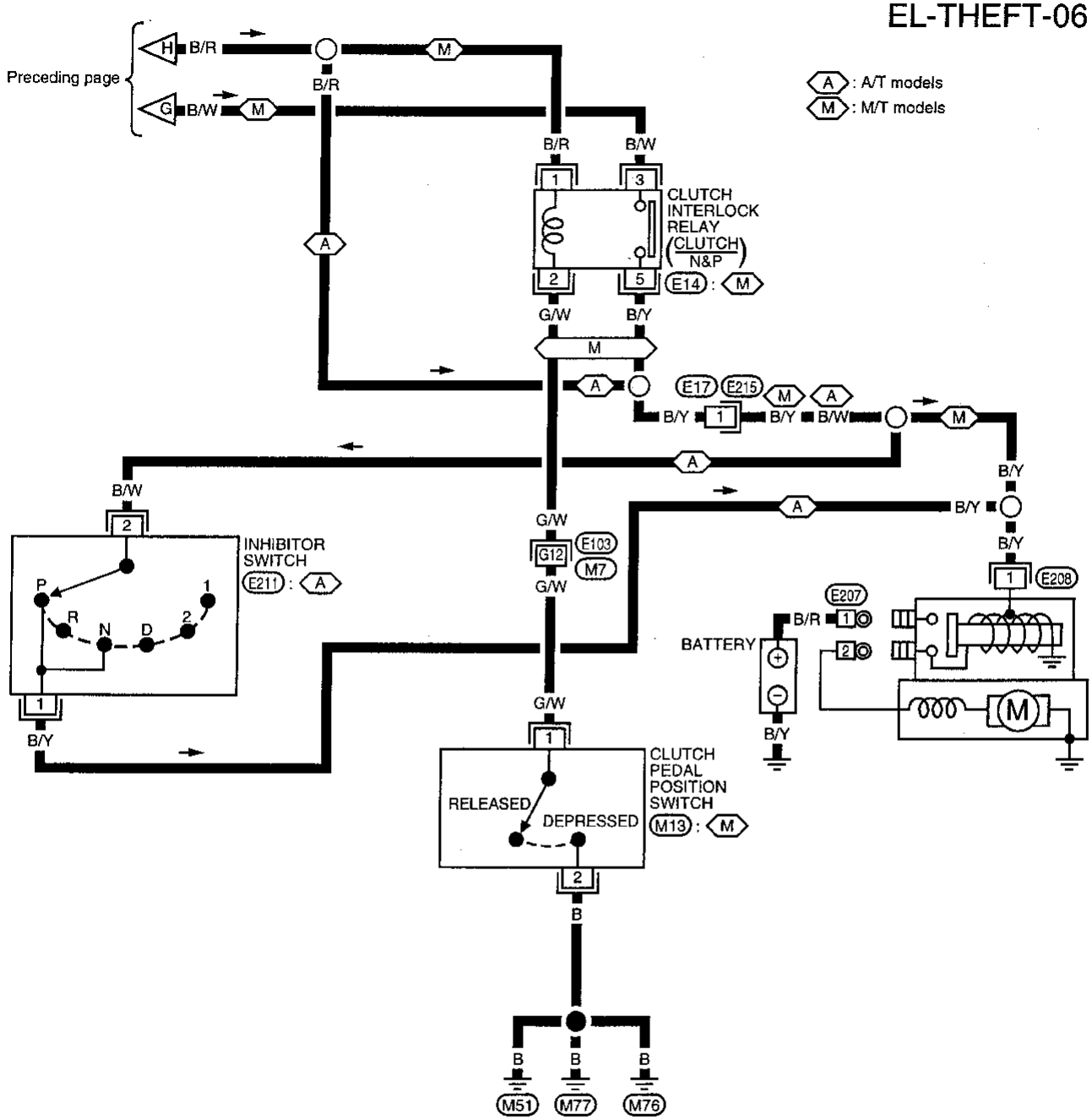
Adjust the ASCD wire as follows.

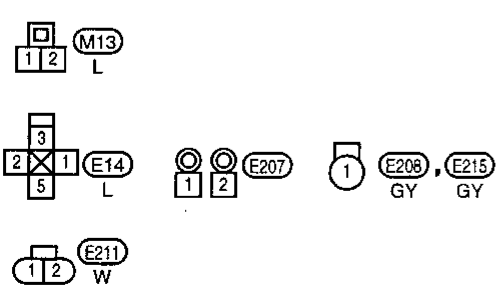
1. Loosen lock nut and tighten adjusting nut until throttle drum starts to move.
2. From that position turn back adjusting nut 0.5 to 1 turn, and secure lock nut.
   (This prevents a delay in the operation of the ASCD.)

- For ASCD cancel switch adjustment, refer to BR and CL sections ("Adjustment", "BRAKE PEDAL AND BRACKET" and "Adjusting Clutch Pedal", "INSPECTION AND ADJUSTMENT", respectively).

Wiring Diagram –THEFT– (Cont'd)

EL-THEFT-06





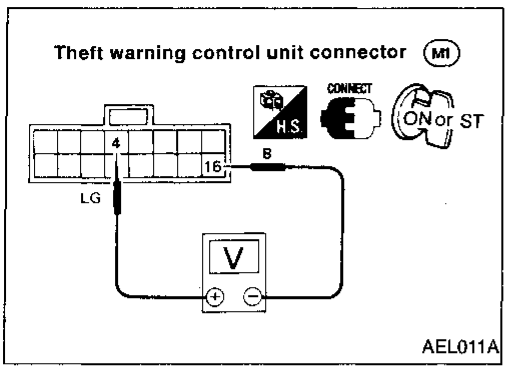
Refer to last page (Foldout page).
M7 , E103

AEL869-F

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

SYMPTOM: STARTER MOTOR can be operated. (Starter killed phase)



Approx. 12V

STARTER MOTOR KILL OUTPUT SIGNAL CHECK
Turn ignition switch to "ON" or "START" position. Check voltage between theft warning control unit harness terminals ④ and ⑯.

→ Replace theft warning control unit.

Approx. 0V

↓

Check theft warning relay-1 and circuit.

NG → Replace theft warning relay-1.

OK

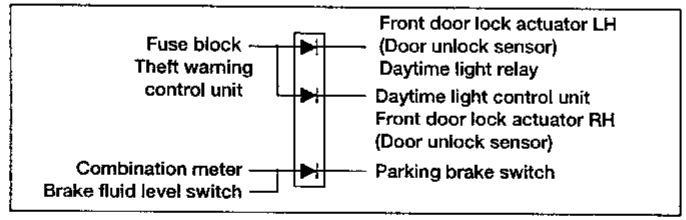
↓

Repair harness between theft warning control unit and clutch interlock relay (M/T models) or inhibitor switch (A/T models).

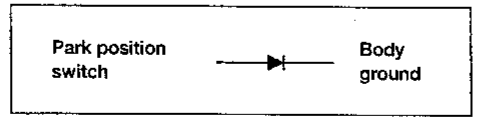
Main Harness

B5 (M1) : Theft warning control unit (For theft warning system)
B4 (M2) : Circuit breaker
A2 (M4) : To (E106)
A2 (M5) : To (E107)
A4 * (M6) : To (B1) (SMJ)
A4 * (M7) : To (E103) (SMJ)
A3 (M8) : To (D13)
A3 (M9) : To (D2)
B4 (M11) : Fuse block
B4 (M12) : Rear window defogger relay
B3 (M13) : Clutch pedal position switch (M/T models)
B3 (M14) : ASCD clutch pedal position switch (M/T models)
A5 (M15) : Data link connector for CONSULT
B2 (M16) : To (R1)
B2 (M17) : ASCD switch
B3 (M18) : Mirror switch
C4 (M19) : Illumination control switch
C4 (M20) : ASCD control unit
C4 (M22) : Door lock control unit
B2 (M23) : ASCD cancel switch (On brake pedal)
C2 (M24) : Stop lamp switch
E1 (M25) : Hazard switch
D1 (M26) : Auto air conditioning unit
E2 (M27) : Auto air conditioning unit
D1 (M28) : Push control unit
E3 (M29) : Push control unit
E1 (M30) : Air conditioning switch
E2 (M31) : Potentio temperature control
D1 (M32) : Fan switch
D4 (M34) : Combination flasher unit
D4 (M35) : Air mix door motor
D4 (M36) : Mode door motor
D4 (M37) : Time control unit
C1 (M38) : Rear window defogger switch
C1 (M40) : In-vehicle sensor
C3 * (M41) : Combination meter
C3 * (M42) : Combination meter
C3 (M43) : Combination meter
C1 (M44) : Combination meter
E3 (M47) : Radio
E3 (M48) : Radio
D4 * (M49) : To (F23)
E4 * (M50) : To (F24)
C2 (M51) : Body Ground
E4 (M53) : Cigarette lighter
E2 (M55) : Blower HI-relay
F3 (M56) : Thermo control amp.
F3 (M57) : Glove box lamp
F3 (M58) : Fresh vent door motor
F3 * (M59) : To (F21)
F4 * (M60) : To (F22)
E1 (M63) : Joint connector-7 (With audio amp. for USA)
F1 (M64) : Joint connector-8 (With audio amp. for Canada)
F1 (M65) : Joint connector-9 (Without audio amp. for Canada)
D2 (M66) : To (A4)
F2 (M67) : Fan control amp.
E2 (M69) : Intake door motor
E1 (M70) : Sunload sensor
F1 (M73) : Tweeter RH
G2 (M74) : To (D51)
G2 (M75) : To (D52)
G2 (M76) : Body ground
G3 (M77) : Body ground
F3 (M78) : Fan resistor
G2 (M79) : Blower motor
G3 (M80) : Daytime light control unit (For Canada)
G3 * (M81) : A/T control unit
G3 (M82) : Daytime light control unit (For Canada)
C1 (M83) : Diode
B2 (M84) : A/T shift lock switch (Without ASCD)
C4 (M85) : Door lock control unit
B3 (M106) : To (B31)
B4 (M107) : Data link connector for GST
E4 (M108) : Shift lock solenoid, park position switch, over-drive switch and A/T illumination (A/T models)
D1 (M109) : Clock (With active speaker audio system)

Diode (In joint connector-7 (M63), In joint connector-8 (M64), In joint connector-9 (M65))



Diode (M83)



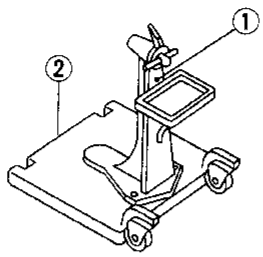
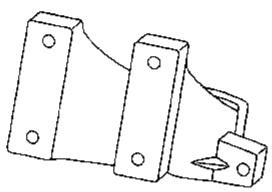
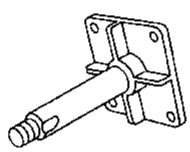
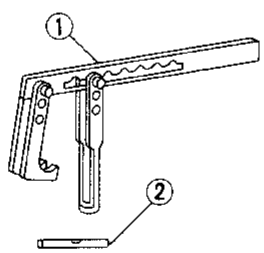
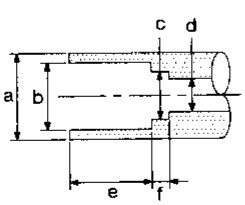
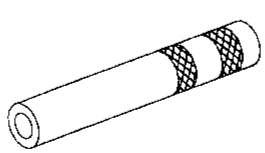
Engine Compartment

F5 (M101) : Power steering oil pressure switch
F5 (M102) : Front sensor RH (For ABS)
D5 (M103) : Body ground (For ABS)
G5 (M104) : Wiper motor
F5 (M105) : Horn (For theft warning system)

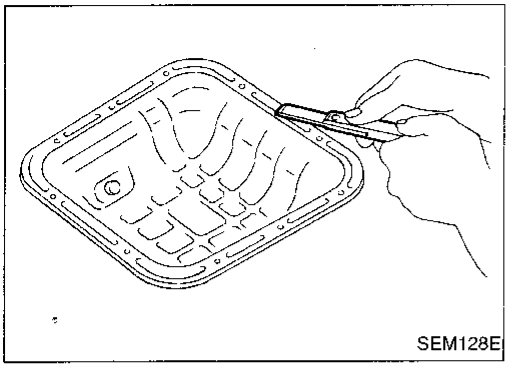
* : Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the on-board diagnostic system to light up the MIL as an open circuit detection.

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
ST0501S000 (—) Engine stand assembly ① ST05011000 (—) Engine stand ② ST05012000 (—) Base	Disassembling and assembling  NT042
KV10114300 (—) Engine sub-attachment	 NT239
KV10106500 (—) Engine stand shaft	 NT028
KV10109250 (J-26336-B) Valve spring compressor ① KV10109210 (—) Compressor ② KV10109220 (—) Adapter or (J-39773) Valve spring compressor kit	Disassembling and assembling valve components  NT021
KV10116300 (J-38955) Valve oil seal drift	Installing valve oil seal   **a: 25 (0.98) dia.** **b: 14.4 (0.567) dia.** **c: 11.8 (0.465) dia.** **d: 10 (0.39) dia.** **e: 11 (0.43)** **f: 9 (0.35)** Unit: mm (in) NT602

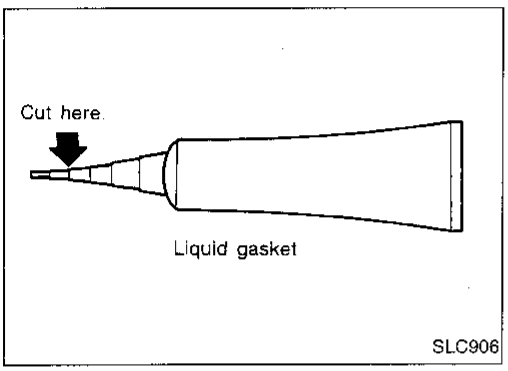
Installation (Cont'd)


SEM128E

6. Install steel oil pan.

a. Use a scraper to remove all traces of liquid gasket from mating surfaces.

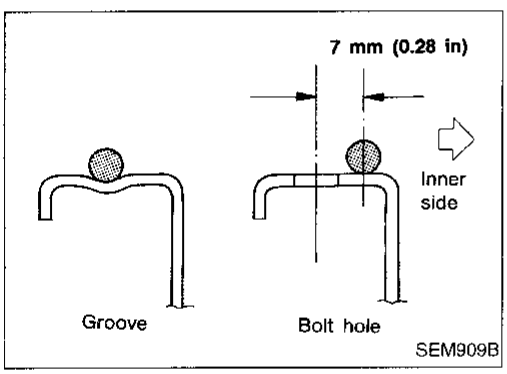
- Also remove traces of liquid gasket from mating surface of aluminum oil pan.



SLC906

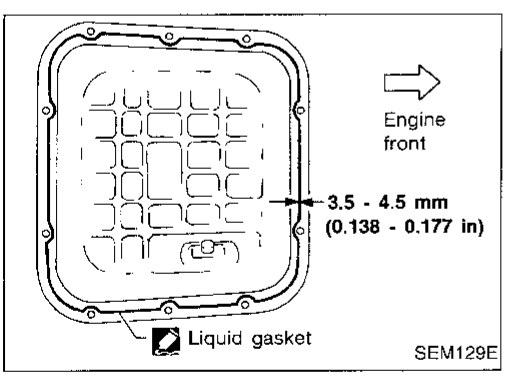
b. Apply a continuous bead of liquid gasket to mating surface of steel oil pan.

- **Use Genuine Liquid Gasket or equivalent.**



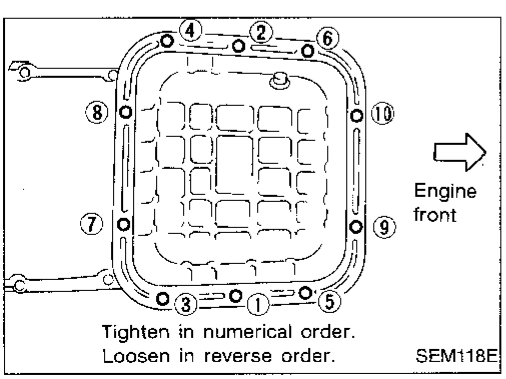
SEM909B

- **Apply to groove on mating surface.**
- **Allow 7 mm (0.28 in) clearance around bolt holes.**



SEM129E

- **Be sure liquid gasket diameter is 3.5 to 4.5 mm (0.138 to 0.177 in).**
- **Attaching should be done within 5 minutes after coating.**

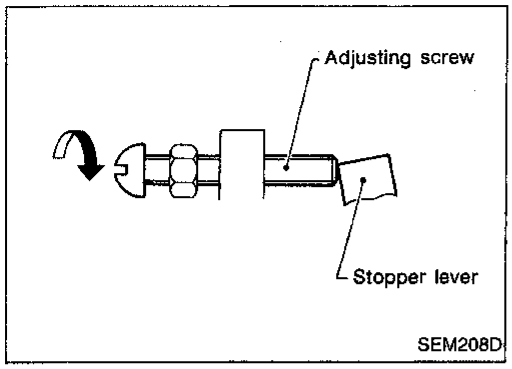


SEM118E

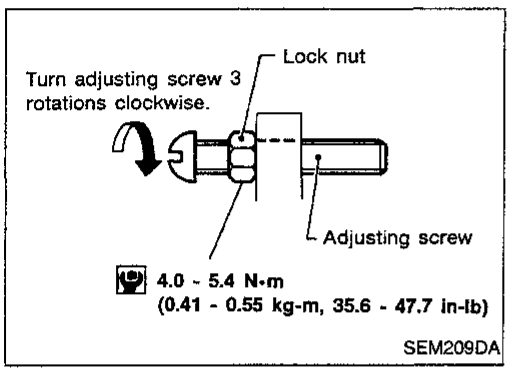
c. Install steel oil pan.

- Tighten bolts in numerical order shown.
- Wait at least 30 minutes before refilling engine oil.

Adjustment (Cont'd)



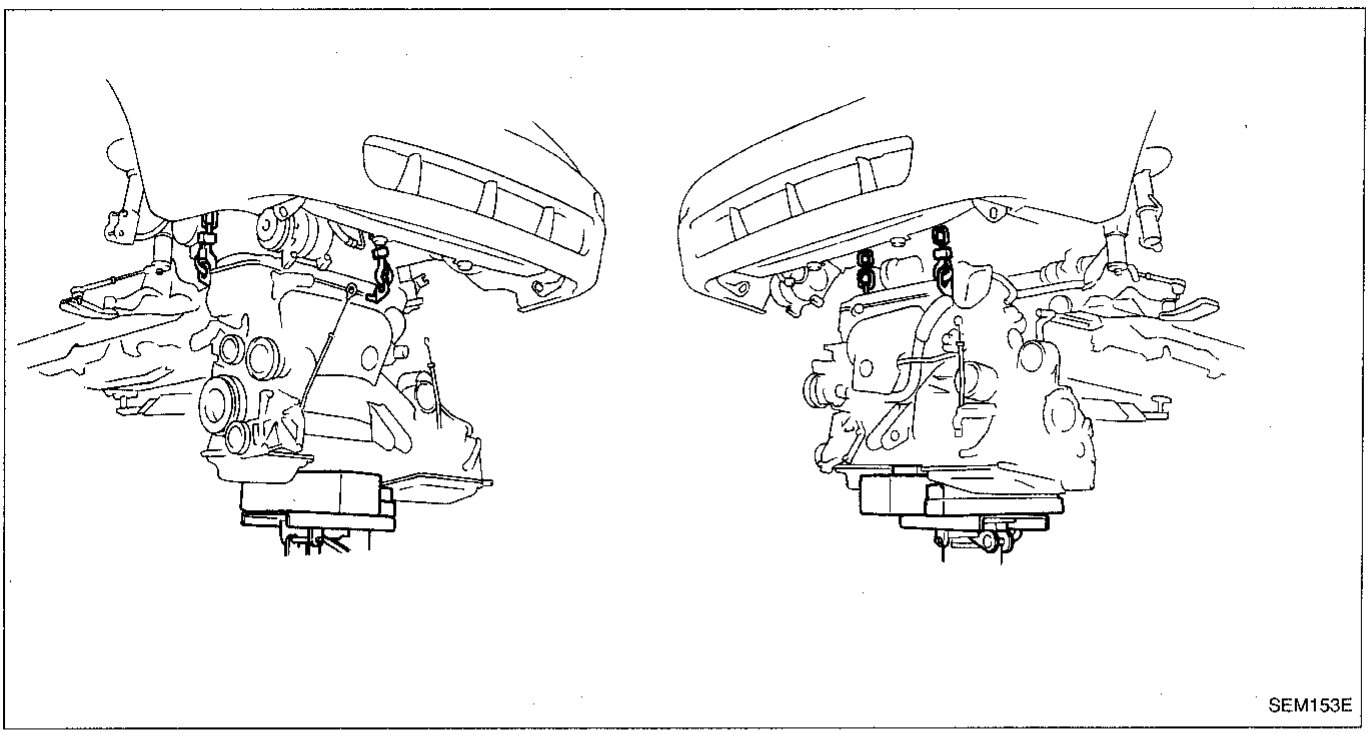
7. Turn adjusting screw until it touches stopper lever.
8. Release accel-drum.



9. Turn adjusting screw 3 rotations clockwise.
10. Tighten lock nut to specification.

Removal (Cont'd)

10. Remove engine with transaxle as shown.



Installation

Installation is in the reverse order of removal.

Inspection and Adjustment (Cont'd)

VALVE SPRING

Free height	mm (in)	45.79 (1.8028)
Pressure N (kg, lb) at height mm (in)		
Standard		471.7 (48.1, 106.1) at 26.06 (1.0260)
Limit		421.31 (42.96, 94.73) at 26.06 (1.0260)
Out-of-square	mm (in)	Less than 2.0 (0.079)

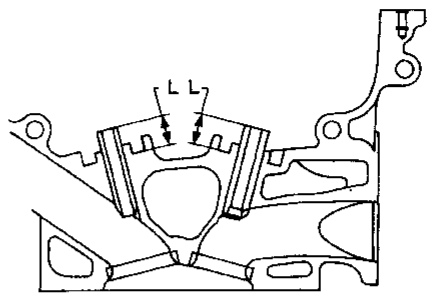
VALVE LIFTER

Unit: mm (in)

Valve lifter outer diameter	33.960 - 33.975 (1.3370 - 1.3376)
Lifter guide inner diameter	34.000 - 34.021 (1.3386 - 1.3394)
Clearance between lifter and filter guide	0.025 - 0.061 (0.0010 - 0.0024)

VALVE GUIDE

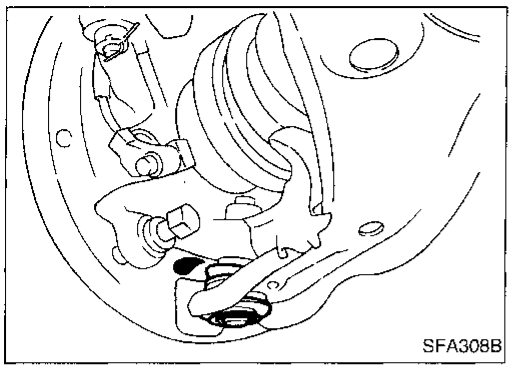
Unit: mm (in)



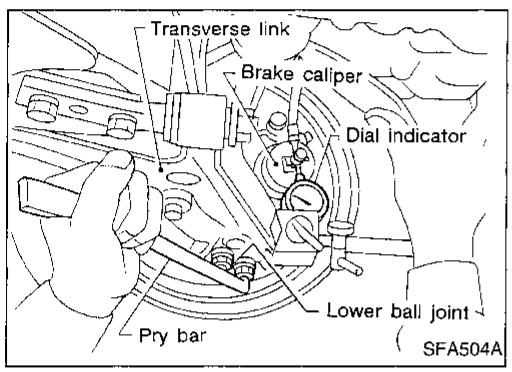
SEM301D

		Standard	Service
Valve guide Outer diameter	Intake & Exhaust	11.023 - 11.034 (0.4340 - 0.4344)	11.223 - 11.234 (0.4418 - 0.4423)
Valve guide Inner diameter (Finished size)	Intake	7.000 - 7.018 (0.2756 - 0.2763)	
	Exhaust	7.000 - 7.018 (0.2756 - 0.2763)	
Cylinder head valve guide hole diameter	Intake & Exhaust	10.975 - 10.996 (0.4321 - 0.4329)	11.175 - 11.196 (0.4400 - 0.4408)
Interference fit of valve guide		0.027 - 0.059 (0.0011 - 0.0023)	
		Standard	Limit
Stem to guide clearance	Intake	0.020 - 0.053 (0.0008 - 0.0021)	0.08 (0.0031)
	Exhaust	0.040 - 0.073 (0.0016 - 0.0029)	0.1 (0.004)
Valve deflection limit		0.2 (0.008)	
Projection length "L"		13.3 - 13.9 (0.524 - 0.547)	

Front Axle and Front Suspension Parts (Cont'd)


SFA308B

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

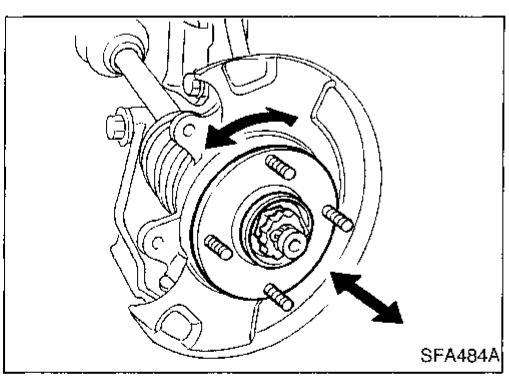


- Check suspension ball joint end play.

1. Jack up front of vehicle and set the stands.
2. Clamp dial indicator onto transverse link and place indicator tip on lower edge of brake caliper.
3. Make sure front wheels are straight and brake pedal is depressed.
4. Place a pry bar between transverse link and inner rim of road wheel.
5. While raising and releasing pry bar, observe maximum dial indicator value.

   Vertical end play:
   0 mm (0 in)

   If ball joint vertical end play exists, remove the transverse link and recheck the ball joint. Refer to FA-24.


SFA484A

Front Wheel Bearing

- Check that wheel bearings operate smoothly.
- Check axial end play.

  Axial end play:
  0.05 mm (0.0020 in) or less

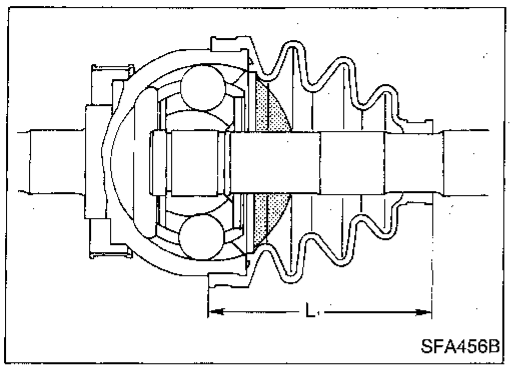
- If out of specification or wheel bearing does not turn smoothly, replace wheel bearing assembly. Refer to FA-10.

Front Wheel Alignment

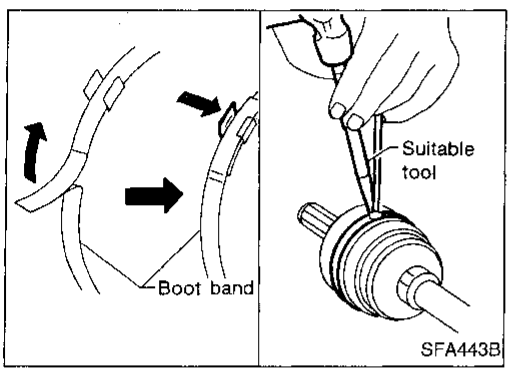
Before checking front wheel alignment, be sure to make a preliminary inspection with vehicle unladen*.

*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

Drive Shaft (Cont'd)



3. Pack drive shaft with specified amount of grease.
   Specified amount of grease:
   100 - 120 g (3.53 - 4.23 oz)
4. Make sure that boot is properly installed on the drive shaft groove.
   Set boot so that it does not swell and deform when its length is "L_1".
   Length "L_1":
   84.5 - 86.5 mm (3.327 - 3.406 in)



5. Lock new larger and smaller boot bands securely with a suitable tool.

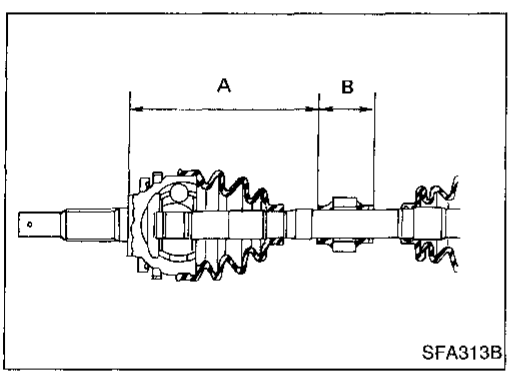
Dynamic damper

1. Use new damper bands when installing.
2. Install dynamic damper from stationary-joint side while holding it securely.

Length:

Unit: mm (in)

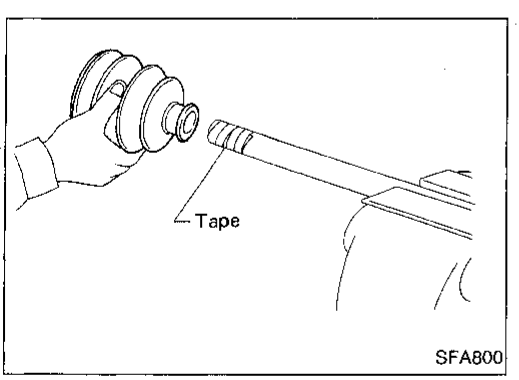
	A/T				M/T			
	RE4F04A		RE4F04V		RS5F50A		RS5F50V	
	RH	LH	RH	LH	RH	LH	RH	LH
"A"	203.1 (8.00)	185.6 (7.31)	203.1 (8.00)	174.6 (6.87)	203.1 (8.00)	185.6 (7.31)	203.1 (8.00)	180.1 (7.09)
"B"	70 (2.76)	50 (1.97)	70 (2.76)	50 (1.97)	70 (2.76)	50 (1.97)	70 (2.76)	50 (1.97)

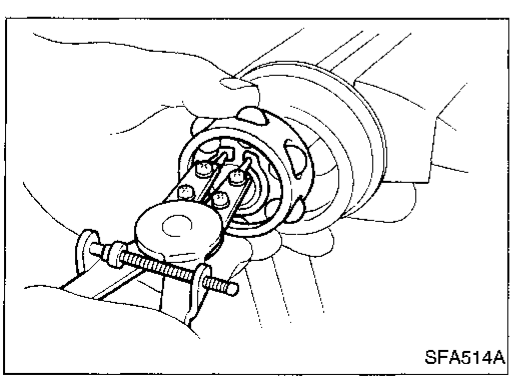


Transaxle side

1. Install boot and new small boot band on drive shaft.

Cover drive shaft serration with tape so as not to damage boot during installation.

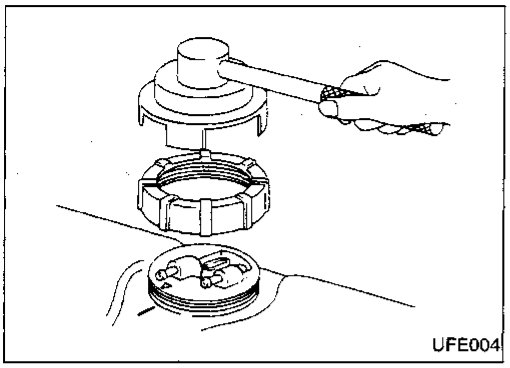




2. Install new snap ring "B", then securely install ball cage, inner race and balls as a unit, making sure the marks which were made during disassembly are properly aligned.
3. Install new snap ring "C".

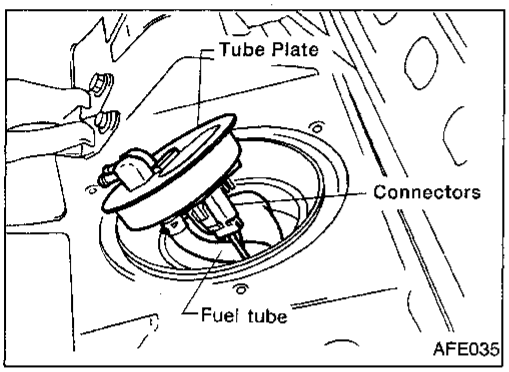
Fuel Tank (Cont'd)

FUEL PUMP AND GAUGE


UFE004

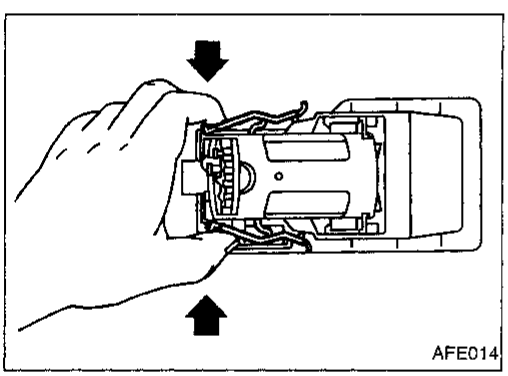
Removal

1. Release fuel pressure from fuel line.
   Refer to MA section ("Changing Fuel Filter", "ENGINE MAINTENANCE").
2. Remove rear seat back and bottom. Refer to BT section.
3. Remove inspection hole cover located under rear seat.
4. Disconnect connectors and fuel tubes.
5. Remove lock ring using SST KV999G0010 (J38879).



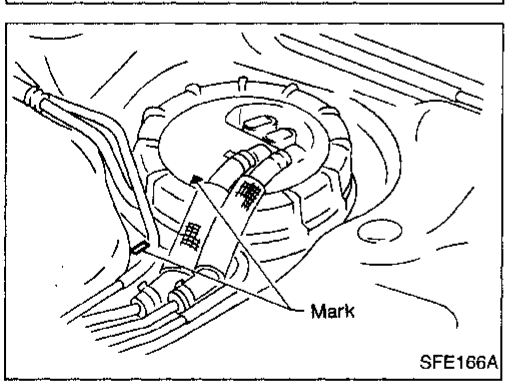
AFE035

6. Remove tube plate assembly, disconnect fuel tubes and electrical connectors.


AFE014

7. Remove fuel pump by pinching the two (2) tabs together as shown in the figure while lifting out of fuel tank bracket.

If fuel sending unit needs to be removed, pull up large tab on sending unit, opposite the end of the float. The sending unit lifts straight out of fuel tank bracket.



SFE166A

Installation

- **Installation procedure is basically the reverse order of removal.**

CAUTION:

- **Always replace O-ring with a new one.**
- **Align parts with alignment marks.**
- **Tighten lock ring to specified torque.**
- **After installation, run engine and check for leaks at connections.**

Engine Oils (Cont'd)

HEALTH PROTECTION PRECAUTIONS

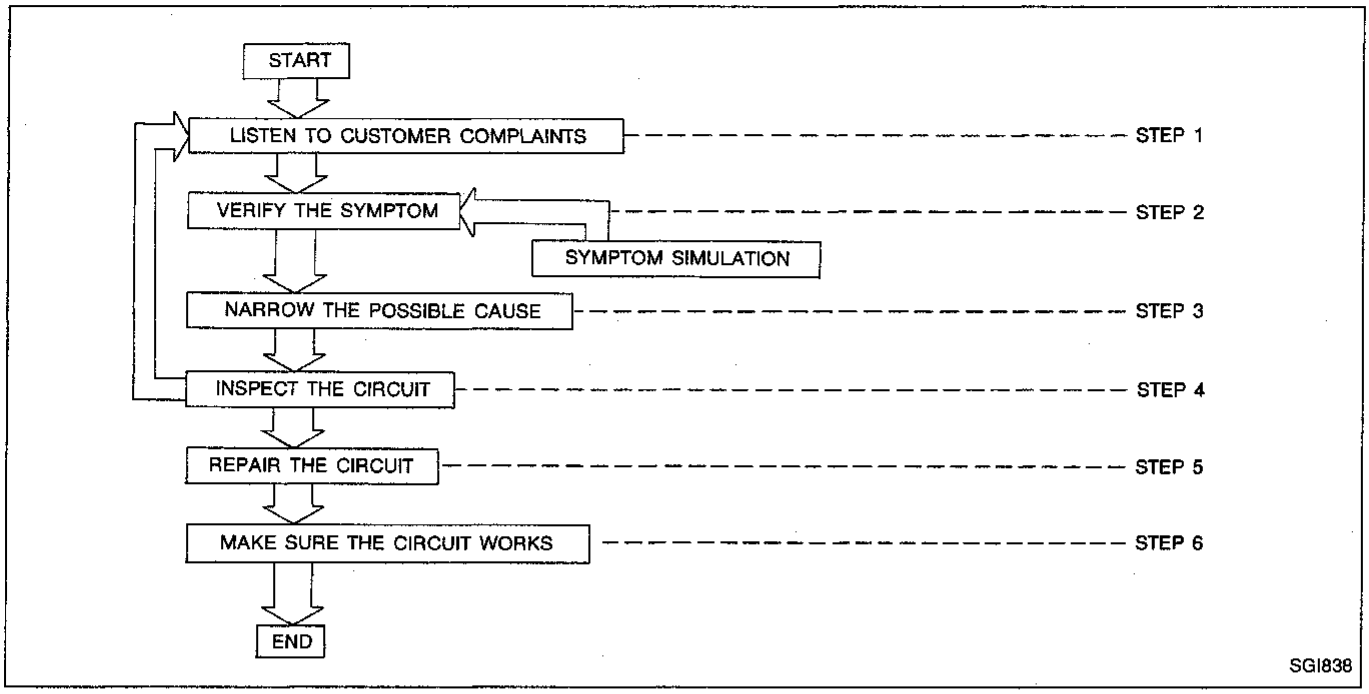
- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including oil resistant gloves where practical.
- Do not put oily rags in pockets.
- Avoid contaminating clothes, particularly underclothing, with oil.
- Heavily soiled clothing and oil-impregnated footwear should not be worn. Overalls must be cleaned regularly.
- First Aid treatment should be obtained immediately for open cuts and wounds.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin.
- Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
- Do not use gasoline, kerosene, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- If skin disorders develop, obtain medical advice without delay.
- Where practical, degrease components prior to handling.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.

ENVIRONMENTAL PROTECTION PRECAUTIONS

- Burning used engine oil in small space heaters or boilers can be recommended only for units of approved design. The heating system must meet the requirements of HM Inspectorate of Pollution for small burners of less than 0.4 MW. If in doubt check with the appropriate local authority and/or manufacturer of the approved appliance.
- Dispose of used oil and used oil filters through authorized waste disposal contractors to licensed waste disposal sites, or to the waste oil reclamation trade. If in doubt, contact the local authority for advice on disposal facilities.
- It is illegal to pour used oil onto the ground, down sewers or drains, or into water courses.

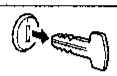
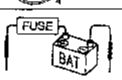
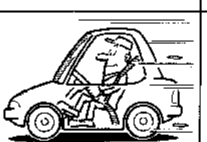
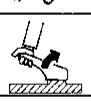
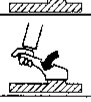
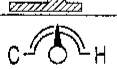
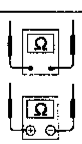
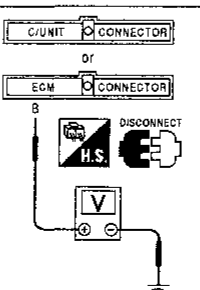
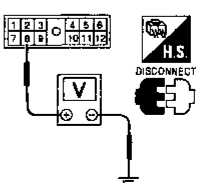
The regulations concerning the pollution of the environment will vary between regions.

Work Flow



STEP	DESCRIPTION
STEP 1	Get detailed information about the conditions and the environment when the incident occurred. The following are key pieces of information required to make a good analysis: **WHAT** Vehicle Model, Engine, Transmission and the System (i.e., Radio). **WHEN** Date, Time of Day, Weather Conditions, Frequency. **WHERE** Road Conditions, Altitude and Traffic Situation. **HOW** System Symptoms, Operating Conditions (Other Components Interaction). Service History and if any After Market Accessories have been installed.
STEP 2	Operate the system, road test if necessary. Verify the parameter of the incident. If the problem cannot be duplicated, refer to "Incident Simulation Tests" next page.
STEP 3	Get the proper diagnosis materials together including: POWER SUPPLY ROUTING System Operation Descriptions Applicable Service Manual Sections Identify where to begin diagnosis based upon your knowledge of system operation and customer comments.
STEP 4	Inspect the system for mechanical binding, loose connectors or wiring damage. Determine which circuits and components are involved and diagnose using the Power Supply Routing and Harness Layouts.
STEP 5	Repair or replace the incident circuit or component.
STEP 6	Operate the system in all modes. Verify the system works properly under all conditions. Make sure you have not inadvertently created a new incident during your diagnosis or repair steps.

Key to symbols signifying measurements or procedures

Symbol	Symbol explanation	Symbol	Symbol explanation
	Check after disconnecting the connector to be measured.		Procedure with Generic Scan Tool (GST, OBD-II scan tool).
	Check after connecting the connector to be measured.		Procedure without CONSULT or GST.
	Insert key into ignition switch.		A/C switch is "OFF".
	Remove key from ignition switch.		A/C switch is "ON".
	Turn ignition switch to "OFF" position.		REC switch is "ON".
	Turn ignition switch to "ON" position.		REC switch is "OFF".
	Turn ignition switch to "START" position.		DEF switch is "ON".
	Turn ignition switch from "OFF" to "ACC" position.		VENT switch is "ON".
	Turn ignition switch from "ACC" to "OFF" position.		Fan switch is "ON". (At any position except for "OFF" position)
	Turn ignition switch from "OFF" to "ON" position.		Fan switch is "OFF".
	Turn ignition switch from "ON" to "OFF" position.		Apply fused battery positive voltage directly to components.
	Do not start engine, check with engine stopped.		Drive vehicle.
	Start engine, check with engine running.		Disconnect battery negative cable.
	Apply parking brake.		Depress brake pedal.
	Release parking brake.		Release brake pedal.
	Check after engine is warmed up sufficiently.		Depress accelerator pedal.
	Voltage should be measured with a voltmeter.		Release accelerator pedal.
	Circuit resistance should be measured with an ohmmeter.		Pin terminal check for SMJ type ECM and A/T control unit connectors. **For details regarding the terminal arrangement, refer to the foldout page.** 
	Current should be measured with an ammeter.		
	Procedure with CONSULT.		
	Procedure without CONSULT.		

SAE J1930 Terminology List (Cont'd)

***: Not applicable

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Manifold surface temperature	MST	***
Manifold surface temperature sensor	MSTS	***
Manifold vacuum zone	MVZ	***
Manifold vacuum zone sensor	MVZS	***
Mass air flow sensor	MAFS	Air flow meter
Mixture control solenoid valve	MC solenoid valve	Air-fuel ratio control solenoid valve
Multiport fuel injection system	MFI system	Fuel injection control
Neutral position switch	***	Neutral switch
Non-volatile random access memory	NVRAM	***
On-board diagnostic system	OBD system	Self-diagnosis
Open loop	OL	Open loop
Oxidation catalyst	OC	Catalyst
Oxidation catalytic converter system	OC system	***
Oxygen sensor	O2S	Exhaust gas sensor
Park position switch	***	Park switch
Park/neutral position switch	PNP switch	Park/neutral switch
Periodic trap oxidizer system	PTOX system	***
Powertrain control module	PCM	***
Programmable read only memory	PROM	***
Pulsed secondary air injection control solenoid valve	PAIRC solenoid valve	AIV control solenoid valve
Pulsed secondary air injection system	PAIR system	Air induction valve (AIV) control
Pulsed secondary air injection valve	PAIR valve	Air induction valve
Random access memory	RAM	***
Read only memory	ROM	***
Scan tool	ST	***
Secondary air injection pump	AIR pump	***
Secondary air injection system	AIR system	***
Sequential multiport fuel injection system	SFI system	Sequential fuel injection
Service reminder indicator	SRI	***
Simultaneous multiport fuel injection system	***	Simultaneous fuel injection
Smoke puff limiter system	SPL system	***
Supercharger	SC	***
Supercharger bypass	SCB	***
System readiness test	SRT	***
Tank fuel temperature sensor	***	***
Thermal vacuum valve	TVV	Thermal vacuum valve
Three way catalyst	TWC	Catalyst
Three way catalytic converter system	TWC system	***
Three way + oxidation catalyst	TWC + OC	Catalyst

Refrigeration Cycle

REFRIGERANT FLOW

The refrigerant flow is in the standard pattern. Refrigerant flows through the compressor, condenser, liquid tank, evaporator, and back to the compressor.
The refrigerant evaporation through the evaporator coil is controlled by an externally equalized expansion valve, located inside the evaporator case.

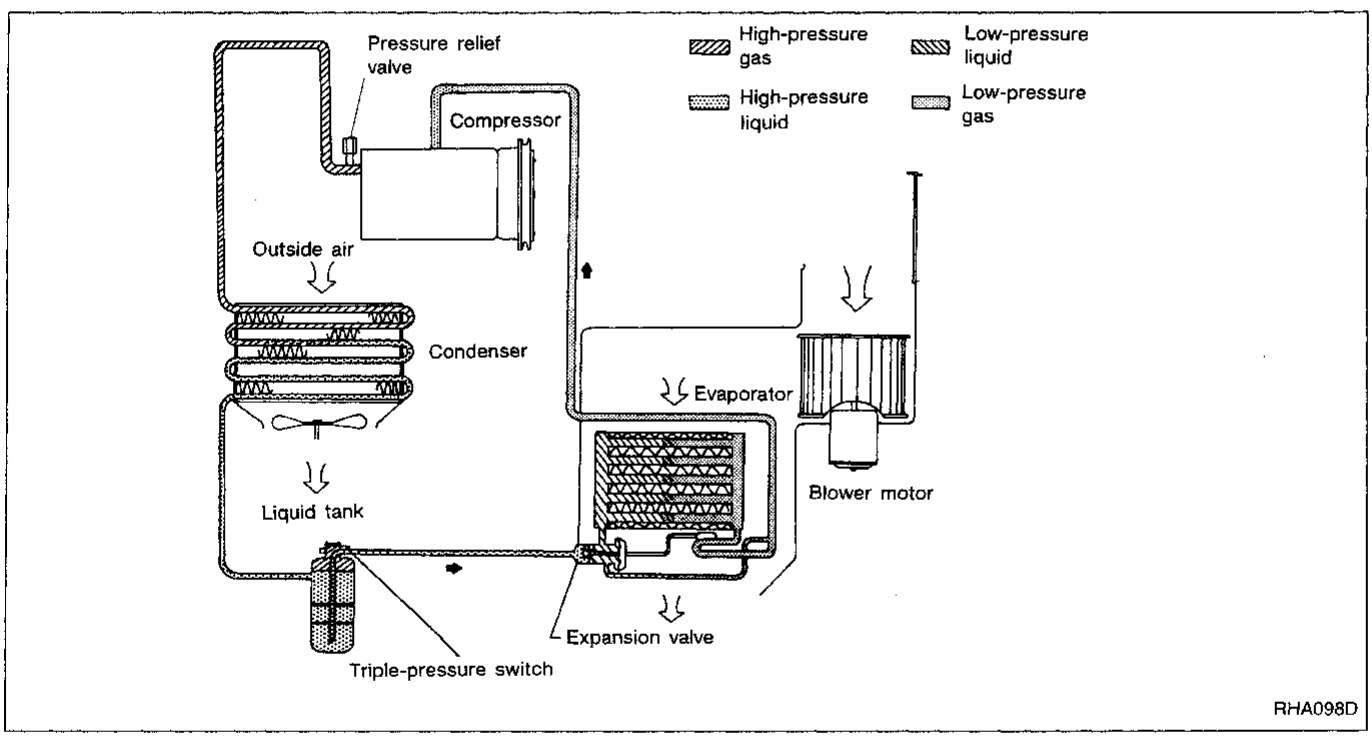
REFRIGERANT SYSTEM PROTECTION

Triple-pressure switch

The triple- or dual-pressure switch is located on the liquid tank. If the system pressure rises or falls out of specifications, the switch opens to interrupt compressor clutch operation. The triple-pressure switch closes to turn on the cooling fan to reduce system pressure (USA model only).

Pressure relief valve

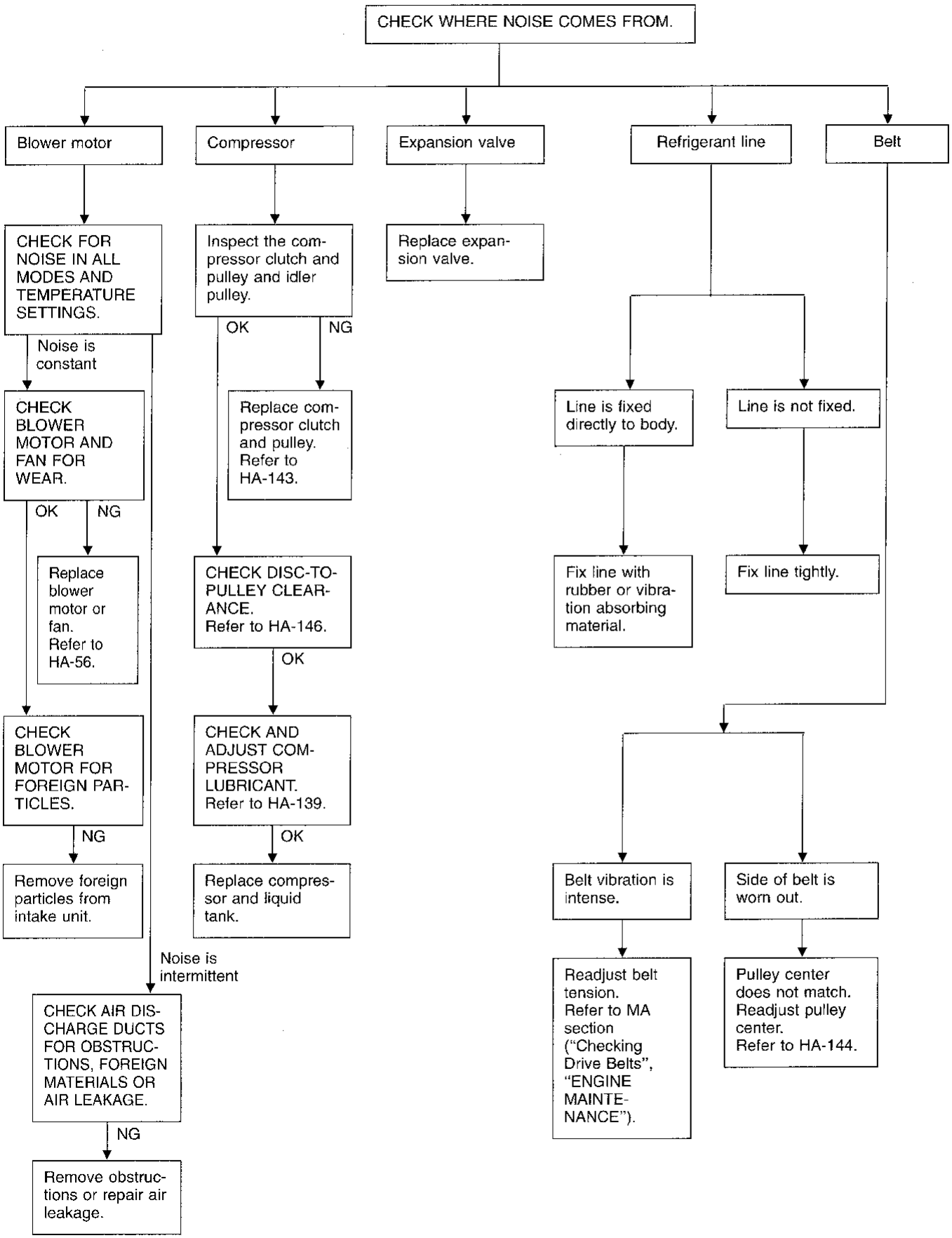
The refrigerant system is protected by a pressure relief valve. The valve is located on the end of the flexible high pressure hose near the compressor. When refrigerant system pressure increases abnormally [over 3,727 kPa (38 kg/cm^2, 540 psi)], the relief valve's port opens. The valve then releases refrigerant into the atmosphere.



Preliminary Check (Cont'd)

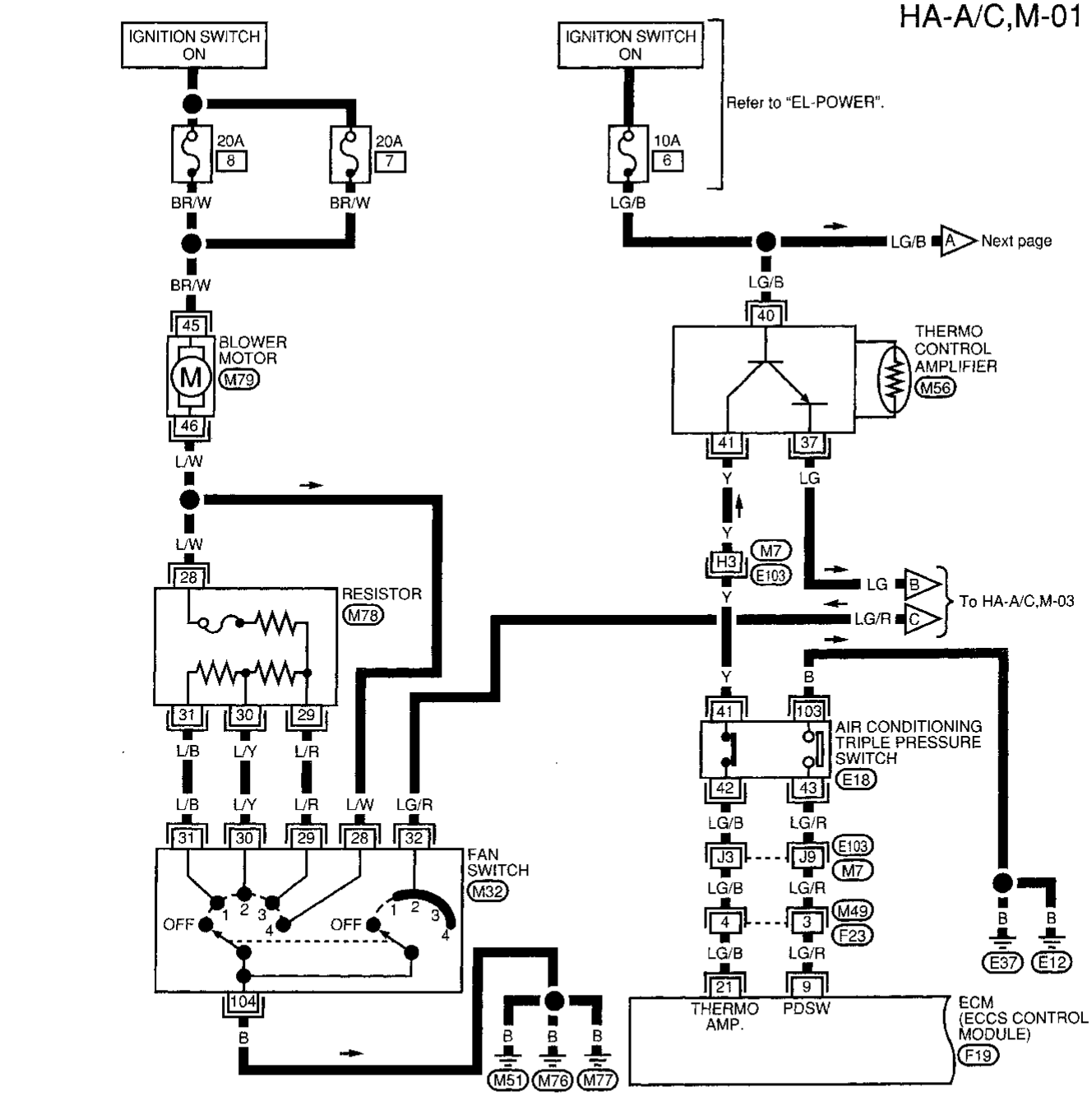
PRELIMINARY CHECK 5

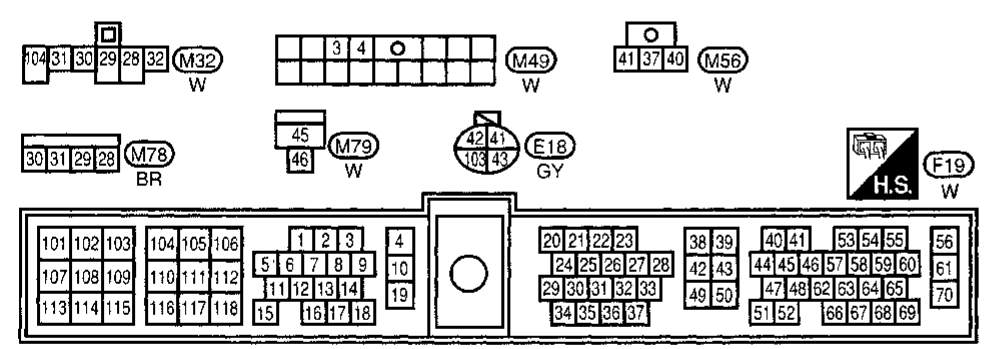
Noise.



Wiring Diagram –A/C, M–

HA-A/C,M-01

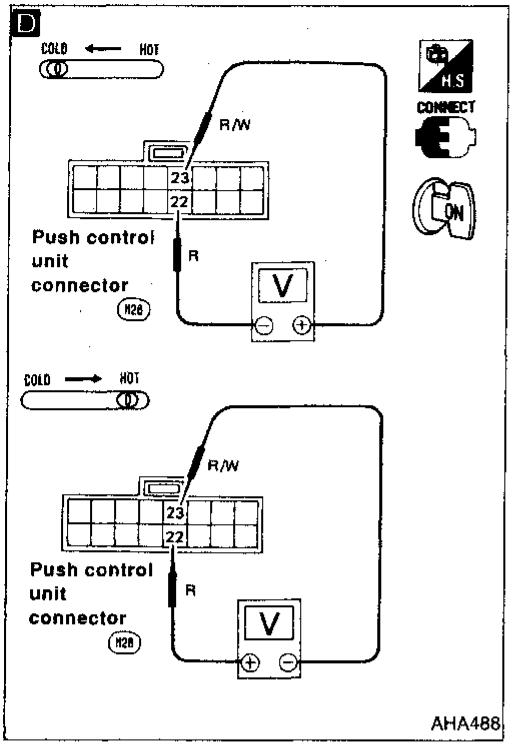




Refer to last page (Foldout page).
M7, E103

AHA463-A

Diagnostic Procedure 4 (Cont'd)



Ⓐ

D

CHECK FOR PUSH CONTROL UNIT OUTPUT.

Do approx. 12 volts exist between push control unit harness terminal No. ㉒ and ㉓ when temperature lever is slid from "HOT" to "COLD" or when temperature lever is slid from "COLD" to "HOT"?

Terminal No.		Air mix door motor	
㉒	㉓	Air mix door operation	Direction of linkage rotation
⊖	⊕	HOT → COLD	Clockwise
⊕	⊖	COLD → HOT	Counterclockwise
⊖	⊖	STOP	STOP

No → Replace push control unit.

Yes

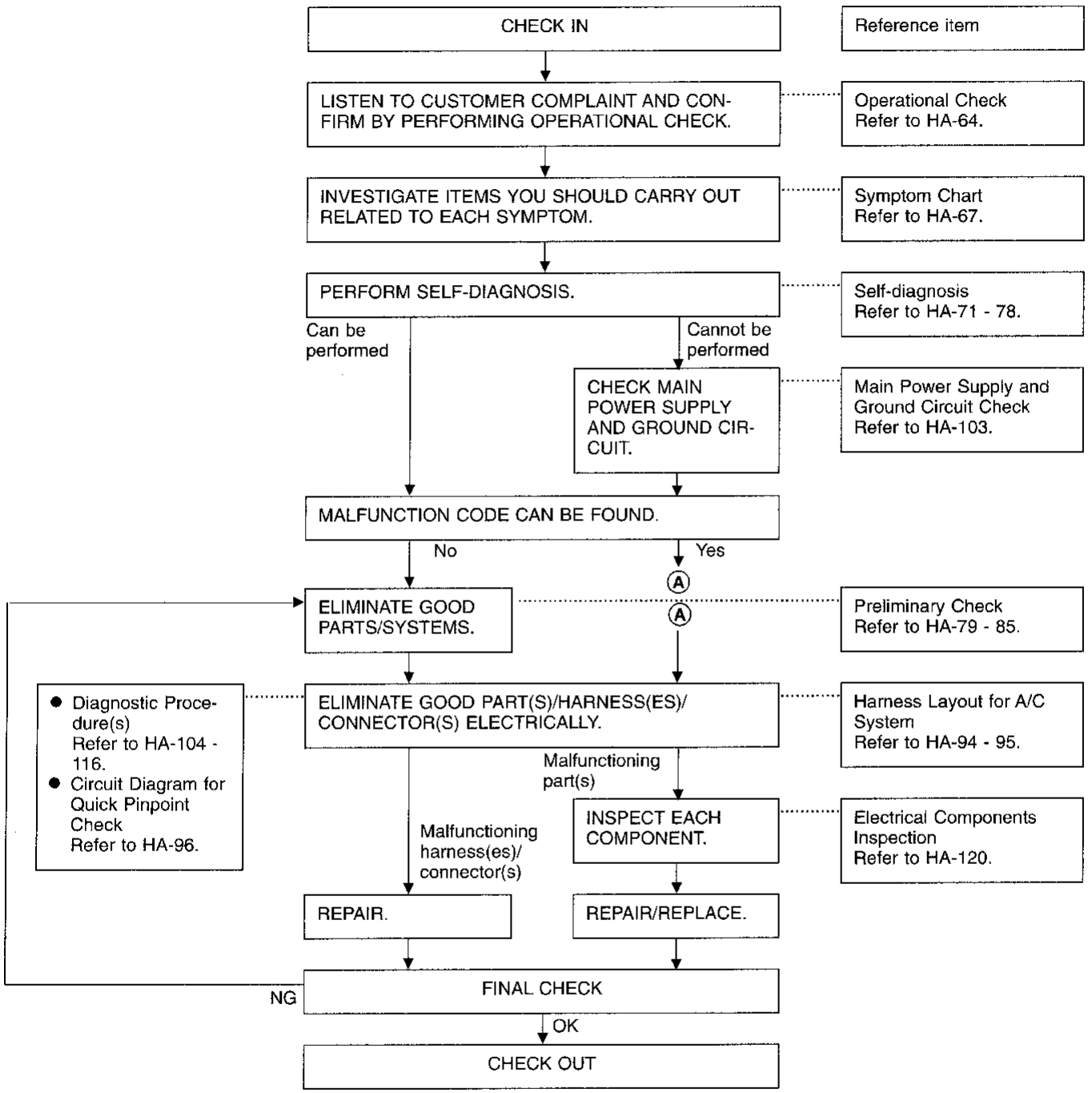
CHECK AIR MIX DOOR.
Refer to HA-58.

OK

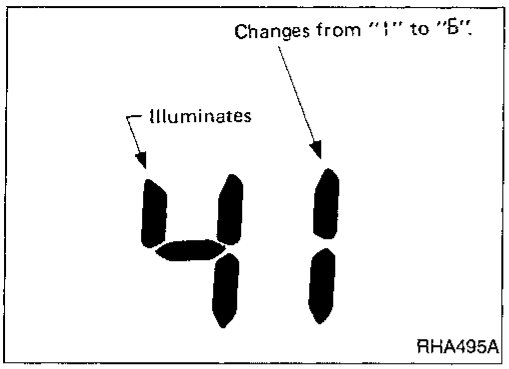
Replace air mix door motor.

How to Perform Trouble Diagnoses for Quick and Accurate Repair

WORK FLOW



Self-diagnosis (Cont'd)



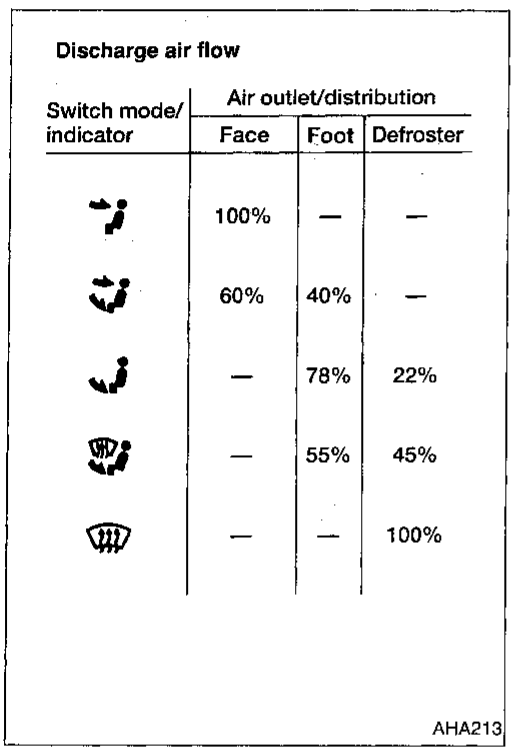
STEP 4: Checks operation of each actuator

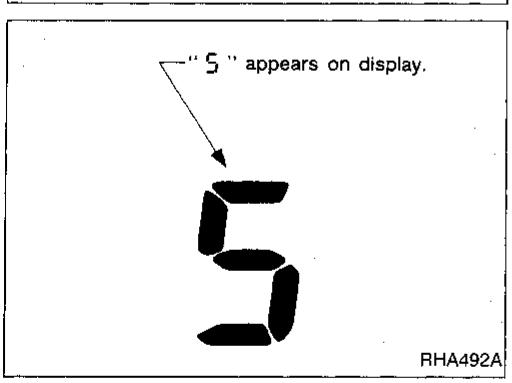
Start engine and run at operating temperature.
Display shows "41" in STEP 4 mode.
When (DEF) switch is pressed one time, display shows "42". Thereafter, each time the switch is pressed, display advances one number at a time, up to "46", then returns to "41".

The auto amplifier will forcefully transmit an output to the affected actuators in response to code No. shown on display, as indicated in table below.

Checks must be made visually, by listening to any noise, or by touching air outlets with your hand, etc. for improper operation.
Operating condition of each actuator cannot be checked by indicators.

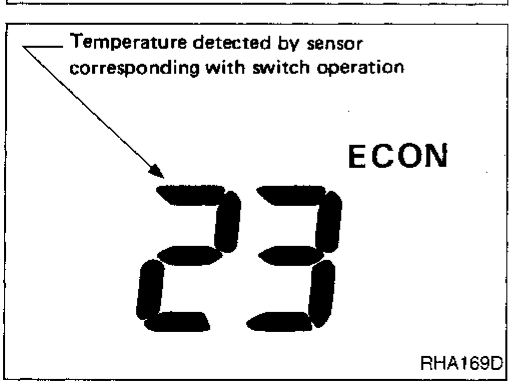
Actuator	Code No.					
	41	42	43	44	45	46
Mode door	VENT	B/L	B/L	FOOT	F/D	DEF
Intake door	REC	REC	20% FRE	FRE	FRE	FRE
Air mix door	Full Cold	Full Cold	Full Hot	Full Hot	Full Hot	Full Hot
Fresh vent door	OPEN	OPEN	CLOSE	CLOSE	CLOSE	CLOSE
Blower motor V	4 - 5	9 - 11	7 - 9	7 - 9	7 - 9	10 - 12
Compressor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





STEP 5: Checks temperature detected by sensors

Display shows "5" in STEP 5 mode.



- When (DEF) switch is pressed one time, display shows temperature detected by ambient sensor.
- When (DEF) switch is pressed second time, display shows temperature detected by in-vehicle sensor.
- ECON indicates display shows negative temperature reading.
- When (DEF) switch is pressed third time, display returns to original presentation "5".

Performance Chart

TEST CONDITION

Before conducting performance test, disconnect ambient sensor harness connector and make short circuit using jumper cable.

Testing must be performed as follows:

Vehicle location: Indoors or in the shade (in a well ventilated place)
Doors: Closed
Door window: Open
Hood: Open
TEMP. setting: 18°C (65°F)
AUTO switch: ON
REC switch: (Recirculation) ON
Fan speed: MAX.
Engine speed: 1,500 rpm

Operate the air conditioning system for 10 minutes before taking measurements.

TEST READING

Recirculating-to-discharge air temperature table

Inside air at blower assembly inlet for recirculation*		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	4.0 - 5.4 (39 - 42)
	25 (77)	4.2 - 5.6 (40 - 42)
	30 (86)	8.5 - 11.1 (47 - 52)
	35 (95)	13.5 - 16.7 (56 - 62)
	40 (104)	18.5 - 22.3 (65 - 72)
60 - 70	20 (68)	5.4 - 6.8 (42 - 44)
	25 (77)	5.6 - 8.0 (42 - 46)
	30 (86)	11.1 - 14.1 (52 - 57)
	35 (95)	16.7 - 20.3 (62 - 69)
	40 (104)	22.3 - 26.5 (72 - 80)

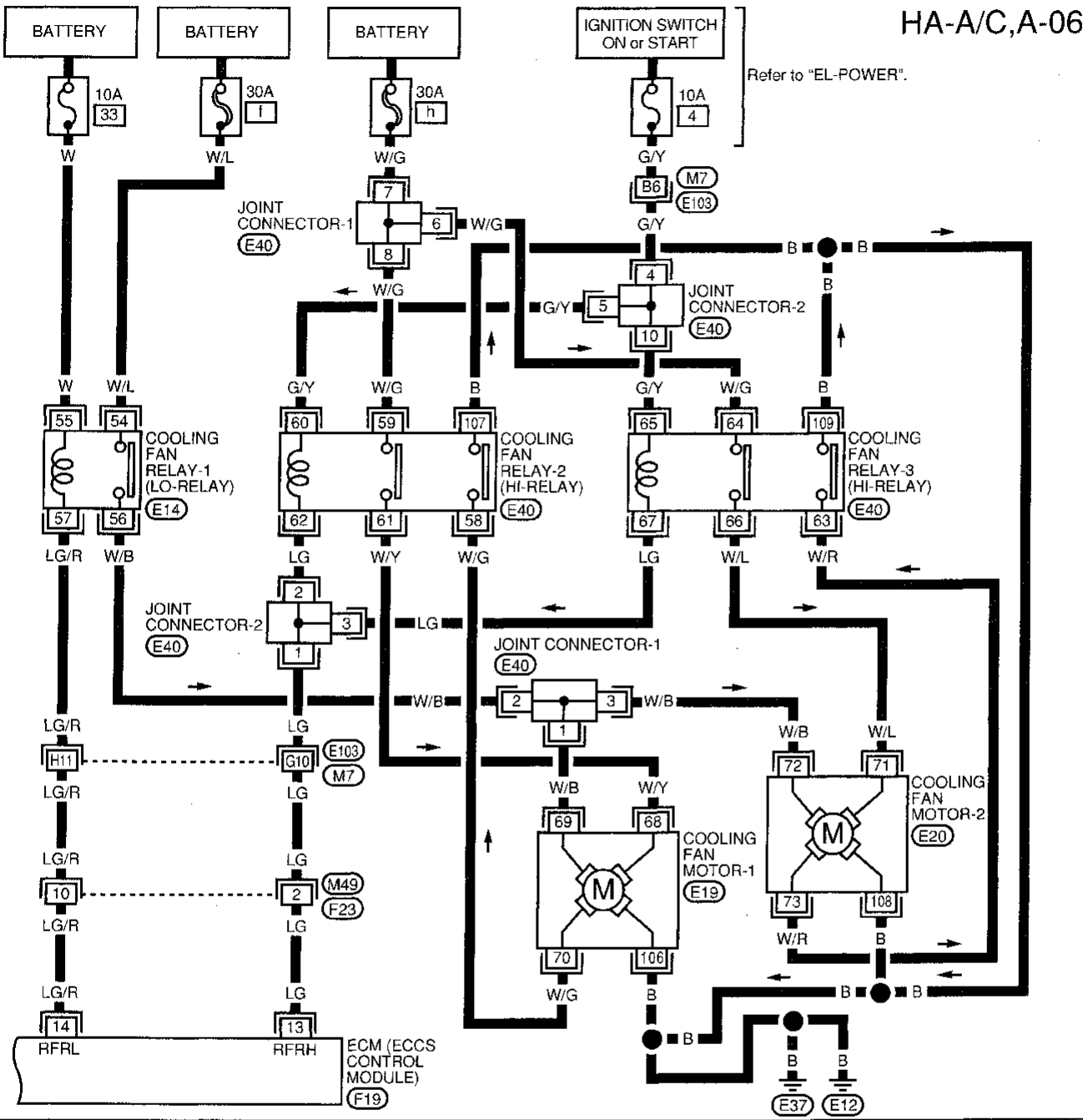
* Thermometer should be placed at intake unit RH side of instrument panel.

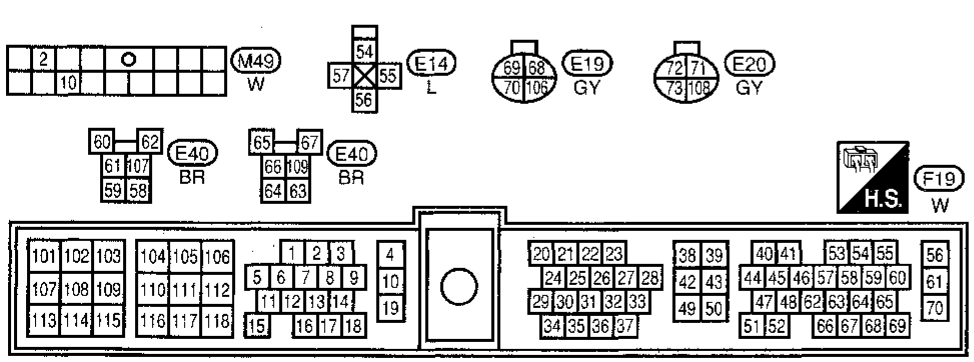
Ambient air temperature-to-operating pressure table

Ambient air		High-pressure (Discharge side) kPa (kg/cm^2, psi)	Low-pressure (Suction side) kPa (kg/cm^2, psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	834 - 1,098 (8.5 - 11.2, 121 - 159)	122.6 - 161.8 (1.25 - 1.65, 17.8 - 23.5)
	25 (77)	1,049 - 1,363 (10.7 - 13.9, 152 - 198)	137.3 - 181.4 (1.4 - 1.85, 19.9 - 26.3)
	30 (86)	1,226 - 1,618 (12.5 - 16.5, 178 - 235)	152.0 - 201.0 (1.55 - 2.05, 22.0 - 29.2)
	35 (95)	1,255 - 1,716 (12.8 - 17.5, 182 - 249)	166.7 - 230.5 (1.7 - 2.35, 24.2 - 33.4)
	40 (104)	1,540 - 2,030 (15.7 - 20.7, 223 - 294)	201.0 - 289.3 (2.05 - 2.95, 29.2 - 41.9)

If pressure is not within range, refer to HA-90 "Trouble Diagnoses for Abnormal Pressure".

Wiring Diagram –A/C, A– (Cont'd)

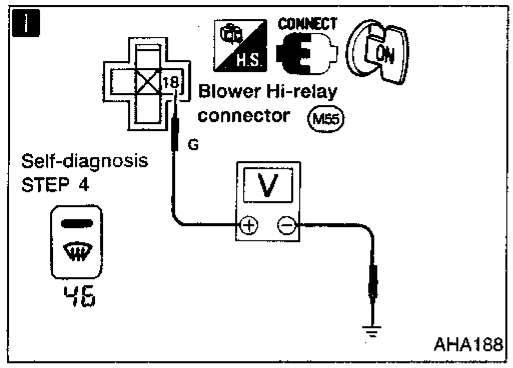


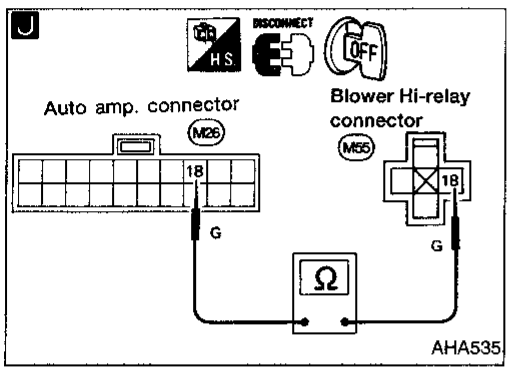


Refer to last page (Foldout page).
M7, E103
E40

AHA465-F

Diagnostic Procedure 9 (Cont'd)





Ⓑ

I

CHECK FOR AUTO AMP. OUTPUT.
Set up Self-diagnosis STEP 4.
Measure voltage across blower Hi-relay harness terminal No. ⑱ and body ground.

Code No.	Terminal No. ⊕	Terminal No. ⊖	Voltage
46	⑱	Body ground	Less than approx. 1.5V

NG → Disconnect blower Hi-relay and auto amp. harness connectors.

J Note

Does continuity exist between blower Hi-relay harness terminal No. ⑱ and auto amp. harness terminal No. ⑱?
Continuity should exist.
If OK, check harness for short.

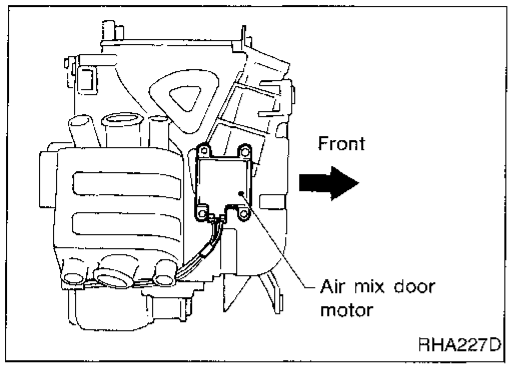
Yes → Replace auto amp.

OK → Replace blower motor.

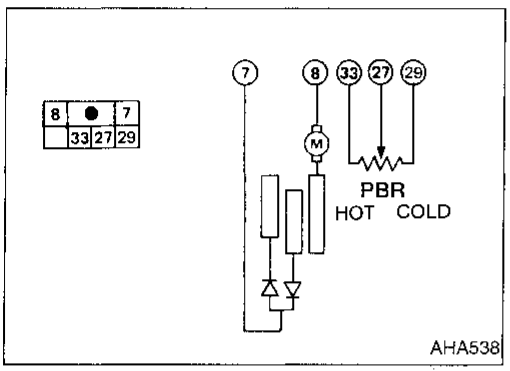
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Control System Output Components (Cont'd)

AIR MIX DOOR MOTOR

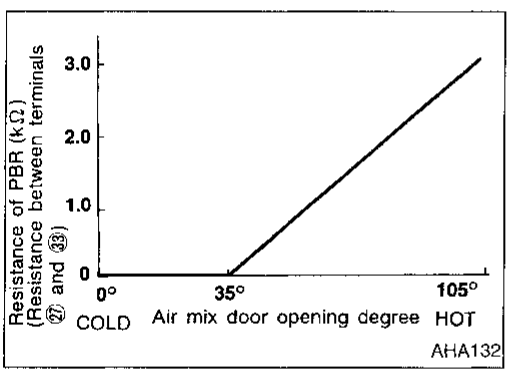


The air mix door motor is attached to the bottom of the heater unit. It rotates so that the air mix door is opened to a position set by the auto amplifier. Motor rotation is conveyed through a shaft and air mix door position. It is then fed back to the auto amplifier by PBR built-in air mix door motor.



Air mix door operation

7	8	Air mix door operation	Direction of lever movement
⊕	⊖	COLD → HOT	Clockwise (Toward passenger compartment)
⊖	⊖	STOP	STOP
⊖	⊕	HOT → COLD	Counterclockwise (Toward engine compartment)



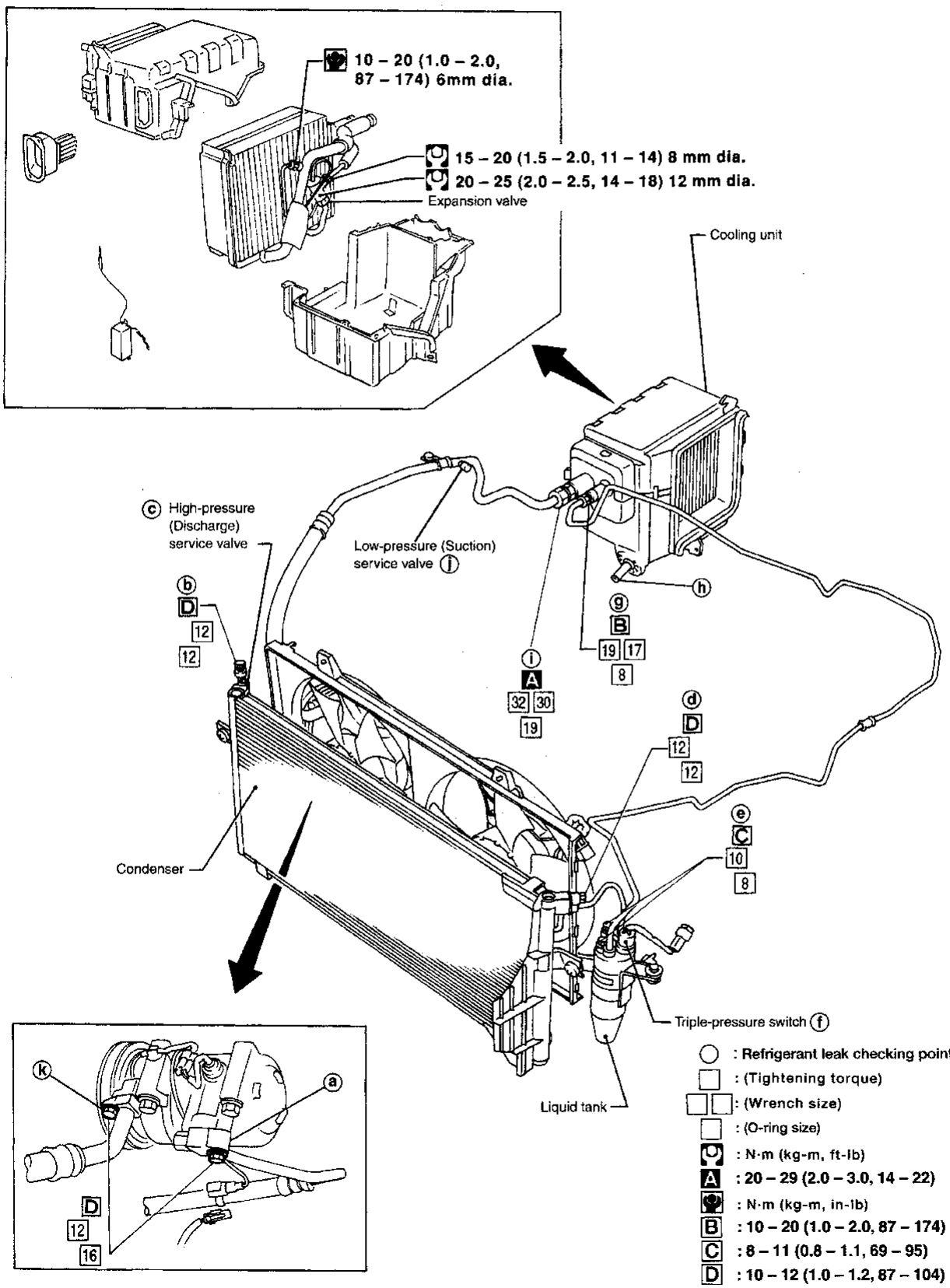
PBR characteristics

Measure voltage between terminals 27 and 33 at vehicle harness side.

Refrigerant Lines

- Refer to HA-4.

SEC. 214•271•274•276



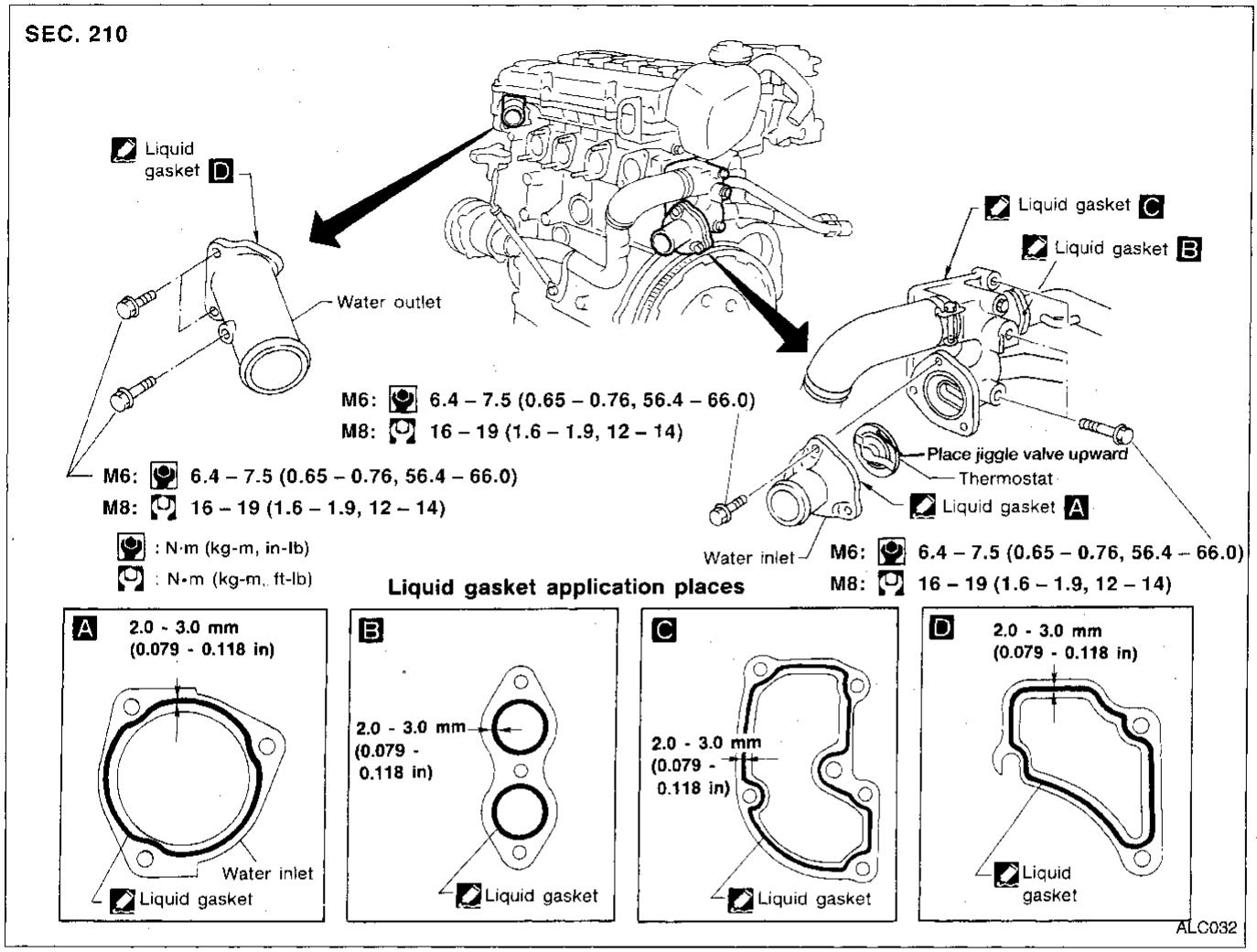
AHA469

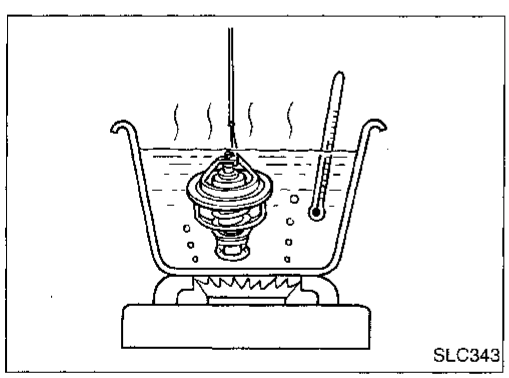
P

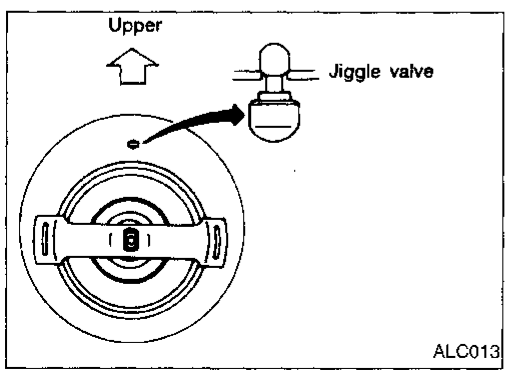
R

S

Thermostat







Be careful not to spill coolant over engine compartment. Use a rag to absorb coolant.

INSPECTION

1. Check valve seating condition at normal room temperatures. It should seat tightly.
2. Check valve opening temperature and maximum valve lift.

		Standard
Valve opening temperature	°C (°F)	76.5 (170)
Valve lift	mm/°C (in/°F)	More than 10/90 (0.39/194)

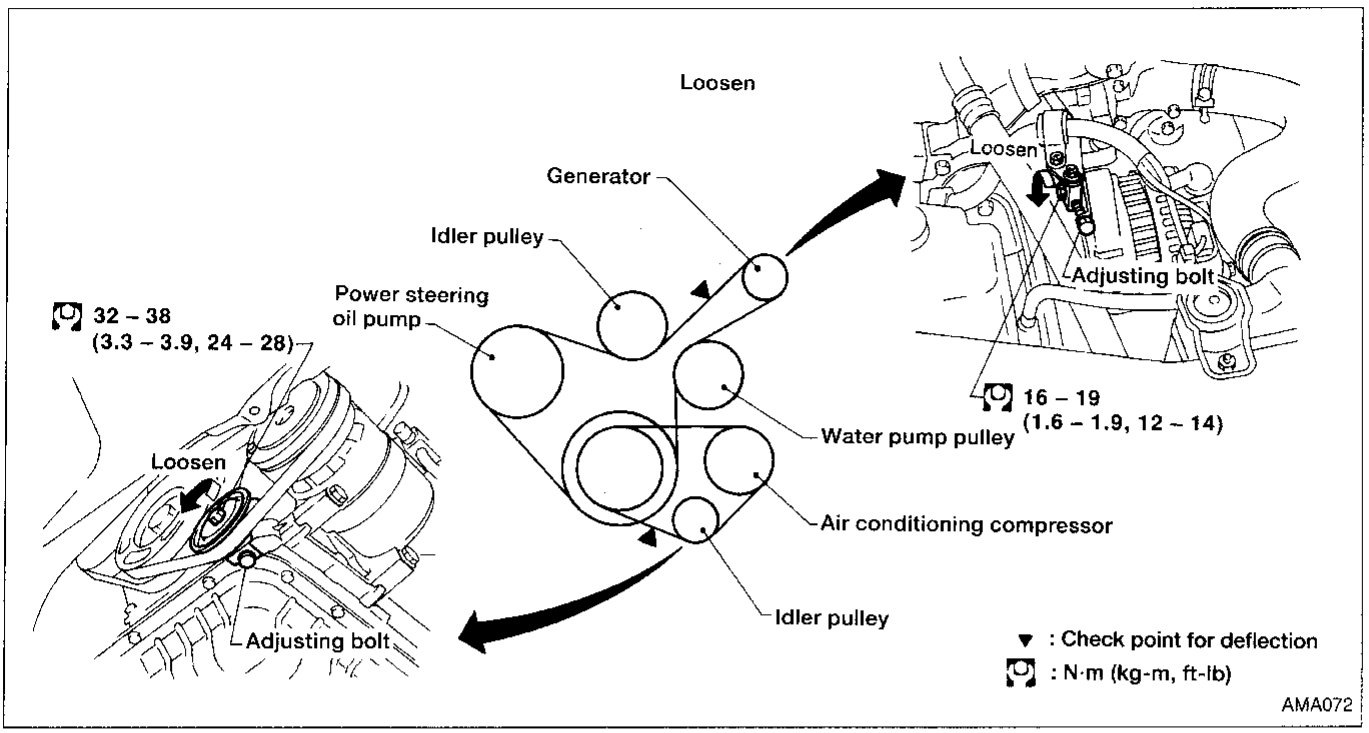
3. Then check if valve is closed at 5°C (9°F) below valve opening temperature.

INSTALLATION

Install thermostat with jiggle valve or air bleeder at upper side.

- **Apply a continuous bead of liquid gasket to mating surface of water inlet.**
- **After installation, run engine for a few minutes, and check for leaks.**

Checking Drive Belts



1. Inspect belts for cracks, fraying, wear or oil. If necessary, replace.
2. Inspect drive belt deflections by pushing midway between pulleys.

Inspect drive belt deflections when engine is cold.
Adjust if belt deflections exceed the limit.

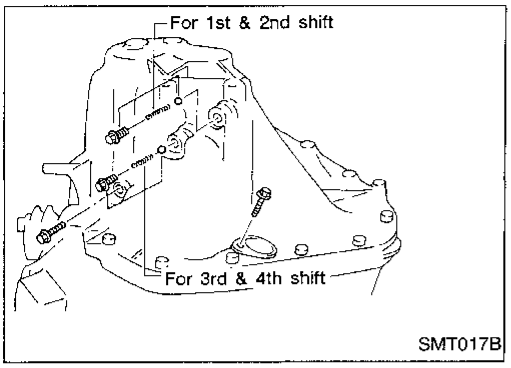
Belt deflection:

Unit: mm (in)

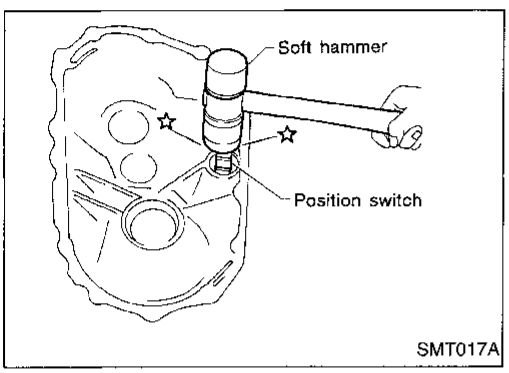
	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Generator & Power steering oil pump	8 (0.31)	6 - 7 (0.24 - 0.28)	5 - 6 (0.20 - 0.24)
Air conditioning compressor	10 (0.39)	7 - 8 (0.28 - 0.31)	6 - 7 (0.24 - 0.28)
Applied pushing force	98 N (10 kg, 22 lb)		

SECTION MT

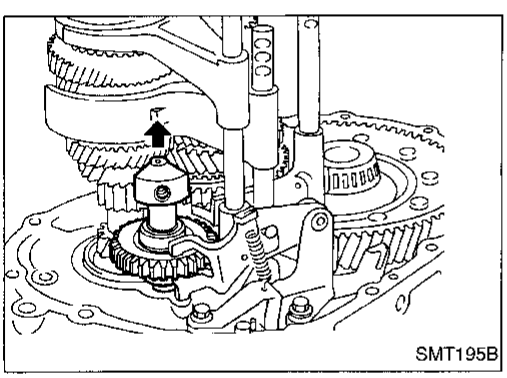
CONTENTS



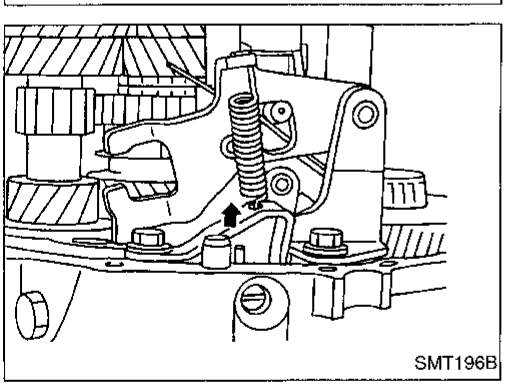
1. Before removing transmission case, remove bolts and plugs as shown left.
2. Remove transmission case.



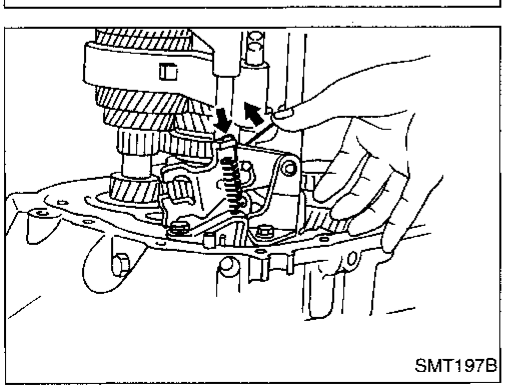
3. Remove position switch.



4. Mesh 4th gear, then remove reverse idler shaft and reverse idler gear.

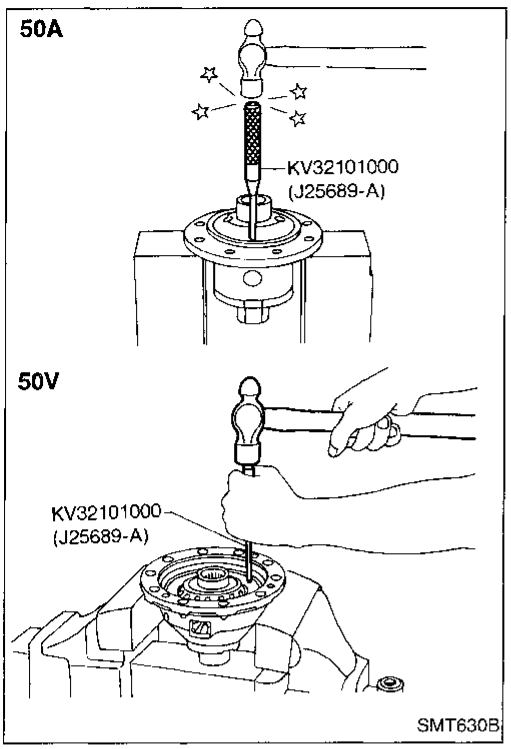


5. Pull out retaining pin.

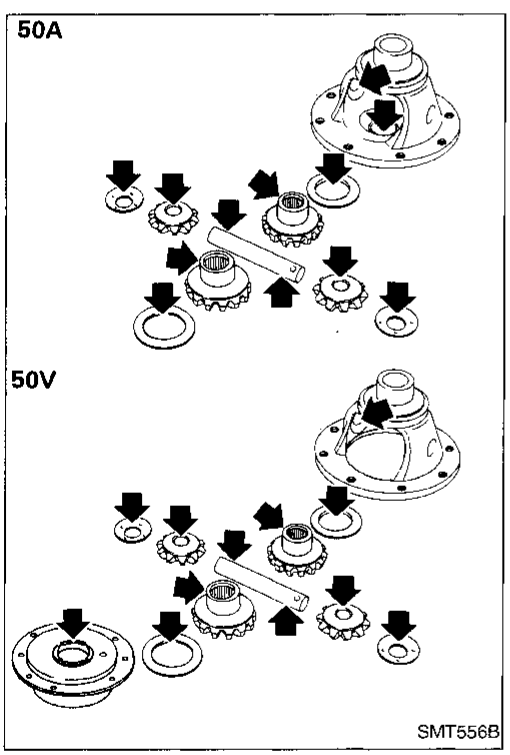


6. Remove reverse lever spring and reverse lock spring from reverse lever assembly.

Final Drive (Cont'd)



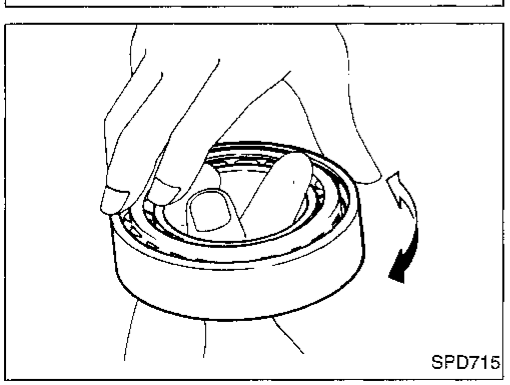
5. Drive out retaining pin and draw out pinion mate shaft.
6. Remove pinion mate gears and side gears.



INSPECTION

Gear, washer, shaft and case

- Check mating surfaces of differential case, viscous coupling, side gears and pinion mate gears.
- Check washers for wear.



Bearing

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing tapered roller bearing, replace outer and inner race as a set.**

Inspection and Adjustment

GEAR END PLAY

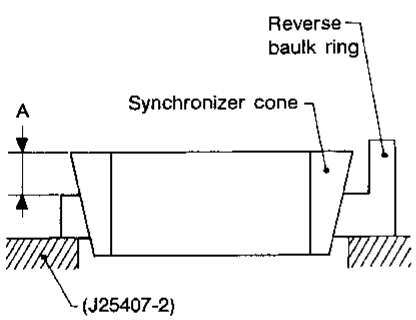
Gear	End play mm (in)
1st main gear	0.23 - 0.43 (0.0091 - 0.0169)
2nd main gear	0.23 - 0.58 (0.0091 - 0.0228)
3rd input gear	0.23 - 0.43 (0.0091 - 0.0169)
4th input gear	0.25 - 0.55 (0.0098 - 0.0217)
5th input gear	0.23 - 0.48 (0.0091 - 0.0189)

CLEARANCE BETWEEN BAULK RING AND GEAR 1ST, 3RD, 4TH, & 5TH

Unit: mm (in)

	Standard	Wear limit
1st	1.0 - 1.35 (0.0394 - 0.0531)	0.7 (0.028)
3rd & 4th	1.0 - 1.35 (0.0394 - 0.0531)	0.7 (0.028)
5th	1.0 - 1.35 (0.0394 - 0.0531)	0.7 (0.028)

REVERSE BAULK RING

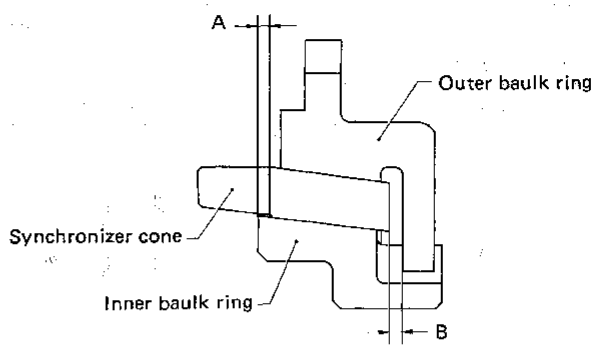


SMT581B

Dimension	Wear limit
A	1.2 mm (0.047 in)

2nd baulk ring

Unit: mm (in)



SMT806B

Dimension	Standard	Wear limit
A	0.6 - 0.8 (0.024 - 0.031)	0.2 (0.008)
B	0.6 - 1.1 (0.024 - 0.043)	

AVAILABLE SNAP RING

3rd & 4th synchronizer hub (At input shaft)

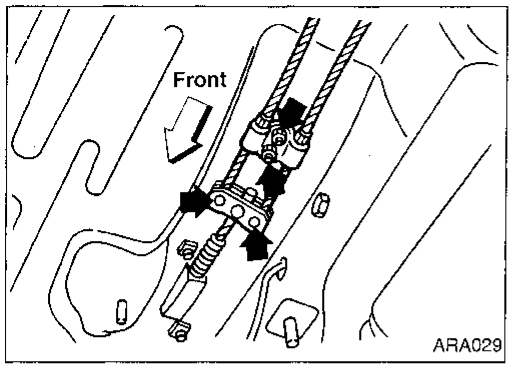
Allowable clearance	0 - 0.1 mm (0 - 0.004 in)
Thickness mm (in)	Part number
1.95 (0.0768)	32269-03E03
2.00 (0.0787)	32269-03E00
2.05 (0.0807)	32269-03E01
2.10 (0.0827)	32269-03E02

1st & 2nd synchronizer hub

Allowable clearance	0 - 0.1 mm (0 - 0.004 in)
Thickness mm (in)	Part number
1.95 (0.0768)	32269-03E03
2.00 (0.0787)	32269-03E00
2.05 (0.0807)	32269-03E01
2.10 (0.0827)	32269-03E02

5th main gear

Allowable clearance	0 - 0.15 mm (0 - 0.0059 in)
Thickness mm (in)	Part number
1.95 (0.0768)	32348-05E00
2.05 (0.0807)	32348-05E01
2.15 (0.0846)	32348-05E02
2.55 (0.1004)	32348-05E03

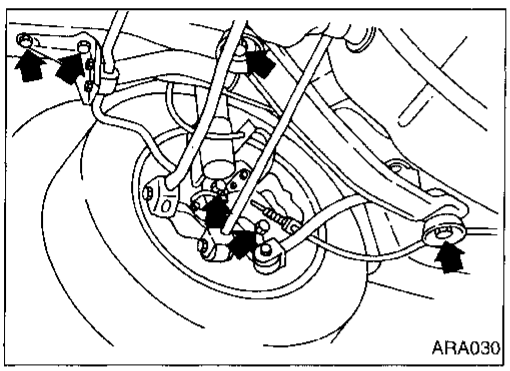


Removal and Installation

CAUTION:

- **Do not jack up at the parallel links or radius links.**
- **Before removing the rear suspension assembly, disconnect the ABS wheel sensor from the assembly. Failure to do so may result in damaged sensor wires and the sensor becoming inoperative.**

1. Disconnect brake hydraulic line and parking brake cable at equalizer. (Models with rear drum brake.)

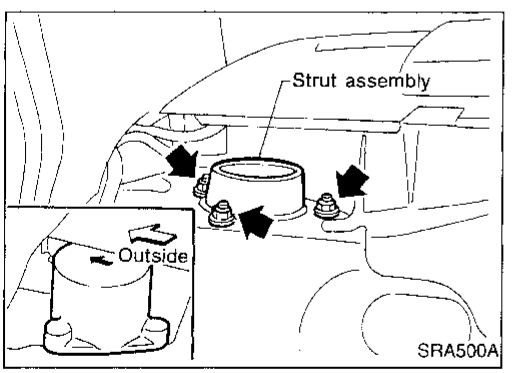


- Drain brake fluid before disconnecting brake lines.

2. Disconnect parking brake cable from caliper and remove brake caliper and rotor. (Models with rear disc brake.)

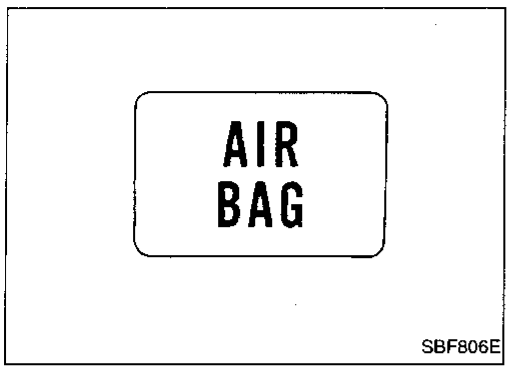
Suspend caliper assembly with wire so as not to stretch brake hose.
Brake hose need not be disconnected from brake caliper.
Be careful not to depress brake pedal, or caliper piston will pop out.
Make sure brake hose is not twisted.

3. Remove parking brake cable fixing bolts. (Models with rear drum brake.)
4. Remove stabilizer fixing bolts and suspension member fixing bolts.
5. Remove rear seat. Refer to BT section ("Rear Seat", "SEAT").
6. Remove rear parcel shelf. Refer to BT section ("Side and Floor Trim", "INTERIOR TRIM").



7. Remove strut securing nuts (upper side). Then pull out strut assembly.

WARNING:
Do not remove piston rod lock nut on vehicle.



Maintenance Items

1. Check "AIR BAG" warning lamp operation
After turning ignition key to "ON" position, "AIR BAG" warning lamp illuminates. The "AIR BAG" warning lamp will turn off after about 7 seconds if no malfunction is detected.
If any of the following air bag warning lamp conditions occur, immediately check the air bag system. Refer to RS-24 for details.
- The warning lamp does not illuminate when the ignition switch is turned "ON".
- The warning lamp does not turn off about 7 seconds after the ignition switch is turned "ON".
- The warning lamp turns off about 7 seconds after the ignition switch is turned "ON", but it turns on again or blinks.

2. Visually check SRS components

(1) Diagnosis sensor unit
- Check diagnosis sensor unit and bracket for dents, cracks or deformities.
- Check connectors for damage, and terminals for deformities.

(2) Air bag module and steering wheel
- Remove air bag module from steering wheel or instrument panel. Check harness cover and connectors for damage, terminals for deformities, and harness for binding.
- Install driver side air bag module to steering wheel to check fit or alignment with the wheel.
- Check steering wheel for excessive free play.
- Install passenger side air bag module to instrument panel to check fit or alignment with the instrument panel.

(3) Spiral cable
- Check spiral cable and combination switch for damage.
- Check connectors and protective tape for damage.
- Check steering wheel for noise, binding or heavy operation.

(4) Main harness and air bag harness
- Check connectors for poor connections, damage, and terminals for deformities.
- Check harnesses for binding, chafing or cut.

CAUTION:
Replace previously used special bolts with new ones.

How to Perform Trouble Diagnoses for Quick and Accurate Repair

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate. In general, each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.

INFORMATION FROM CUSTOMER

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Symptoms

PRELIMINARY CHECK

Check that the following parts are in good order.

- Battery [Refer to MA section ("GENERAL MAINTENANCE").]
- Fuse [Refer to EL section ("Fuse", "POWER SUPPLY ROUTING").]
- System component-to-harness connections

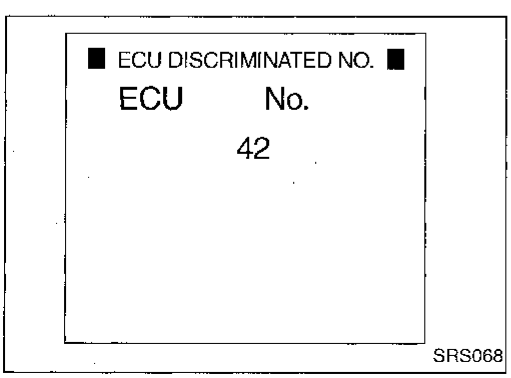
DIAGNOSIS FUNCTION

The SRS self-diagnosis results can be read by using "AIR BAG" warning lamp and/or CONSULT. The reading of these results is accomplished using one of two modes — "User mode" and "Diagnosis mode". The User mode is exclusively prepared for the customer (driver). This mode warns the driver of a system malfunction through the operation of the "AIR BAG" warning lamp.
The Diagnosis mode allows the technician to locate and inspect the malfunctioning part.
The mode applications for the "AIR BAG" warning lamp and CONSULT are as follows:

	User mode	Diagnosis mode	Display type
"AIR BAG" warning lamp	X	X	ON-OFF operation
CONSULT	—	X	Monitoring

DIAGNOSIS MODE FOR CONSULT

- SELF-DIAG [CURRENT]
  A current Self-diagnosis result (also indicated by the number of warning lamp flashes in the Diagnosis mode) is displayed on the CONSULT screen in real time. This refers to a malfunctioning part requiring repairs.
- SELF-DIAG [PAST]
  Diagnosis results previously stored in the memory (also indicated by the warning lamp flashes in the User mode) are displayed on the CONSULT screen. The stored results are not erased until memory erasing is executed.
- TROUBLE DIAG RECORD
  With TROUBLE DIAG RECORD, diagnosis results previously erased by a reset operation can be displayed on the CONSULT screen.



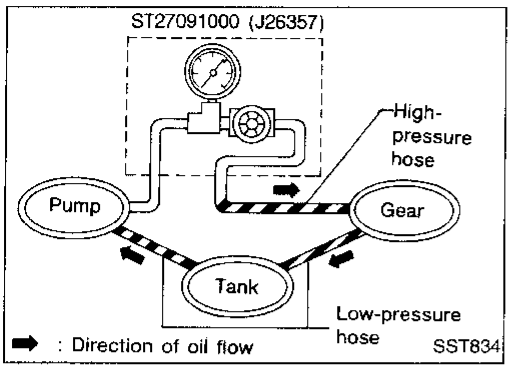
- ECU DISCRIMINATED NO.
  The diagnosis sensor unit for each vehicle model is assigned with its own, individual classification number. This number will be displayed on the CONSULT screen, as shown at left. When replacing the diagnosis sensor unit, refer to the part number for the compatibility. After installation, replacement with a correct unit can be checked by confirming this classification number on the CONSULT screen.
  For model U13, the diagnosis sensor unit classification number assigned is 42.

Self-diagnosis (Cont'd)

CONSULT DIAGNOSTIC CODE CHART

Diagnostic item	Explanation/Possible causes	Repair order *Recheck SRS using CONSULT at each replacement
NO SELF DIAGNOSTIC FAILURE INDICATED	• No malfunction is detected.	—
AIRBAG MODULE [OPEN]	• Driver air bag module circuit is open (including the spiral cable).	1. Visually check the wiring harness connections. 2. Replace spiral cable. 3. Replace driver's air bag module. (Before disposing of it, it must be deployed.) 4. Replace diagnosis sensor unit. 5. Replace air bag harness.
AIRBAG MODULE [VB-SHORT]	• Driver air bag module circuit is shorted to some power supply circuit (including the spiral cable).	
AIRBAG MODULE [GND-SHORT]	• Driver air bag module circuit is shorted to ground (including the spiral cable).	
AIRBAG MODULE [SHORT]	• Driver air bag module circuits are shorted to each other.	
ASSIST A/B MODULE [OPEN]	• The circuit for front passenger air bag module is open.	1. Visually check wiring harness connections. 2. Replace front passenger air bag module. (Before disposing of it, it must be deployed.) 3. Replace diagnosis sensor unit. 4. Replace air bag harness.
ASSIST A/B MODULE [VB-SHORT]	• Front passenger air bag module circuit is shorted to some power supply circuit.	
ASSIST A/B MODULE 1 [GND-SHORT]	• Front passenger air bag module circuit is shorted to ground.	
ASSIST A/B MODULE 1 [SHORT]	• Front passenger air bag module circuits are shorted to each other.	
CONTROL UNIT	• Diagnosis sensor unit is out of order.	1. Visually check wiring harness connections. 2. Replace diagnosis sensor unit. 3. Replace air bag harness. 4. Replace main harness.
INDEFINITE FAILURES [AIR BAG]	• A problem which cannot be specified occurs because more than two parts are out of order.	1. Visually check wiring harness connections. 2. Replace diagnosis sensor unit. 3. Replace spiral cable and air bag modules. 4. Replace air bag harness. 5. Replace the main harness.

*Follow the procedures in numerical order when repairing malfunctioning parts. Confirm whether malfunction is eliminated using the air bag warning lamp (in user mode) or CONSULT each time repair is finished. If malfunction is still observed, proceed to the next step. When malfunction is eliminated, further repair work is not required.



Checking Hydraulic System

Before starting, check belt tension, driving pulley and tire pressure.

1. Set Tool. Open shut-off valve. Then bleed air. Refer to "Bleeding Hydraulic System", ST-5.
2. Run engine.

Make sure fluid temperature in reservoir tank rises to 60 to 80°C (140 to 176°F).

WARNING:

Warm up engine with shut-off valve fully opened. If engine is started with shut-off valve closed, fluid pressure in the power steering pump increases to maximum. This will raise fluid temperature abnormally.

3. Check pressure with steering wheel fully turned to left and right positions with engine idling at 1,000 rpm.

CAUTION:

Do not hold the steering wheel in a locked position for more than 15 seconds.

Power steering pump maximum standard pressure: 7,649 - 8,238 kPa (78 - 84 kg/cm^2, 1,109 - 1,194 psi)

4. If power steering pressure is below the standard pressure, slowly close shut-off valve and check pressure.

CAUTION:

Do not close shut-off valve for more than 15 seconds.

- When pressure reaches standard pressure, gear is damaged.
- When pressure remains below standard pressure, pump is damaged.

5. If power steering pressure is higher than standard pressure, check power steering pump flow control valve.
6. After checking hydraulic system, remove Tool and add fluid as necessary. Then completely bleed air out of system. Refer to ST-5.