INFINITI

G20

MODEL P10 SERIES

FOREWORD

This supplement contains information concerning necessary service procedures and relevant data for the 1993.5 G20 vehicle.

All information, illustrations and specifications contained in this supplement are based on the latest product information available at the time of publication. If your INFINITI model differs from the specifications contained in this supplement, consult your INFINITI distributor for information.

The right is reserved to make changes in specifications and methods at any time without notice.

INFINITI

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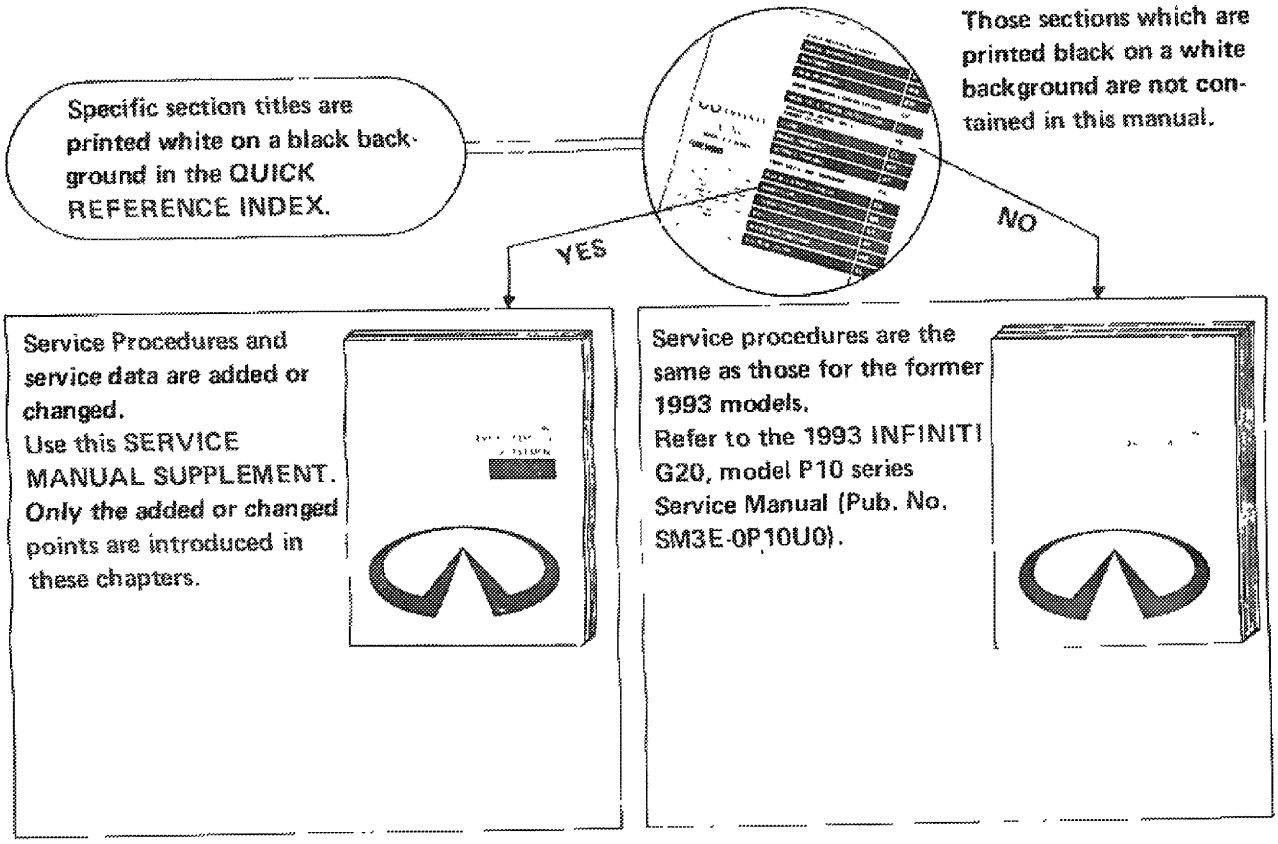
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HOW TO USE THIS MANUAL

- This Service Manual contains the new service procedures, service data and specifications for the 1993 INFINITI G20, model P10 series face-lift.
- This Service Manual does not contain the service procedures, etc. which are the same as those for the former 1993 models.
  Please use this manual in conjunction with the 1993 INFINITI G20, model P10 series Service Manual (Pub. No. SM3E-0P10U0).

- Follow the instruction below when using this manual.



IMPORTANT SAFETY NOTICE

The proper performance of service is essential for both the safety of the mechanic and the efficient functioning of the vehicle.
The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately.
Service varies with the procedures used, the skills of the mechanic and the tools and parts available. Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by INFINITI must first completely satisfy himself that neither his safety nor the vehicle's safety will be jeopardized by the service method selected.

GENERAL INFORMATION

SECTION GI

GI

STARTING IDENTIFICATION NUMBER:

Oppama plant
JNKCP01D*PT 450021

OUTLINE OF MODIFICATIONS:

Body

- SRS air bags have been adopted on both the driver and passenger sides.

Seat

- Front power support seats have been introduced.

Automatic transaxle

- An electronically controlled type automatic transaxle (RE4F03A) has been introduced.

Heater and air conditioner

- R134a refrigerant has been introduced.

Electrical system

- The keyless entry system has been introduced.

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Function and System Application

Diagnostic test mode	Function	ECCS	A/T	Air bag	ASCD
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT	×	—	—	—
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	×	×	×	×
Data monitor	Input/Output data in the ECM can be read.	×	×	—	×
Active test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ECMs and also shifts some parameters in a specified range	×	—	—	—
ECM part number	ECM part number can be read.	×	×	—	—
Function test	ECCS faults can be isolated to a general area, semi-automatically and in a short time, by following the directions on the screen	×	—	—	—

×: Applicable

Lithium Battery Replacement

CONSULT contains a lithium battery. When replacing the battery obey the following:

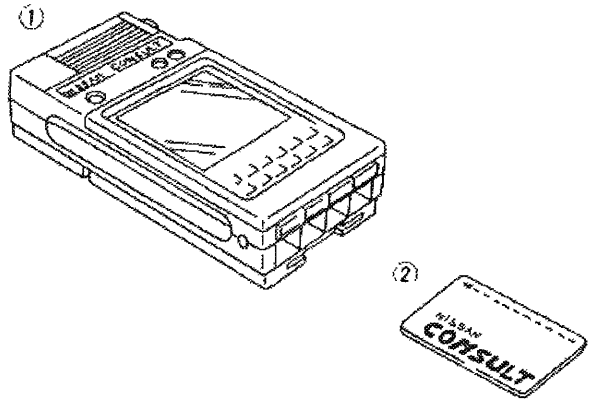
WARNING:

Replace the lithium battery with SANYO Electric Co., Ltd., CR2032 only. Use of another battery may present a risk of fire or explosion. The battery may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble or dispose of in fire.

Keep the battery out of reach of children and discard used battery conforming to the local regulations.

Checking Equipment

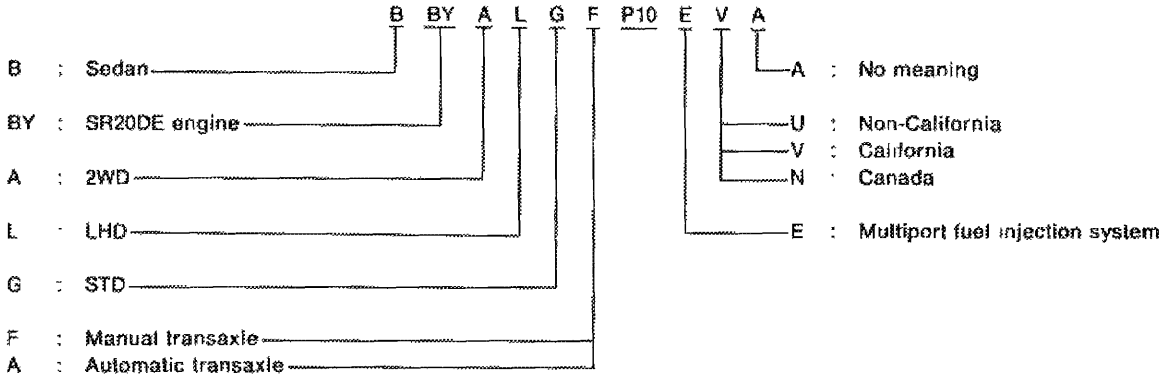
When ordering the below equipment, contact your INFINITI distributor.

Tool name	Description
NISSAN CONSULT kit ① CONSULT unit and accessories ② Program card (UE970)	

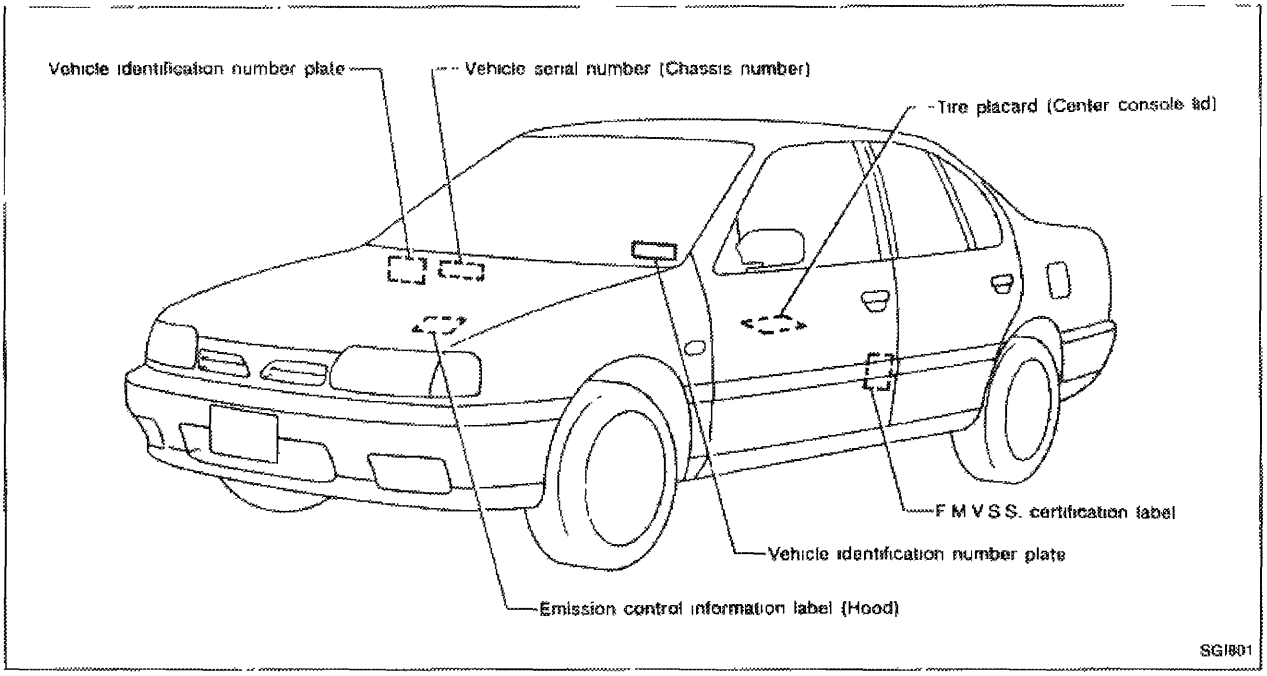
Model Variation

Body	Destination	Grade	Model	Engine	Transaxle
Sedan	Non-California	STD	BBYALGF P10 EUA	SR20DE	RS5F32A
			BBYALGA P10 EUA		RE4F03A
	California		BBYALGF P10 EVA		RS5F32A
			BBYALGA P10 EVA		RE4F03A
	Canada		BBYALGF P10 ENA		RS5F32A
			BBYALGA P10 ENA		RE4F03A

Prefix and suffix designations:



Identification Number



VEHICLE IDENTIFICATION NUMBER ARRANGEMENT

JNK C P 0 1 D * P T 000001

Manufacturer
JNK : Nissan, Passenger vehicle

Engine type
C : SR20DE engine

Vehicle line
P : INFINITI G20

Model change (0 to 9)

Body type
1 : 4-door Sedan

Vehicle serial number
(Chassis number)

Manufacturing plant
T : Oppama

Model year
P : 1993 year model

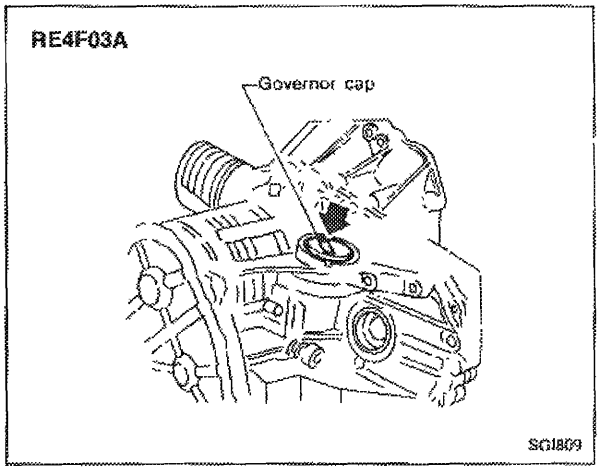
Check digit (0 to 9 or x)
The code for the check digit is determined by mathematical computation.

Restraint system
D : Driver and passenger SRS air bags + 3-point manual seat belts

Identification Number (Cont'd)

AUTOMATIC TRANSAXLE NUMBER

RE4F03A



Dimensions

Unit: mm (in)

Model		Sedan
Overall length		4,440 (174.8)
Overall width		1,694 (66.7)
Overall height		1,389 (54.7)
Wheel base		2,550 (100.4)
Tread	Front	1,471 (57.9)
	Rear	1,461 (57.5)

Wheels and Tires

Road wheel	Aluminum	6-JJ x 14
	Offset mm (in)	45 (1.77)
Tire size	Conventional	P195/65R1488H
	Spare	T125/70D15

MAINTENANCE

SECTION MA

MA

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Supplemental Restraint System "AIR BAG"

The Supplemental Restraint System "Air Bag" helps to reduce the risk or severity of injury to the driver in a frontal collision. The Supplemental Restraint System consists of an air bag (located in the center of the steering wheel), sensors, a diagnostic unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **BF section** of this Service Manual.

WARNING:

a. **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized INFINITI dealer.**
b. **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
c. **All SRS electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS "Air Bag".**

Schedule 1

CHASSIS AND BODY MAINTENANCE

Air bag system	See NOTE (6).

NOTE: (6) Inspect the air bag system 10 years after the date of manufacture as noted on the F.M.V.S.S. certification label.

Schedule 2

CHASSIS AND BODY MAINTENANCE

Air bag system	See NOTE (4)

NOTE: (4) Inspect the air bag system 10 years after the date of manufacture as noted on the F.M.V.S.S. certification label.

ENGINE MECHANICAL

SECTION EM

EM

MODIFICATION NOTICE:

- The PAIR valve has been discontinued.
- The valve timing and the valve lift have been altered (For A/T models).

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OUTER COMPONENT PARTS 3
SERVICE DATA AND SPECIFICATIONS (S.D.S.) 5
General Specifications 5
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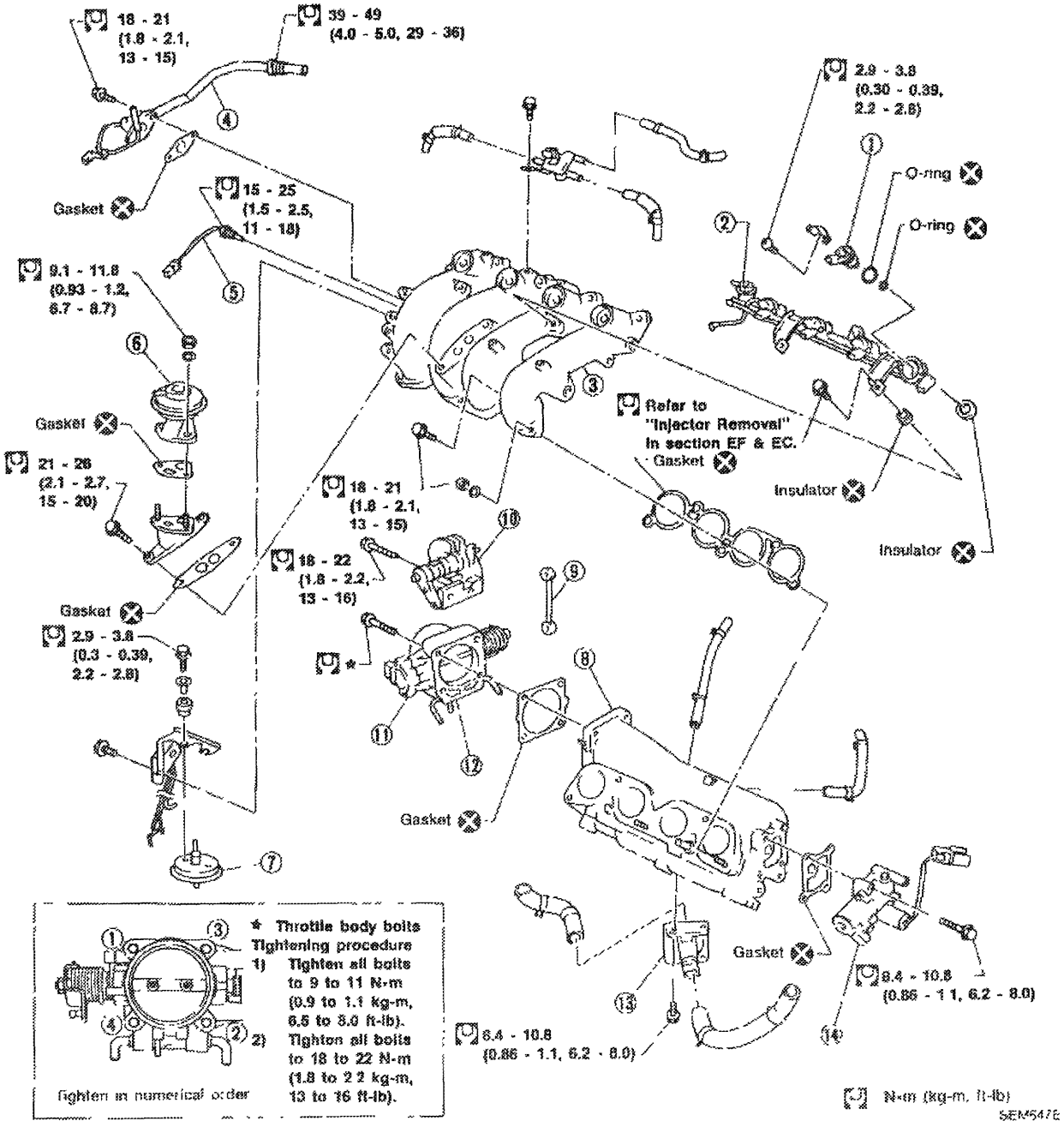
Supplemental Restraint System "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner" help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, sensors, a control unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **BF section** of this Service Manual.

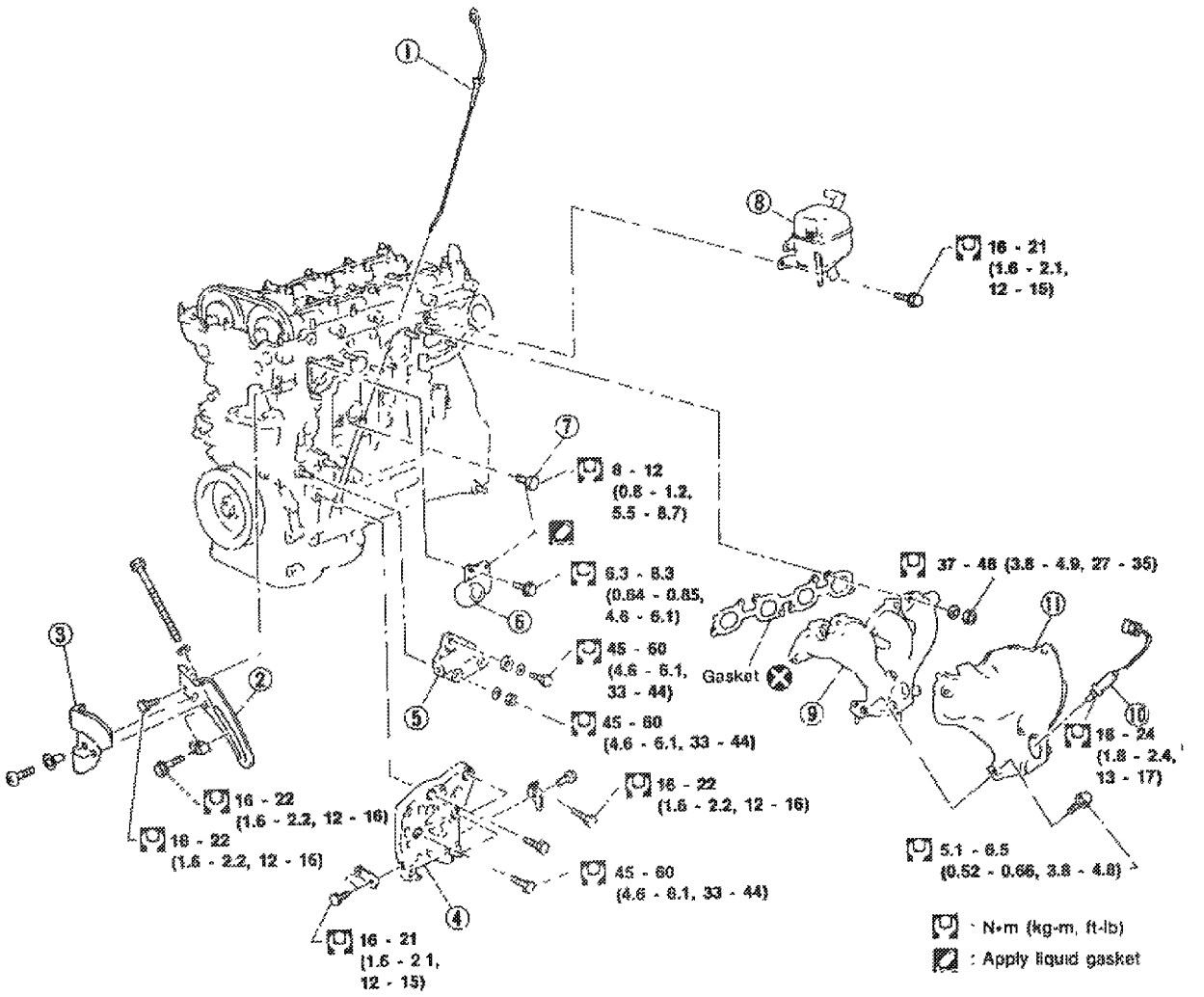
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- **All SRS air bag electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS SYSTEM.**

OUTER COMPONENT PARTS



① Injector
② Pressure regulator
③ Intake manifold
④ EGR tube
⑤ EGR temperature sensor
⑥ EGR valve
⑦ EGRC-BPT valve
⑧ Intake manifold collector
⑨ Rod
⑩ Accel-drum unit
⑪ Throttle position sensor
⑫ Throttle body
⑬ IACV-air regulator
⑭ IACV-AAC valve

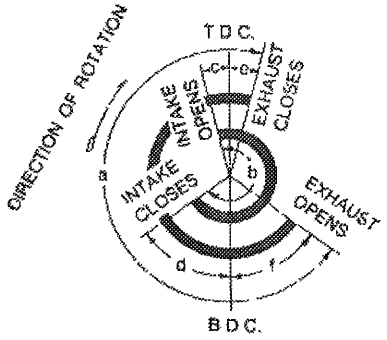


SEM648E

(1) Oil level gauge
(2) Alternator adjusting bar
(3) Air guide
(4) Compressor bracket
(5) Alternator bracket
(6) Water outlet
(7) Drain plug
(8) Oil separator
(9) Exhaust manifold
(10) Heated oxygen sensor
(11) Exhaust manifold cover

General Specifications

Valve timing



EM129

Unit: degree

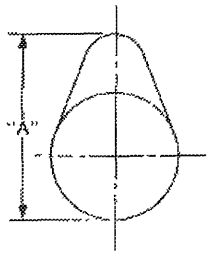
	a	b	c	d	e	f
M/T	240°	248°	13°	55°	3°	57°
A/T	240°	240°	13°	47°	3°	57°

Inspection and Adjustment

CAMSHAFT AND CAMSHAFT BEARING

Unit: mm (in)

	Standard	Limit
Camshaft journal to bearing clearance	0.045 - 0.086 (0.0018 - 0.0034)	0.12 (0.0047)
Inner diameter of camshaft bearing	28.000 - 28.021 (1.1024 - 1.1032)	-
Outer diameter of camshaft journal	27.935 - 27.955 (1.0998 - 1.1006)	-
Camshaft runout [T.I.R.*]	Less than 0.02 (0.0008)	0.1 (0.004)
Camshaft sprocket runout [T.I.R.*]	Less than 0.25 (0.0098)	-
Camshaft end play	0.055 - 0.139 (0.0022 - 0.0055)	0.20 (0.0079)



EM67

Cam height "A"	
Intake	
M/T	38.408 - 38.598 (1.5121 - 1.5196)
A/T	37.920 - 38.110 (1.4929 - 1.5004)
Exhaust	37.920 - 38.110 (1.4929 - 1.5004)
Wear limit of cam height	0.2 (0.008)
Valve lift	
Intake	
M/T	10.0 (0.394)
A/T	9.2 (0.362)
Exhaust	9.2 (0.362)

*Total indicator reading

ENGINE FUEL & EMISSION CONTROL SYSTEM

SECTION EF & EC

MODIFICATION POINT:

- Wiring diagrams have been changed.
- Diagnostic trouble code for signal circuit from A/T control unit to ECM has been added to Diagnostic test mode II (Self-diagnostic results).

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Note: Refer to Foldout page for "ECCS WIRING DIAGRAM".

When you read wiring diagrams:
- **Read GI section, "HOW TO READ WIRING DIAGRAMS".**
- **See EL section, "POWER SUPPLY ROUTING" for power distribution circuit.**

When you perform trouble diagnoses, read GI section, "HOW TO FOLLOW FLOW CHART IN TROUBLE DIAGNOSES".

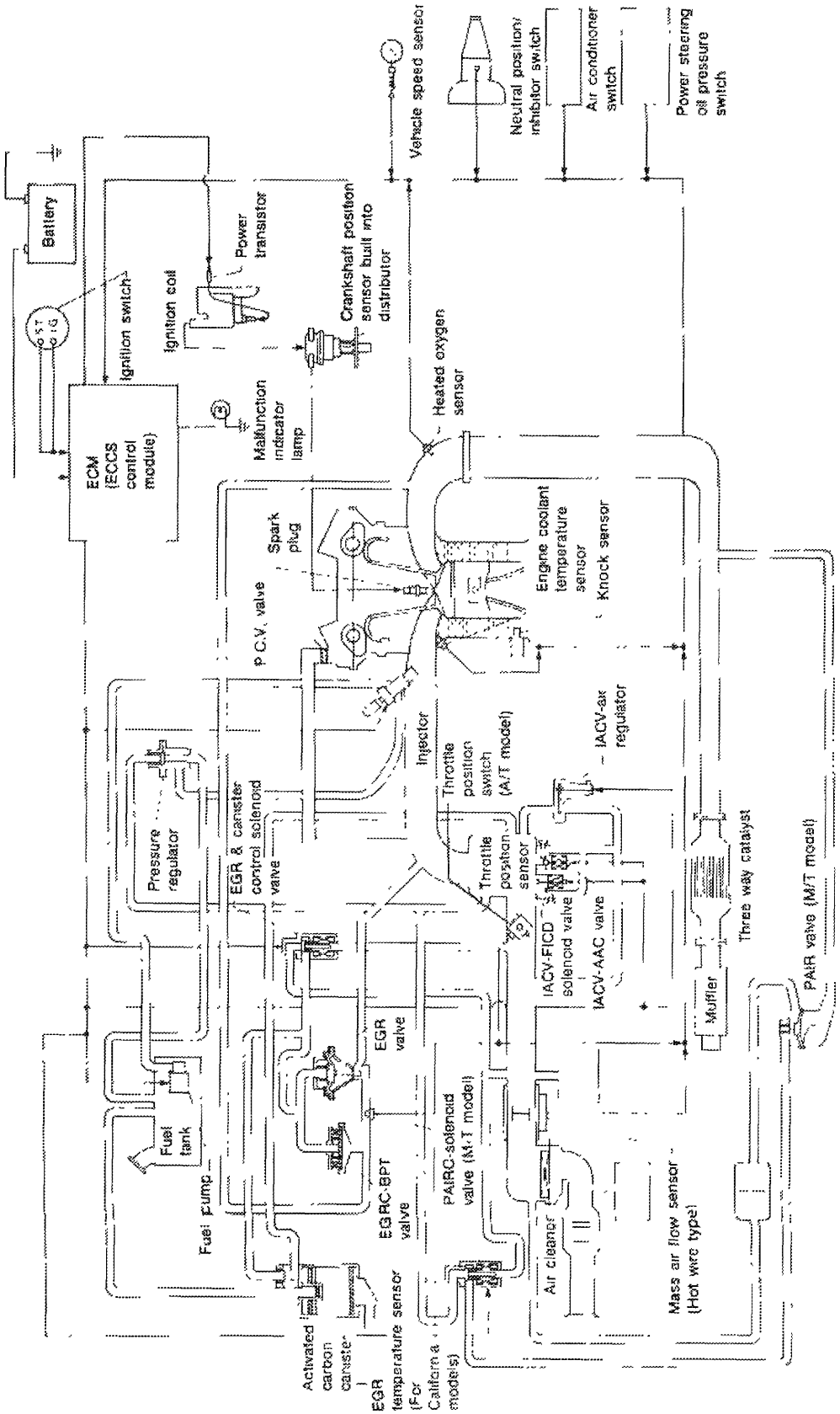
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WARNING:

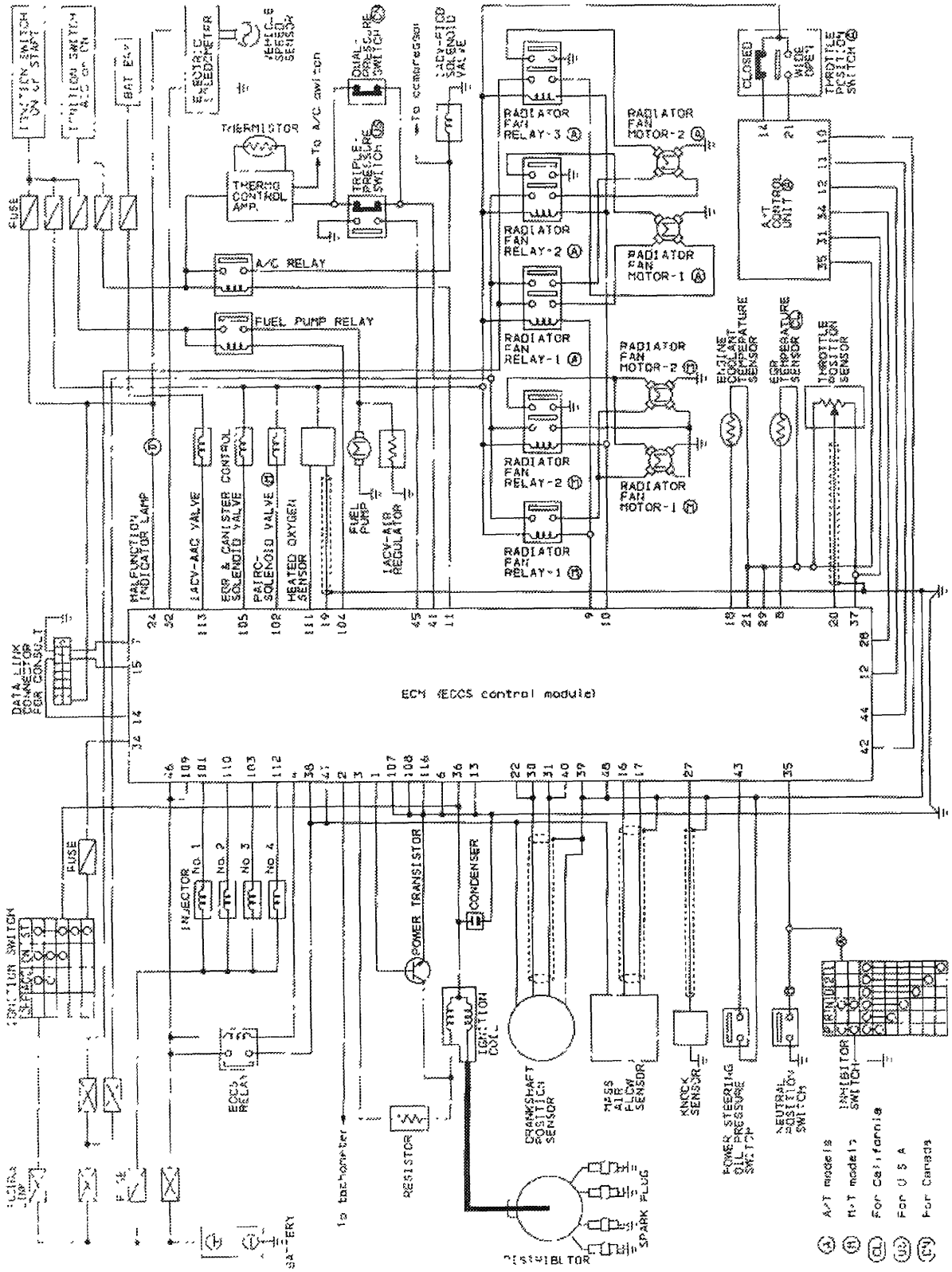
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- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **All SRS air bag electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS SYSTEM.**

System Diagram

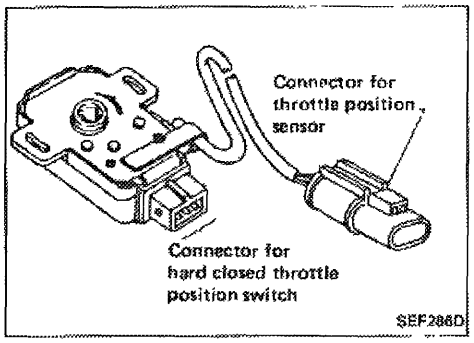


SEI225N

Circuit Diagram



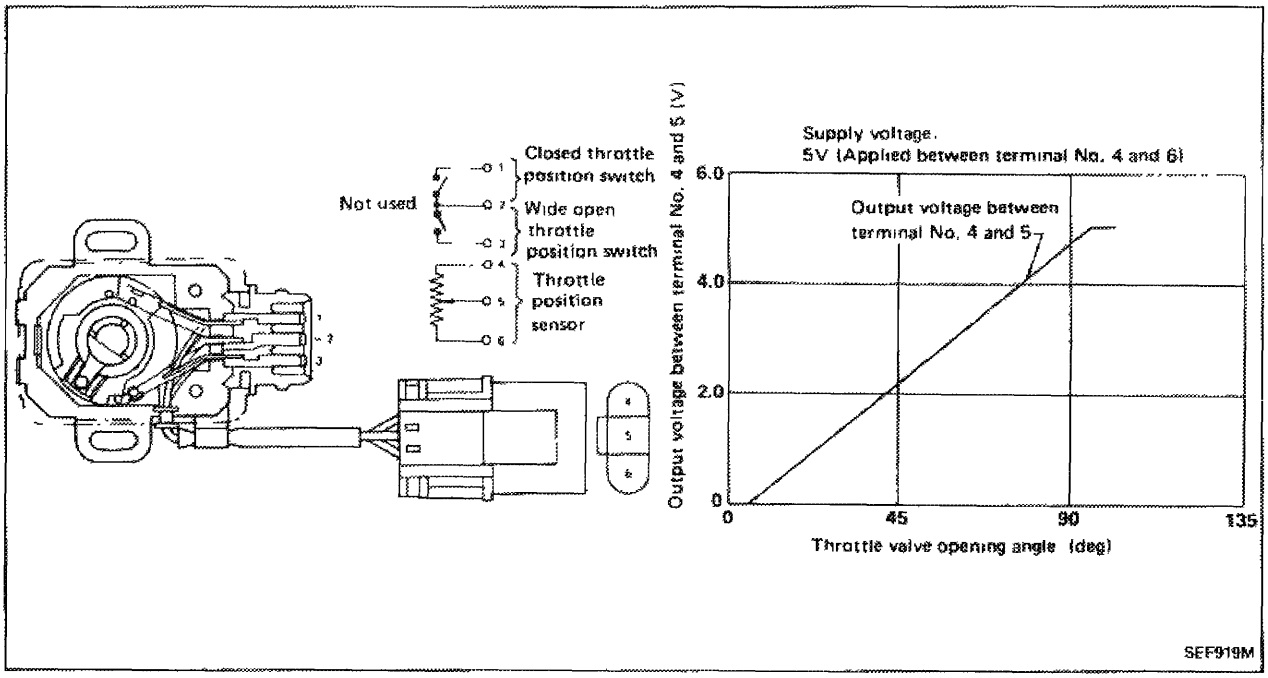
MEF683E



Throttle Position Sensor (TP) & Soft/Hard Closed Throttle Position (CTP) Switch (A/T models)

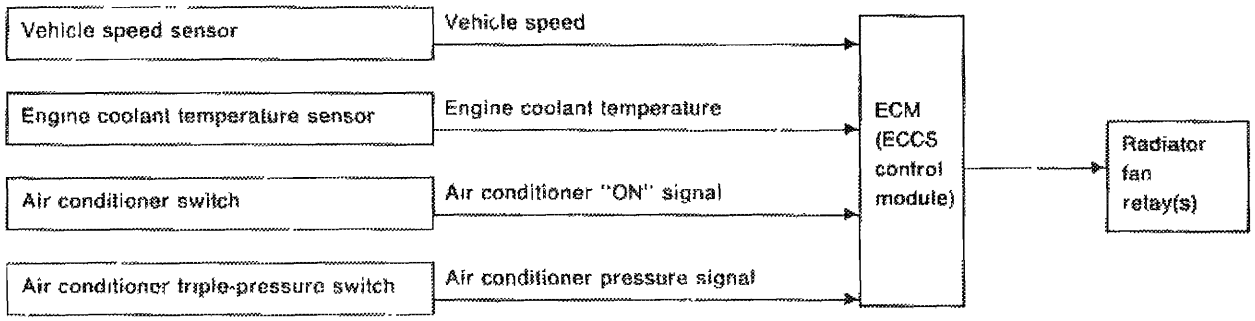
The throttle position sensor responds to the accelerator pedal movement. This sensor is a kind of potentiometer which transforms the throttle position into output voltage, and emits the voltage signal to the ECM. In addition, the sensor detects the opening and closing speed of the throttle valve and feeds the voltage signal to the ECM.

Idle position of the throttle valve is determined by the ECM receiving the signal from the throttle position sensor. This system is called "soft closed throttle position switch". This one controls engine operation such as fuel cut. On the other hand, "hard closed throttle position switch", which is built in the throttle position sensor unit, is not used for engine control.



Radiator Fan Control

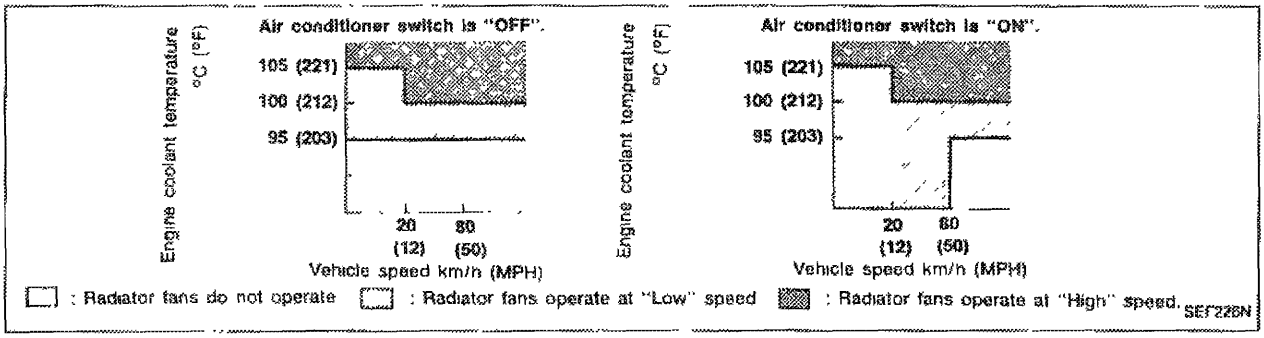
INPUT/OUTPUT SIGNAL LINE



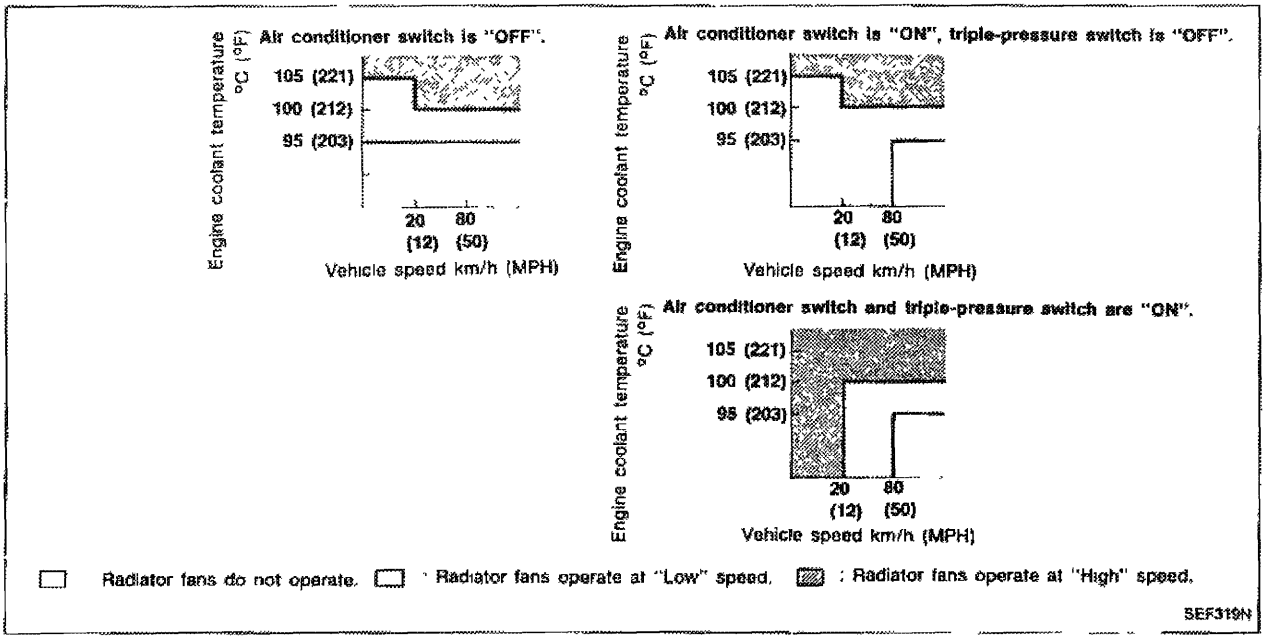
The ECM controls the radiator fan corresponding to the vehicle speed, engine coolant temperature, air conditioner system pressure and air conditioner ON signal. The control system has 3-step control [HIGH/LOW/OFF].

Operation

For Canada



For U.S.A.

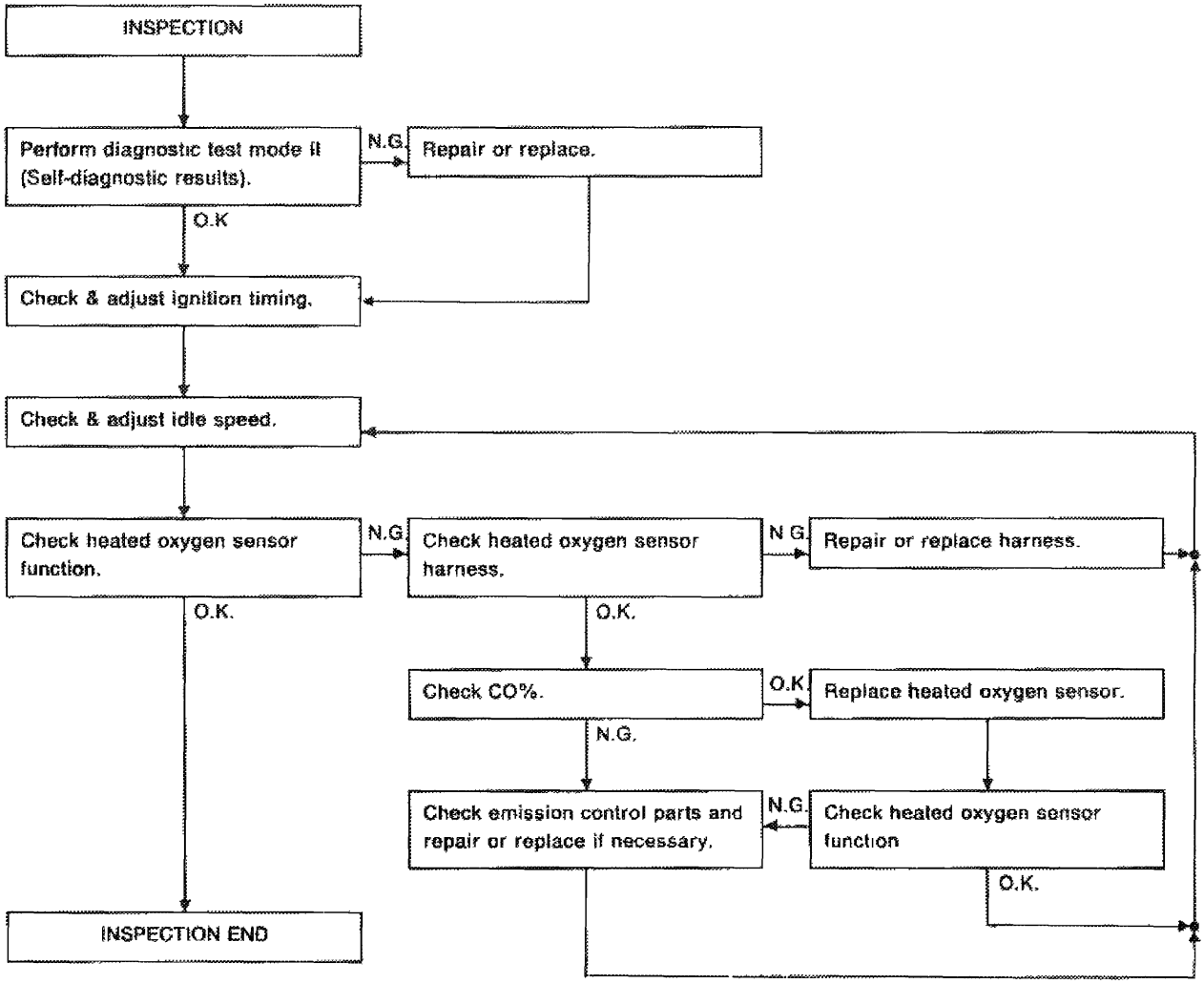


PREPARATION

1. Make sure that the following parts are in good order.
- Battery
- Ignition system
- Engine oil and coolant levels
- Fuses
- ECM harness connector
- Vacuum hoses
- Air intake system
  (Oil filler cap, oil level gauge, etc.)
- Fuel pressure
- Engine compression
- Throttle valve

2. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".
3. On automatic transaxle equipped models, when checking idle speed, ignition timing and mixture ratio, checks should be carried out while shift lever is in "N" position.
4. When measuring "CO" percentage, insert probe more than 40 cm (15.7 in) into tail pipe.
5. Turn off headlamps, heater blower, rear defogger.
6. Keep front wheels pointed straight ahead.
7. Make the check after the radiator fan has stopped.

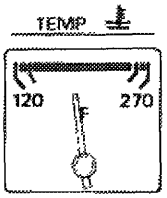
Overall inspection sequence



IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION

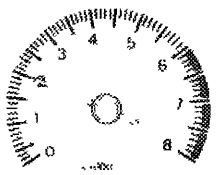
START

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



SEF246F

Start engine and warm it up until water temperature indicator points to the middle of gauge
Ensure engine stays below 1,000 rpm.


SEF247F

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


RED L.E.D.



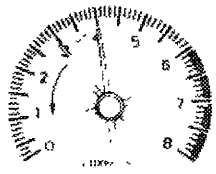
Malfunction indicator lamp

MEF028D

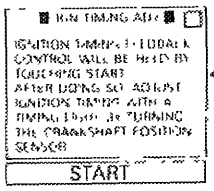
Perform diagnostic test mode II (Self-diagnostic results) (Diagnostic Test Mode II).

O.K. | N.G.

Repair or replace components as necessary.


SEF248F

Run engine at about 2,000 rpm for about 2 minutes under no-load
Race engine two or three times under no-load, then run engine at idle speed.

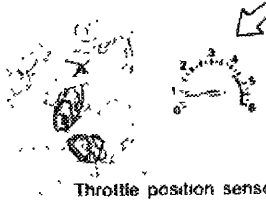


MEF026D

1) Select "IGN TIMING ADJ" in "WORK SUPPORT" mode.
2) Touching "START".

OR

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

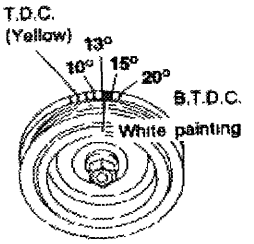

Throttle position sensor harness connector

MEF027D

Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load and then run engine at idle speed.

Check ignition timing with a timing light.

M/T: 15° ± 2° B.T.D.C.
A/T: 15° ± 2° B.T.D.C. (In "N" position)



SR20DE

SEF238N

O.K. → Ⓐ

N.G. → Ⓘ

Ⓐ

Ⓘ

Adjust ignition timing to the specified value by turning distributor after loosing bolts which secure distributor.

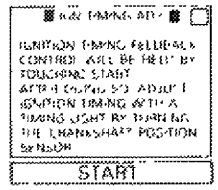
M/T: 15° ± 2° B.T.D.C.
A/T: 15° ± 2° B.T.D.C. (In "N" position)

Ⓔ

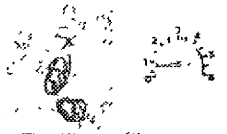
1) Select "IGN TIMING ADJ" in "WORK SUPPORT" mode
2) Touching "START".

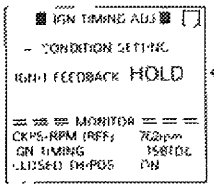
OR

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



MEF026D


Throttle position sensor harness connector
MEF027D



MEF029D

Check idle speed.

- Read idle speed in "IGN TIMING ADJ" in "WORK SUPPORT" mode.

OR

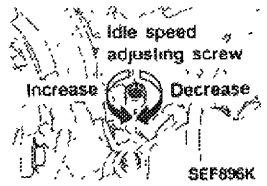
- Check idle speed

M/T: 750 ± 50 rpm
A/T: 750 ± 50 rpm (In "N" position)

O.K.

N.G.

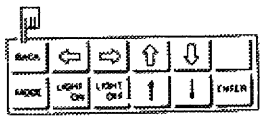
Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load and run engine at idle speed.



SEF896K

Adjust idle speed by turning idle speed adjusting screw.

M/T: 750 ± 50 rpm
A/T: 750 ± 50 rpm (In "N" position)


SEF913J

1) Touch "BACK".

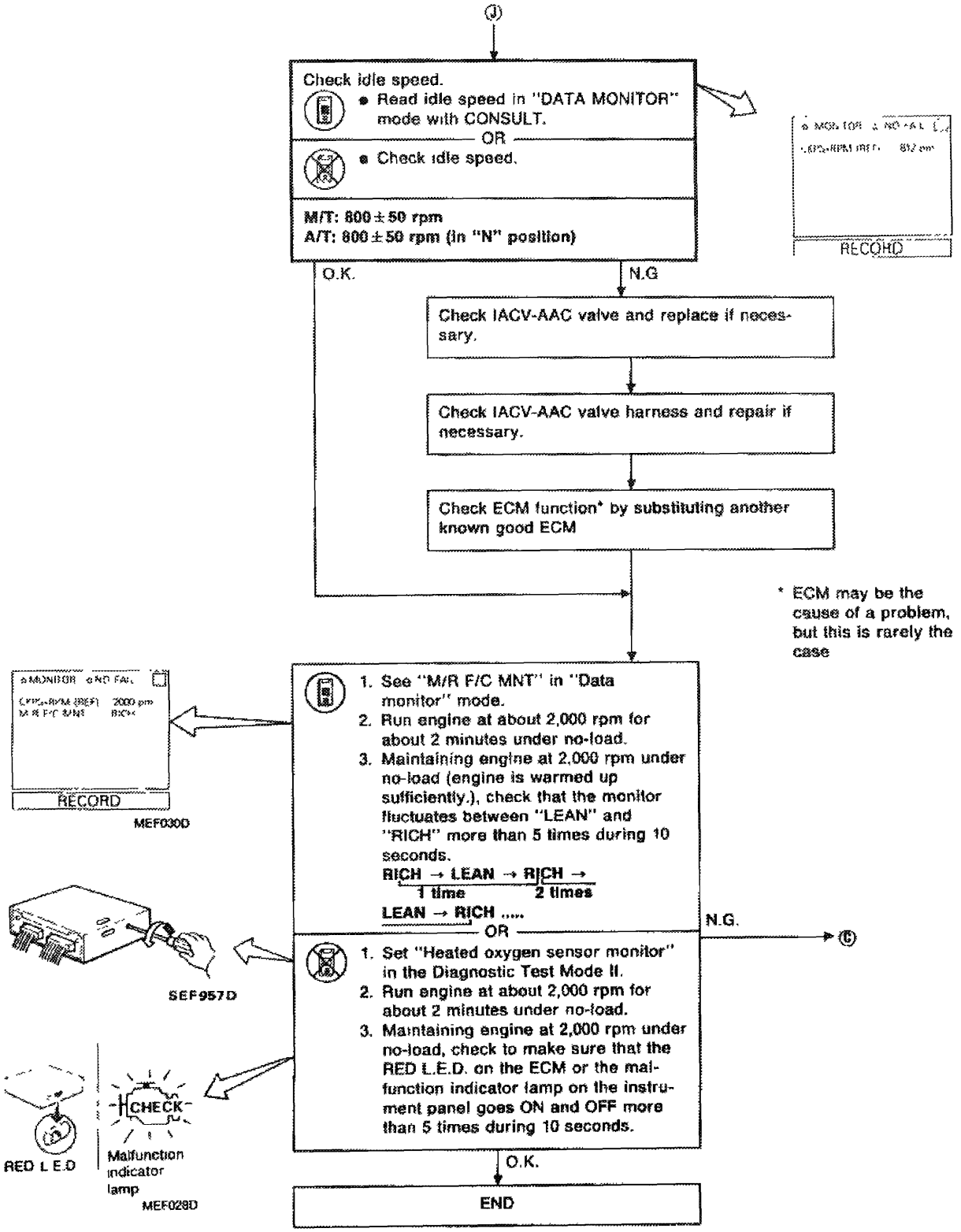
OR

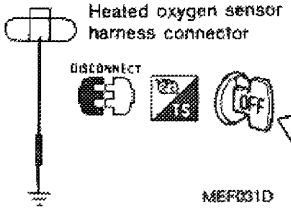
1) Turn off engine and connect throttle position sensor harness connector.
2) Start engine.

Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load and run engine at idle speed.

Ⓙ

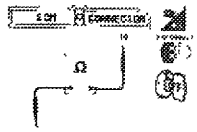
IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION





MEF031D

As for the location of heated oxygen sensor harness connector refer to Diagnostic Procedure 16.



MEF032D

Ⓒ

Check heated oxygen sensor harness:
1) Turn off engine and disconnect battery ground cable.
2) Disconnect ECM S.M.J. harness connector from ECM
3) Disconnect heated oxygen sensor harness connector and connect main harness side terminal for heated oxygen sensor to ground with a jumper wire
4) Check for continuity between terminal No 19 of ECM S.M.J. harness connector and body ground.

Continuity exists .....**O.K.**
Continuity does not exist .....**N.G.**

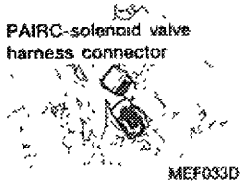
O.K.

N.G

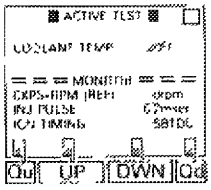
Repair or replace harness. → Ⓔ

Connect ECM S.M.J. harness connector to ECM.

PAIRC-solenoid valve harness connector


MEF033D

M/T models only
1) Disconnect PAIRC-solenoid valve harness connector.
2) Disconnect PAIR valve hose and plug it at front tube side



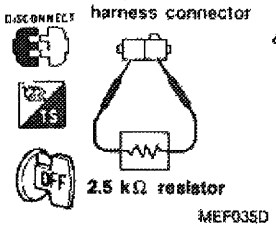
MEF034D

1) Connect battery ground cable.
2) Select "ENG COOLANT TEMP" in "ACTIVE TEST" mode.
3) Set "COOLANT TEMP" to 20°C (68°F) by touching "Qu" and "Qd" and "UP", "DOWN".

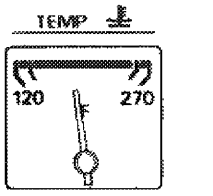
OR

1) Disconnect engine coolant temperature sensor harness connector.
2) Connect a resistor (2.5 kΩ) between terminals of engine coolant temperature sensor harness connector.
3) Connect battery ground cable

Engine coolant temperature sensor harness connector



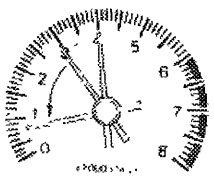
2.5 kΩ resistor
MEF035D



SEF246F

Start engine and warm it up until water temperature indicator points to middle of gauge.

Ⓓ



SEF248F

(D)

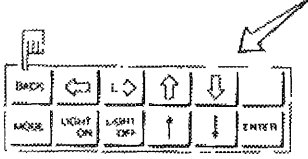
Race engine two or three times under no-load, then run engine at idle speed

Check "CO"%.

Idle CO: Less than 10%

After checking CO%,

1) Touch "BACK"
2) Connect PAIRC-solenoid valve harness connector.

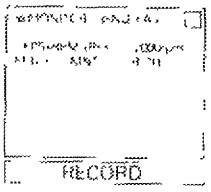


SEF913J

1) Disconnect the resistor from terminals of engine coolant temperature sensor harness connector.
2) Connect engine coolant temperature sensor harness connector to engine coolant temperature sensor.
3) Connect PAIRC-solenoid valve harness connector and PAIR valve hose. (M/T models only)

N.G. O.K.

Replace heated oxygen sensor

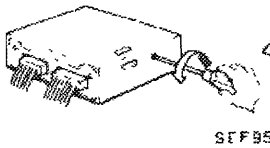


MEF030D

1. See "M/R F/C MNT" 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

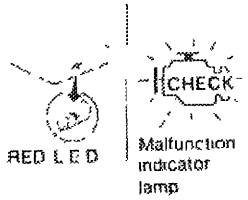
RICH → LEAN → RICH →
1 time 2 times
LEAN → RICH .....

OR



SEF957D

1. Set "Heated oxygen sensor monitor" in the Diagnostic Test Mode II
2. Maintaining engine at 2,000 rpm under no-load, check to make sure that the RED L.E.D. on the ECM or the malfunction indicator lamp on the instrument panel goes ON and OFF more than 5 times during 10 seconds.

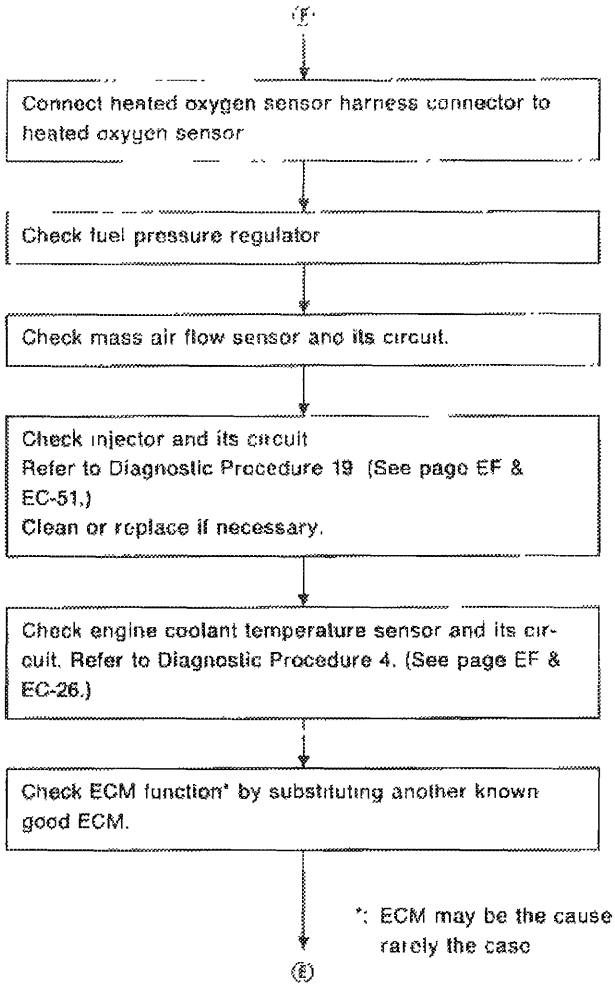


RED L.E.D. Malfunction indicator lamp

MEF028D

N.G. O.K.

(F) (E)


(F)
Connect heated oxygen sensor harness connector to heated oxygen sensor
Check fuel pressure regulator
Check mass air flow sensor and its circuit.
Check injector and its circuit
Refer to Diagnostic Procedure 19 (See page EF & EC-51.)
Clean or replace if necessary.
Check engine coolant temperature sensor and its circuit. Refer to Diagnostic Procedure 4. (See page EF & EC-26.)
Check ECM function* by substituting another known good ECM.
*: ECM may be the cause of a problem, but this is rarely the case
(E)

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MAIN POWER SUPPLY AND GROUND CIRCUIT (Not self-diagnostic item) ..... EF & EC-21
Diagnostic Procedure 2
CRANKSHAFT POSITION SENSOR (Diagnostic trouble code No. 11) ..... EF & EC-24
Diagnostic Procedure 3
MASS AIR FLOW SENSOR (Diagnostic trouble code No. 12 CHECK) ..... EF & EC-25
Diagnostic Procedure 4
ENGINE COOLANT TEMPERATURE SENSOR (Diagnostic trouble code No. 13 CHECK) ... EF & EC-26
Diagnostic Procedure 5
VEHICLE SPEED SENSOR (Diagnostic trouble code No. 14 CHECK) ..... EF & EC-28
Diagnostic Procedure 6
IGNITION SIGNAL (Diagnostic trouble code No. 21) ..... EF & EC-30
Diagnostic Procedure 7
EGR FUNCTION (Diagnostic trouble code No. 32 CHECK) ..... EF & EC-33
Diagnostic Procedure 8
HEATED OXYGEN SENSOR (Diagnostic trouble code No. 33 CHECK) ..... EF & EC-34
Diagnostic Procedure 9
KNOCK SENSOR (Diagnostic trouble code No. 34) ..... EF & EC-37
Diagnostic Procedure 10
EGR TEMPERATURE SENSOR (Diagnostic trouble code No. 35 CHECK) ..... EF & EC-38
Diagnostic Procedure 11
THROTTLE POSITION SENSOR (Diagnostic trouble code No 43 CHECK) ..... EF & EC-40
Diagnostic Procedure 12
A/T CONTROL (Diagnostic trouble code No 54) ..... EF & EC-43
Diagnostic Procedure 13
CRANKSHAFT POSITION SENSOR (Not self-diagnostic item) ..... EF & EC-45
Diagnostic Procedure 14
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HEATED OXYGEN SENSOR HEATER (Not self-diagnostic item) ..... EF & EC-48
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START SIGNAL (Not self-diagnostic item) ..... EF & EC-49
Diagnostic Procedure 17
PAIR VALVE CONTROL (Not self-diagnostic item) ..... EF & EC-50
Diagnostic Procedure 18
INJECTOR (Not self-diagnostic item) ..... EF & EC-51
Diagnostic Procedure 19
FUEL PUMP (Not self-diagnostic item) ..... EF & EC-53
Diagnostic Procedure 20
IACV-AIR REGULATOR (Not self-diagnostic item) ..... EF & EC-54
Diagnostic Procedure 21
IACV-AAC VALVE (Not self-diagnostic item) ..... EF & EC-55
Diagnostic Procedure 22
IACV-FICD SOLENOID VALVE (Not self-diagnostic item) ..... EF & EC-58
Diagnostic Procedure 23
RADIATOR FAN CONTROL (Not self-diagnostic item) ..... EF & EC-61

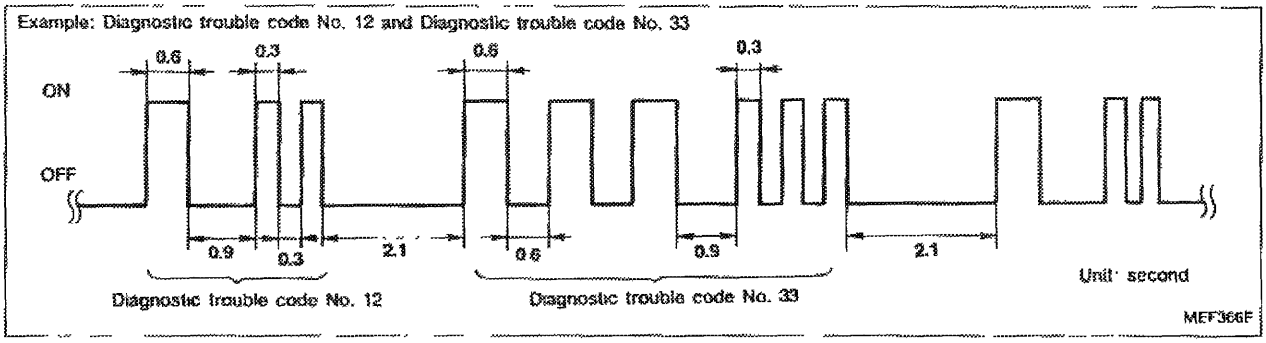
Contents (Cont'd)

Diagnostic Procedure 24
POWER STEERING OIL PRESSURE SWITCH (Not self-diagnostic item) ..... EF & EC-74
Diagnostic Procedure 25
NEUTRAL POSITION/INHIBITOR SWITCH (Not self-diagnostic item) ..... EF & EC-75
Electrical Components Inspection ..... EF & EC-78

On-board Diagnostic System — Diagnostic Test Mode II (Self-diagnostic results)

DESCRIPTION

In this mode, a diagnostic trouble code is indicated by the number of flashes from the RED L.E.D. or the MALFUNCTION INDICATOR LAMP as shown below:



Long (0.6 second) blinking indicates the number of ten digits and short (0.3 second) blinking indicates the number of single digits.

For example, the red L.E.D. flashes once for 0.6 seconds and then it flashes twice for 0.3 seconds. This indicates the number "12" and refers to a malfunction in the mass air flow sensor. In this way, all the problems are classified by their diagnostic trouble code numbers.

The diagnostic results will remain in ECM memory.

Display diagnostic trouble code table

Diagnostic trouble code No.	Detected items	California models	Non-California models
11*	Crankshaft position sensor circuit	X	X
12 (CHECK)	Mass air flow sensor circuit	X	X
13 (CHECK)	Engine coolant temperature sensor circuit	X	X
14 (CHECK)	Vehicle speed sensor circuit	X	X
21*	Ignition signal circuit	X	X
31 (CHECK)	ECM	X	X
32 (CHECK)	EGR function	X	—
33 (CHECK)	Heated oxygen sensor circuit	X	X
34	Knock sensor circuit	X	X
35 (CHECK)	EGR temperature sensor circuit	X	—
43 (CHECK)	Throttle position sensor circuit	X	X
45 (CHECK)	Injector leak	X	—
54	Signal circuit from A/T control unit to ECM	X	X
55	No malfunction in the above circuits	X	X

X: Available

—: Not available

(CHECK): Malfunction indicator lamp item

*: Check items causing a malfunction of crankshaft position sensor circuit first, if both diagnostic trouble code No. 11 and 21 are displayed at the same time.

On-board Diagnostic System — Diagnostic Test Mode II (Self-diagnostic results) (Cont'd)

Diagnostic trouble code No.	Detected items	Malfunction is detected when	Check item (remedy)
*11	Crankshaft position sensor circuit	• Either 1° or 180° signal is not entered for the first few seconds during engine cranking. • Either 1° or 180° signal is not input often enough while the engine speed is higher than the specified rpm	• Harness and connector (If harness and connector are normal, replace crankshaft position sensor.)
12	Mass air flow sensor circuit	• The mass air flow sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector (If harness and connector are normal, replace mass air flow sensor.)
13	Engine coolant temperature sensor circuit	• The engine coolant temperature sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.)	• Harness and connector • Engine coolant temperature sensor
14	Vehicle speed sensor circuit	• The vehicle speed sensor circuit is open or shorted	• Harness and connector • Vehicle speed sensor (reed switch)
*21	Ignition signal circuit	• The ignition signal in the primary circuit is not entered during engine cranking or running.	• Harness and connector • Power transistor unit
31	ECM	• ECM calculation function is malfunctioning.	[Replace ECM (ECCS control module).]
32	EGR function	• EGR valve does not operate (EGR valve spring does not lift.)	• EGR valve • EGR & canister control solenoid valve
33	Heated oxygen sensor circuit	• The heated oxygen sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.)	• Harness and connector • Heated oxygen sensor • Fuel pressure • Injectors • Intake air leaks
34	Knock sensor circuit	• The knock sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector • Knock sensor
35	EGR temperature sensor circuit	• The EGR temperature sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector • EGR temperature sensor
43	Throttle position sensor circuit	• The throttle position sensor circuit is open or shorted (An abnormally high or low voltage is entered.)	• Harness and connector • Throttle position sensor
45	Injector leak	• Fuel leaks from injector.	• Injector
54	Signal circuit from A/T control unit to ECM (A/T only)	• The A/T communication line is open or shorted.	• Harness and connector

*: Check items causing a malfunction of crankshaft position sensor circuit first, if both diagnostic trouble code No. 11 and 21 come out at the same time.

On-board Diagnostic System — Diagnostic Test Mode II (Self-diagnostic results) (Cont'd)

HOW TO ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

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

- **When the battery terminal is disconnected, the diagnostic trouble code will be lost from the backup memory within 24 hours.**
- **Before starting on-board diagnostic system, do not erase the stored memory before beginning on-board diagnostic system.**

Consult

ECCS COMPONENT PARTS APPLICATION

ECCS COMPONENT PARTS		DIAGNOSTIC TEST MODE				
		WORK SUPPORT	SELF-DIAG-NOSTIC RESULTS	DATA MONITOR	ACTIVE TEST	FUNCTION TEST
INPUT	Crankshaft position sensor		X	X		
	Mass air flow sensor		X	X		
	Engine coolant temperature sensor		X	X	X	
	Heated oxygen sensors		X	X		X
	Vehicle speed sensors		X	X		X
	Throttle position sensor	X	X	X		X
	EGR temperature sensor*		X	X		
	Knock sensor		X			
	Ignition switch (start signal)			X		X
	Air conditioner switch			X		
	Neutral position switch			X		X
	Power steering oil pump switch			X		X
	Battery			X		
	A/T signal		X			
OUT-PUT	Injectors		X	X	X	X
	Power transistor (ignition timing)	X	X (Ignition signal)	X	X	X
	IACV-AAC valve	X		X	X	X
	EGR & canister control solenoid valve			X	X	X
	Air conditioner relay			X		
	Fuel pump relay	X		X	X	X
	Radiator fan			X	X	X
	PAIRC-solenoid valve			X	X	

: The ECCS component part marked "" is applicable to vehicles for California only

X: Applicable

Consult (Cont'd)

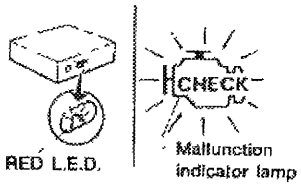
SELF-DIAGNOSTIC MODE

DIAGNOSTIC ITEM	DIAGNOSTIC ITEM IS DETECTED WHEN ...	CHECK ITEM (REMEDY)
CRANK POSITION SEN*	• Either 1° or 180° signal is not entered for the first few seconds during engine cranking. • Either 1° or 180° signal is not input often enough while the engine speed is higher than the specified rpm	• Harness and connector (If harness and connector are normal, replace crankshaft position sensor.)
MASS AIR FLOW SEN	• The mass air flow sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector (If harness and connector are normal, replace mass air flow sensor.)
COOLANT TEMP SEN	• The engine coolant temperature sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.)	• Harness and connector • Engine coolant temperature sensor
VEHICLE SPEED SEN	• The vehicle speed sensor circuit is open or shorted.	• Harness and connector • Vehicle speed sensor (reed switch)
IGN SIGNAL-PRIMARY*	• The ignition signal in primary circuit is not entered during engine cranking or running	• Harness and connector • Power transistor unit
ECM	• ECM calculation function is malfunctioning.	(Replace ECM (ECCS control module).)
EGRC SOLENOID/V	• EGR valve does not operate. (EGR valve spring does not lift.)	• EGR valve • EGR & canister control solenoid valve
OXYGEN SEN	• The heated oxygen sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.)	• Harness and connector • Heated oxygen sensor • Fuel pressure • Injectors • Intake air leaks
KNOCK SENSOR	• The knock sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector • Knock sensor
EGR TEMP SENSOR**	• The EGR temperature sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector • EGR temperature sensor
THROTTLE POSI SEN	• The throttle position sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector • Throttle position sensor
INJECTOR LEAK**	• Fuel leaks from injector.	• Injector
A/T COMM LINE	• The A/T communication line is open or shorted.	• Harness and connector

*: Check items causing a malfunction of crankshaft position sensor circuit first, if both "CRANKSHAFT POSITION SENSOR" and "IGN SIGNAL-PRIMARY" come out at the same time.

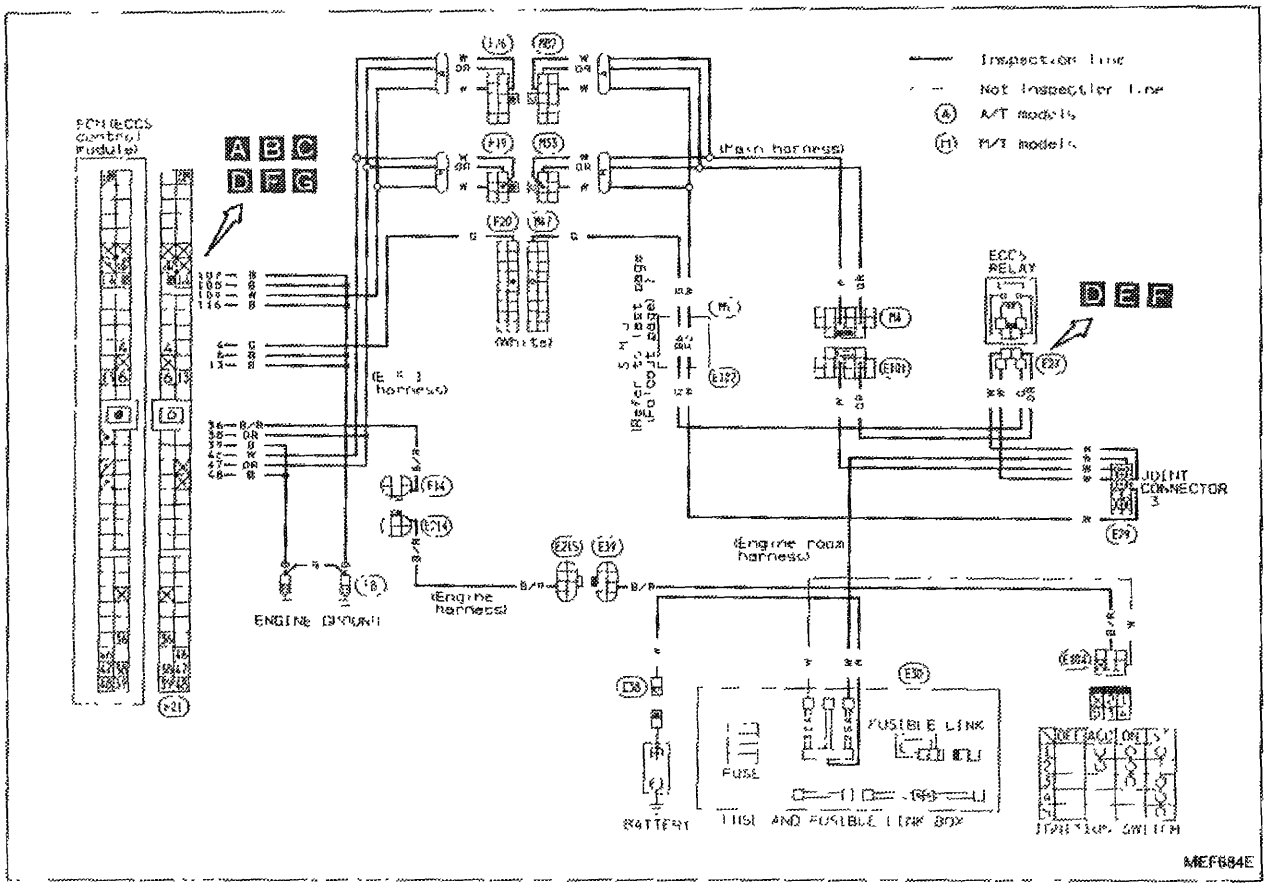
: The diagnostic item marked "" is applicable to vehicles for California only

How to Execute On-board Diagnostic System In Diagnostic Test Mode II

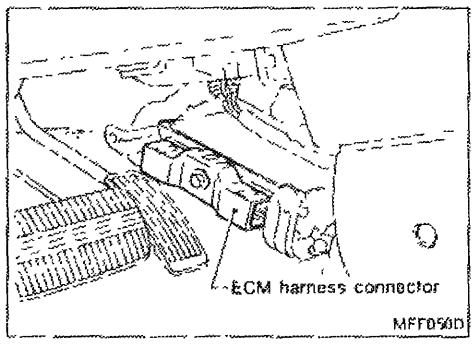
Detected items	Display Diagnostic trouble code No	How to perform diagnostic test mode II (Self-diagnostic results) judgement	
		Illustration	Method
Signal circuit from A/T control unit to ECM	54	☆MONITOR ☆NO FAIL CKPS·RPM (REF) 800rpm MAS AIR/FL SE 1.55V COOLAN TEMP/S 79°C O2 SEN 0.80V M/R F/C MNT RICH VHCL SPEED SE 0km/h BATTERY VOLT 14.0V THRTL POS SEN 0.50V EGR TEMP SEN 2.4V RECORD MEF046D  SEF677D	**PERFORM DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS).** 1) Turn ignition switch "ON" or start engine 2) Select "DATA MONITOR" mode with CONSULT. ☆ **NO FAIL** — OR — 2) Perform diagnostic test mode II (Self-diagnostic results) with ECM **Malfunction indicator lamp and red L.E.D. display diagnostic trouble code No. 55.**

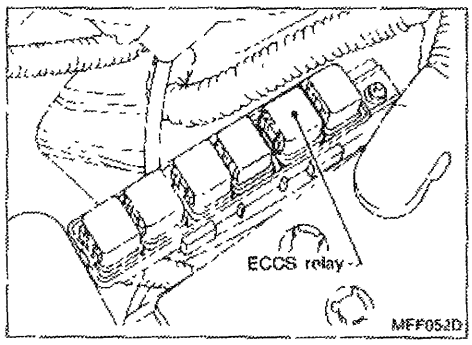
Diagnostic Procedure 1

MAIN POWER SUPPLY AND GROUND CIRCUIT (Not self-diagnostic item)

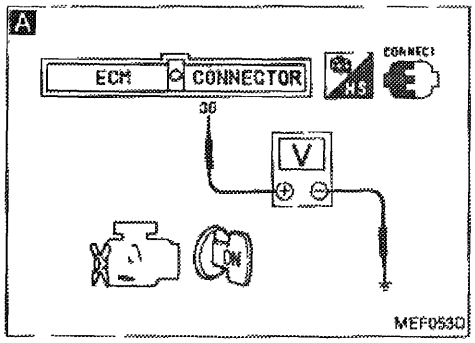


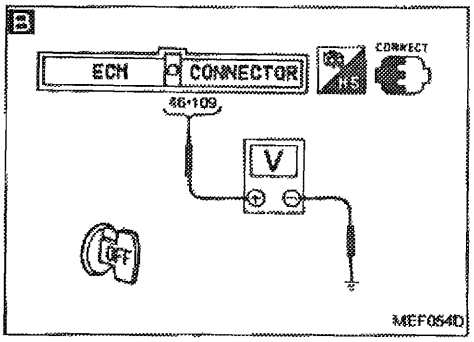
Harness layout

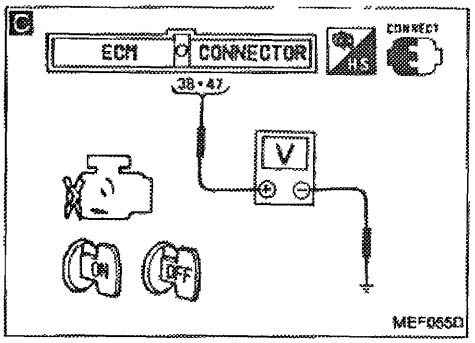




MAIN POWER SUPPLY AND GROUND CIRCUIT (Not self-diagnostic item)







INSPECTION START

Start engine.
Is engine running?

No → A

Yes

A

CHECK POWER SUPPLY-I.
1) Turn ignition switch "ON".
2) Check voltage between ECM terminal (36) and ground with CONSULT or tester.
Voltage: Battery voltage

If N.G., check the following.
- Harness connectors (F14), (E214)
- Harness connectors (E215), (E38)
- Harness continuity between ECM and ignition switch

If N.G., repair harness or connectors.

O.K.

Go to "CHECK GROUND CIRCUIT"

B

CHECK POWER SUPPLY-II.
1) Stop engine.
2) Check voltage between ECM terminals (46), (108) and ground with CONSULT or tester.
Voltage: Battery voltage

N.G.

Check the following.
- Harness connectors (F28), (M82) (A/T models)
- Harness connectors (F19), (M83) (M/T models)
- Harness connectors (M4), (E16)
- Harness connectors (M5), (E102)
- Joint connector-3
- 25A fusible link
- Harness continuity between ECM and battery

If N.G., repair harness or connectors.

O.K.

C

CHECK POWER SUPPLY-III.
1) Turn ignition switch "ON" and then "OFF".
2) Check voltage between ECM terminals (38), (47) and ground with CONSULT or tester.
Voltage:
Ignition switch "ON" and for a few seconds after turning ignition switch "OFF"
Battery voltage
A few seconds after turning ignition switch "OFF"
Approximately 0V

O.K. → Go to "CHECK GROUND CIRCUIT".

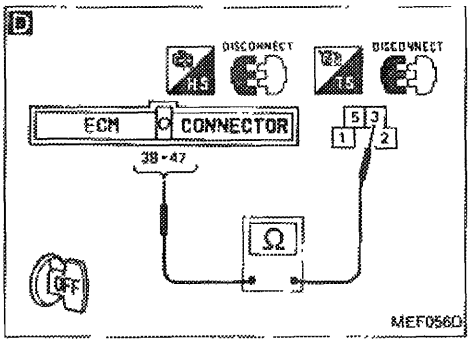
Case-1: Battery voltage does not exist for a few seconds.
Case-2: Battery voltage exists for more than a few seconds.

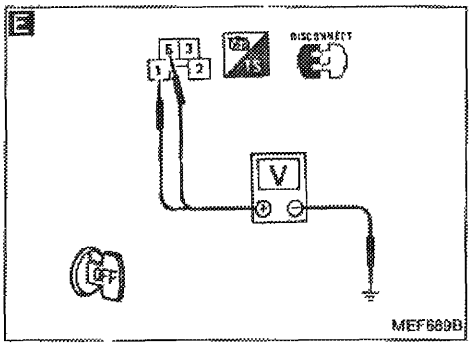
N G

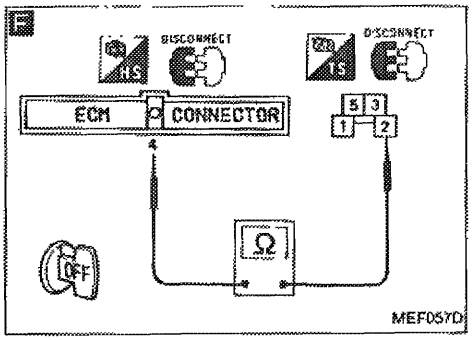
Case-2 → Go to "CHECK COMPONENT (ECCS relay)".

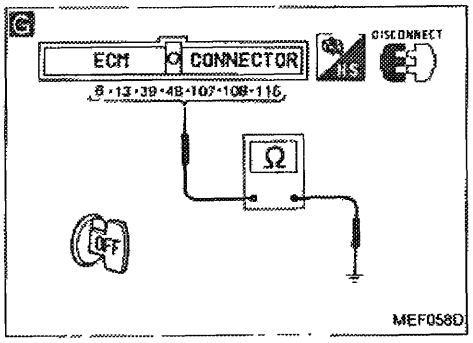
Case-1 → Ⓐ

MAIN POWER SUPPLY AND GROUND CIRCUIT (Not self-diagnostic item)









Ⓐ

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 (38), (47) and terminal (3).
Continuity should exist.

N.G. → Check the following.
- Harness connectors (F26), (M82) (A/T models)
- Harness connectors (F18), (M83) (M/T models)
- Harness connectors (M8), (E101)
- Harness continuity between ECM and ECCS relay

If N.G., repair harness or connectors.

O.K.

E

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

N.G. → Check the following.
- Joint connector-3
- Harness continuity between ECCS relay and joint connector-3

If N.G., repair harness or connectors.

O.K.

F

CHECK OUTPUT SIGNAL CIRCUIT.
1) Check harness continuity between ECM terminal (4) and terminal (2).
Continuity should exist.

N.G. → Check the following.
- Harness connectors (F20), (M47)
- Harness connectors (M5), (E102)
- Harness continuity between ECM and ECCS relay

If N.G., repair harness or connectors.

O.K.

CHECK COMPONENT (ECCS relay).
Refer to "Electrical Components Inspection".

N.G. → Replace ECCS relay.

O.K.

G

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Check harness continuity between ECM terminals (6), (13), (39), (48), (107), (108), (116) and engine ground.
Continuity should exist.

N.G. → Repair harness or connectors.

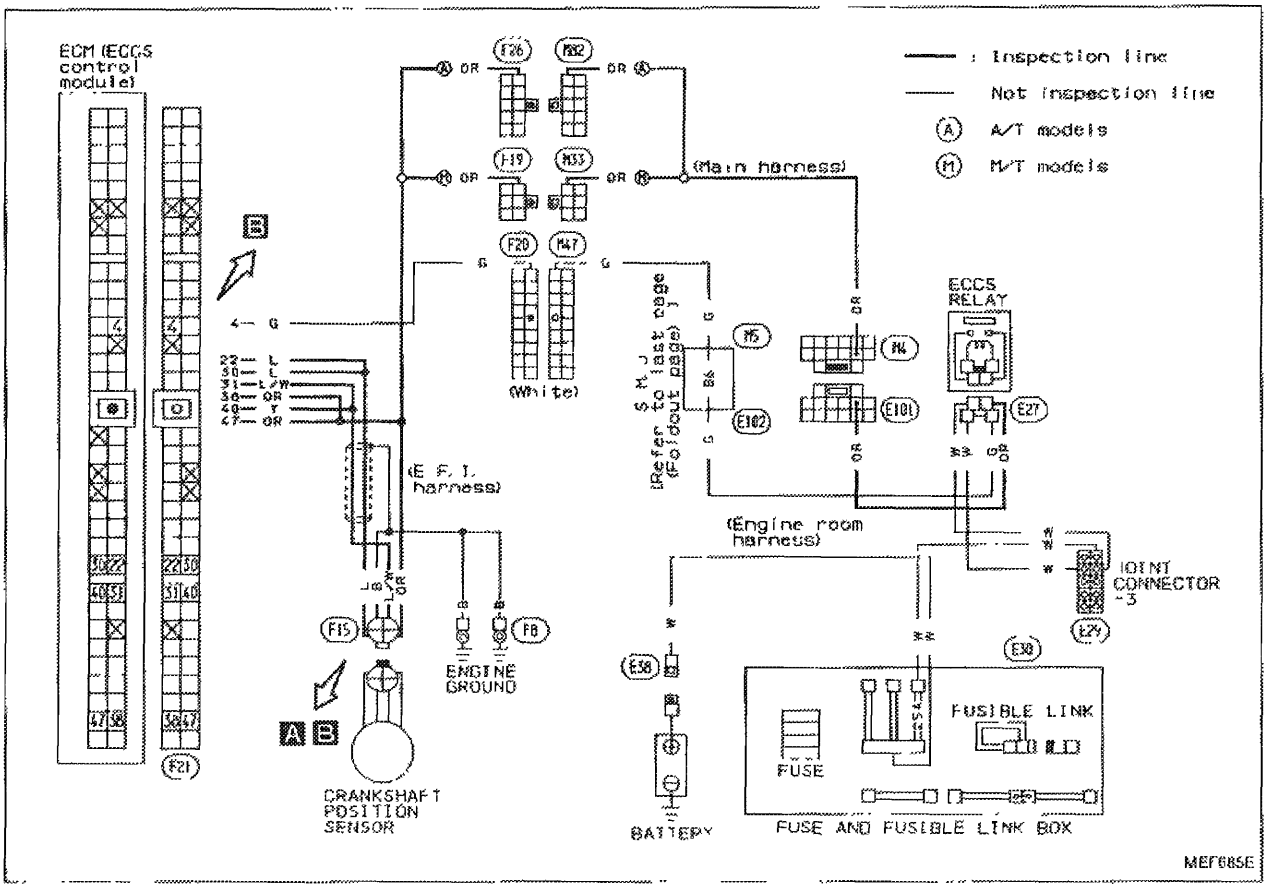
O.K.

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

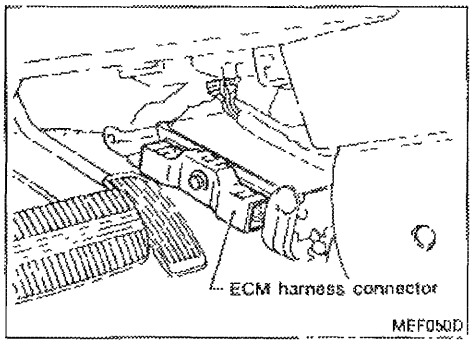
INSPECTION END

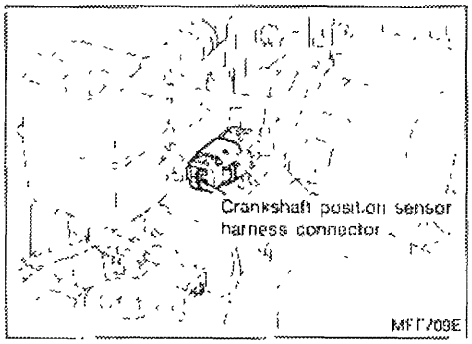
Diagnostic Procedure 2

CRANKSHAFT POSITION SENSOR (Diagnostic trouble code No. 11)



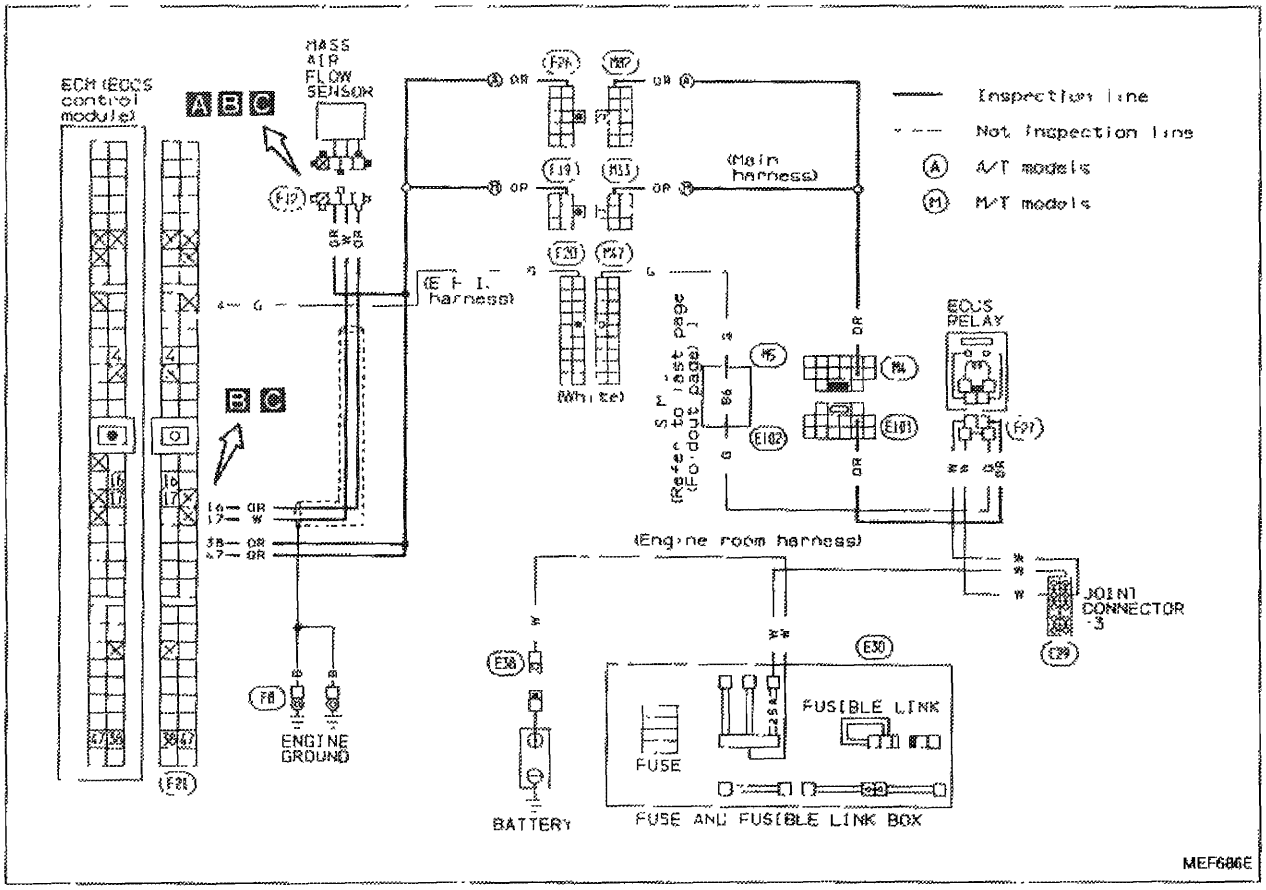
Harness layout



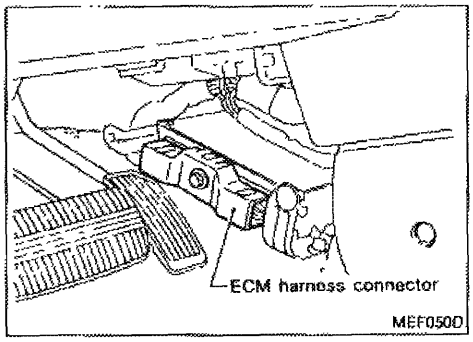


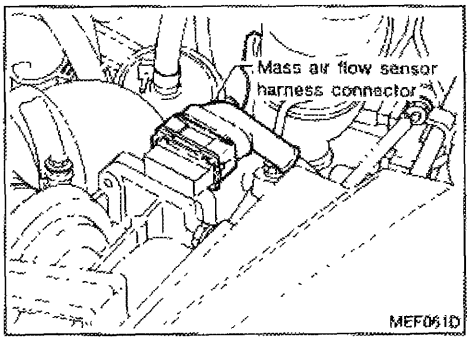
Diagnostic Procedure 3

MASS AIR FLOW SENSOR (Diagnostic trouble code No. 12) (CHECK) (Malfunction indicator lamp item: California models)



Harness layout

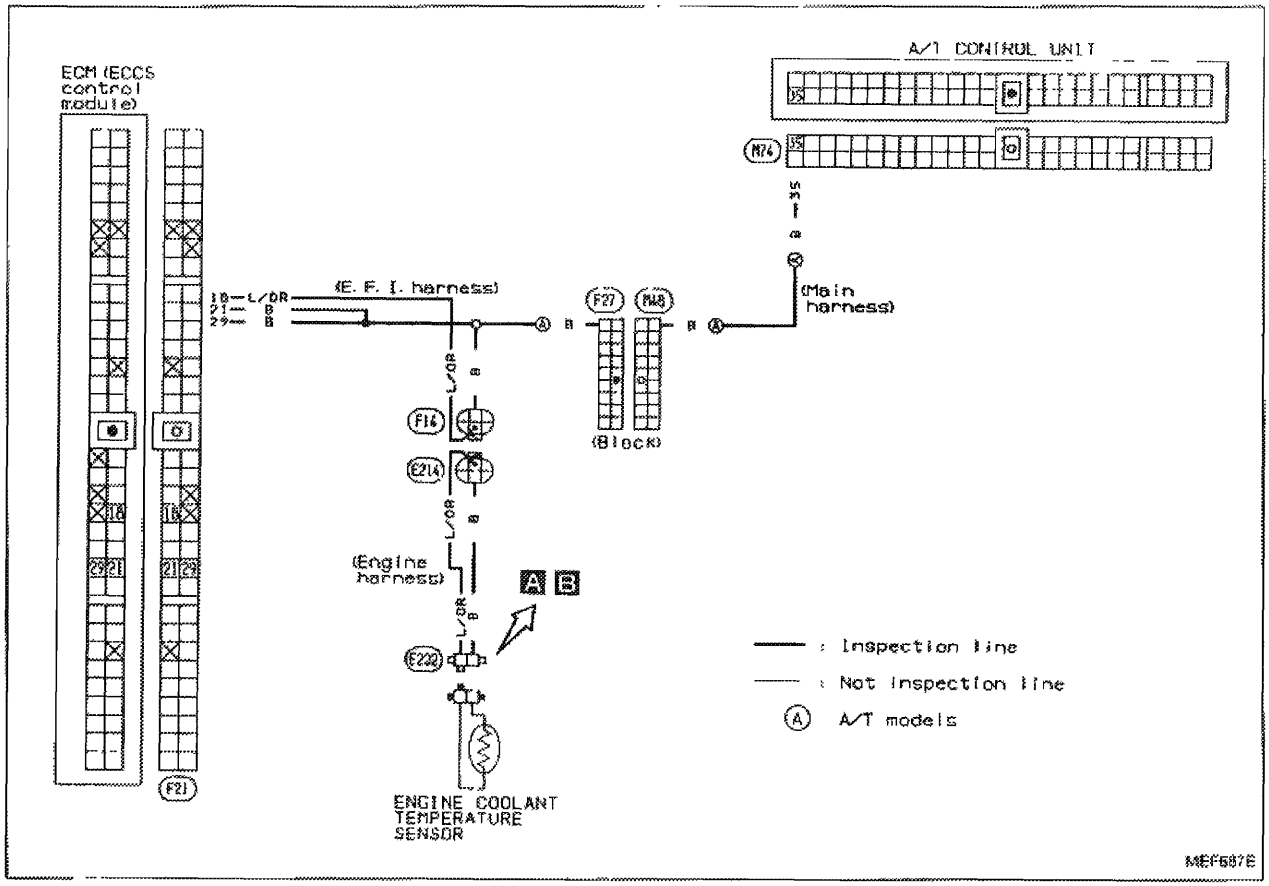




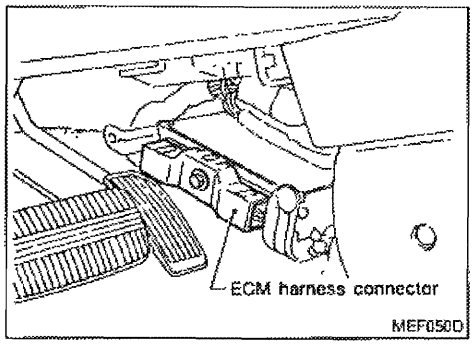
Diagnostic Procedure 4

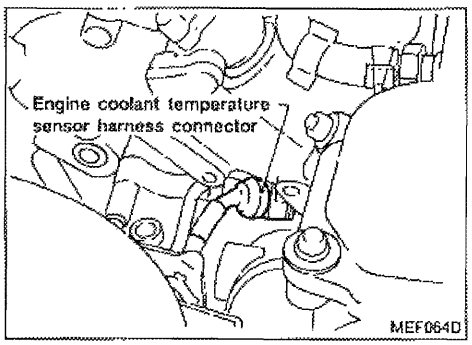
ENGINE COOLANT TEMPERATURE SENSOR (Diagnostic trouble code No. 13)

CHECK (Malfunction indicator lamp item: California models)

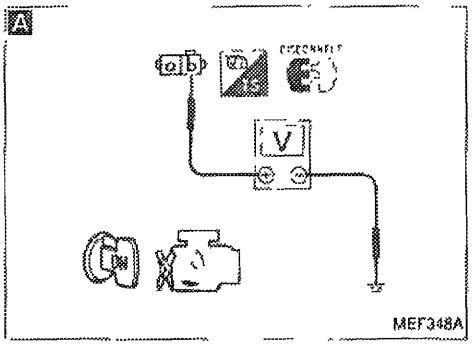


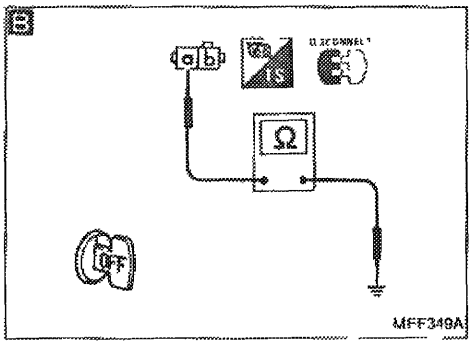
Harness layout





ENGINE COOLANT TEMPERATURE SENSOR (Diagnostic trouble code No.13) (Malfunction indicator lamp item: California models)





INSPECTION START

PERFORM DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS).
- O.K. → INSPECTION END
- N.G.

A

CHECK POWER SUPPLY.
1) Turn ignition switch "OFF".
2) Disconnect engine coolant temperature sensor harness connector.
3) Turn ignition switch "ON".
4) Check voltage between terminal (b) and ground with CONSULT or tester.
Voltage: Approximately 5V

- N.G → Check the following.
  - Harness connectors (F14), (E216)
  - Harness continuity between ECM and engine coolant temperature sensor.

  If N.G., repair harness or connectors.
- O.K.

B

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Check harness continuity between terminal (a) and engine ground.
Continuity should exist.

- N.G. → Check the following
  - Harness connectors (F14), (E216)
  - Harness connectors (F27), (M49) (A/T models)
  - Harness continuity between ECM and engine coolant temperature sensor
  - Harness continuity between A/T control unit and engine coolant temperature sensor

  If N.G., repair harness or connectors.
- O.K.

CHECK COMPONENT
(Engine coolant temperature sensor).
Refer to "Electrical Components Inspection"

- N.G. → Replace engine coolant temperature sensor.
- O.K.

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

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

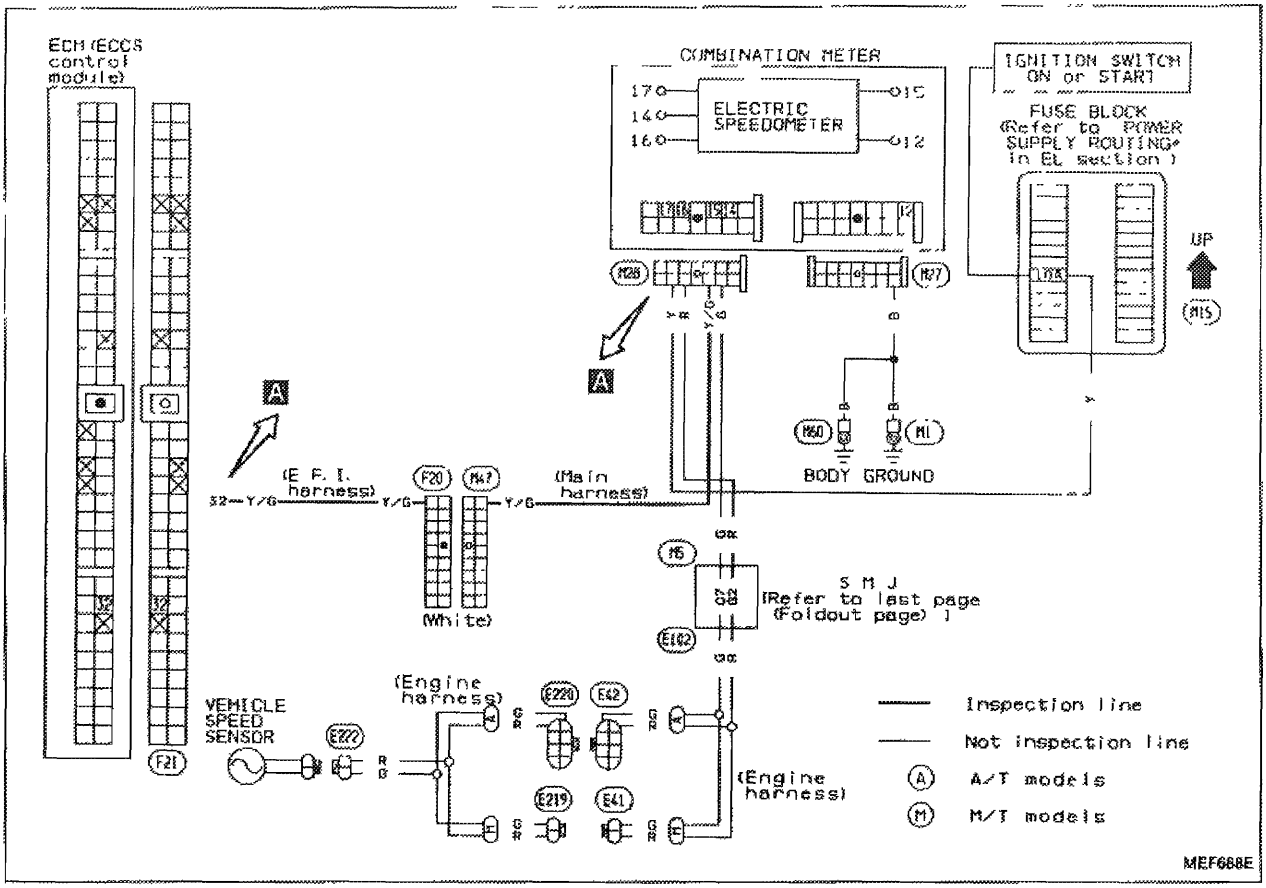
FINAL CHECK
1) Erase the diagnostic test mode II (Self-diagnostic results) memory.
2) Perform test drive.
3) Perform diagnostic test mode II (Self-diagnostic results) again.

- N.G. → Recheck ECM pin terminals for damage or the connection of ECM harness connector.
- O.K.

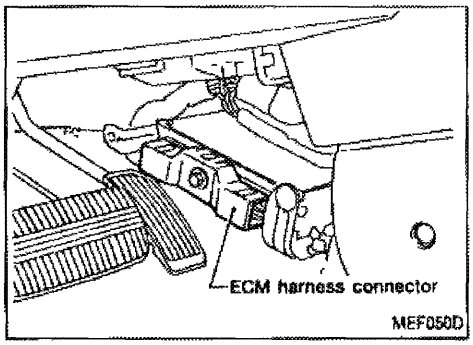
INSPECTION END

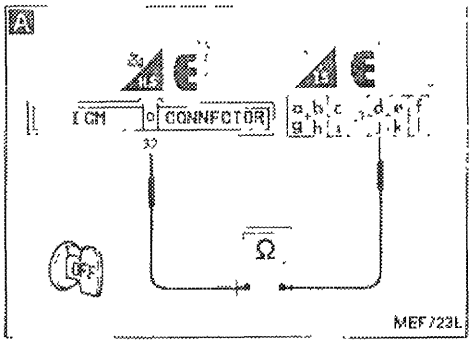
Diagnostic Procedure 5

VEHICLE SPEED SENSOR (Diagnostic trouble code No. 14) (Malfunction indicator lamp item: California models)



Harness layout





VEHICLE SPEED SENSOR (Diagnostic trouble code No.14) (Malfunction indicator lamp item: California models)

INSPECTION START

CHECK OVERALL FUNCTION → O.K → INSPECTION END

N.G.

CHECK SPEEDOMETER FUNCTION
Make sure that speedometer functions properly → N.G. → Check vehicle speed sensor and its circuit. (Refer to EL section.)

O.K.

A

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF"
2) Disconnect ECM harness connector and combination meter harness connector.
3) Check harness continuity between ECM terminal (42) and terminal ( ).
Continuity should exist.
→ N.G. → Check the following.
- Harness connectors (F16), (M1)
- Harness continuity between ECM and combination meter

If N.G., repair harness or connectors.

O.K

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

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

FINAL CHECK

Erase the diagnostic test mode II (Self-diagnostic results) memory

Perform test drive

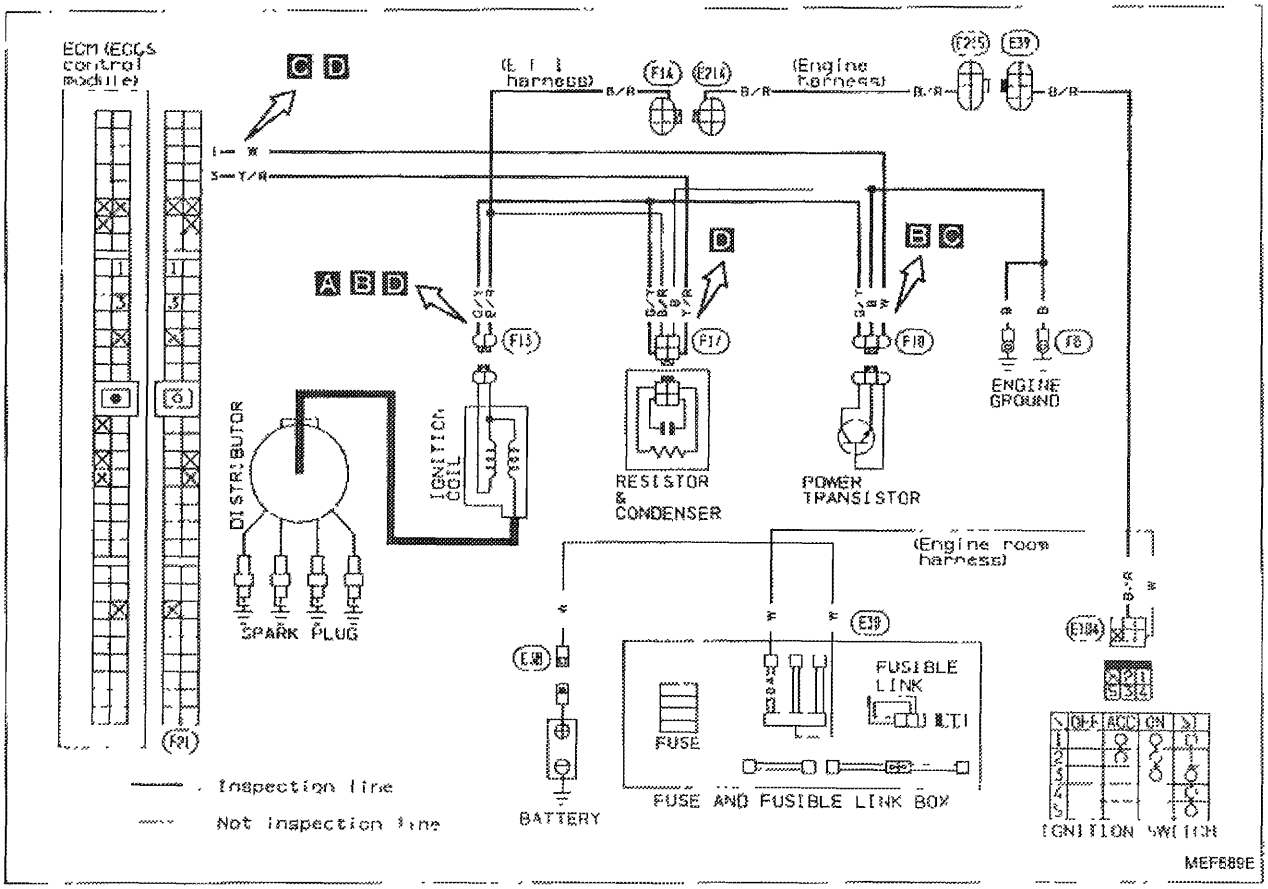
Check overall function again → N.G. → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

O.K.

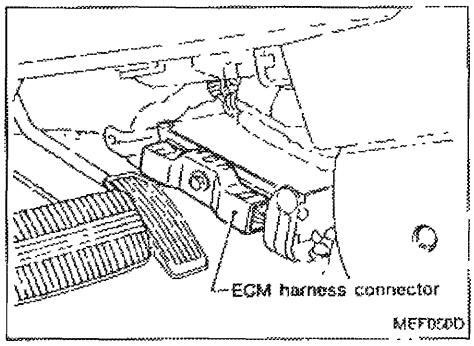
INSPECTION END

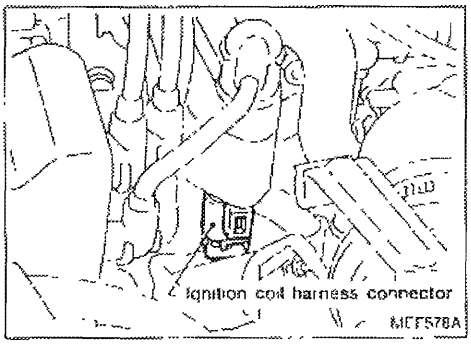
Diagnostic Procedure 6

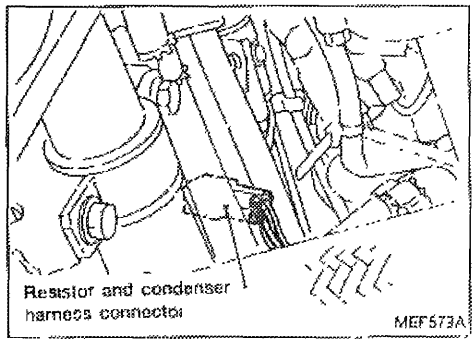
IGNITION SIGNAL (Diagnostic trouble code No. 21)

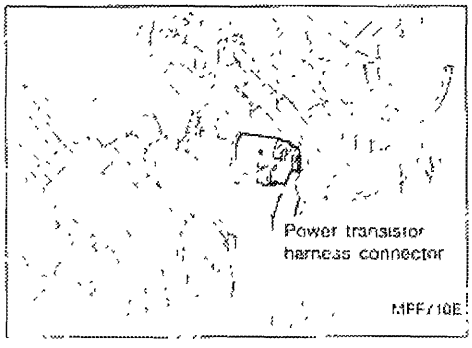


Harness layout

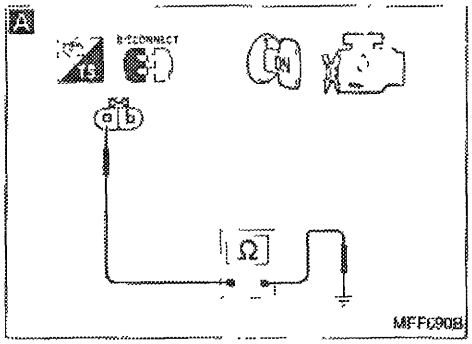


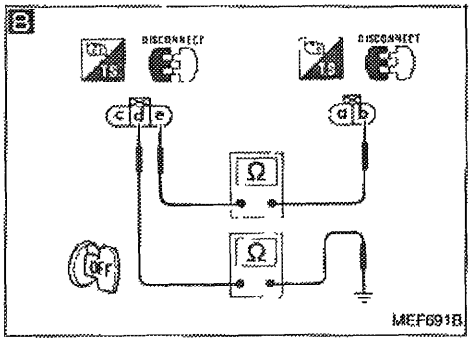


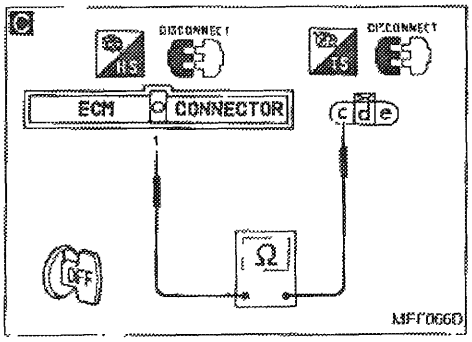




IGNITION SIGNAL (Diagnostic trouble code No.21)







INSPECTION START

PERFORM DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS).

O.K → INSPECTION END

N.G.

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

Yes → Ⓐ

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

N.G. → Check the following.
- Harness connectors (F14), (E214)
- Harness connectors (E215), (E39)
- Harness continuity between ignition coil and ignition switch

If N.G., repair harness or connectors.

O.K

B

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect power transistor harness connector
3) Check harness continuity between terminal ⓑ and terminal ⓔ, terminal ⓓ and engine ground.
Continuity should exist.

N.G. → Repair harness or connectors.

O.K

C

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ① and terminal ⑥.
Continuity should exist.

N.G. → Repair harness or connectors.

O K

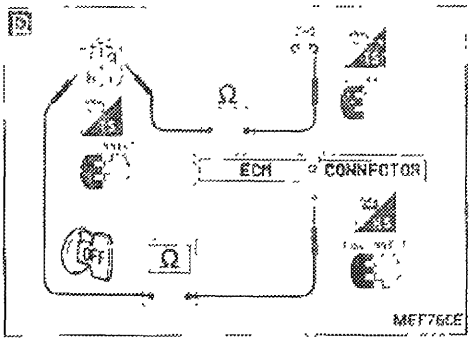
CHECK COMPONENT
(Ignition coil, power transistor).
Refer to "Electrical Components Inspection"

N.G. → Replace malfunctioning component(s).

O K.

Check ECM pin terminals for damage or the connection of ECM harness connector

IGNITION SIGNAL (Diagnostic trouble code No.21)



CHECK INPUT SIGNAL CIRCUIT
1) Stop engine
2) Disconnect ignition coil harness connector and resistor & condenser harness connector
3) Disconnect ECM harness connector
4) Check harness continuity between terminal (b) and terminal (g), terminal (f) and ECM terminal (3).
Continuity should exist.

N.G. → Repair harness or connectors

O.K

CHECK COMPONENT
(Resistor)
Refer to "Electrical Components Inspection"

N.G → Replace resistor & condenser

O.K.

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

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

FINAL CHECK

Erase the diagnostic test mode II (Self-diagnostic results) memory

Perform test drive

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

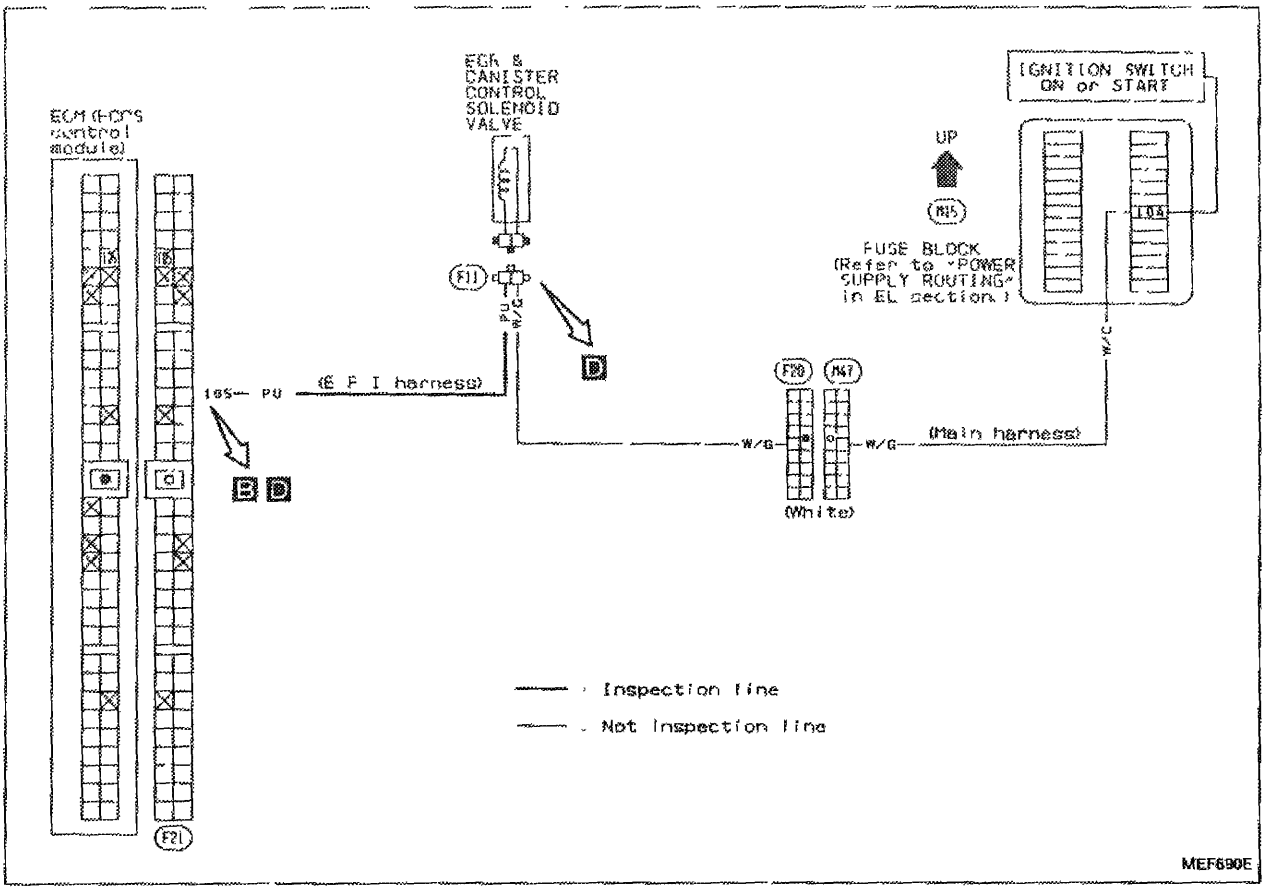
N.G. → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

O.K.

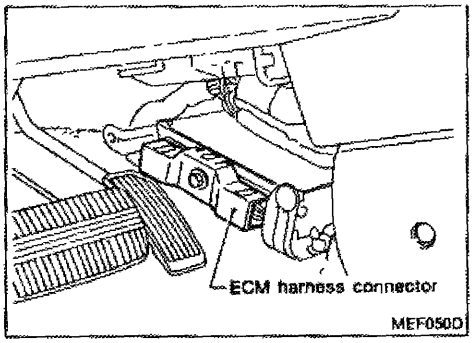
INSPECTION END

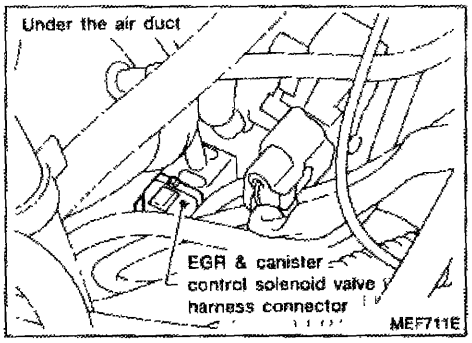
Diagnostic Procedure 7

EGR FUNCTION (Diagnostic trouble code No. 32) (Malfunction indicator lamp item): California models



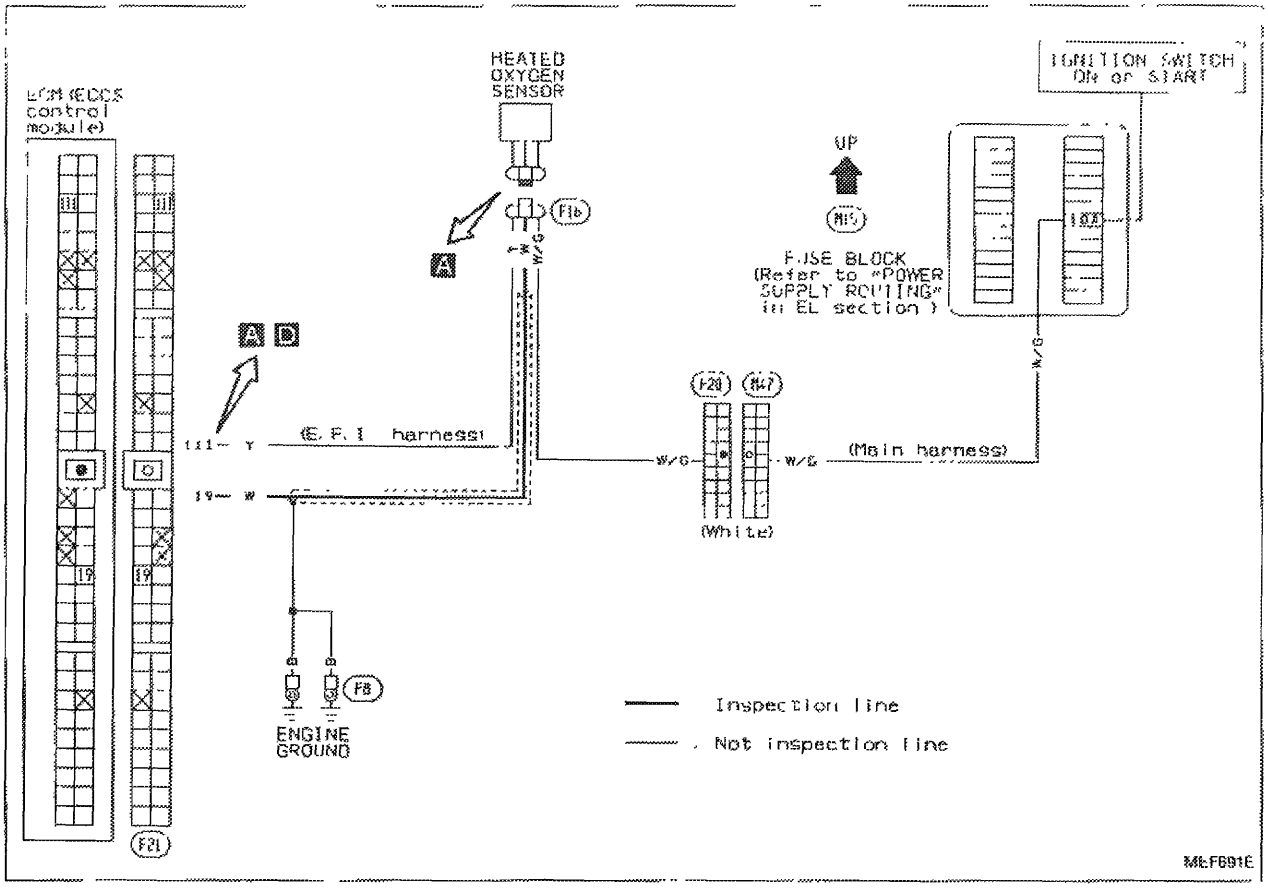
Harness layout



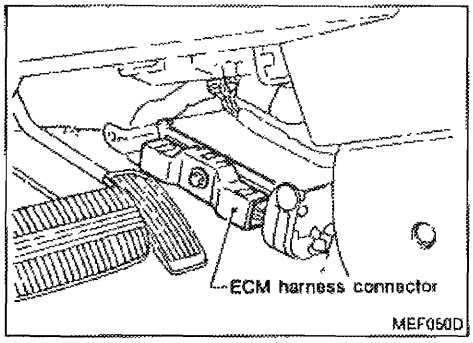


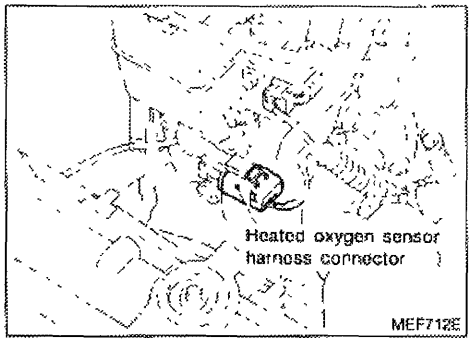
Diagnostic Procedure 8

HEATED OXYGEN SENSOR (Diagnostic trouble code No. 33) (Malfunction indicator lamp item: California models)

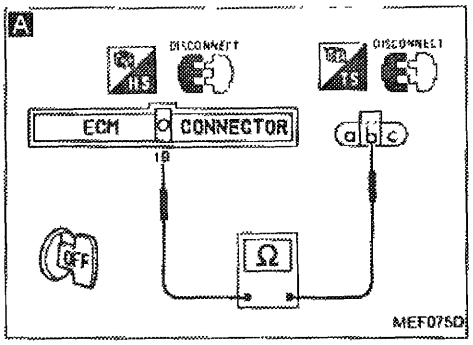


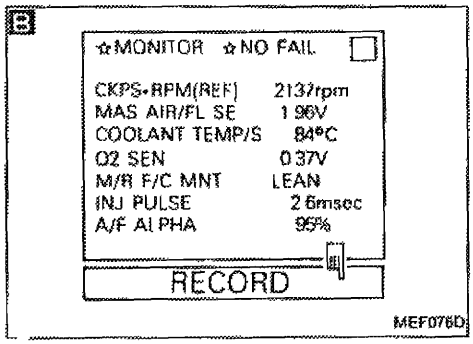
Harness layout

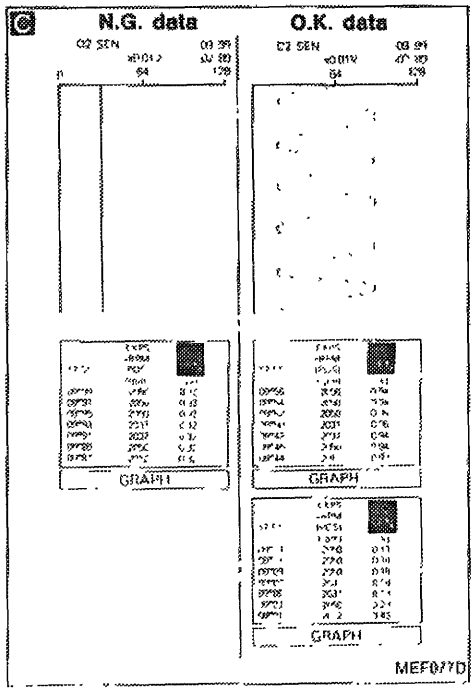


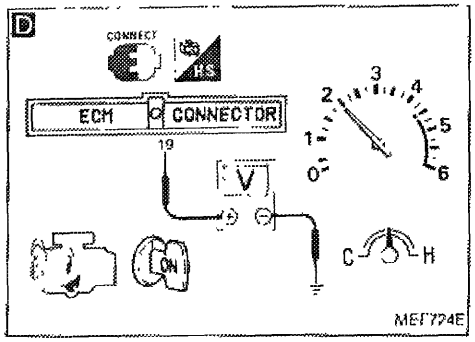


HEATED OXYGEN SENSOR (Diagnostic trouble code No.33) (Malfunction indicator lamp item: California models)









INSPECTION START

CHECK OVERALL FUNCTION.

O.K. → INSPECTION END

N.G.

A

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect heated oxygen sensor harness connector and ECM harness connector.
3) Check harness continuity between ECM terminal ⑲ and terminal ⓑ.
Continuity should exist.

N.G. → Repair harness or connectors.

O.K.

CHECK VOLTAGE
1) Reconnect heated oxygen sensor harness connector and ECM harness connector.
2) Start engine and warm it up sufficiently.
B 3) Select "DATA MONITOR" mode with CONSULT.
4) Touch "RECORD" on CONSULT with engine speed held at approximately 2,000 rpm.
C 5) Check O_2 SEN voltage.
① **Approx. 0.3 volts (No voltage fluctuations) ... N.G.**
② **Other than ① above ... O.K.**

N.G. → Replace heated oxygen sensor.

OR

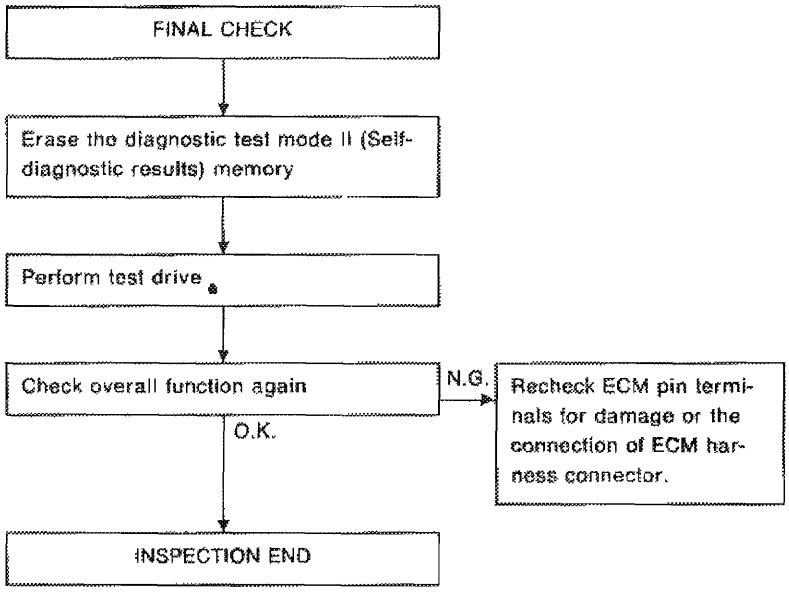
D 3) Check voltage between ECM terminal ⑲ and ground, with engine speed held at approximately 2,000 rpm.
① **Approx. 0.3 volts (No voltage fluctuations) ... N.G.**
② **Other than ① above ... O.K.**

O.K.

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

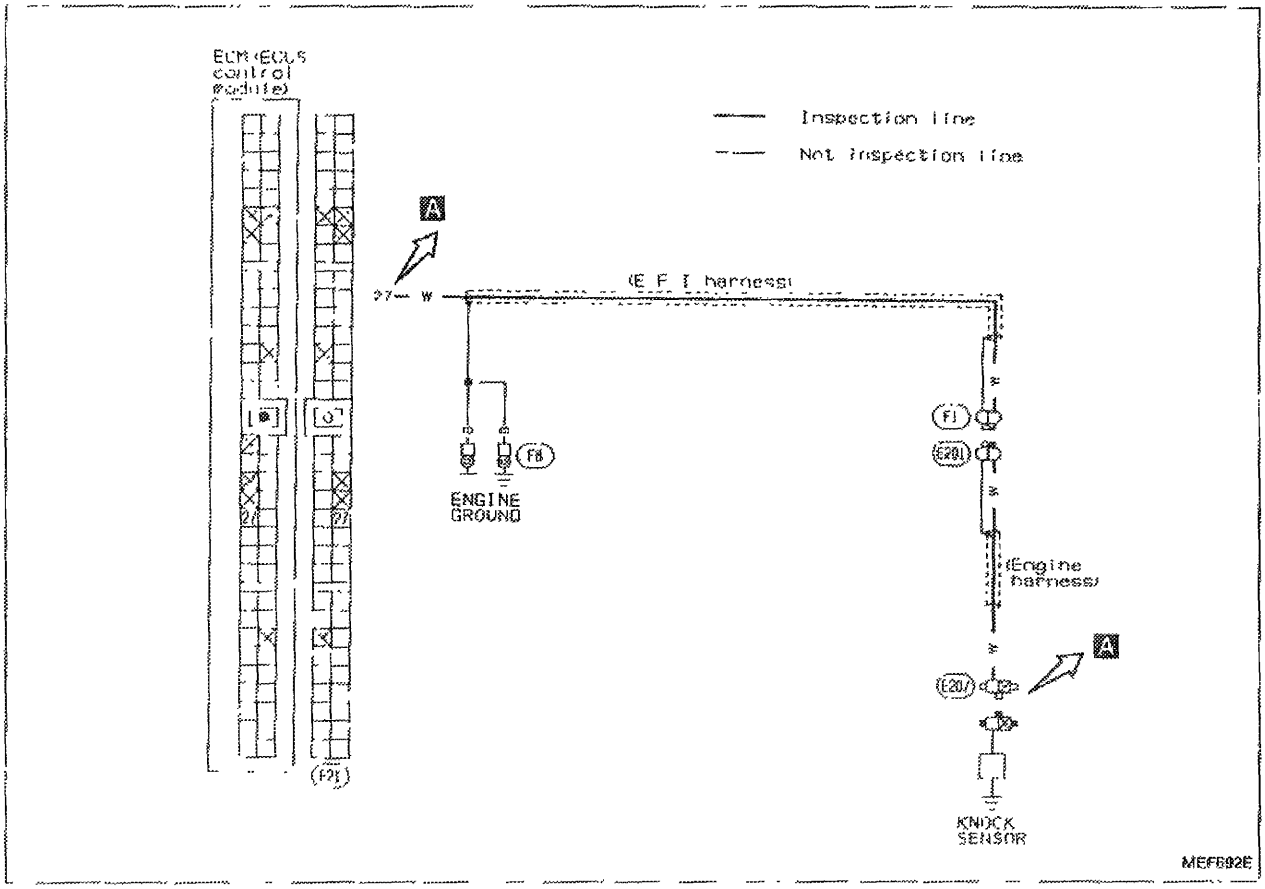
HEATED OXYGEN SENSOR (Diagnostic trouble code No.33) (Malfunction indicator lamp item: California models)

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

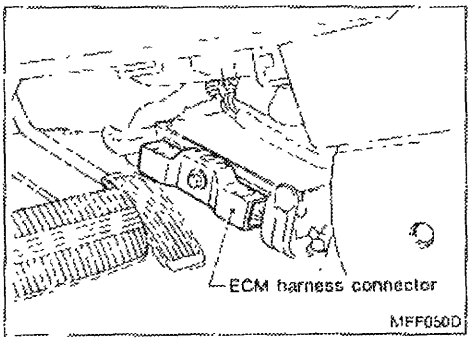


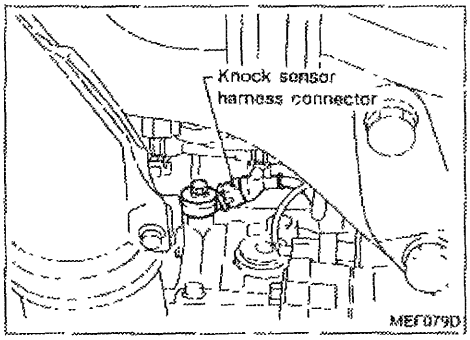
Diagnostic Procedure 9

KNOCK SENSOR (Diagnostic trouble code No. 34)



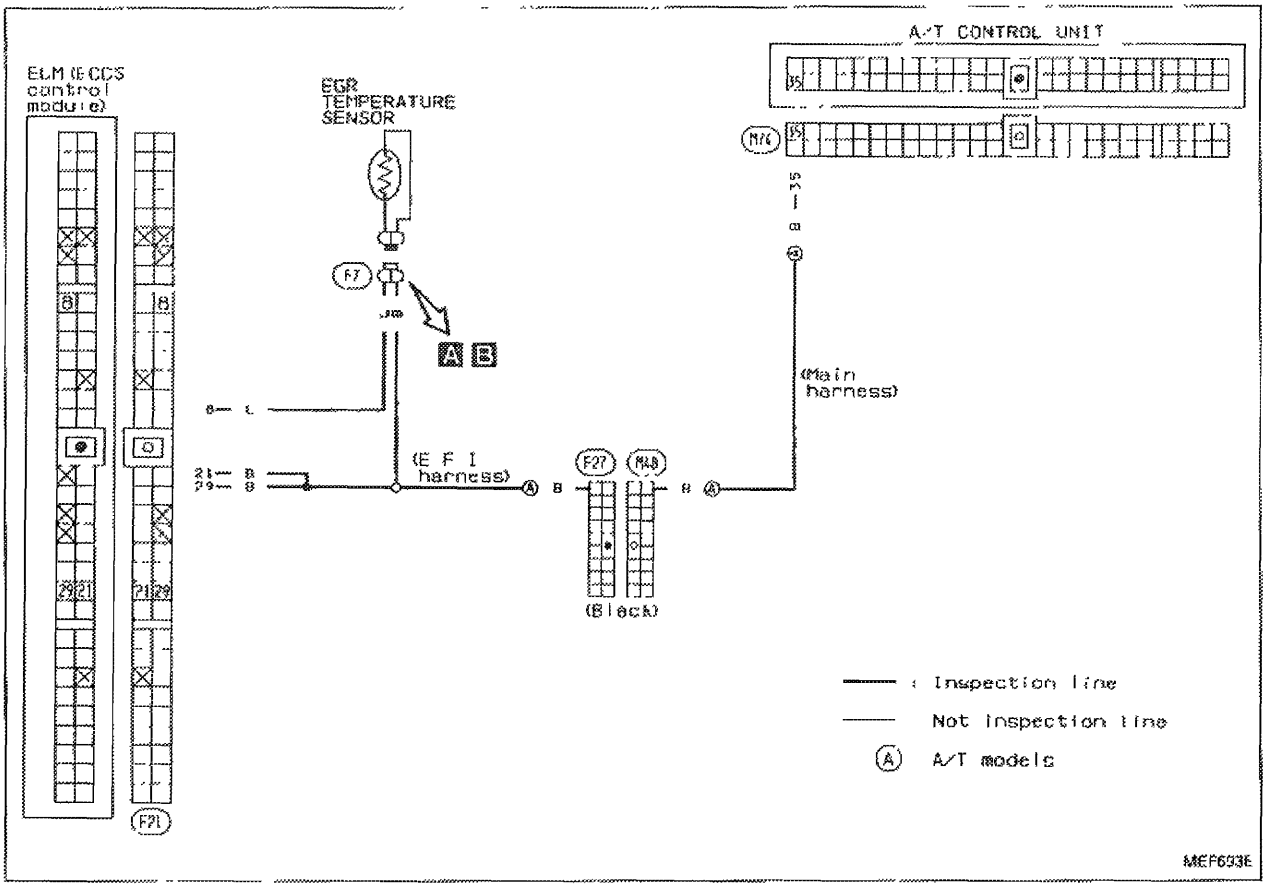
Harness layout



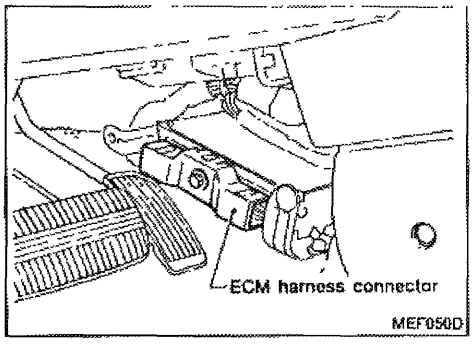


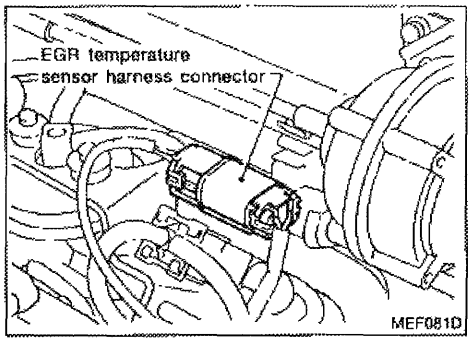
Diagnostic Procedure 10

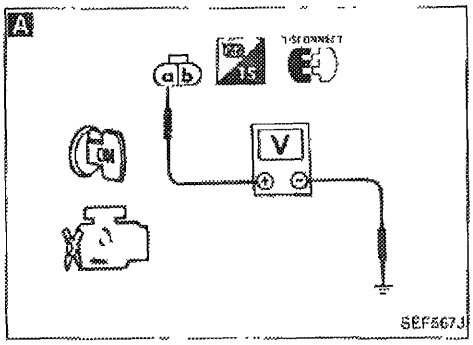
EGR TEMPERATURE SENSOR (Diagnostic trouble code No. 35) (Malfunction indicator lamp item): California models

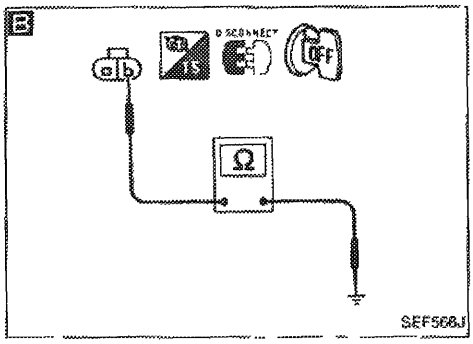


Harness layout









EGR TEMPERATURE SENSOR (Diagnostic trouble code No.35) (Malfunction indicator lamp item): California models

INSPECTION START

PERFORM DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS).
- O.K. → INSPECTION END
- N.G. ↓

A

CHECK POWER SUPPLY.
1) Turn ignition switch "OFF".
2) Disconnect EGR temperature sensor harness connector
3) Turn ignition switch "ON".
4) Check voltage between terminal (a) and ground with CONSULT or tester.
Voltage: Approximately 5V

- N.G. → Repair harness or connectors.
- O.K. ↓

B

CHECK GROUND CIRCUIT
1) Turn ignition switch "OFF".
2) Check harness continuity between terminal (b) and engine ground
Continuity should exist.

- N.G. → Check the following.
  - Harness connectors (F27), (M48) (A/T models)
  - Harness continuity between A/T control unit and EGR temperature sensor
  - Harness continuity between ECM and EGR temperature sensor

  If N.G., repair harness or connectors.
- O.K. ↓

CHECK COMPONENT (EGR temperature sensor)
Refer to "Electrical Components Inspection".

- N.G. → Replace EGR temperature sensor.
- O.K. ↓

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

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

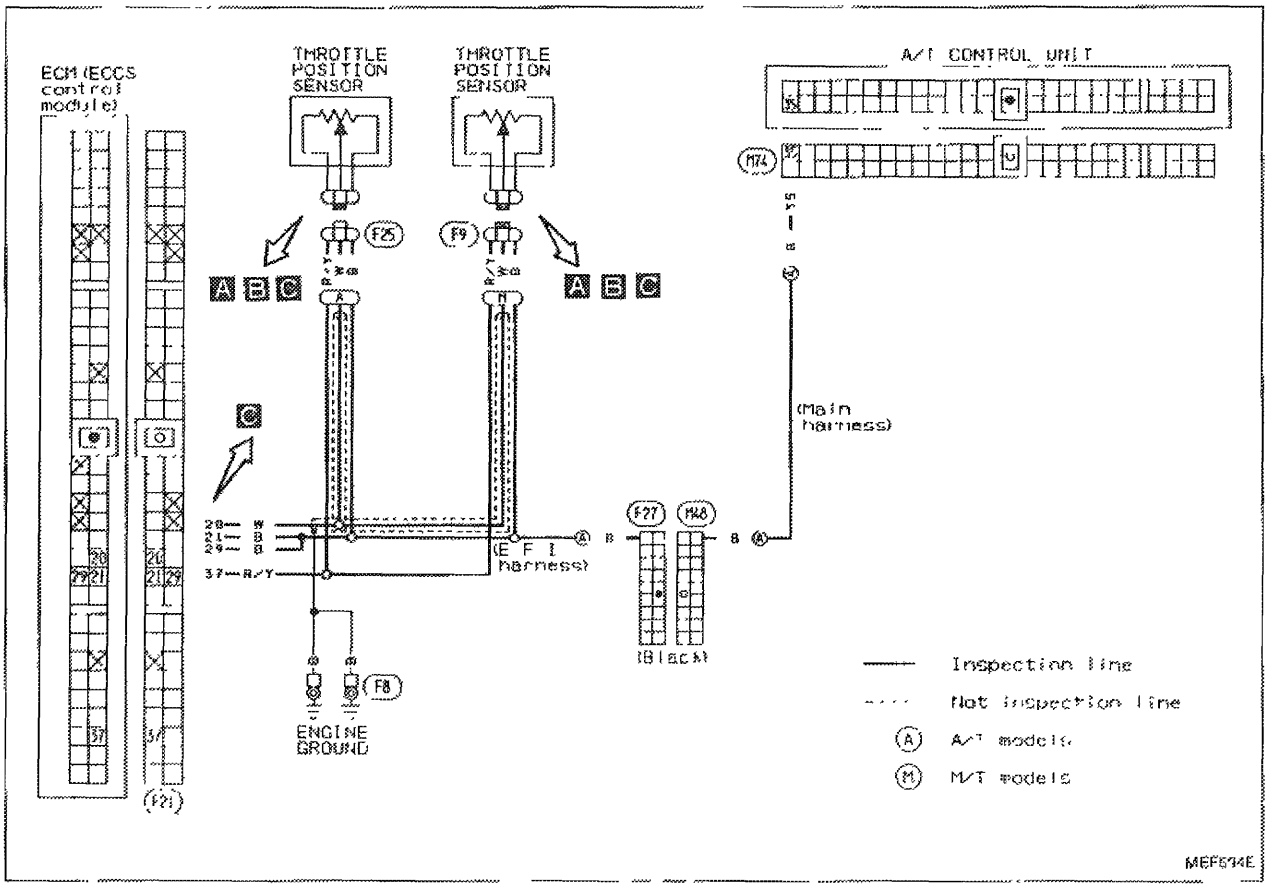
FINAL CHECK
1) Erase the diagnostic test mode II (Self-diagnostic results) memory.
2) Perform test drive.
3) Perform diagnostic test mode II (Self-diagnostic results) again.

- N.G. → Recheck ECM pin terminals for damage or the connection of ECM harness connector
- O.K. ↓

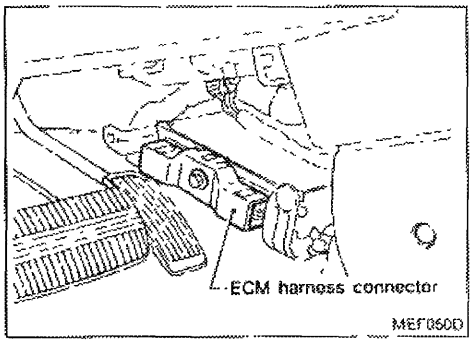
INSPECTION END

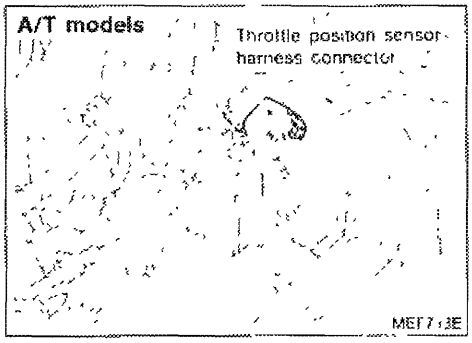
Diagnostic Procedure 11

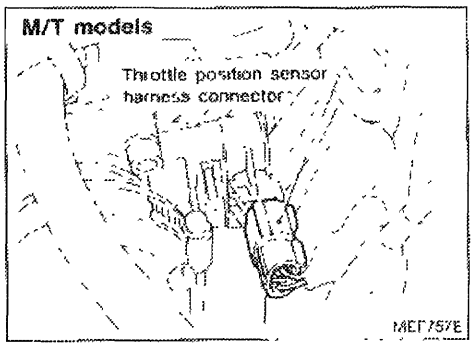
THROTTLE POSITION SENSOR (Diagnostic trouble code No. 43) (Malfunction indicator lamp item: California models)

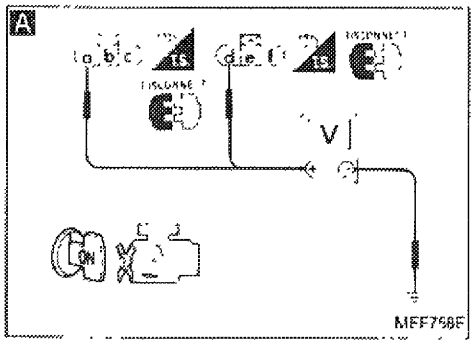


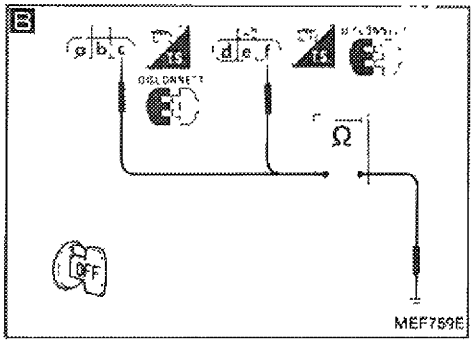
Harness layout

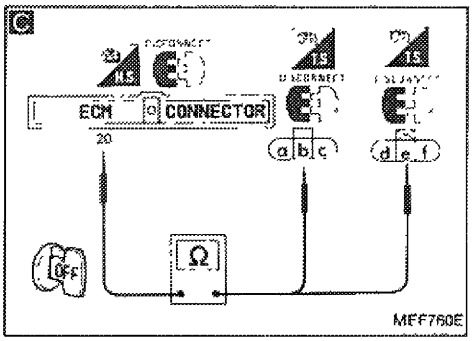












THROTTLE POSITION SENSOR (Diagnostic trouble code No.43) (Malfunction indicator lamp item: California models)

INSPECTION START

PERFORM DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)
- O.K → INSPECTION END
- N.G. ↓

A

CHECK POWER SUPPLY.
1) Turn ignition switch "OFF"
2) Disconnect throttle position sensor harness connector.
3) Turn ignition switch "ON".
4) Check voltage between terminal ⓔ (A/T models), terminal ⓓ (M/T models) and ground with CONSULT or tester.
Voltage: Approximately 5V

- N.G. → Repair harness or connectors.
- O.K. ↓

B

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Check harness continuity between terminal ⓒ (A/T models), terminal ⓘ (M/T models) and engine ground.
Continuity should exist.

- N.G. → Check the following.
  - Harness connectors (F27), (M48) (A/T models)
  - Harness continuity between A/T control unit and throttle position sensor
  - Harness continuity between ECM and throttle position sensor

  If N.G., repair harness or connectors.
- O.K. ↓

C

CHECK INPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ⑳ and terminal ⓑ (A/T models), terminal ⓔ (M/T models)
Continuity should exist.

- N.G. → Repair harness or connectors.
- O.K. ↓

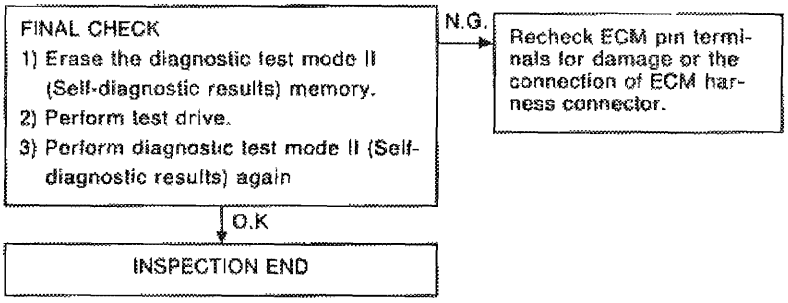
CHECK COMPONENT (Throttle position sensor)
Refer to "Electrical Components Inspection" (See page EF & EC-78)

- N.G. → Replace throttle position sensor
- O.K. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector

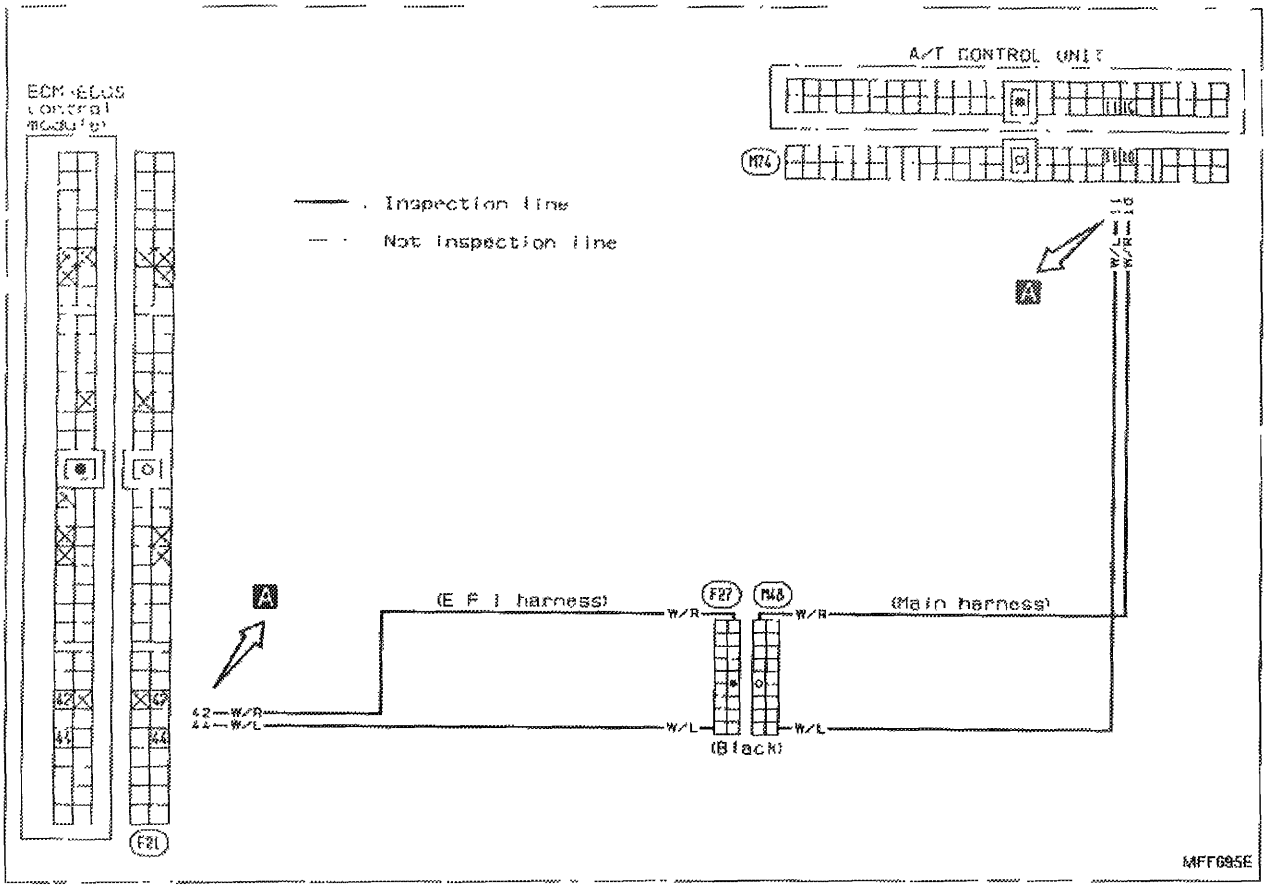
THROTTLE POSITION SENSOR (Diagnostic trouble code No.43) (Malfunction indicator lamp item: California models)

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

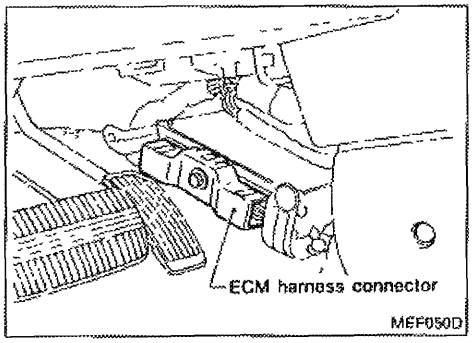


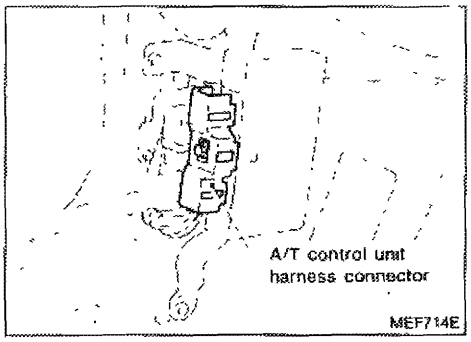
Diagnostic Procedure 12

A/T CONTROL (Diagnostic trouble code No. 54)

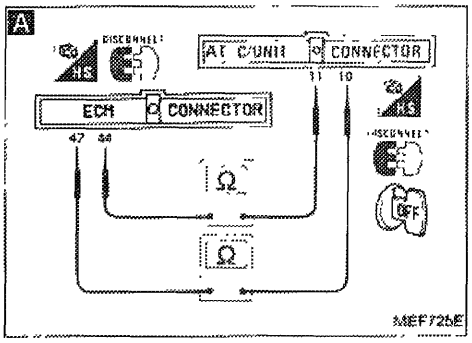


Harness layout





A/T CONTROL (Diagnostic trouble code No.54)



INSPECTION START

PERFORM DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS).

O.K → INSPECTION END

N.G.

A

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector and A/T control unit harness connector.
3) Check harness continuity between ECM terminal (42) and terminal (10), ECM terminal (44) and terminal (11).
Continuity should exist.

N.G. → Check the following.
- Harness connectors (F27), (M48)
- Harness continuity between ECM and A/T control unit

If N.G., repair harness or connectors.

O.K

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

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

FINAL CHECK

Erase the diagnostic test mode II (Self-diagnostic results) memory.

Perform test drive.

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

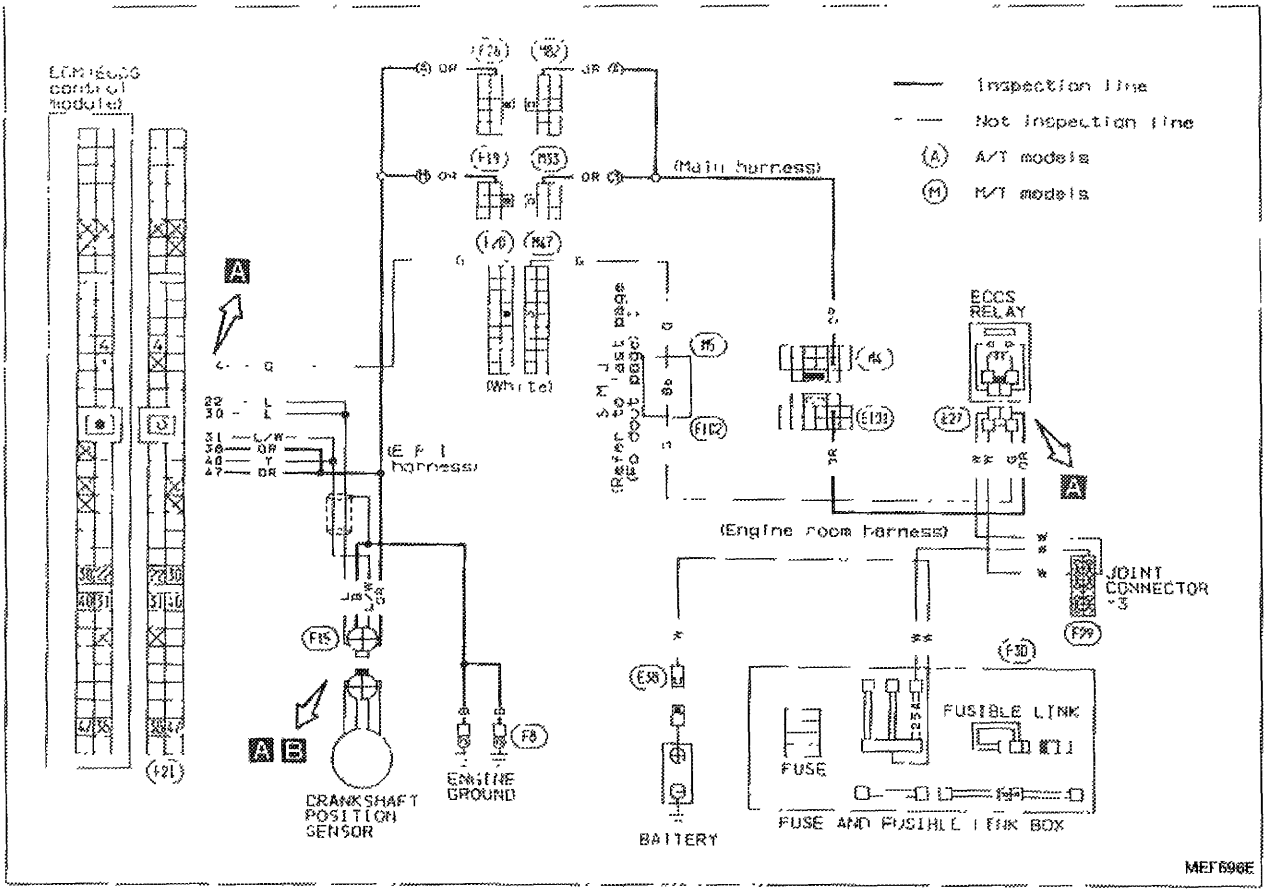
N.G. → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

O.K.

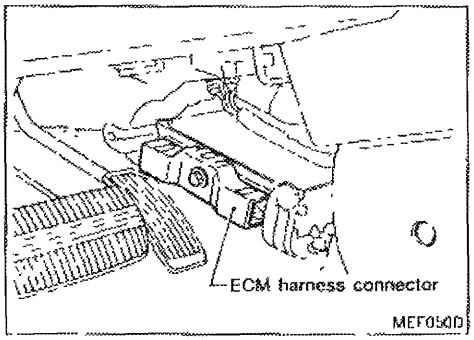
INSPECTION END

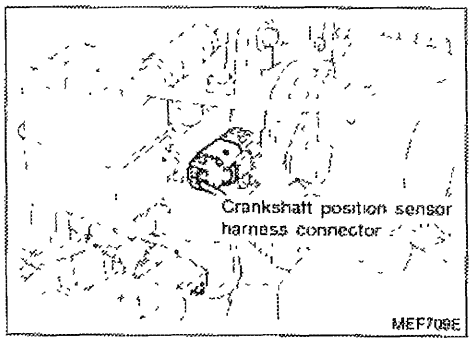
Diagnostic Procedure 13

CRANKSHAFT POSITION SENSOR (Not self-diagnostic item)

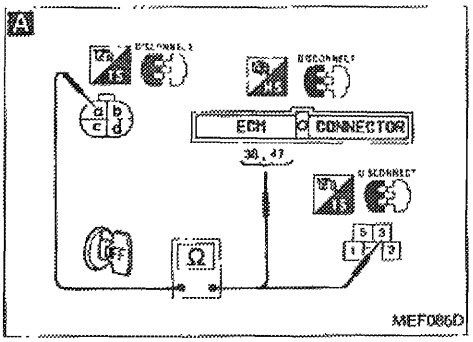


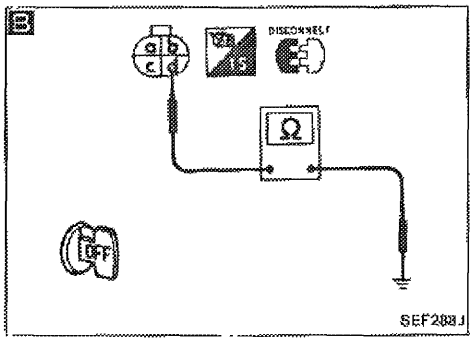
Harness layout





CRANKSHAFT POSITION SENSOR (Not self-diagnostic item)





INSPECTION START

A

CHECK POWER SUPPLY CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect crankshaft position sensor harness connector
3) Disconnect ECM harness connector and ECCS relay.
4) Check harness continuity between terminal ⑧ and terminal ③, ECM terminals ㊽, ㊼.
Continuity should exist.

N G → Check the following.
- Harness connectors (F28), (M82) (A/T models)
- Harness connectors (F19), (M33) (M/T models)
- Harness connectors (M4), (E101)
- Harness continuity between crankshaft position sensor and ECCS relay
- Harness continuity between crankshaft position sensor and ECM

If N.G., repair harness or connectors.

O.K

B

CHECK GROUND CIRCUIT
1) Check harness continuity between terminal ④ and engine ground
Continuity should exist.

N G. → Repair harness or connectors.

O.K.

CHECK COMPONENT
(Crankshaft position sensor)
Refer to "Electrical Components Inspection"

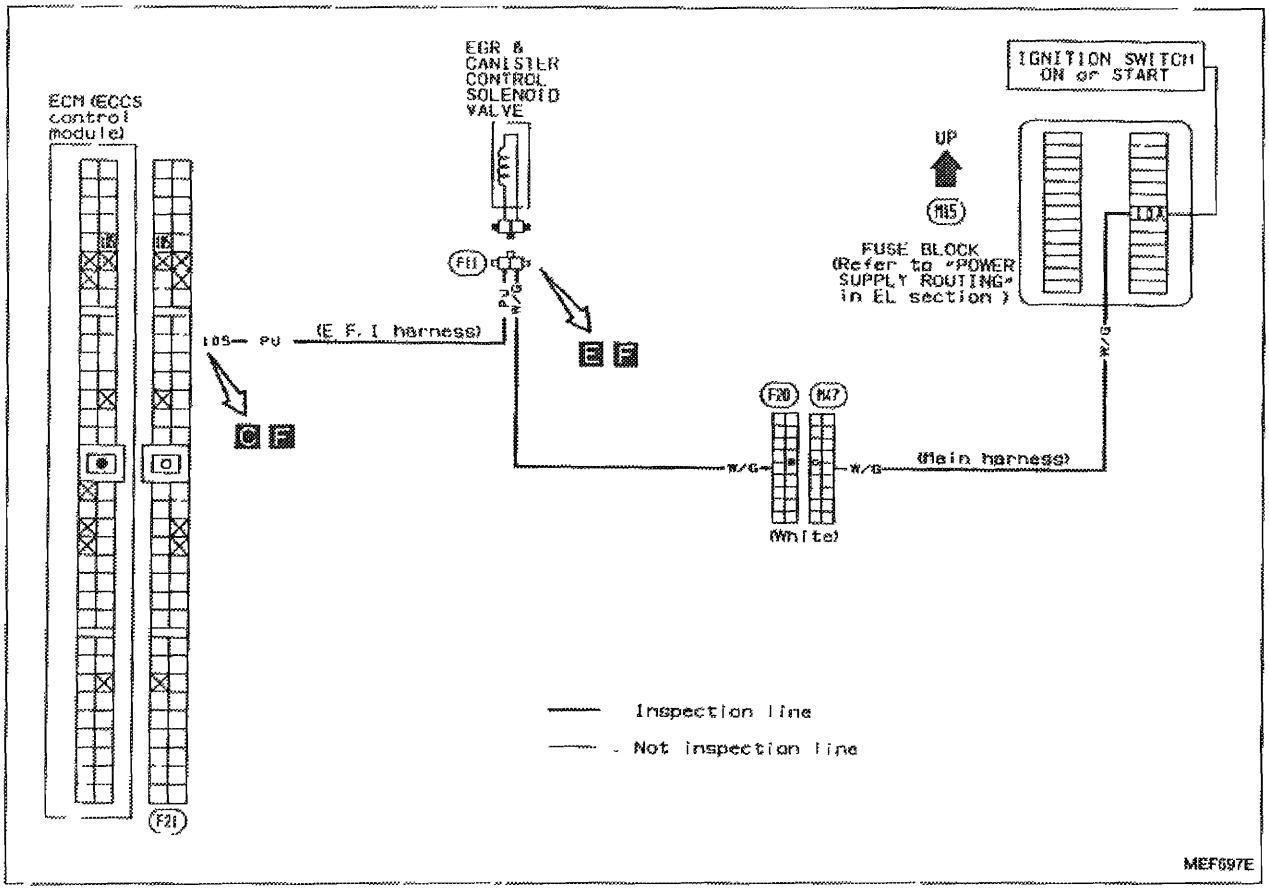
N G → Replace crankshaft position sensor.

O K

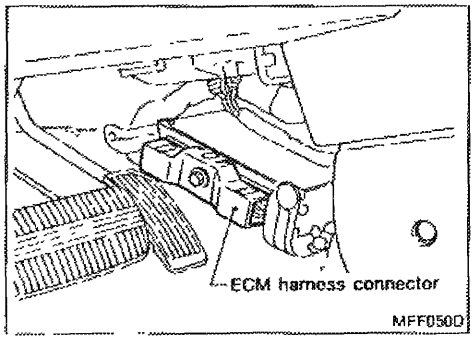
INSPECTION END

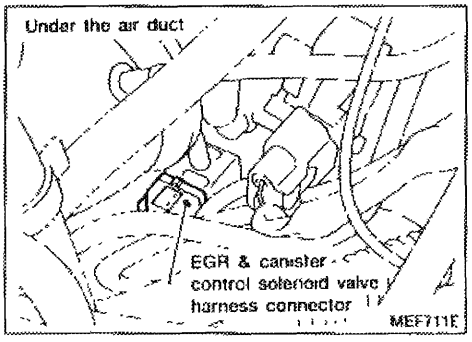
Diagnostic Procedure 14

EGR CONTROL (Not self-diagnostic item)



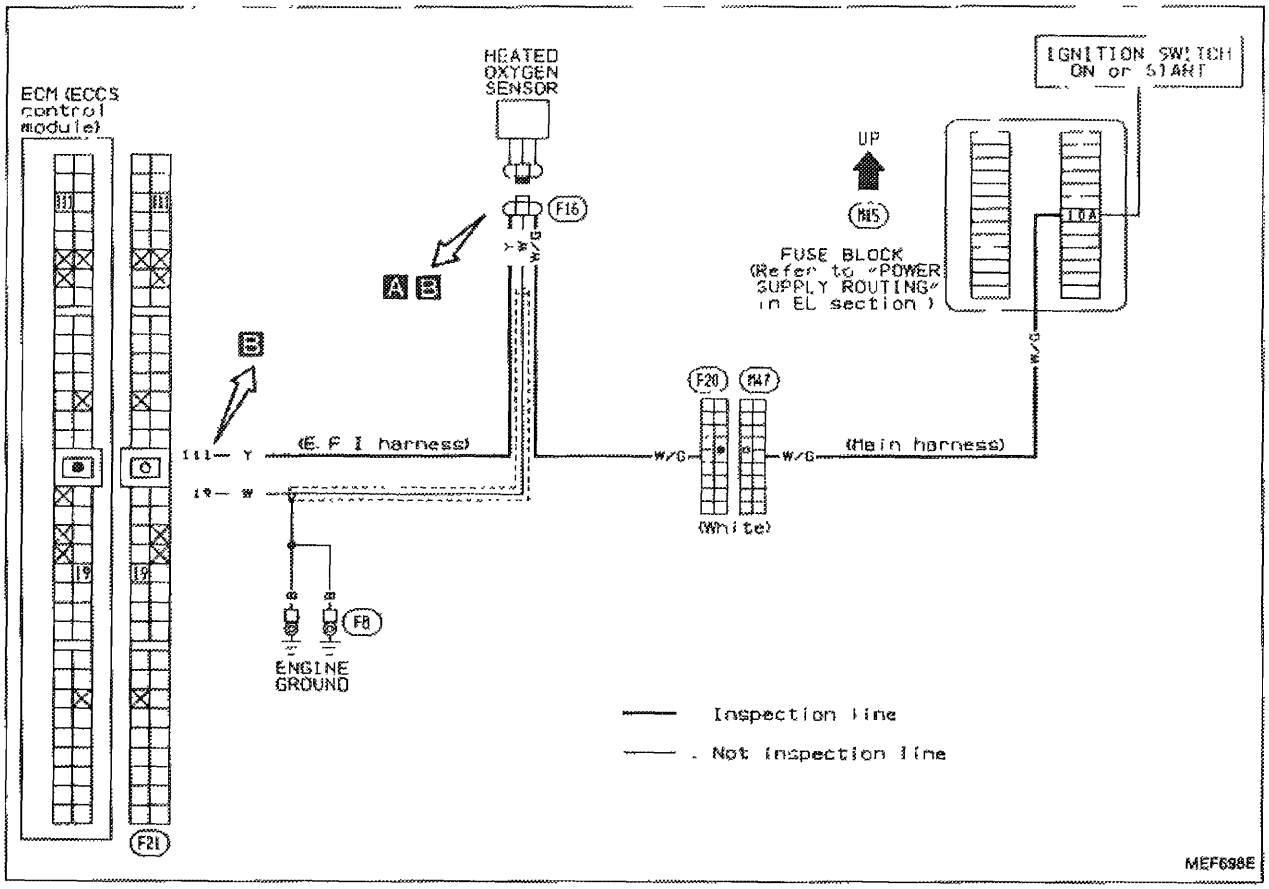
Harness layout



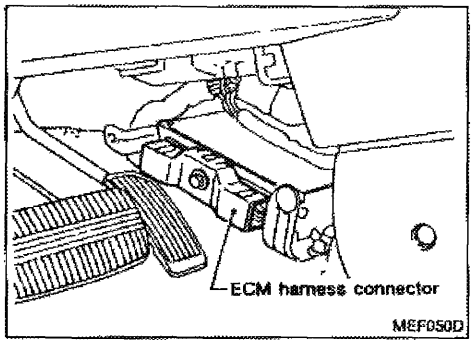


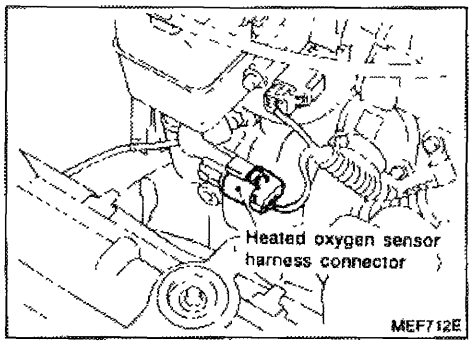
Diagnostic Procedure 15

HEATED OXYGEN SENSOR HEATER (Not self-diagnostic item)



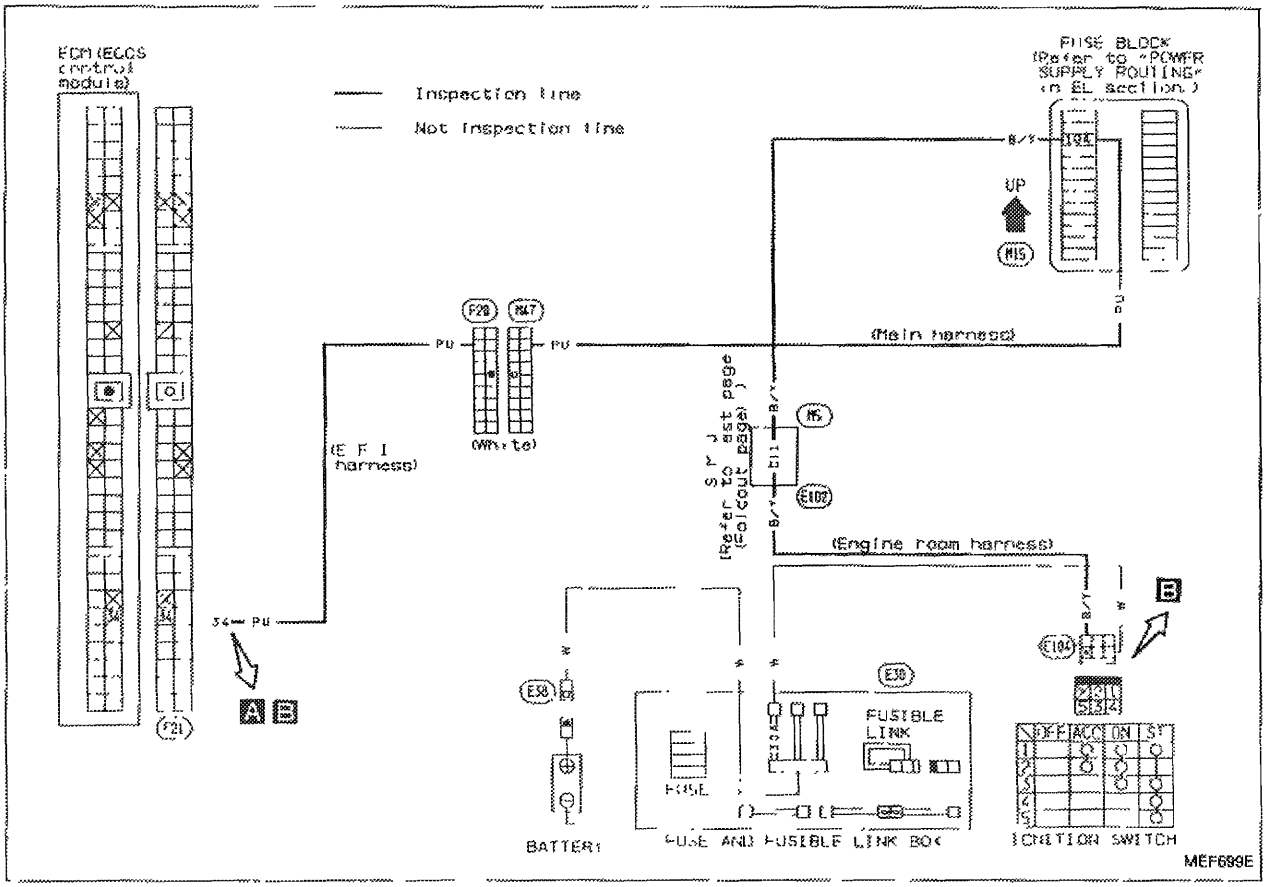
Harness layout



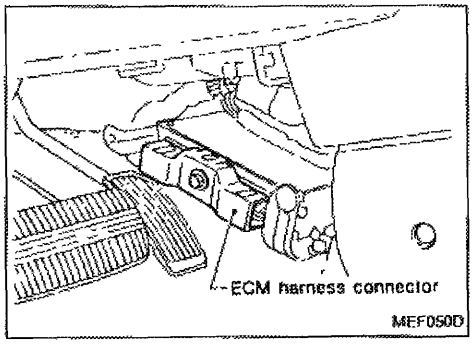


Diagnostic Procedure 16

START SIGNAL (Not self-diagnostic item)

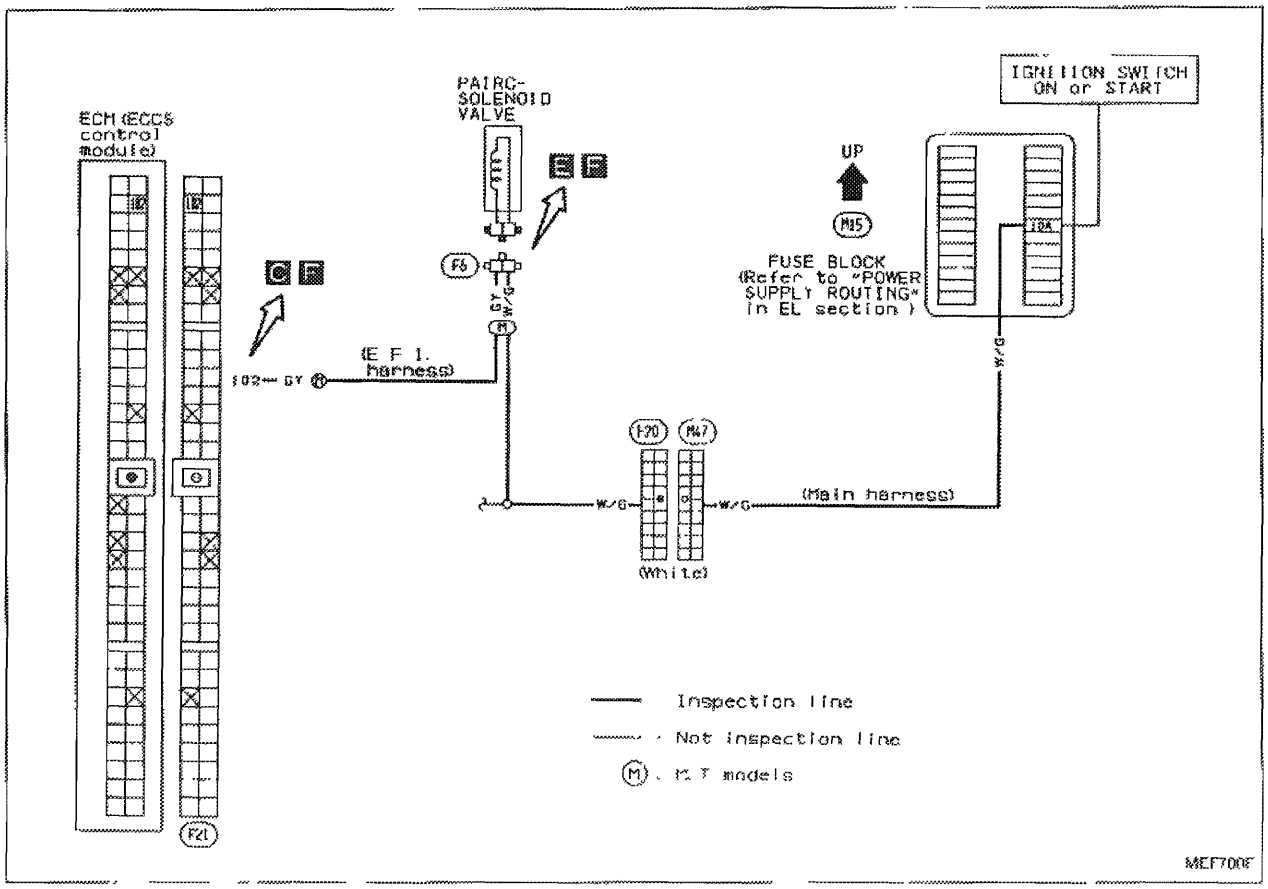


Harness layout

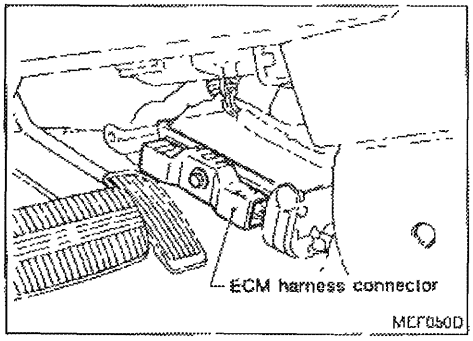


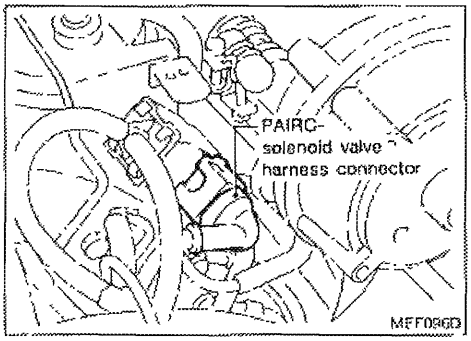
Diagnostic Procedure 17

PAIR VALVE CONTROL (Not self-diagnostic item): M/T models



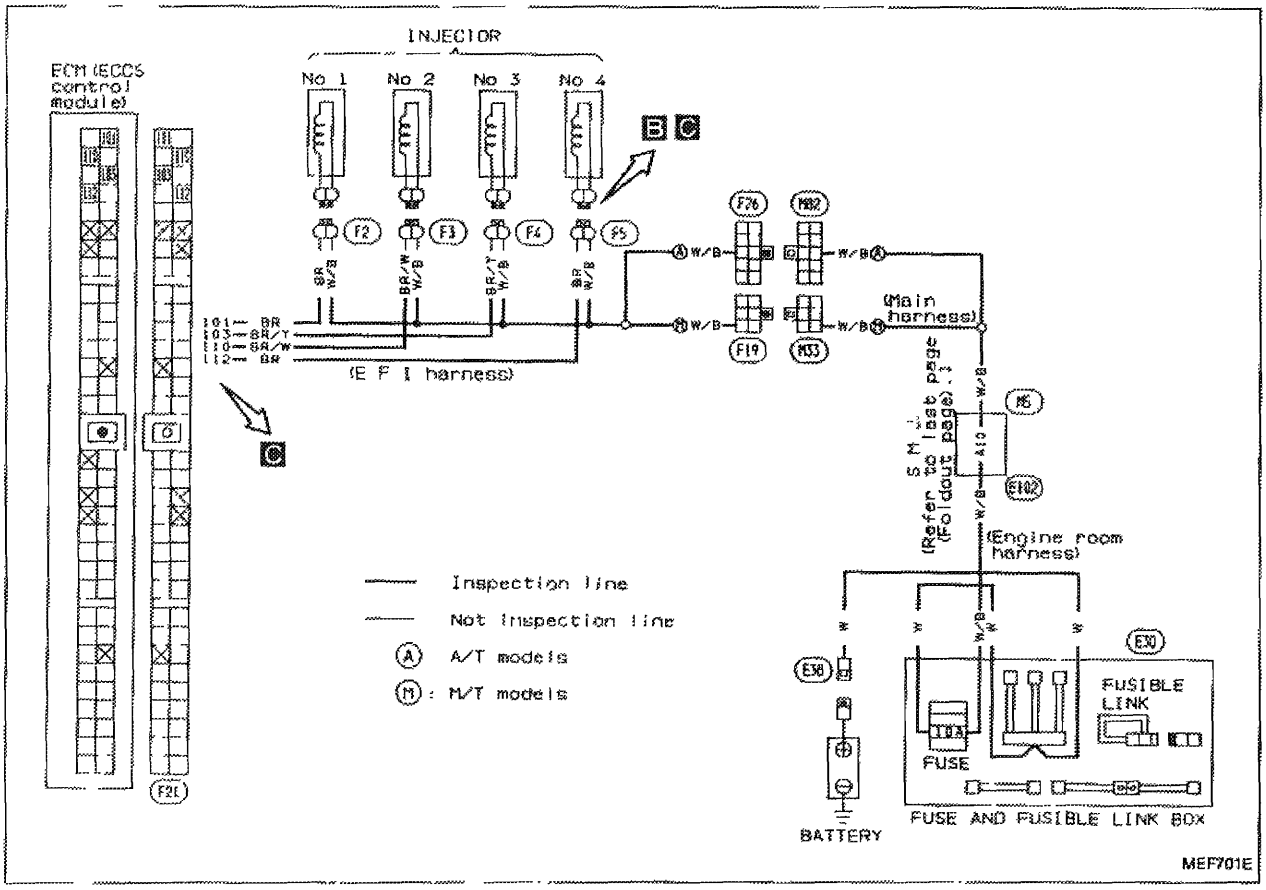
Harness layout



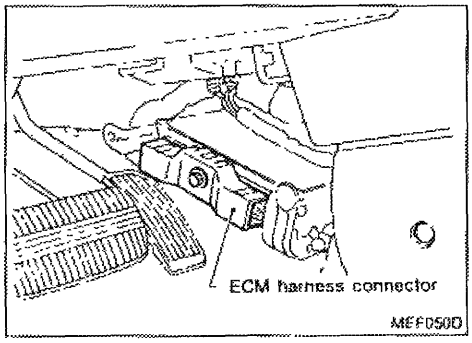


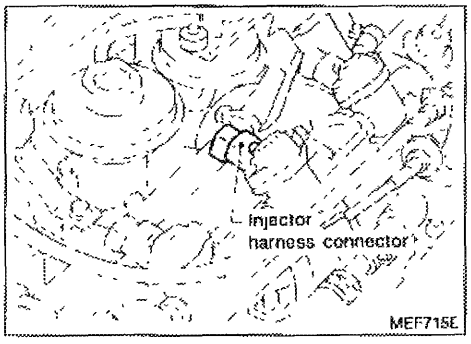
Diagnostic Procedure 18

INJECTOR (Not self-diagnostic item)

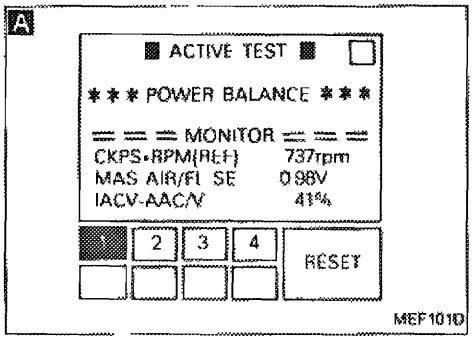


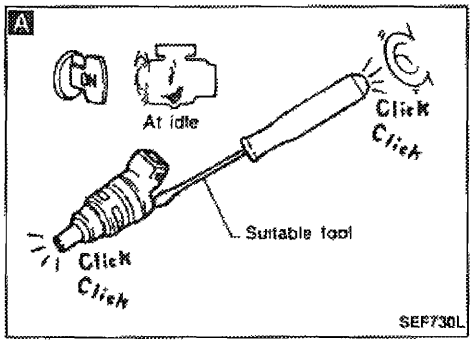
Harness layout

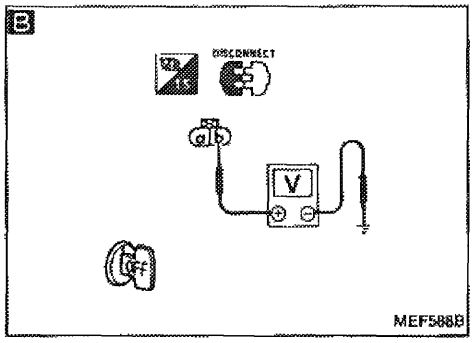


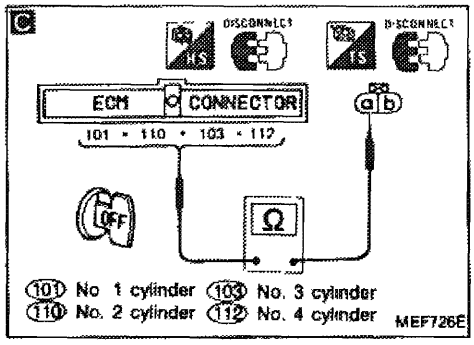


INJECTOR (Not self-diagnostic item)









INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Start engine.
2) Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
3) Make sure that each circuit produces a momentary engine speed drop

— OR —

2) Listen to each injector operating sound.
Clicking noise should be heard.

O.K → INSPECTION END

N.G

B

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect injector harness connector.
3) Check voltage between terminal (b) and ground with CONSULT or tester.
Voltage: Battery voltage

N.G. → Check the following.
- Harness connectors (F26), (M82) (A/T models)
- Harness connectors (F19), (M33) (M/T models)
- Harness connectors (M5), (E102)
- 10A fuse
- Harness continuity between injector and battery

If N.G., repair harness or connectors.

O.K.

C

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between terminal (a) and ECM terminals (101), (103), (110), (112)
Continuity should exist.

N.G. → Repair harness or connectors.

O.K.

CHECK COMPONENT (Injector).
Refer to "Electrical Components Inspection".

N.G. → Replace injector.

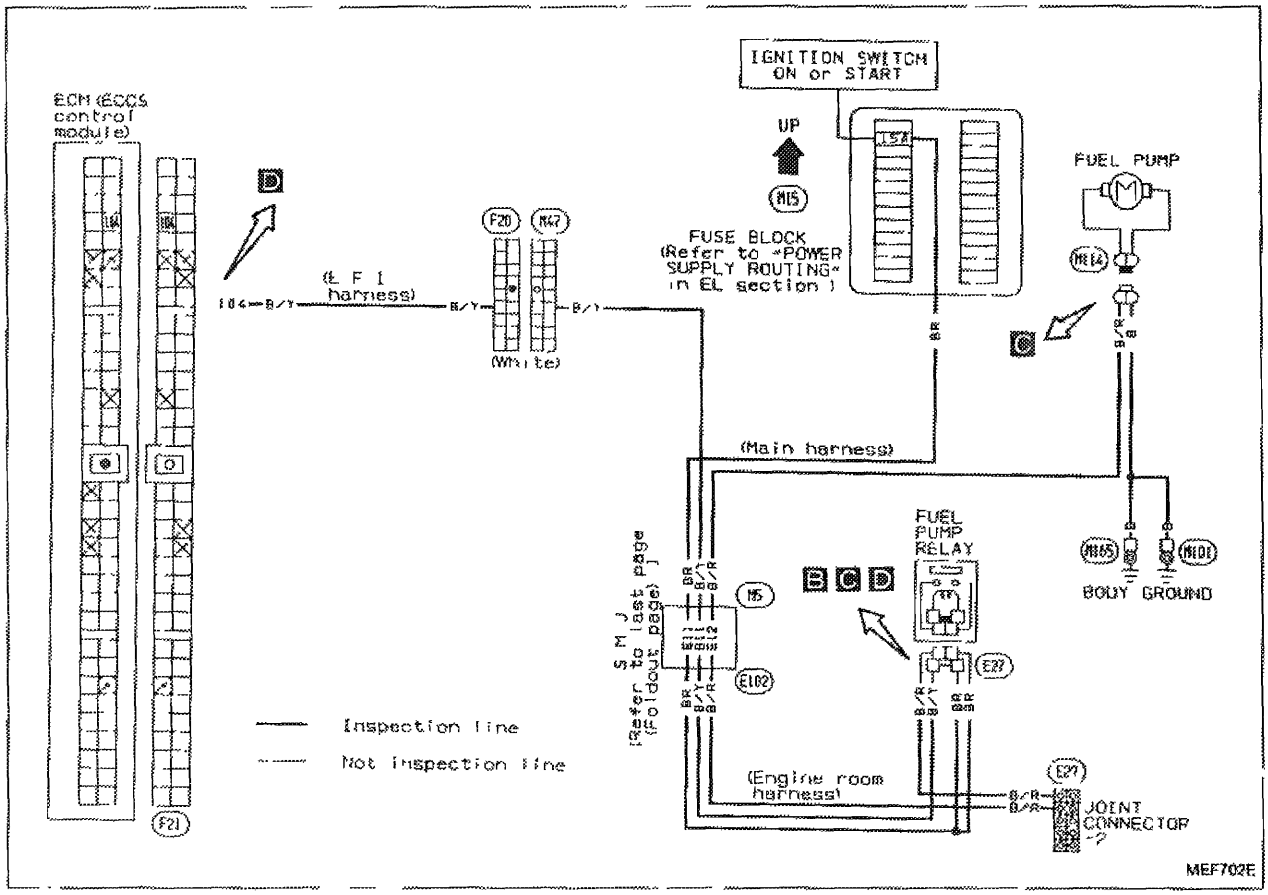
O.K.

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

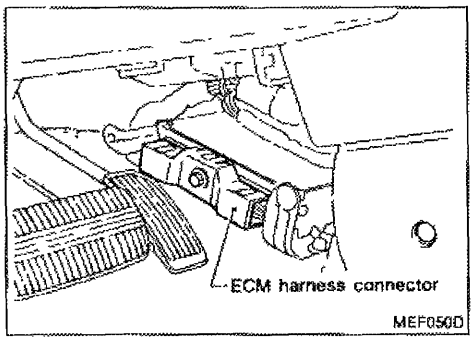
INSPECTION END

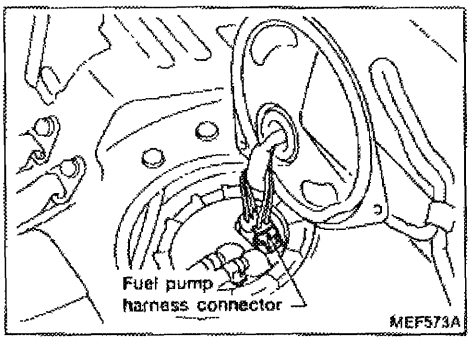
Diagnostic Procedure 19

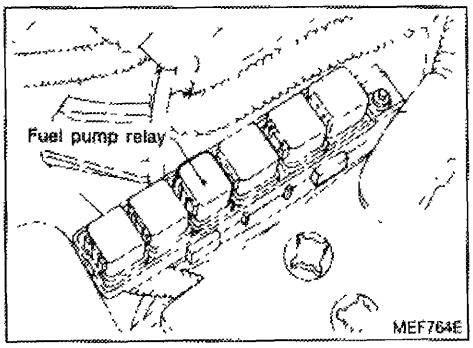
FUEL PUMP (Not self-diagnostic item)



Harness layout

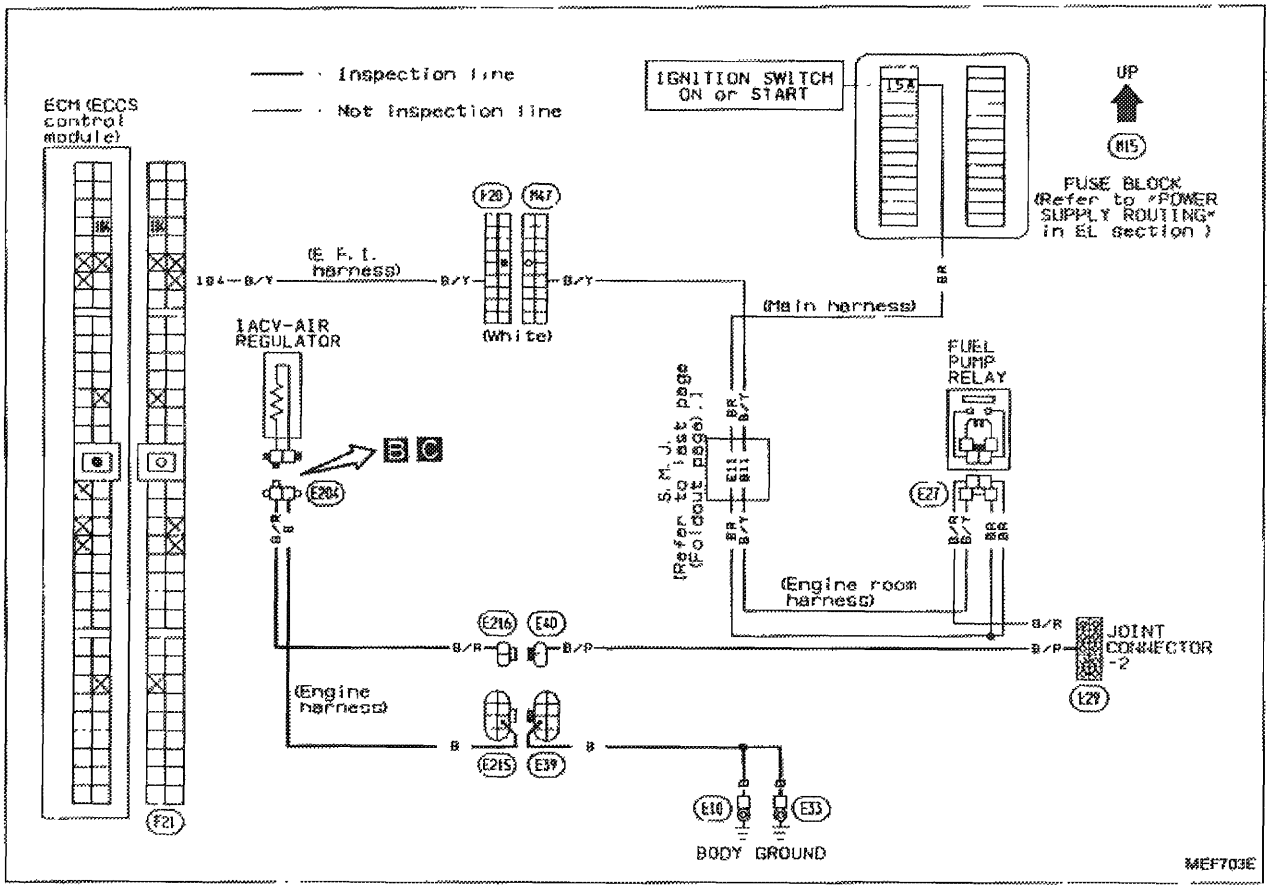




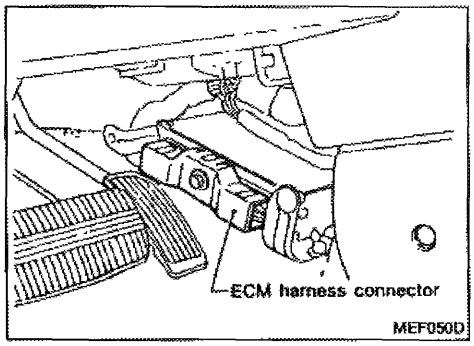


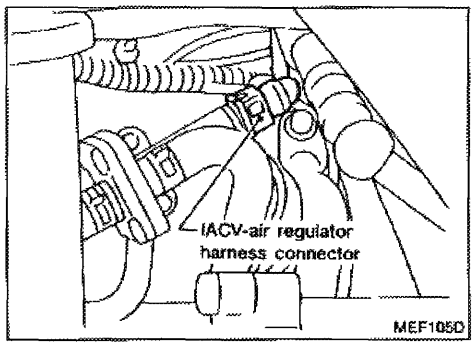
Diagnostic Procedure 20

IACV-AIR REGULATOR (Not self-diagnostic item)



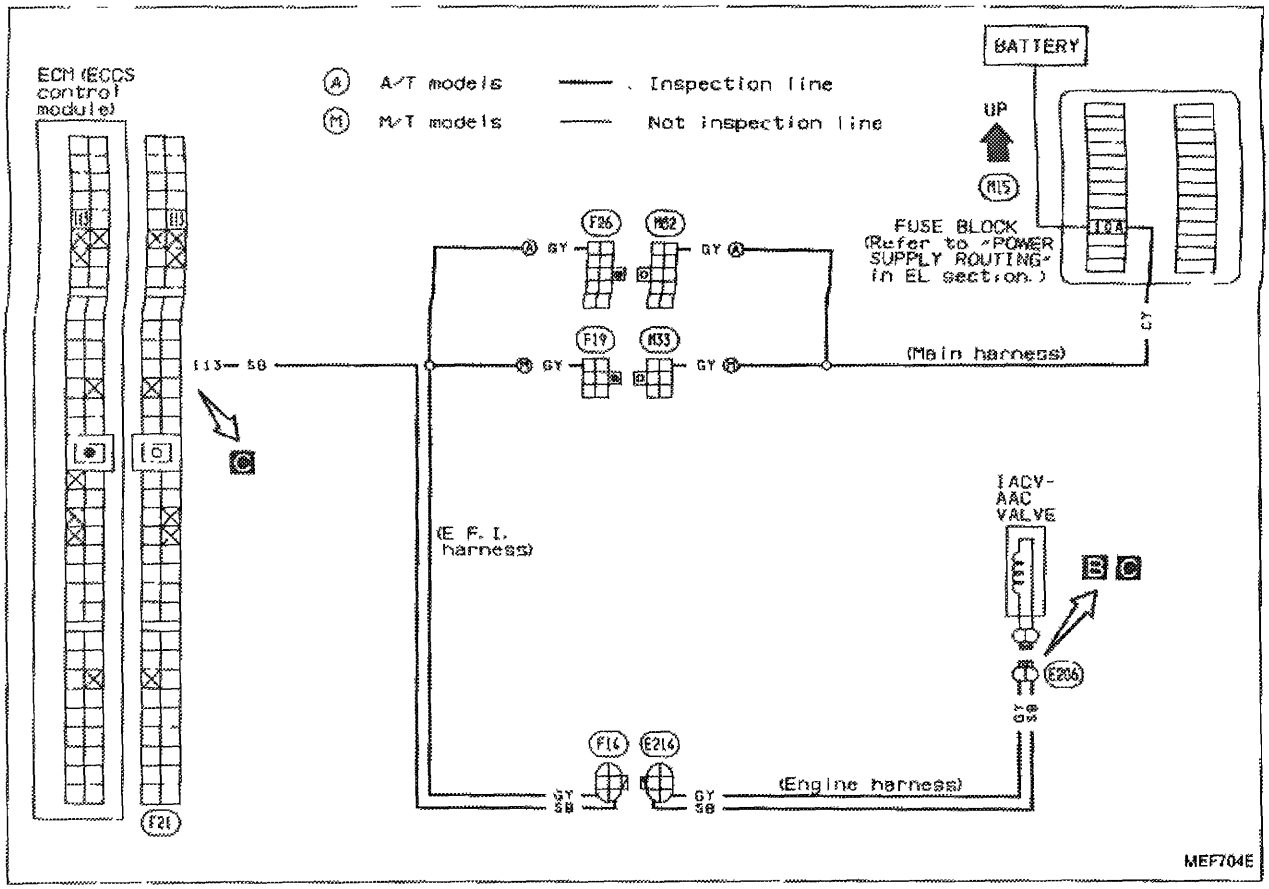
Harness layout



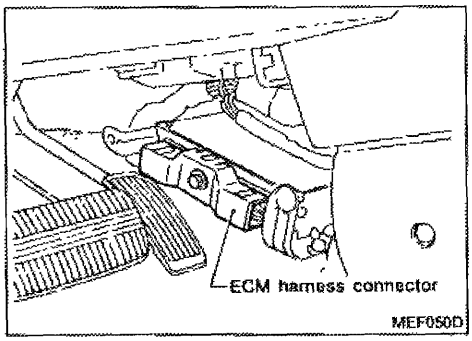


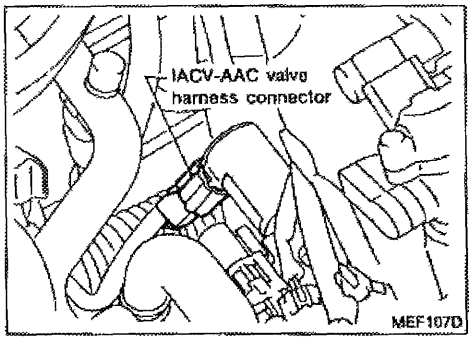
Diagnostic Procedure 21

IACV-AAC VALVE (Not self-diagnostic item)

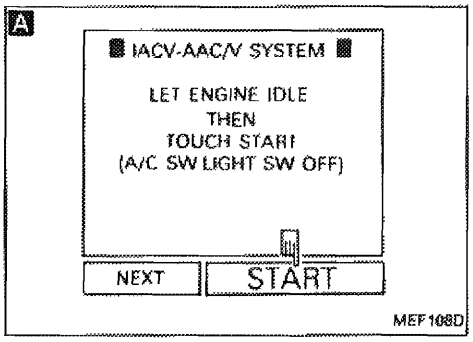


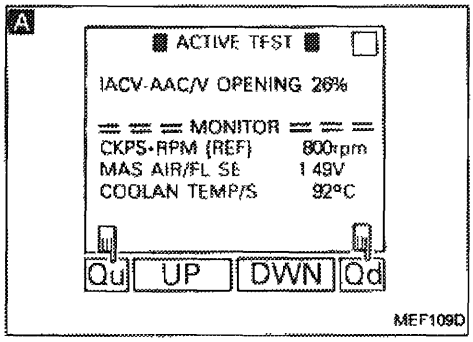
Harness layout

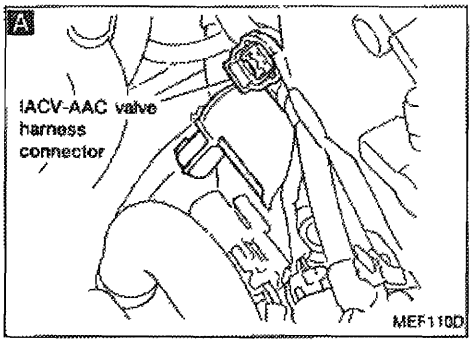


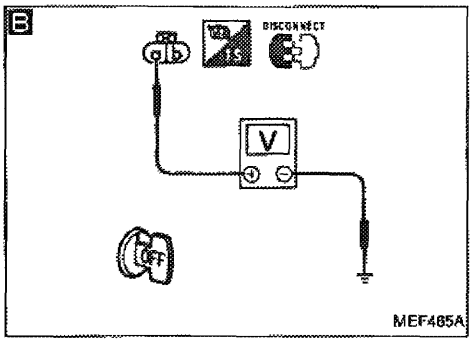


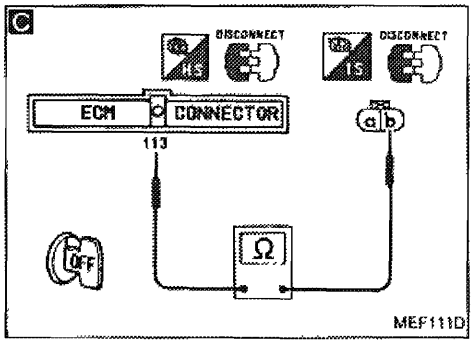
IACV-AAC VALVE (Not self-diagnostic item)











INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Start engine and warm it up sufficiently.
2) Check idle speed.
800 ± 50 rpm
If N.G., adjust idle speed.
3) Perform "IACV-AAC/V SYSTEM" in "FUNCTION TEST" mode with CONSULT

O.K. → INSPECTION END

OR

3) Select "IACV-AAC/V OPENING" in "ACTIVE TEST" mode with CONSULT.
4) When touching "Qu" and "Qd", check that engine speed changes according to the IACV-AAC valve opening percentage.

OR

3) Disconnect IACV-AAC valve harness connector.
4) Make sure that idle speed drops.

N.G.

B

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect IACV-AAC valve harness connector.
3) Check voltage between terminal ⓑ and ground with CONSULT or tester.
Voltage: Battery voltage

N.G. → Check the following.
- Harness connectors (F26), (M82) (A/T models)
- Harness connectors (F19), (M33) (M/T models)
- Harness connectors (F14), (E214)
- 10A fuse
- Harness continuity between IACV-AAC valve and fuse

If N.G., repair harness or connectors.

O.K.

C

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal (113) and terminal ⓑ
Continuity should exist.

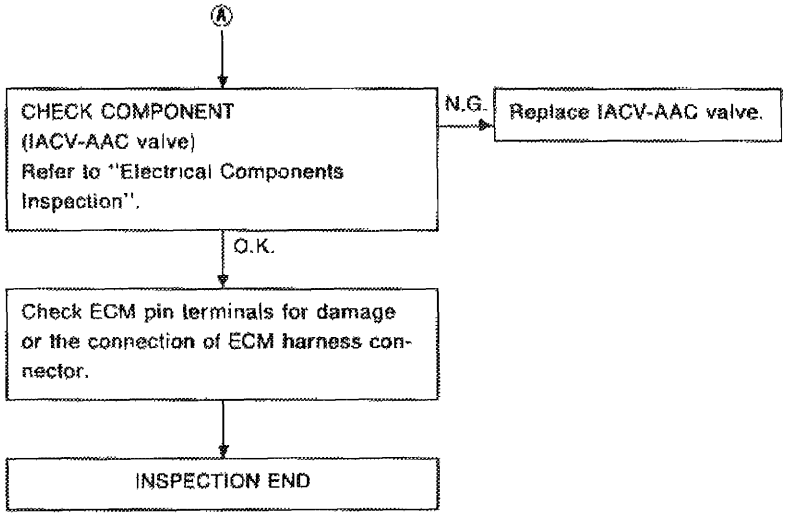
N.G. → Check the following.
- Harness connectors (F14), (E214)
- Harness continuity between ECM and IACV-AAC valve

If N.G., repair harness or connectors.

O.K.

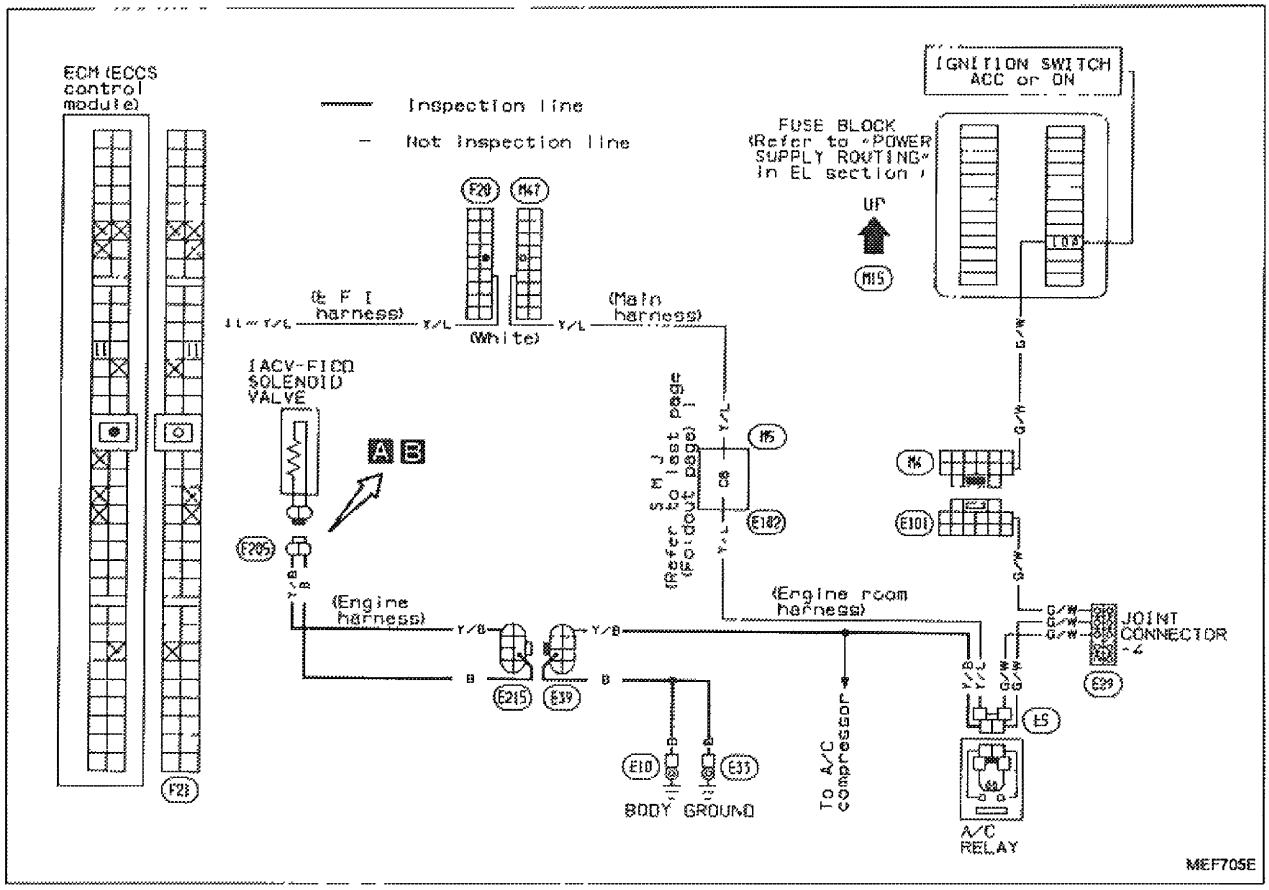
Ⓐ

IACV-AAC VALVE (Not self-diagnostic item)

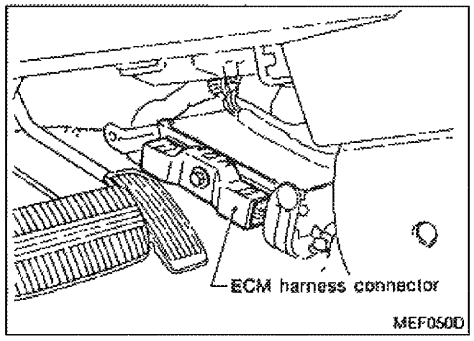


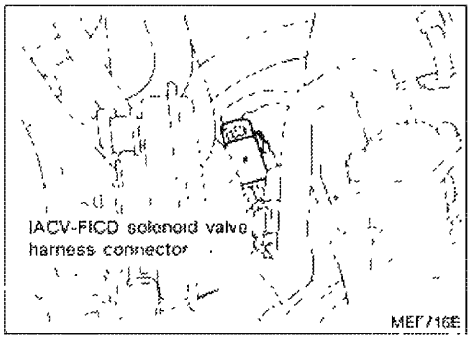
Diagnostic Procedure 22

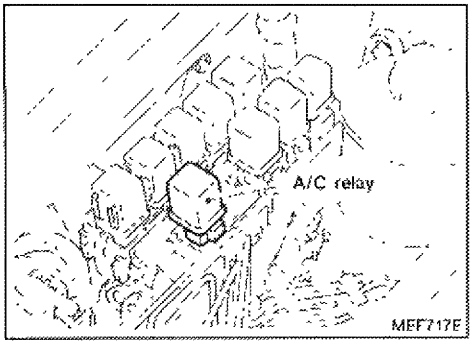
IACV-FICD SOLENOID VALVE (Not self-diagnostic item)



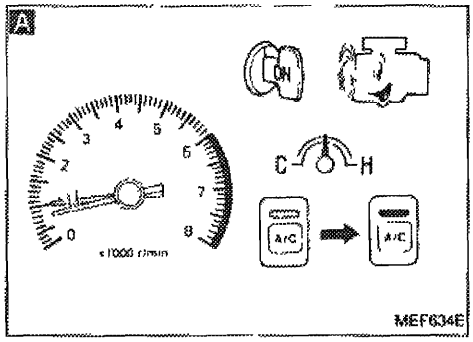
Harness layout

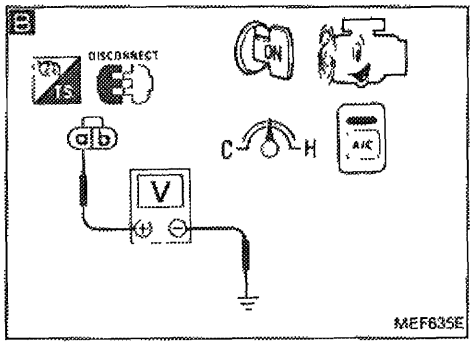


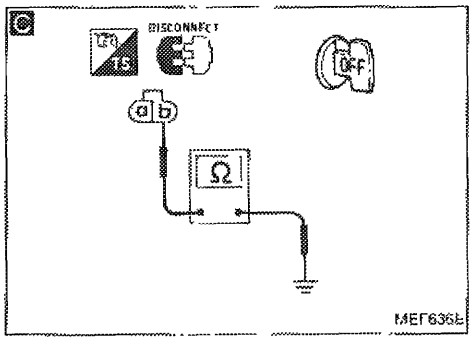




IACV-FICD SOLENOID VALVE (Not self-diagnostic item)







INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Start engine and warm it up sufficiently.
2) Check idle speed.
M/T: 800 ± 50 rpm
A/T: 800 ± 50 rpm (in "N" position)
If N G., adjust idle speed.
3) Turn air conditioner switch and blower fan switch "ON".
4) Recheck idle speed
M/T: Approx. 850 rpm
A/T: Approx. 850 rpm (in "N" position)

O K. → INSPECTION END

N G.

Check if air conditioner compressor functions normally.

N G. → Refer to HA section.

O.K.

B

CHECK POWER SUPPLY.
1) Stop engine
2) Disconnect IACV-FICD solenoid valve harness connector
3) Restart engine and let it idle.
4) Check voltage between terminal (a) and ground with CONSULT or tester.
Voltage: Battery voltage

N G. → Check the following.
- Harness connectors (E216), (E39)
- Harness continuity between IACV-FICD solenoid valve and A/C relay

If N.G., repair harness or connectors.

O K.

C

CHECK GROUND CIRCUIT.
1) Stop engine
2) Check harness continuity between terminal (b) and body ground.
Continuity should exist.

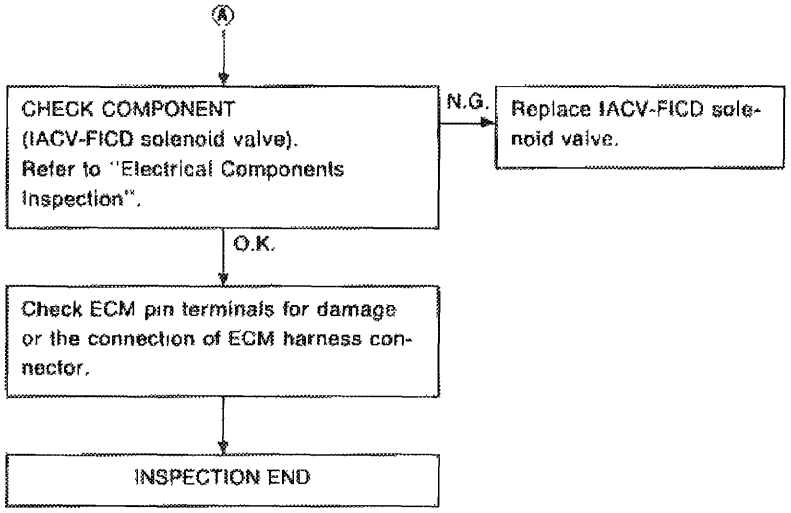
N.G. → Check the following
- Harness connectors (E215), (E39)
- Harness continuity between IACV-FICD solenoid valve and body ground

If N G , repair harness or connectors.

O.K

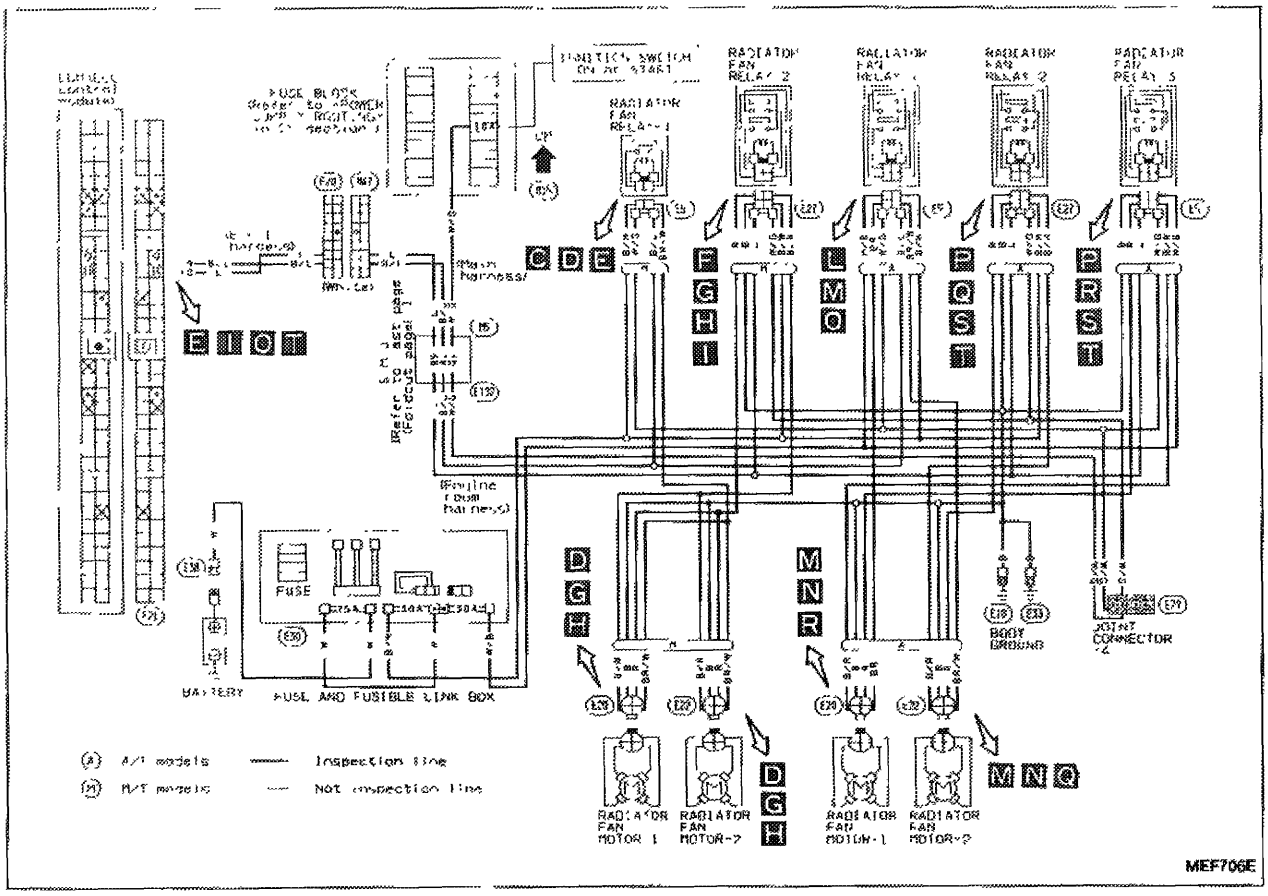
(A)

IACV-FICD SOLENOID VALVE (Not self-diagnostic item)

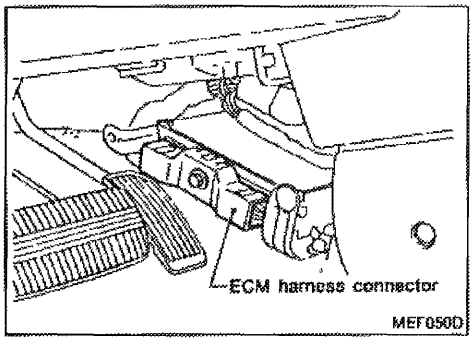


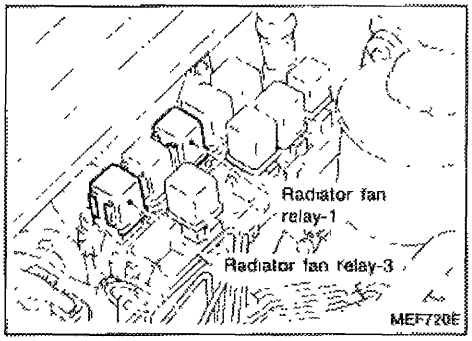
Diagnostic Procedure 23

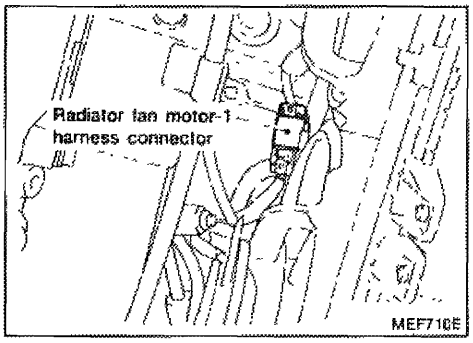
RADIATOR FAN CONTROL (Not self-diagnostic item)

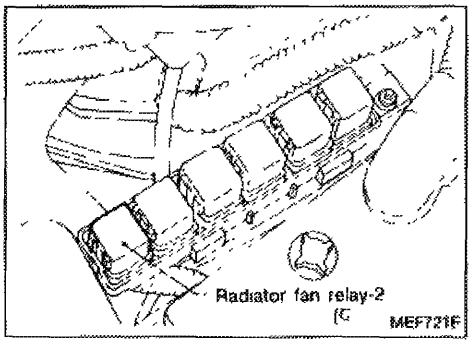


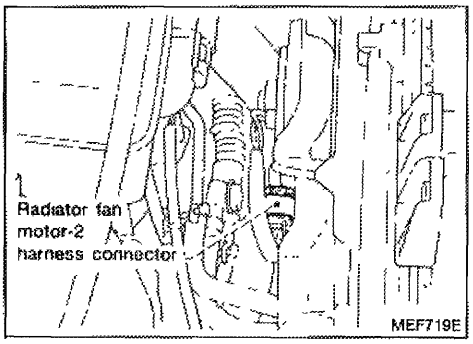
RADIATOR FAN CONTROL (Not self-diagnostic item)



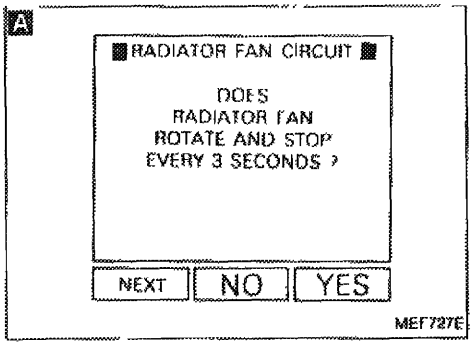


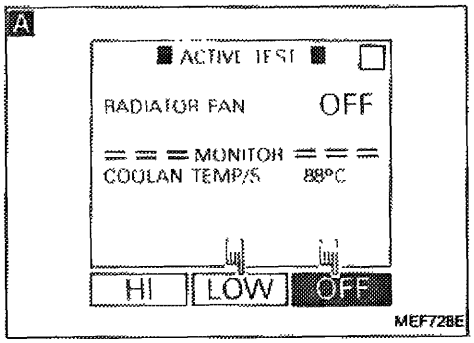


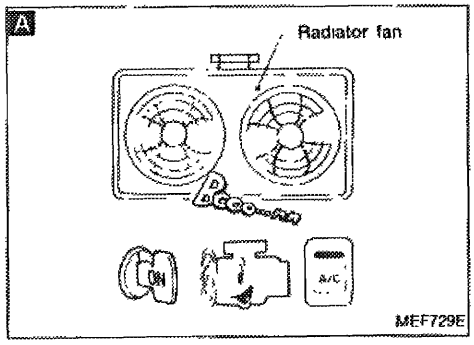




RADIATOR FAN CONTROL (Not self-diagnostic item)







M/T models

INSPECTION START

A

CHECK RADIATOR FAN LOW SPEED OPERATION

1) Disconnect radiator fan relay-2

2) Turn ignition switch "ON".

3) Perform "RADIATOR FAN CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

OR

2) Turn ignition switch "ON".

3) Perform "RADIATOR FAN" in "ACTIVE TEST" mode with CONSULT.

OR

2) Start engine.

3) Set temperature lever at full cold position.

4) Turn air conditioner switch "ON".

5) Turn blower fan switch "ON".

6) Run engine at idle for a few minutes with air conditioner operating.

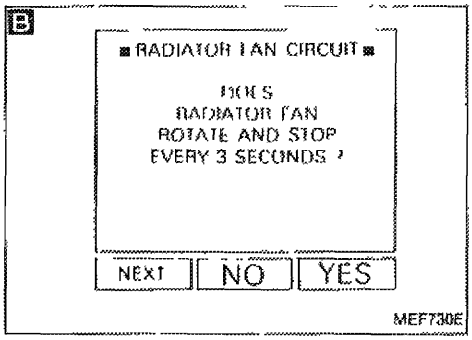
7) Make sure that radiator fan operates at low speed.

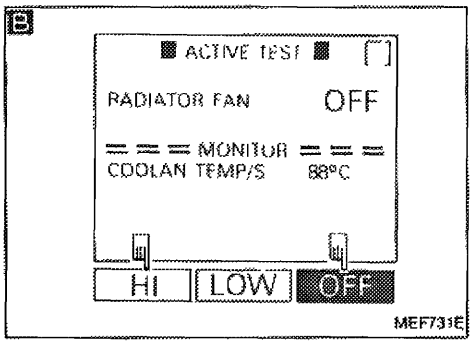
N.G. → Check radiator fan low speed control circuit. (Go to PROCEDURE A .)

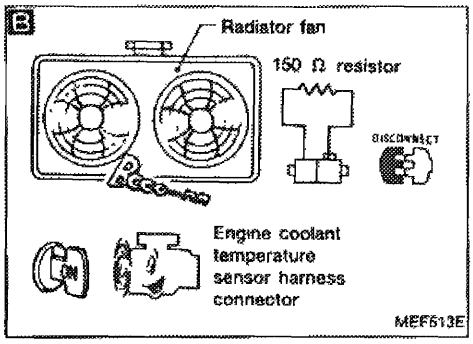
O.K

Ⓐ

RADIATOR FAN CONTROL (Not self-diagnostic item)







Ⓐ

B

CHECK RADIATOR FAN HIGH SPEED OPERATION.
1) Turn ignition switch "OFF".
2) Reconnect radiator fan relay-2.
3) Disconnect radiator fan relay-1.
4) Turn ignition switch "ON".
5) Perform "RADIATOR FAN CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

OR

4) Turn ignition switch "ON".
5) Perform "RADIATOR FAN" in "ACTIVE TEST" mode with CONSULT

OR

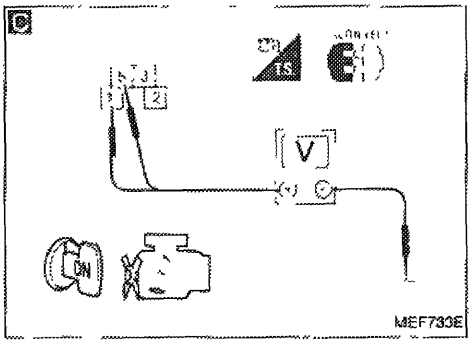
4) Turn air conditioner switch and blower fan switch "OFF"
5) Disconnect engine coolant temperature sensor harness connector.
6) Connect 150Ω resistor to engine coolant temperature sensor harness connector.
7) Restart engine and make sure that radiator fan operates at higher speed than low speed

N.G. → Check radiator fan high speed control circuit. (Go to PROCEDURE B.)

O K. ↓

INSPECTION END

RADIATOR FAN CONTROL (Not self-diagnostic item)



PROCEDURE A

INSPECTION START

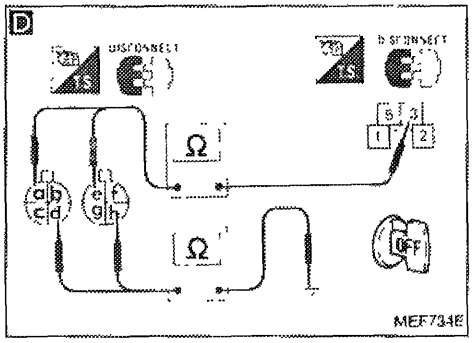
C

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect radiator fan relay-1.
3) Turn ignition switch "ON".
4) Check voltage between terminals ①, ⑤ and ground with CONSULT or tester.
Voltage: Battery voltage

N.G. →
Check the following
- Harness connectors (M5), (E102)
- 10A fuse
- 30A fusible link
- 75A fusible link
- Joint connector-4
- Harness continuity between radiator fan relay-1 and fuse
- Harness continuity between radiator fan relay-1 and battery

If N.G., repair harness or connectors.

O.K.

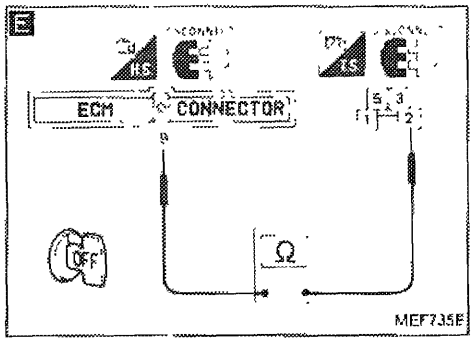


D

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect radiator fan motor-1 harness connector and radiator fan motor-2 harness connector.
3) Check harness continuity between terminals ⓐ, ⓔ and terminal ③, terminals ⓕ, ⓗ and body ground.
Continuity should exist.

N.G. →
Repair harness or connectors.

O.K.



E

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ⑨ and terminal ②.
Continuity should exist.

N.G →
Check the following.
- Harness connectors (F20), (M47)
- Harness connectors (M5), (E102)
- Harness continuity between radiator fan relay-1 and ECM

If N.G., repair harness or connectors.

O.K

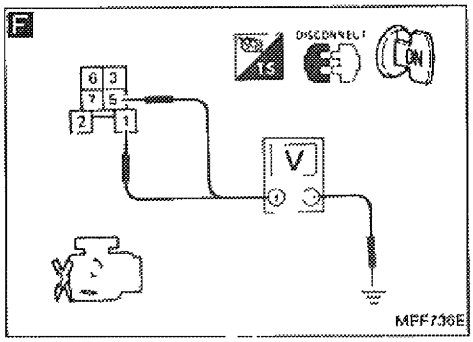
CHECK COMPONENT
(Radiator fan relay-1).
Refer to "Electrical Components Inspection"

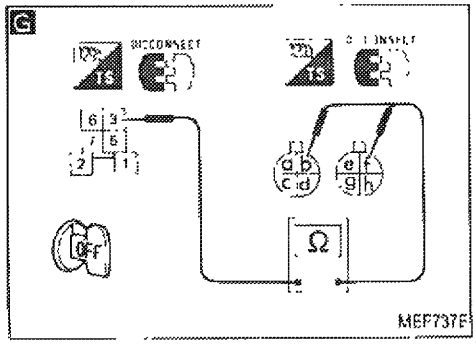
N.G. →
Replace radiator fan relay.

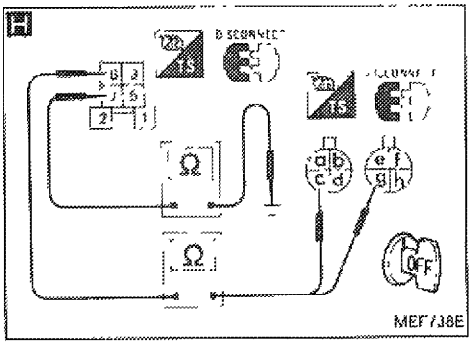
O.K.

Ⓐ

RADIATOR FAN CONTROL (Not self-diagnostic item)







Ⓐ

CHECK COMPONENTS
(Radiator fan motors).
Refer to "Electrical Components Inspection". (See page EF & EC-78.)

N.G. → Replace radiator fan motors.

O.K

Check ECM pin terminals for damage or the connection of ECM harness connector

INSPECTION END

PROCEDURE B

INSPECTION START

F

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect radiator fan relay-2.
3) Turn ignition switch "ON".
4) Check voltage between terminals ①, ⑤ and ground
Voltage: Battery voltage

N.G. → Check the following.
- Harness connectors (M5), (E102)
- 10A fuse
- 30A fusible link
- 75A fusible link
- Joint connector-4
- Harness continuity between radiator fan relay-2 and fuse
- Harness continuity between radiator fan relay-2 and battery

If N G , repair harness or connectors

O.K.

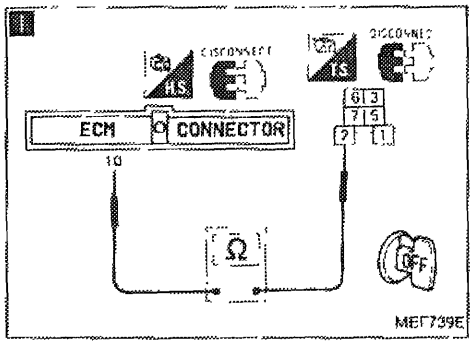
CHECK GROUND CIRCUIT
1) Turn ignition switch "OFF"
2) Disconnect radiator fan motor-1 harness connector and radiator fan motor-2 harness connector
G 3) Check harness continuity between terminal ③ and terminals ⑤, ⑦.
Continuity should exist.
H 4) Check harness continuity between terminal ⑥ and terminals ⑧, ⑨, terminal ⑦ and body ground.
Continuity should exist.

N G. → Repair harness or connectors.

O.K.

Ⓑ

RADIATOR FAN CONTROL (Not self-diagnostic item)



(8)

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal (10) and terminal (2).
Continuity should exist.

N.G. → Check the following.
- Harness connectors (F20), (M47)
- Harness connectors (M5), (E102)
- Harness continuity between ECM and radiator fan relay-2

If N.G., repair harness or connectors.

O.K. ↓

CHECK COMPONENT
(Radiator fan relay-2).
Refer to "Electrical Components Inspection".

N.G. → Replace radiator fan relay.

O.K. ↓

CHECK COMPONENTS
(Radiator fan motors).
Refer to "Electrical Components Inspection". (See page EF & EC-78)

N.G. → Replace radiator fan motors

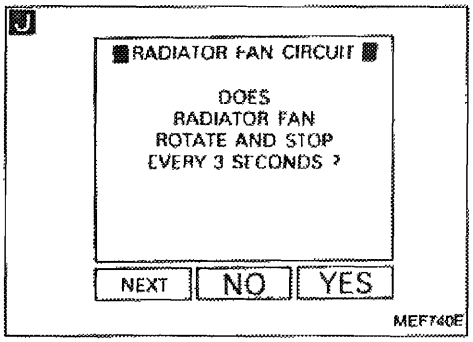
O.K. ↓

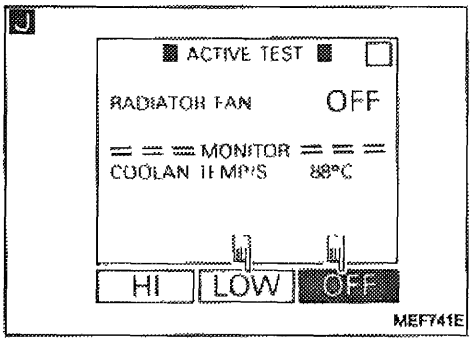
Check ECM pin terminals for damage or the connection of ECM harness connector

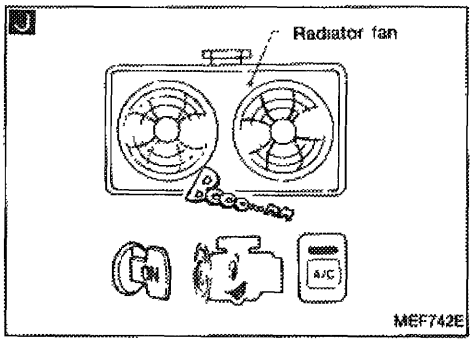
↓

INSPECTION END

RADIATOR FAN CONTROL (Not self-diagnostic item)







A/T models

INSPECTION START

CHECK RADIATOR FAN LOW SPEED OPERATION.

1) Disconnect radiator fan relay-2, 3
2) Turn ignition switch "ON".
3) Perform "RADIATOR FAN CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

OR

2) Turn ignition switch "ON".
3) Perform "RADIATOR FAN" in "ACTIVE TEST" mode with CONSULT.

OR

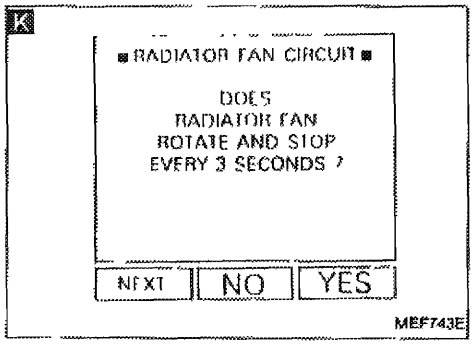
2) Start engine.
3) Set temperature lever at full cold position.
4) Turn air conditioner switch "ON".
5) Turn blower fan switch "ON".
6) Run engine at idle for a few minutes with air conditioner operating.
7) Make sure that radiator fan operates at low speed.

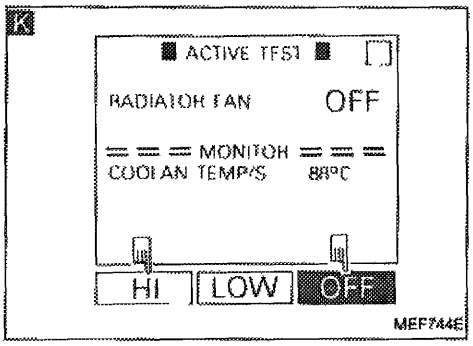
N.G. → Check radiator fan low speed control circuit. (Go to PROCEDURE C.)

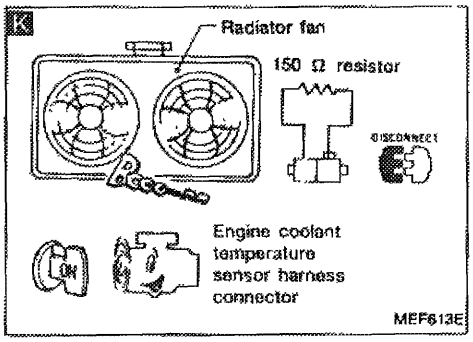
O.K. ↓

Ⓐ

RADIATOR FAN CONTROL (Not self-diagnostic item)







Ⓐ

CHECK RADIATOR FAN HIGH SPEED OPERATION.

1) Turn ignition switch "OFF".
2) Reconnect radiator fan relay-2, 3.
3) Disconnect radiator fan relay-1.

4) Turn ignition switch "ON".
5) Perform "RADIATOR FAN CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

— OR —

4) Turn ignition switch "ON".
5) Perform "RADIATOR FAN" in "ACTIVE TEST" mode with CONSULT.

— OR —

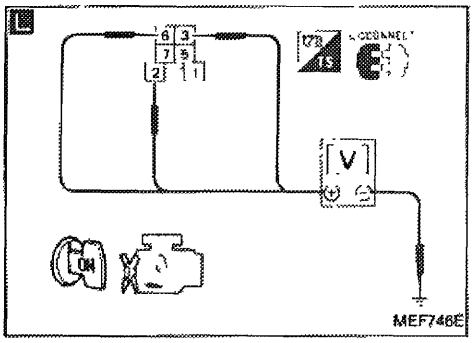
4) Turn air conditioner switch and blower fan switch "OFF".
5) Disconnect engine coolant temperature sensor harness connector.
6) Connect 150 Ω resistor to engine coolant temperature sensor harness connector.
7) Restart engine and make sure that radiator fan operates at higher speed than low speed.

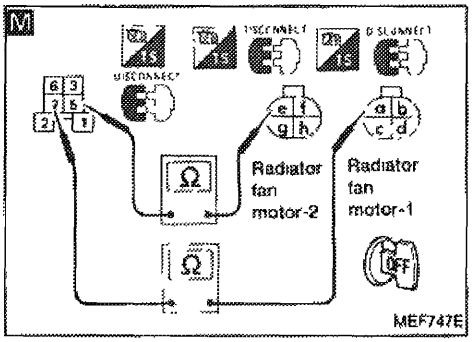
N.G. → Check radiator fan high speed control circuit. (Go to PROCEDURE D.)

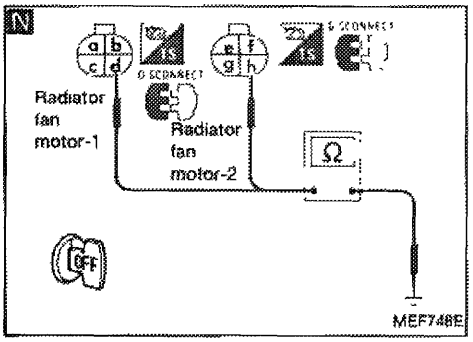
O K. ↓

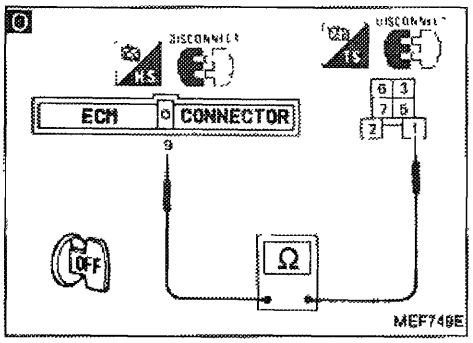
INSPECTION END

RADIATOR FAN CONTROL (Not self-diagnostic item)









PROCEDURE C

INSPECTION START

L

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect radiator fan relay-1.
3) Turn ignition switch "ON".
4) Check voltage between terminals ②, ③, ⑥ and ground with CONSULT or tester.
Voltage: Battery voltage

N.G. → Check the following.
- Harness connectors (M5), (E102)
- 10A fuse
- 30A fusible link
- 75A fusible link
- Joint connector-4
- Harness continuity between radiator fan relay-1 and fuse
- Harness continuity between radiator fan relay-1 and battery

If N.G., repair harness or connectors.

O.K. ↓

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect radiator fan motor-1 harness connector and radiator fan motor-2 harness connector.
M 3) Check harness continuity between terminal ⑦ and terminal ⑧, terminal ⑤ and terminal ⑥.
Continuity should exist.
N 4) Check harness continuity between terminals ⓓ, ⓗ and body ground.
Continuity should exist.

N.G. → Repair harness or connectors.

O.K. ↓

O

CHECK OUTPUT SIGNAL CIRCUIT
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ⑨ and terminal ①.
Continuity should exist.

N.G → Check the following
- Harness connectors (F20), (M41)
- Harness connectors (M5), (E102)
- Harness continuity between radiator fan relay-1 and ECM

If N.G., repair harness or connectors.

O.K. ↓

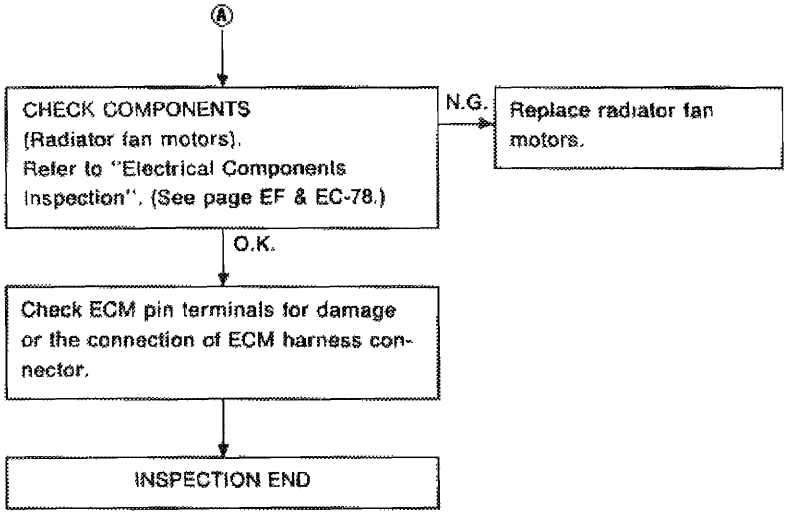
CHECK COMPONENT
(Radiator fan relay-1).
Refer to "Electrical Components Inspection".

N.G. → Replace radiator fan relay.

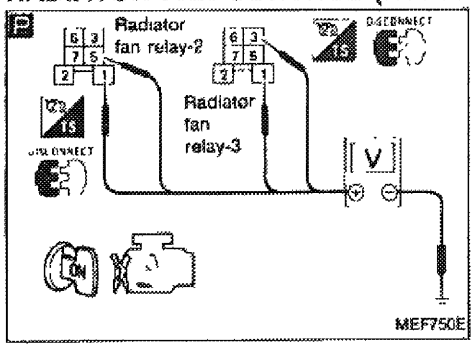
O.K. ↓

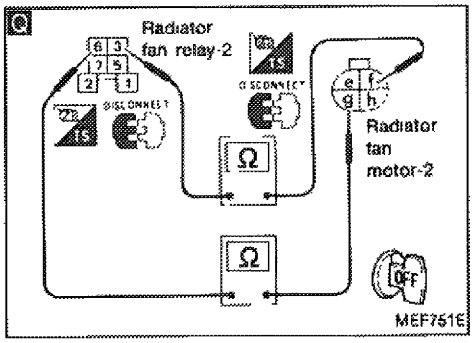
Ⓐ

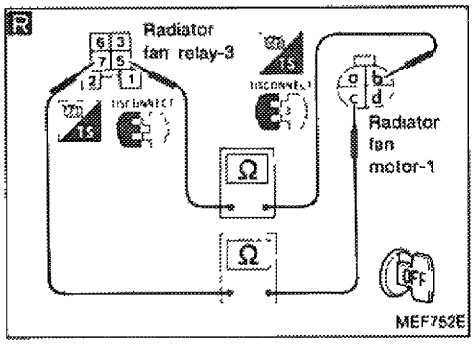
RADIATOR FAN CONTROL (Not self-diagnostic item)

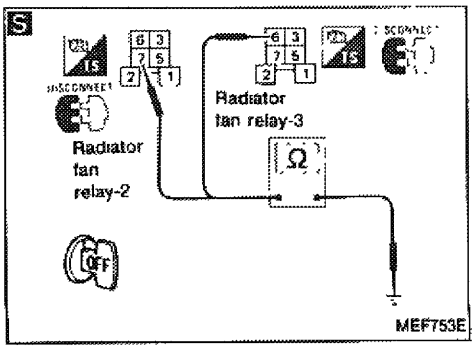


RADIATOR FAN CONTROL (Not self-diagnostic item)









PROCEDURE D

INSPECTION START

P

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect radiator fan relay-2, 3.
3) Turn ignition switch "ON".
4) Check voltage between terminals ①, ⑤ and ground (Radiator fan relay-2), terminals ①, ③ and ground (Radiator fan relay-3).
Voltage: Battery voltage

N.G → Check the following.
- Harness connectors (M5), (E102)
- 10A fuse
- 30A fusible link
- 75A fusible link
- Joint connector-4
- Harness continuity between radiator fan relay-2, 3 and fuse
- Harness continuity between radiator fan relay-2, 3 and battery

If N.G., repair harness or connectors.

O.K ↓

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect radiator fan motor-1 harness connector and radiator fan motor-2 harness connector

Q 3) Check harness continuity between terminal ③ (Radiator fan relay-2) and terminal ⓕ (Radiator fan motor-2), terminal ⑥ (Radiator fan relay-2) and terminal ⓖ (Radiator fan motor-2)
Continuity should exist.

R 4) Check harness continuity between terminal ⑤ (Radiator fan relay-3) and terminal ⓑ (Radiator fan motor-1), terminal ⑦ (Radiator fan relay-3) and terminal ⓒ (Radiator fan motor-1).
Continuity should exist.

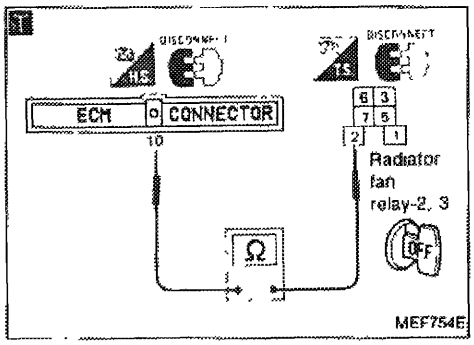
S 5) Check harness continuity between terminal ⑦ (Radiator fan relay-2), terminal ⑥ (Radiator fan relay-3) and body ground.
Continuity should exist.

N.G → Repair harness or connectors.

O.K. ↓

Ⓑ

RADIATOR FAN CONTROL (Not self-diagnostic item)



(B)

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ⑩ and terminal ②.
Continuity should exist.

N.G. → Check the following.
- Harness connectors (F28), (M47)
- Harness connectors (M5), (E102)
- Harness continuity between ECM and radiator fan relay-2, 3

If N.G, repair harness or connectors.

O.K. ↓

CHECK COMPONENT
(Radiator fan relays).
Refer to "Electrical Components Inspection".

N.G. → Replace radiator fan relays.

O.K. ↓

CHECK COMPONENTS
(Radiator fan motors).
Refer to "Electrical Components Inspection" (See page EF & EC-78.)

N.G. → Replace radiator fan motors.

O.K. ↓

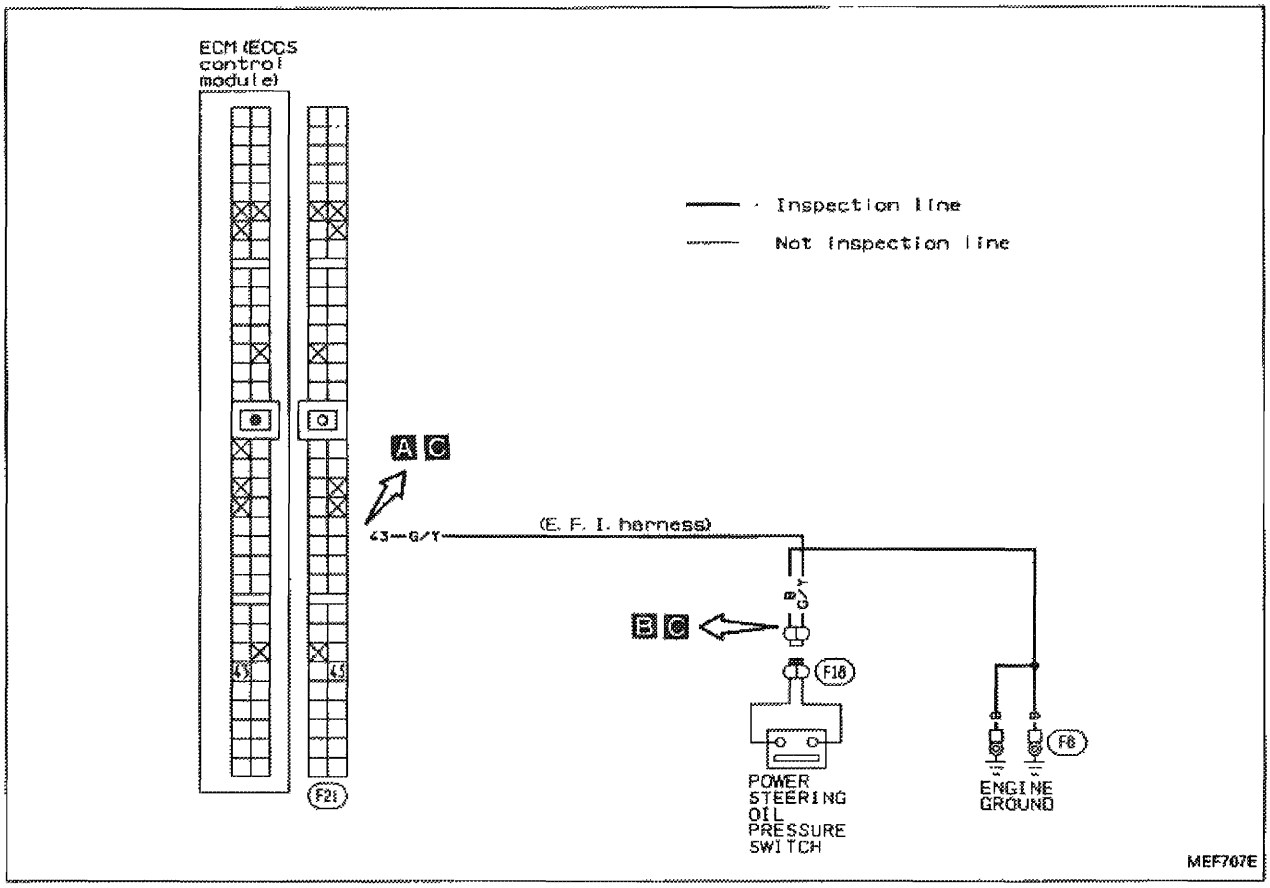
Check ECM pin terminals for damage or the connection of ECM harness connector.

↓

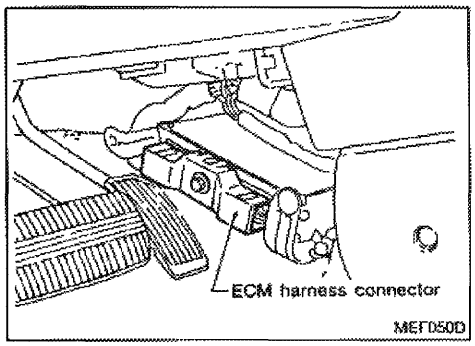
INSPECTION END

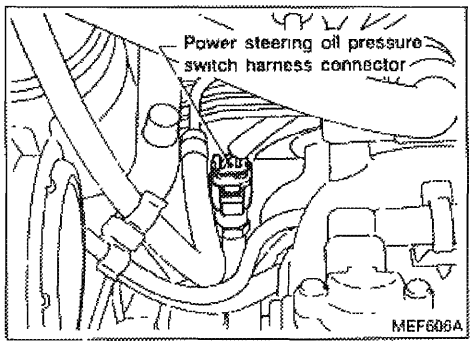
Diagnostic Procedure 24

POWER STEERING OIL PRESSURE SWITCH (Not self-diagnostic item)



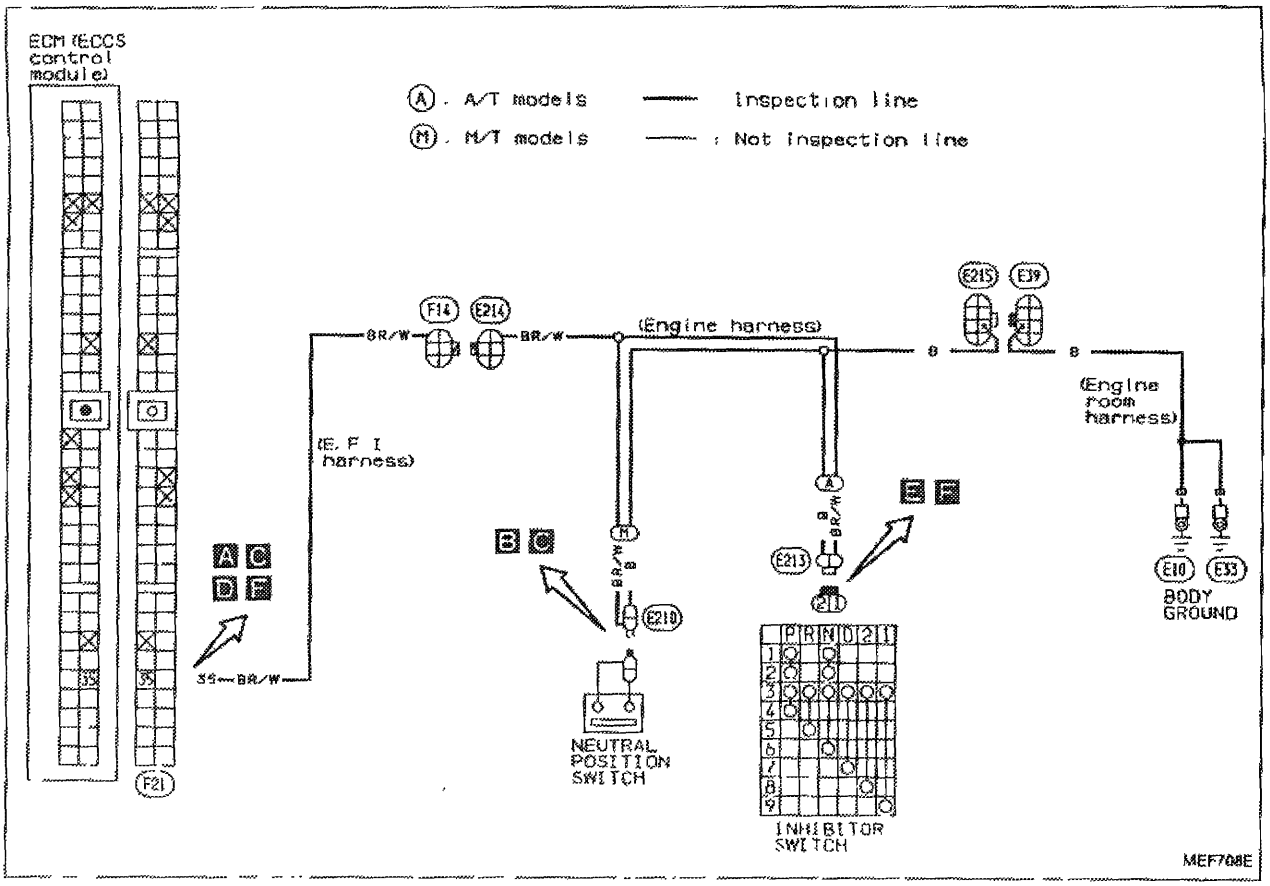
Harness layout



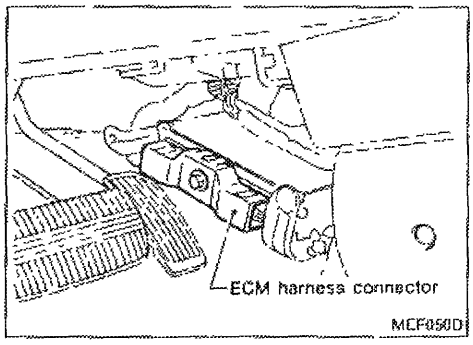


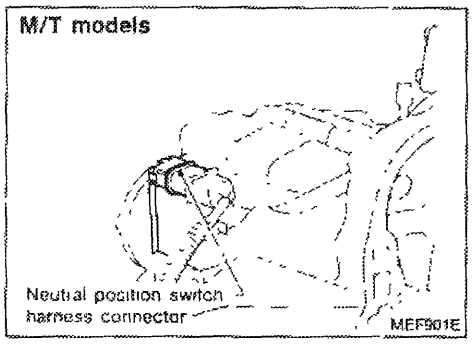
Diagnostic Procedure 25

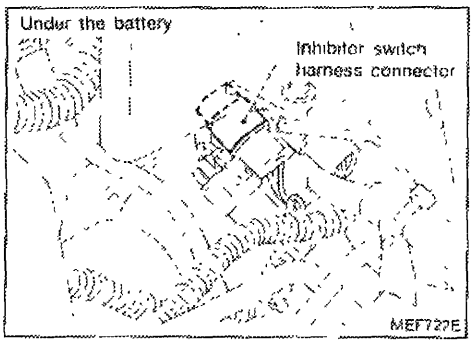
NEUTRAL POSITION/INHIBITOR SWITCH (Not self-diagnostic item)



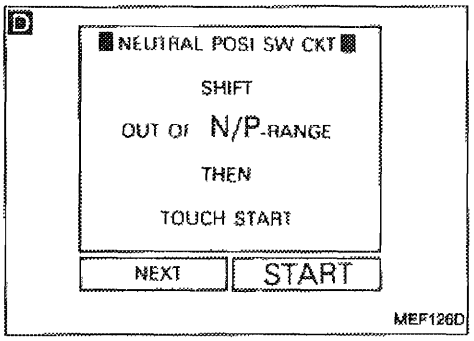
Harness layout

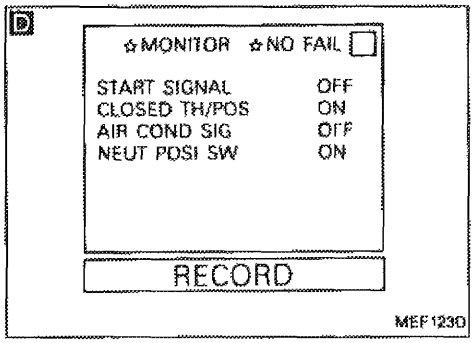


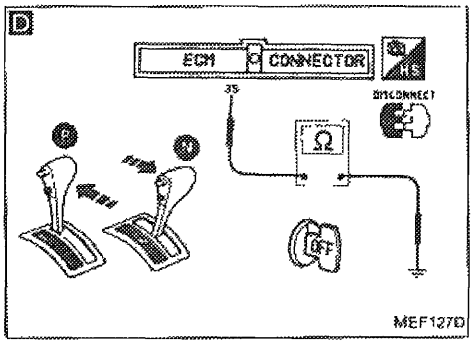


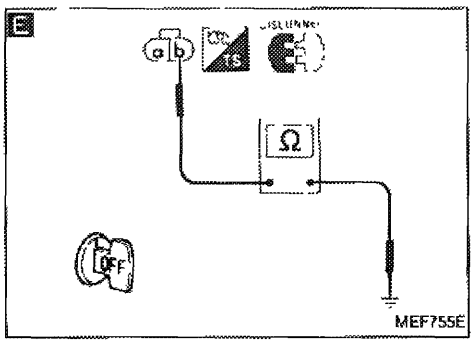


NEUTRAL POSITION/INHIBITOR SWITCH (Not self-diagnostic item)









Inhibitor switch

INSPECTION START

D

CHECK OVERALL FUNCTION.
1) Turn ignition switch "ON".
2) Perform "NEUTRAL POSI SW CKT" in "FUNCTION TEST" mode with CONSULT

O.K → INSPECTION END

OR

1) Turn ignition switch "ON".
2) Check neutral position switch signal in "DATA MONITOR" mode with CONSULT.
"N" or "P": ON
Except above: OFF

OR

1) Shift selector lever to "P" range.
2) Disconnect ECM harness connector.
3) Check harness continuity between ECM terminal ㉟ and body ground.
Continuity should exist.
4) Shift selector lever to "N" range.
5) Check harness continuity between ECM terminal ㉟ and body ground.
Continuity should exist.

N.G.

Turn ignition switch "OFF"

E

CHECK GROUND CIRCUIT.
1) Disconnect inhibitor switch harness connector.
2) Check harness continuity between terminal ⓑ and body ground.
Continuity should exist.

N.G. → Check the following.
- Harness connectors ㉑⑤, ㉚⑧
- Harness continuity between inhibitor switch and body ground

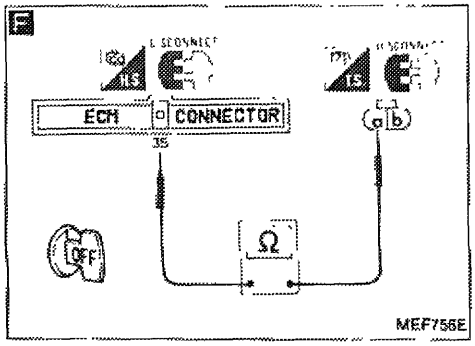
If N.G., repair harness or connectors

O.K.

Disconnect ECM harness connector.

Ⓐ

NEUTRAL POSITION/INHIBITOR SWITCH (Not self-diagnostic item)



(A)

CHECK INPUT SIGNAL CIRCUIT.
1) Check harness continuity between ECM terminal (35) and terminal (9)
Continuity should exist.

N.G. → Check the following
- Harness connectors (F14), (E218)
- Harness continuity between ECM and inhibitor switch

If N.G., repair harness or connectors.

O.K. ↓

CHECK COMPONENT
(Inhibitor switch).
Refer to AT section.

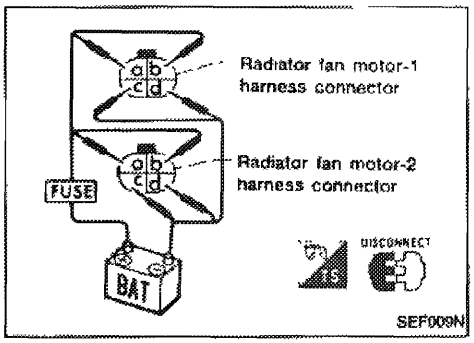
N.G. → Replace inhibitor switch.

O.K ↓

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

↓

INSPECTION END



Electrical Components Inspection

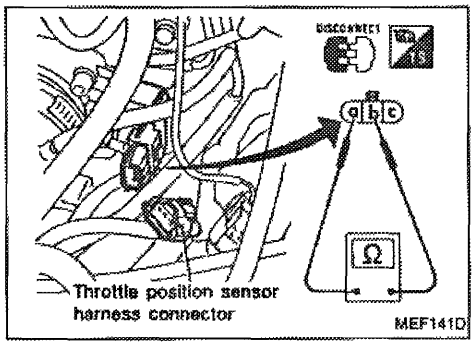
RADIATOR FAN MOTORS-1 AND -2

1. Disconnect radiator fan motor harness connectors.
2. Supply radiator fan motor terminals with battery voltage and check operation.

	Speed	Terminals	
		(⊕)	(⊖)
Radiator fan motor-1	Low	ⓐ	ⓒ
	High	ⓐ, ⓑ	ⓒ, ⓓ
Radiator fan motor-2	Low	ⓑ	ⓒ
	High	ⓐ, ⓑ	ⓒ, ⓓ

Radiator fan motor should operate.

If N.G., replace radiator fan motor.

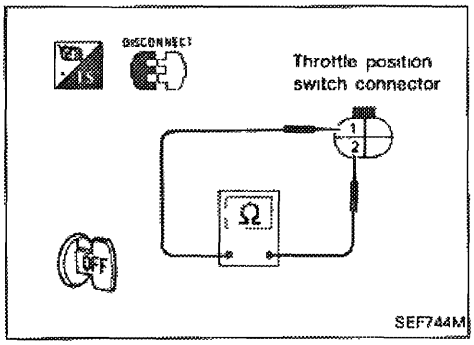


THROTTLE POSITION SENSOR

1. Disconnect throttle position sensor harness connector.
2. Make sure that resistance between terminals ⓐ and ⓑ changes when opening throttle valve manually.

Accelerator pedal conditions	Resistance kΩ
Completely released	Approximately 1
Partially released	1 - 10
Completely depressed	Approximately 10

If N.G., replace throttle position sensor.



CLOSED THROTTLE POSITION SWITCH (Idle position) — A/T model only

1. Warm up engine sufficiently
- Make sure fast idle cam holds cam follower lever released.
2. Disconnect throttle position switch harness connector.
3. Check continuity between terminals ① and ②.

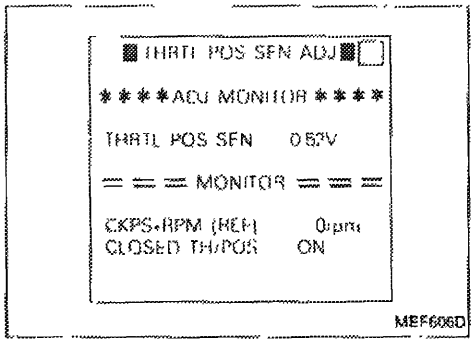
Accelerator pedal condition	Continuity
Released	Yes
Depressed	No

If N.G., replace closed throttle position switch.

Adjustment

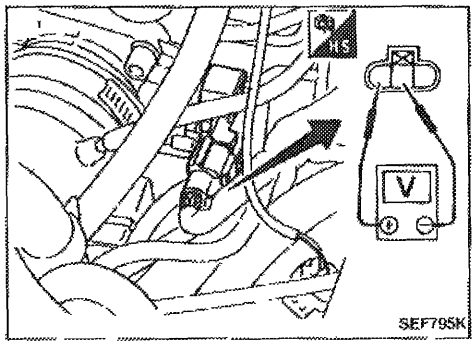
If throttle position sensor, closed throttle position switch or wide open throttle position switch is replaced or removed, it is necessary to install in proper position, by following the procedure as shown below.

Electrical Components Inspection (Cont'd)

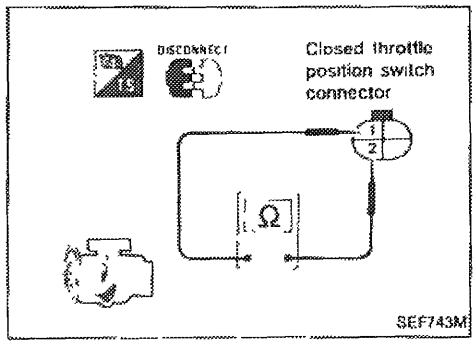


MT model;

1. Install throttle position sensor body in throttle body. Do not tighten bolts. Leave bolts loose.
2. Connect throttle position sensor harness connector.
3. Start engine and warm it up sufficiently.
4. Perform "THRTL POS SEN ADJ" in "WORK SUPPORT" mode.
   Measure output voltage of throttle position sensor using voltmeter.



5. Adjust by rotating throttle position sensor body so that output voltage is 0.45 to 0.55V.
6. Tighten mounting bolts.
7. Disconnect throttle position sensor harness connector for a few seconds and then reconnect it.

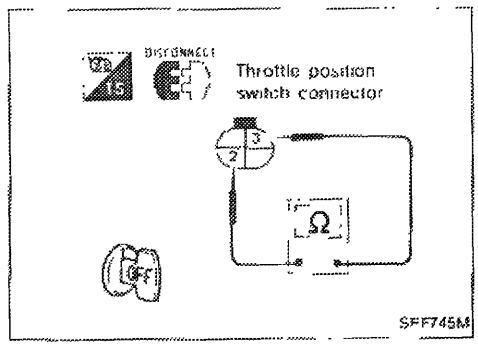


AT model;

1. Install throttle position sensor in throttle body. Do not tighten bolts. Leave bolts loose.
2. Connect throttle position sensor and closed throttle position switch harness connector.
3. Start engine and warm it up sufficiently.
4. Disconnect closed throttle position switch harness connector.
5. Check closed throttle position switch OFF → ON engine speed with circuit tester, closing throttle valve manually.

   Closed throttle position switch continuity OFF → ON engine speed:

   A/T: Engine speed in "N" position
   1,050 ± 150 rpm



WIDE OPEN THROTTLE POSITION SWITCH — A/T model only

1. Disconnect throttle position switch harness connector.
2. Check continuity between terminals ② and ③.

Accelerator pedal condition	Continuity
Released	No
Depressed	Yes

If N G., replace wide open throttle position switch.

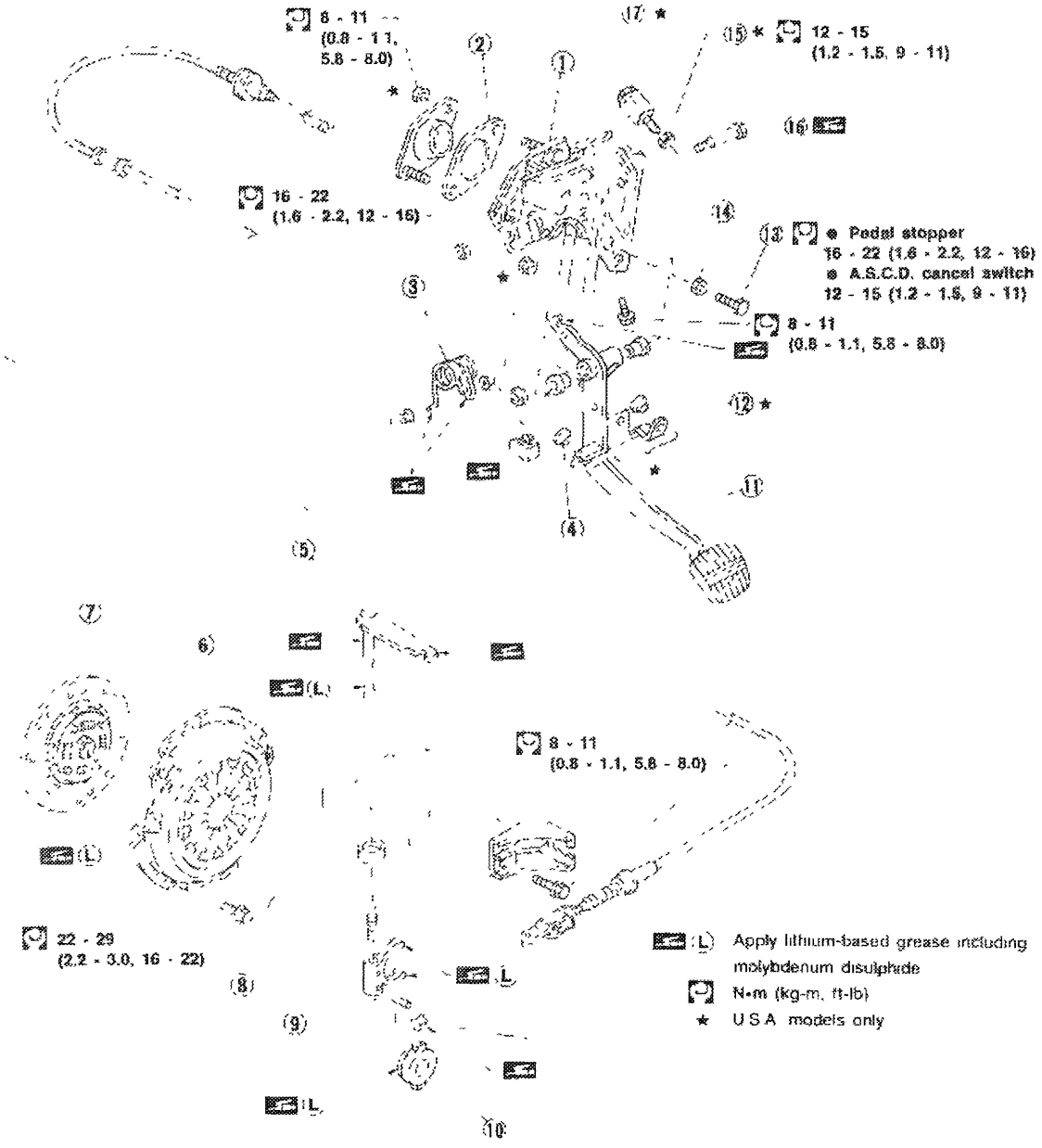
SECTION CL

MODIFICATION NOTICE:

The clutch cover has been changed.

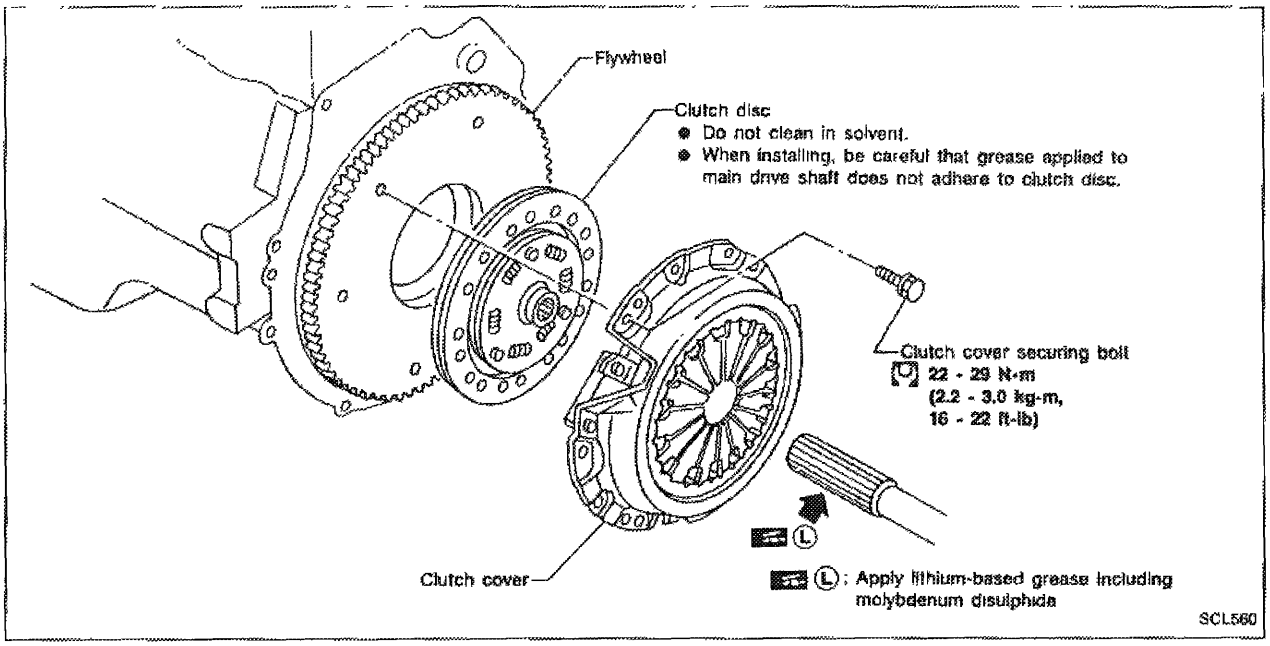
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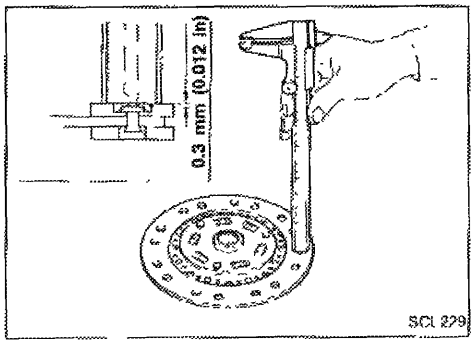
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CLUTCH DISC AND CLUTCH COVER 3
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SCL569

① Clutch pedal bracket
② Insulator
③ Assist spring
④ Stopper rubber
⑤ Withdrawal lever
⑥ Clutch cover
⑦ Clutch disc
⑧ Return spring
⑨ Clutch lever
⑩ Release bearing
⑪ Clutch pedal
⑫ Stopper rubber
⑬ Pedal stopper or A.S.C.D. cancel switch
⑭ Lock nut
⑮ Lock nut
⑯ Fulcrum pin
⑰ Clutch interlock switch



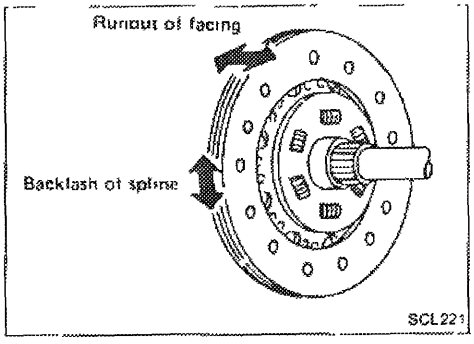


Clutch Disc

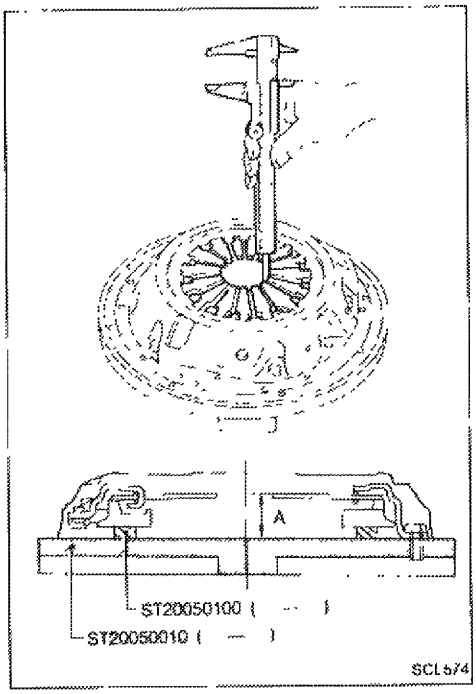
INSPECTION

Check clutch disc for wear of facing.

Wear limit of facing surface to rivet head:
0.3 mm (0.012 in)



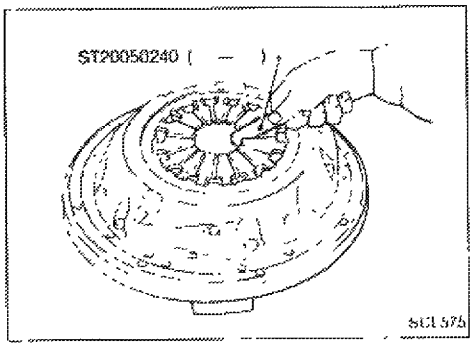
- Check clutch disc for backlash of spline and runout of facing.
  Maximum backlash of spline (at outer edge of disc):
  Model 215 0.9 mm (0.035 in)
  Runout limit:
  1.0 mm (0.039 in)
  Distance of runout check point (from hub center):
  Model 215 102.5 mm (4.04 in)
- Check clutch disc for burns, discoloration or oil or grease leakage. Replace if necessary.



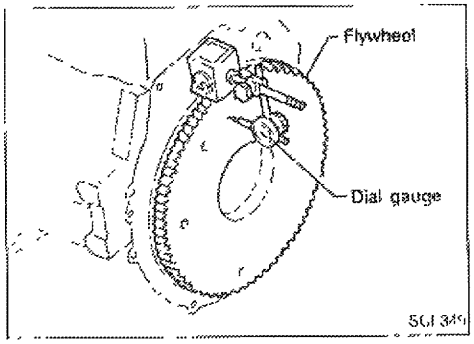
Clutch Cover and Flywheel

INSPECTION AND ADJUSTMENT

- Set Tool and check height and unevenness of diaphragm spring
  Diaphragm spring height "A":
  Model 215 30.5 - 32.5 mm (1.201 - 1.280 in)
- Check thrust rings for wear or damage by shaking cover assembly and listening for chattering noise, or lightly hammering on rivets for a slightly cracked noise. Replace clutch cover assembly if necessary.
- Check pressure plate and clutch disc contact surface for slight burns or discoloration. Repair pressure plate with emery paper.
- Check pressure plate and clutch disc contact surface for deformation or damage. Replace if necessary.

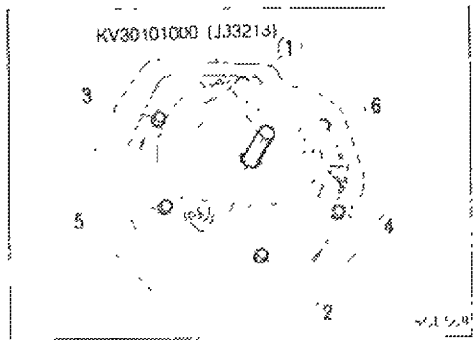


- Adjust unevenness of diaphragm spring with Tool.
  Uneven limit:
  0.7 mm (0.028 in)



FLYWHEEL INSPECTION

- Check contact surface of flywheel for slight burns or discoloration. Repair flywheel with emery paper.
- Check flywheel runout.
  Runout (Total indicator reading):
  Flywheel
  Less than 0.15 mm (0.0059 in)



INSTALLATION

- Insert Tool into clutch disc hub when installing clutch cover and disc.
- Tighten bolts in numerical order.
- **Be careful that grease does not contaminate clutch facing.**

General Specifications

CLUTCH DISC

Unit: mm (in)

Engine	SR20DE
Model	215
Facing size (Outer dia. x inner dia. x thickness)	215 x 140 x 3.5 (8.46 x 5.51 x 0.138)
Thickness of disc assembly with load	7.6 - 8.0 (0.299 - 0.315) with 3,923 N (400 kg, 882 lb)

CLUTCH COVER

Engine		SR20DE
Model		215
Full-load	N (kg, lb)	4,413 (450, 992)

Inspection and Adjustment

CLUTCH DISC

Unit: mm (in)

Model	215
Wear limit of facing surface to rivet head	0.3 (0.012)
Runout limit of facing	1.0 (0.039)
Distance of runout check point (from hub center)	102.5 (4.04)
Maximum backlash of spline (at outer edge of disc)	0.9 (0.035)

CLUTCH COVER

Unit: mm (in)

Model	215
Diaphragm spring height	30.5 - 32.5 (1.201 - 1.280)
Uneven limit of diaphragm spring toe height "A"	0.7 (0.028)

MANUAL TRANSAXLE

SECTION MT

MODIFICATION NOTICE:

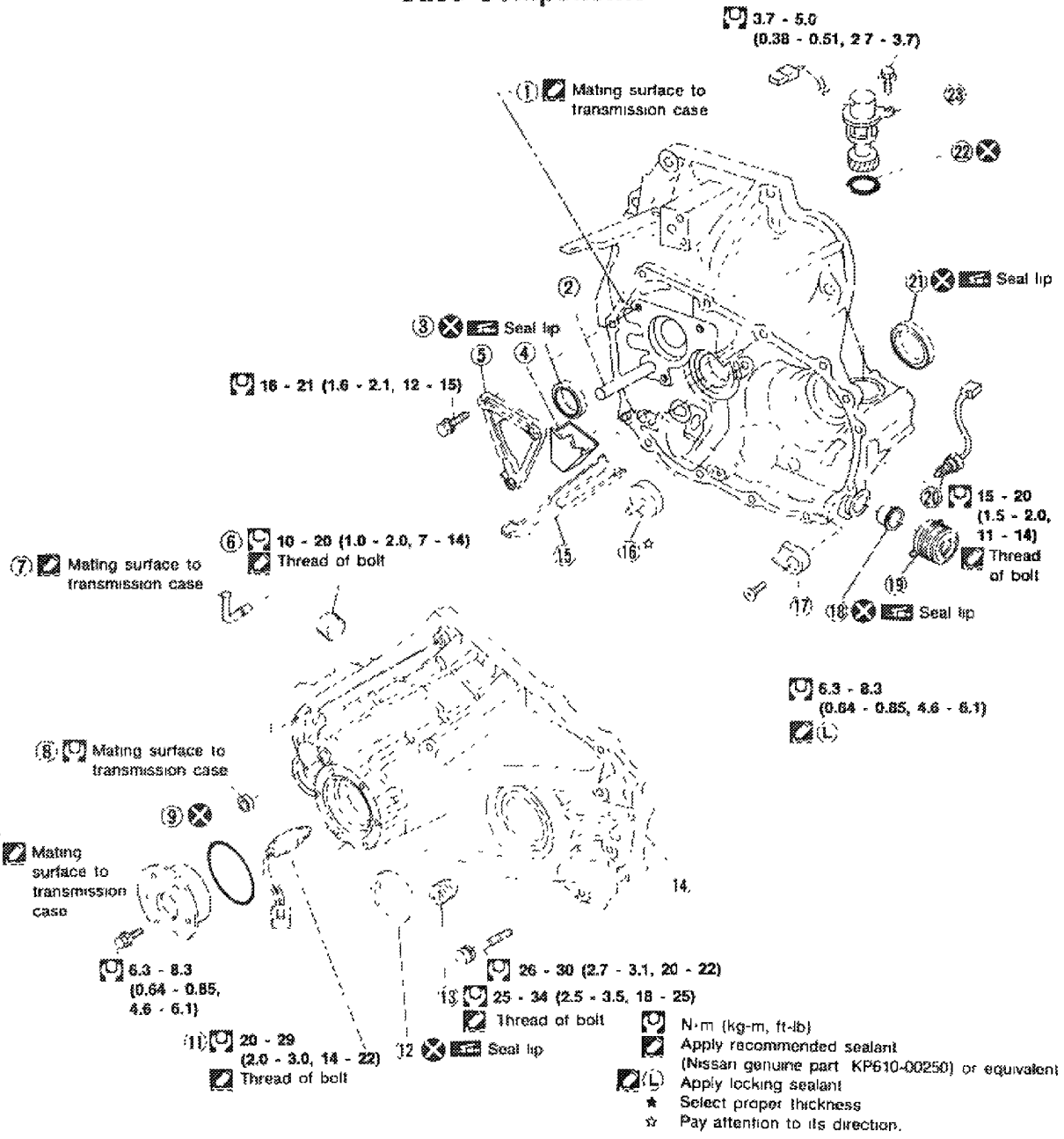
The speedometer pinion has been changed from the mechanical type to an electrical type.

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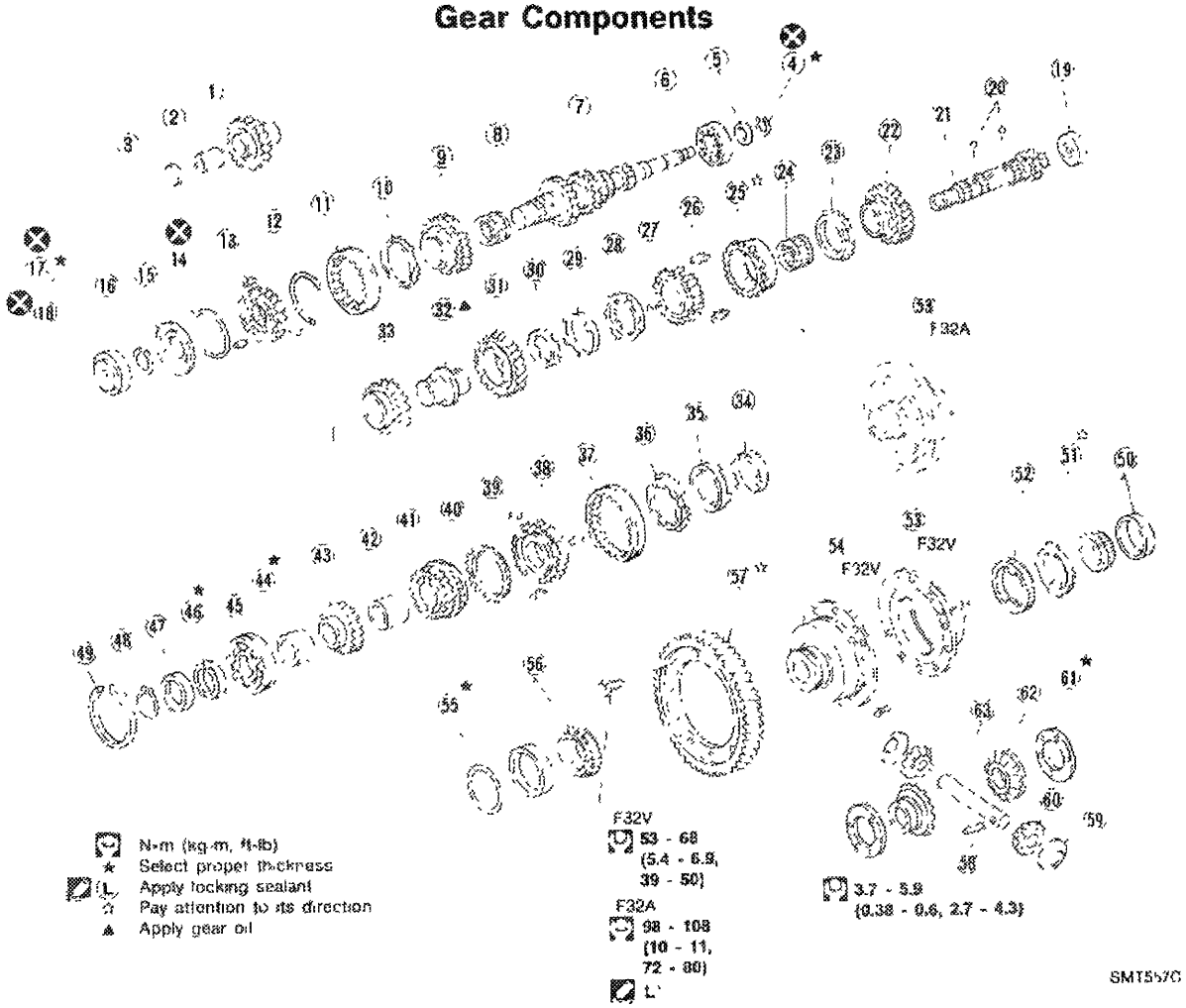
Case Components



SMT566C

① Clutch housing
② Reverse idler shaft
③ Input shaft oil seal
④ Oil pocket
⑤ Bearing retainer
⑥ Filler plug
⑦ Air breather
⑧ Welch plug
⑨ O-ring
⑩ Case cover
⑪ Reverse lamp switch
⑫ Differential oil seal
⑬ Drain plug
⑭ Transmission case
⑮ Oil gutter
⑯ Oil channel
⑰ Bearing retainer
⑱ Striking rod oil seal
⑲ Boot
⑳ Neutral switch
㉑ Differential oil seal
㉒ O-ring
㉓ Speedometer pinion assembly

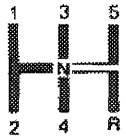
Gear Components



(1) Reverse idler gear
(2) Reverse idler bushing
(3) Reverse idler spacer
(4) Snap ring
(5) Spacer
(6) Input shaft front bearing
(7) Input shaft
(8) 5th gear needle bearing
(9) 5th input gear
(10) Baulk ring
(11) Coupling sleeve
(12) Spread ring
(13) Insert spring
(14) 5th gear synchronizer hub
(15) Spread ring
(16) 5th stopper
(17) Snap ring
(18) Input shaft bearing
(19) Mainshaft front bearing
(20) Steel ball
(21) Mainshaft
(22) 1st main gear
(23) Baulk ring
(24) 1st gear needle bearing
(25) Reverse main gear (Coupling sleeve)
(26) Insert spring
(27) 1st & 2nd synchronizer hub
(28) 2nd outer baulk ring
(29) 2nd gear synchronizer cone
(30) 2nd inner baulk ring
(31) 2nd main gear
(32) 2nd & 3rd bushing
(33) 3rd main gear
(34) 3rd inner baulk ring
(35) 3rd gear synchronizer cone
(36) 3rd outer baulk ring
(37) Coupling sleeve
(38) 3rd & 4th synchronizer hub
(39) Insert spring
(40) Baulk ring
(41) 4th main gear
(42) 4th gear bushing
(43) 5th main gear
(44) Spacer
(45) Mainshaft rear bearing
(46) C-ring
(47) C-ring holder
(48) Snap ring
(49) Snap ring
(50) Differential side bearing
(51) Speedometer stopper
(52) Speedometer drive gear
(53) Differential case
(54) Viscous coupling
(55) Differential side bearing adjusting shim
(56) Differential side bearing
(57) Final gear
(58) Retaining pin
(59) Thrust washer
(60) Pinion mate gear
(61) Thrust washer
(62) Side gear
(63) Pinion mate shaft

General Specifications

TRANSAXLE

Engine	SR20DE
Transaxle model	RS5F32A & RS5F32V
Number of speeds	5
Synchromesh type	Warner
Shift pattern	

	Gear ratio	Number of teeth	
		Input gear	Main gear
1st	3.063	16	49
2nd	1.826	23	42
3rd	1.207	29	35
4th	0.926	41	38
5th	0.733	45	33
Reverse	3.153	13	41
Reverse idler gear		31	
Oil capacity		3.5 - 3.7ℓ (7-3/8 - 7-7/8 US pt, 6-1/8 - 6-1/2 Imp pt)	

FINAL GEAR

Engine		SR20DE
Final gear ratio		4.176
Number of teeth	Final gear/Pinion	71/17
	Side gear/Pinion mate gear	14/10

Inspection and Adjustment

GEAR END PLAY

Gear	End play mm (in)
1st main gear	0.18 - 0.31 (0.0071 - 0.0122)
2nd main gear	0.20 - 0.30 (0.0079 - 0.0118)
3rd main gear	0.20 - 0.30 (0.0079 - 0.0118)
4th main gear	0.20 - 0.30 (0.0079 - 0.0118)
5th input gear	0.18 - 0.31 (0.0071 - 0.0122)

CLEARANCE BETWEEN BAULK RING AND GEAR

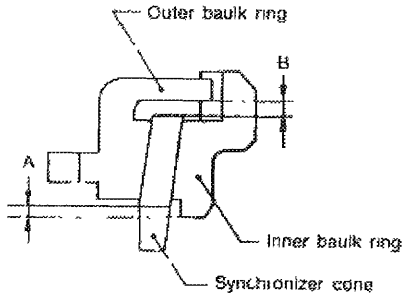
1st, 4th, 5th baulk ring

Unit: mm (in)

	Standard	Wear limit
1st	0.95 - 1.45 (0.0374 - 0.0571)	0.7 (0.028)
4th	0.9 - 1.45 (0.0354 - 0.0571)	
5th	0.9 - 1.5 (0.035 - 0.059)	

2nd and 3rd baulk ring

Unit: mm (in)



SMT644A

Dimension	Standard	Wear limit
A	0.7 - 0.9 (0.028 - 0.035)	0.2 (0.008)
B	0.6 - 1.1 (0.024 - 0.043)	

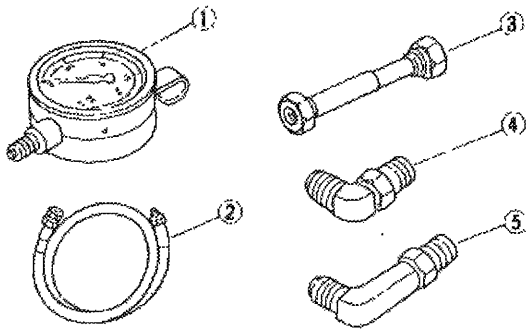
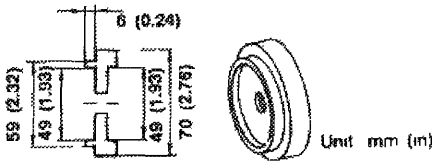
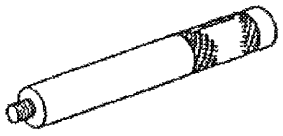
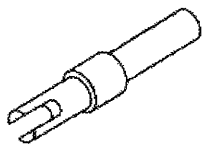
AUTOMATIC TRANSAXLE

SECTION AT

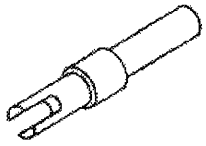
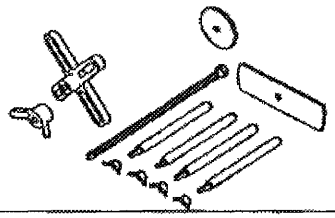
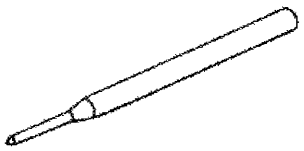
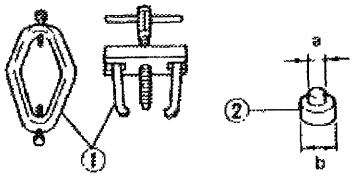
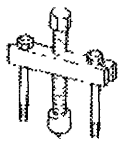
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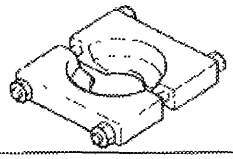
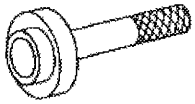
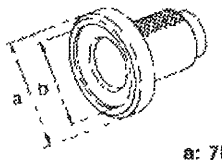
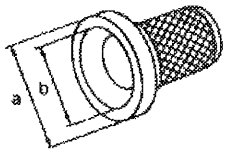
Special Service Tools

Tool number (Kent-Moore No.) Tool name	Description	
ST2505S001 (J25695-A) Oil pressure gauge set ① ST25051001 (J25695-1) Oil pressure gauge ② ST25052000 (J25695-2) Hose ③ ST25053000 (J25695-3) Joint pipe ④ ST25054000 (J25695-4) Adapter ⑤ ST25055000 (J25695-5) Adapter		Measuring line pressure and governor pressure
ST33290001 (J25810-A) Puller		Removing differential side oil seals
KV31103000 (—) Drift		Installing differential oil seal (Use with ST35325000.)
ST35325000 (—) Drift		Installing differential oil seal (Use with KV31103000.)
KV38105710 (—) Preload adapter		— RE4F03A — • Measuring turning torque of final drive assembly • Measuring clearance between side gear and differential case with washer • Selecting differential side bearing adjusting shim

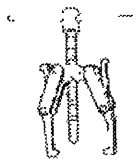
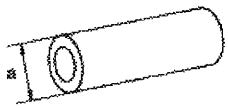
Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
KV38107700 (—) Preload adapter		— RE4F03V — • Measuring turning torque of final drive assembly • Measuring clearance between side gear and differential case with washer • Selecting differential side bearing adjusting shim
KV31103200 (—) Clutch spring compressor		Removing and installing clutch return spring
ST23540000 (—) Pin punch		Removing and installing parking rod plate, manual plate and differential pinion mate shaft retaining pins
KV32101000 (J25689-A) Pin punch		Installing throttle lever and manual shaft retaining pins Removing pinion mate shaft retaining pin
ST3306S001 (—) Differential side bearing puller set ① ST33051001 (—) Puller ② ST33061000 (J8107-2) Adapter	 a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.	Removing differential side bearing inner race
KV38105450 (—) Puller		• Removing idler gear bearing outer race • Removing differential side bearing outer race • Removing needle bearing from bearing retainer
ST27180001 (—) Puller		Removing idler gear

Special Service Tools (Cont'd)

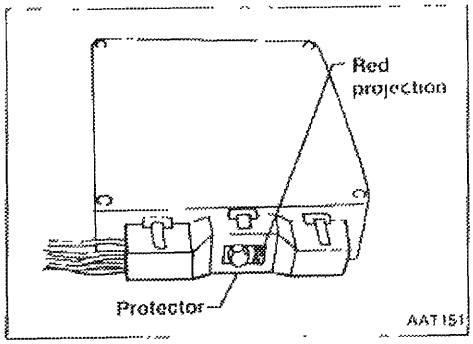
Tool number (Kent-Moore No.) Tool name	Description	
ST30031000 (—) Puller		Removing reduction gear bearing inner race
ST35272000 (—) Drift		• Installing reduction gear bearing inner race • Installing idler gear bearing inner race
ST37830000 (—) Drift		Installing idler gear bearing outer race
ST35321000 (—) Drift		Installing output shaft bearing
ST30633000 (—) Drift		Installing differential side bearing outer race
ST35271000 (—) Drift	 a: 76 mm (2.99 in) dia. b: 67 mm (2.64 in) dia.	Installing idler gear
ST33400001 (J26082) Drift	 a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.	Installing oil pump housing oil seal

Commercial Service Tools

Tool name	Description	
Puller		• Removing idler gear bearing inner race • Removing and installing band servo piston snap ring
Drift	 **a: 34 mm (1.34 in) dia.**	Removing idler gear bearing inner race
Drift	 **a: 36 mm (1.42 in) dia.**	Installing needle bearing onto bearing retainer

Service Notice

- Before proceeding with disassembly, thoroughly clean the outside of the transaxle. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transaxle.
- When disassembling parts, place them in order in a parts rack so that they can be put back into the unit in their proper positions.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the transaxle is disassembled.
- When connecting A/T control unit harness connector, tighten bolt until red projection is in-line with connector.



- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place removed parts in order on a parts rack so they can be put back in the valve body in the same positions and sequences. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along their bores in the valve body under their own weight.
- Before assembly, apply a coat of recommended A.T.F. to all parts. Petroleum jelly may be applied to O-rings and seals and used to hold small bearings and washers in place during reassembly. Do not use grease
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- After overhaul, refill the transaxle with new A.T.F.

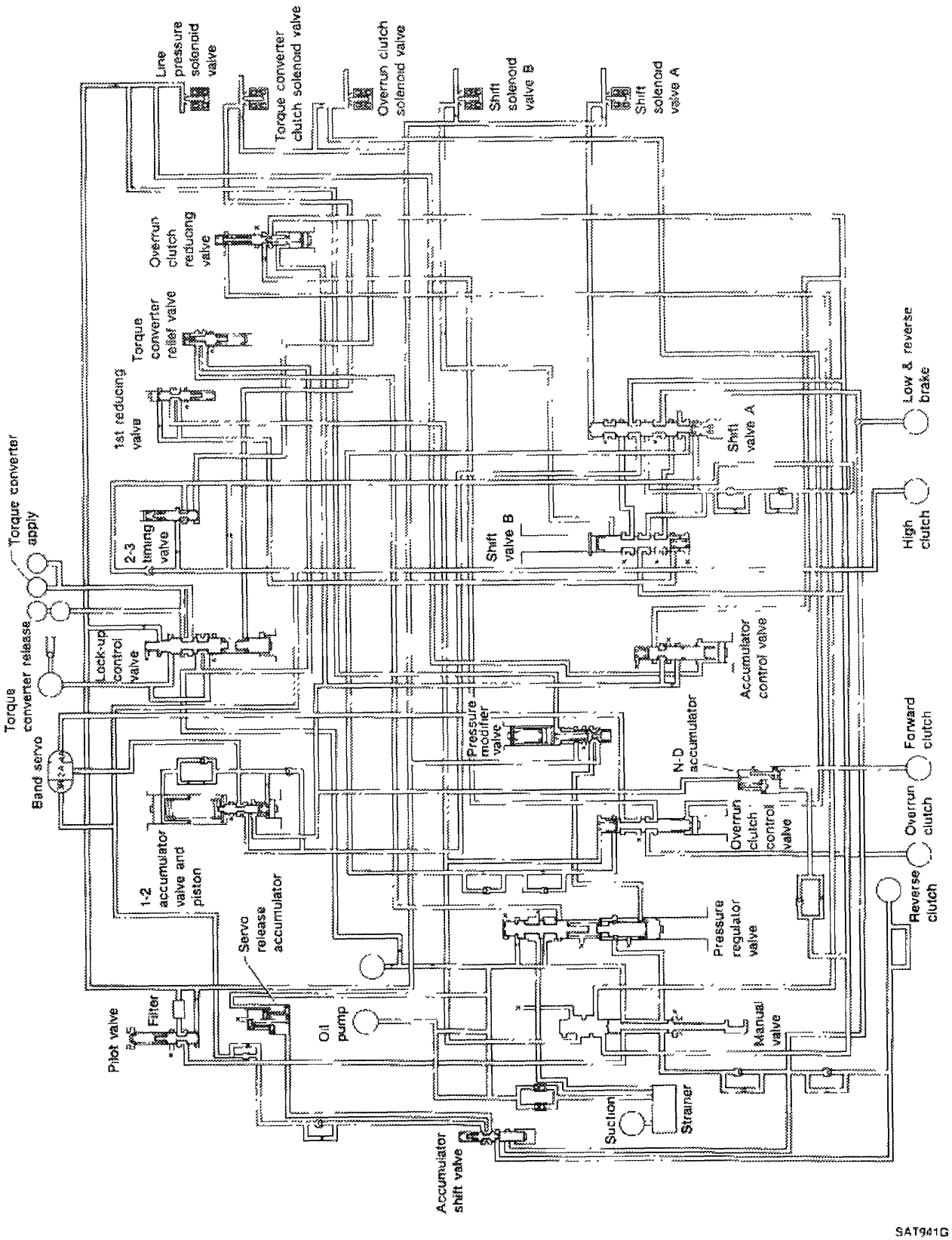
Precaution for Supplemental Restraint System "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner" help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, sensors, a control unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **BF section** of this Service Manual.

WARNING:

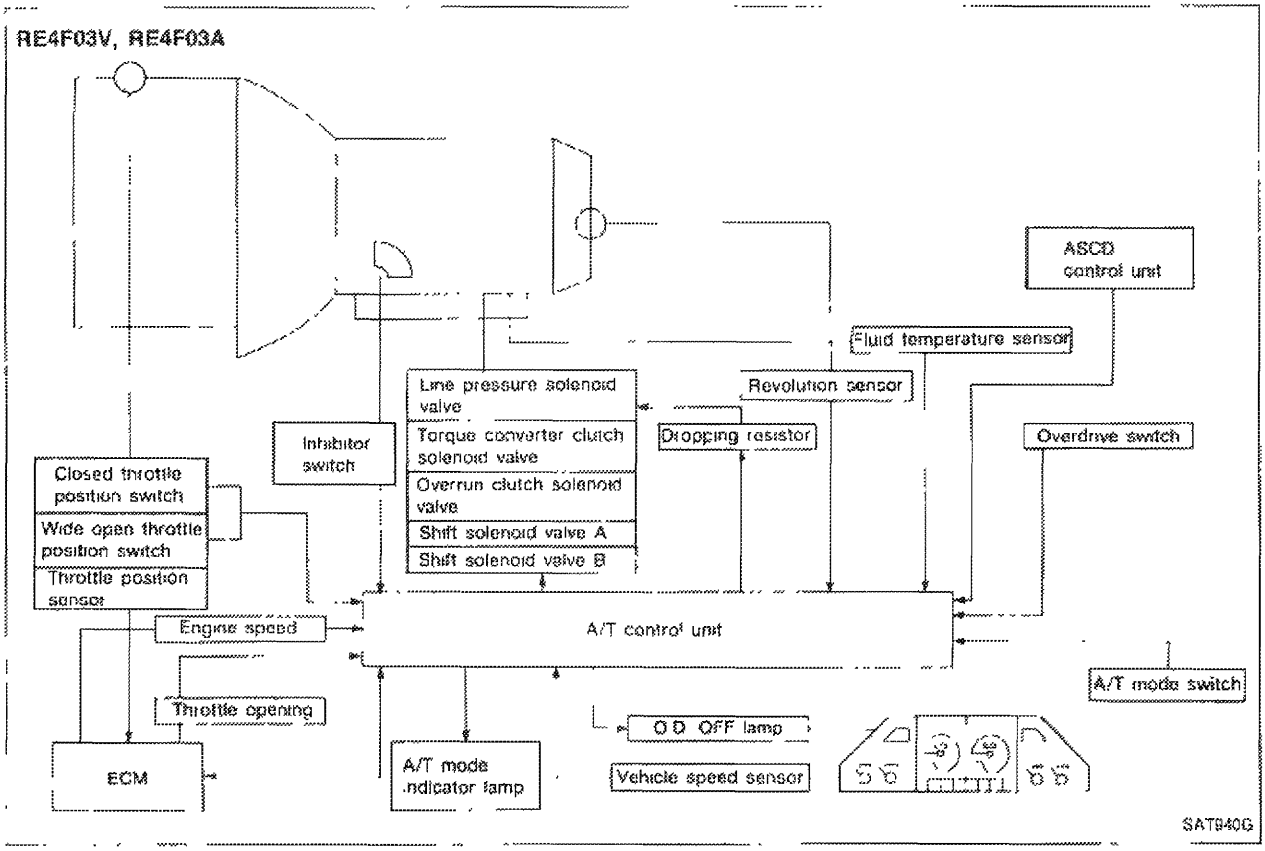
- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **All SRS air bag electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS SYSTEM.**

Hydraulic Control Circuit



SAT941G

Electrical Control Chart

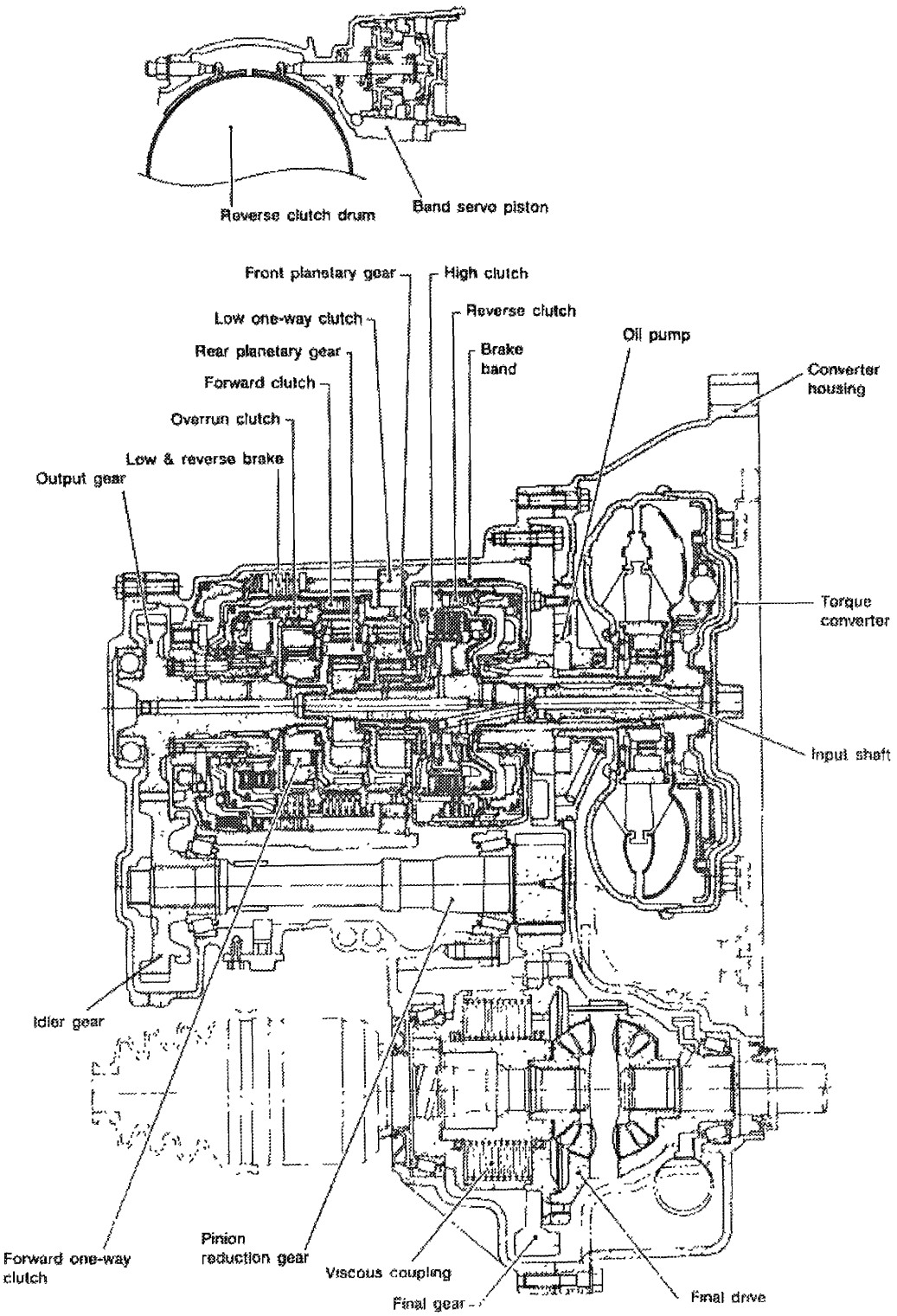


Mechanical Operation

Shift position		Reverse clutch	High clutch	Forward clutch	Overrun clutch	Band servo: 2nd apply	Band servo: 3rd release	Band servo: 4th apply	Forward one-way clutch	Low one-way clutch	Low & reverse brake	Lock-up	Remarks
P													PARK POSITION
R		○									○		REVERSE POSITION
N													NEUTRAL POSITION
D *4	1st			○	○				●	●			Automatic shift 1 ↔ 2 ↔ 3 ↔ 4
	2nd			○	*1 ○	○			●				
	3rd		○	○	○	*2 ⊗	⊗		●			*1 ○	
	4th		○	⊗		*3 ⊗	⊗	○				○	
2	1st			○	○				●	●			Automatic shift 1 ↔ 2
	2nd			○	○	○			●				
1	1st			○	○				●		○		Locks (hold stationary) in 1st speed 1 ← 2
	2nd			○	○	○			●				

*1 : Operates when overdrive switch is set to "OFF".
*2 : Oil pressure is applied to both 2nd "apply" side and 3rd "release" side of band servo piston. However, brake band does not contract because oil pressure area on the "release" side is greater than that on the "apply" side.
*3 : Oil pressure is applied to 4th "apply" side in condition *2 above, and brake band contracts.
*4 : A/T will not shift to 4th when overdrive switch is set to "OFF" position.
○ : Operates
○ : Operates when throttle opening is less than 1/16.
● : Operates during "progressive" acceleration.
⊗ : Operates but does not affect power transmission.

Cross-sectional View — RE4F03V



SAT324G

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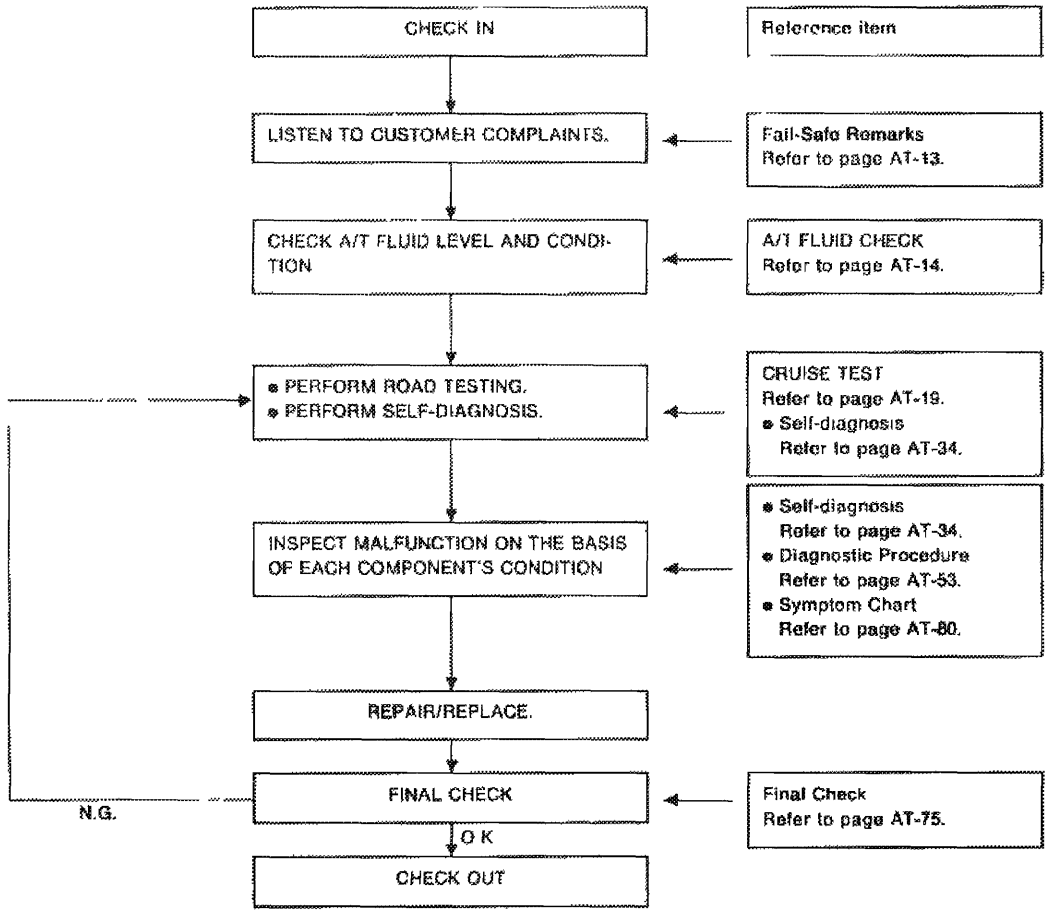
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How to Perform Trouble Diagnoses for Quick and Accurate Repair

WORK FLOW



Fail-Safe Remarks

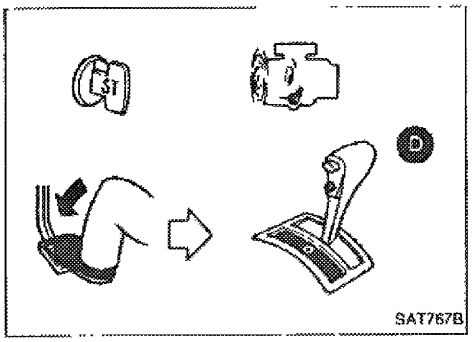
The A/T control unit has an electronic Fail-Safe (limp home mode) to allow the vehicle to be driven even in the event of damage of a major electrical input or output device circuit.
In this condition, the vehicle runs in third gear in positions 1, 2 or D and will not upshift. Customer may say "Sluggish, poor acceleration."
When Fail-Safe operation occurs the next time the key is turned to the ON position, the powershift indicator lamp will blink for about 8 seconds. (For diagnosis, refer to AT-34.)

Remarks

If the vehicle is driven under extreme conditions such as excessive wheel spinning and emergency braking suddenly after, Fail-Safe may be activated even if all electrical circuits are undamaged.
In this case, normal shift pattern can be returned by turning the ignition key OFF for 3 seconds and then back ON.
The blinking of the powershift indicator lamp for about 8 seconds will appear only once and be cleared.
The customer may resume normal driving conditions by chance.
Always follow the "WORK FLOW" (see the previous page).
The SELF-DIAGNOSIS results will be as follows:

The first SELF-DIAGNOSIS will indicate the damage of the vehicle speed sensor or the revolution sensor.

During the next SELF-DIAGNOSIS performed after checking the sensors, no damages will be indicated.

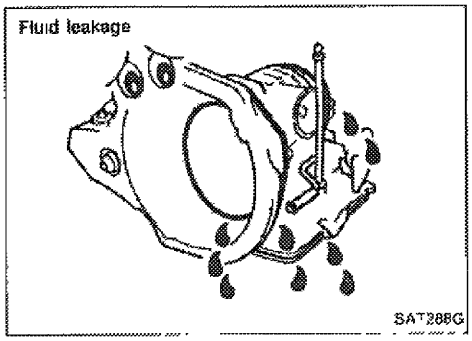


Preliminary Check

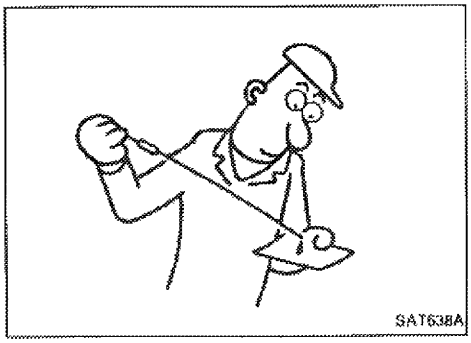
A/T FLUID CHECK

Fluid leakage check

1. Clean area suspected of leaking. — for example, mating surface of converter housing and transmission case.
2. Start engine, apply foot brake, place selector lever in "D" position and wait a few minutes.
3. Stop engine.



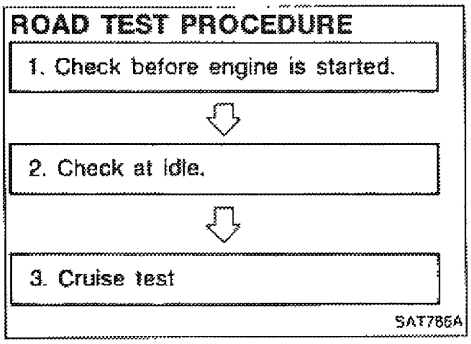
4 Check for fresh leakage.



Fluid condition check

Fluid color	Suspected problem
Dark or black with burned odor	Wear of frictional material
Milky pink	Water contamination — Road water entering through filler tube or breather
Varnished fluid, light to dark brown and tacky	Oxidation — Over or under filling, — Overheating

Fluid level check — Refer to section MA.

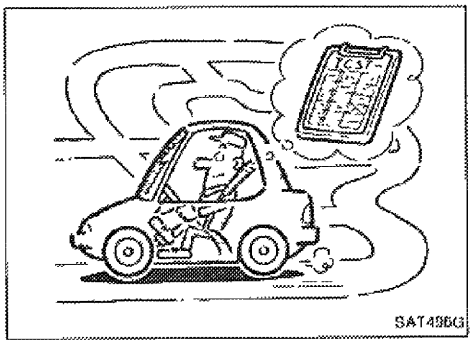


ROAD TESTING

Description

- The purpose of this road test is to determine overall performance of automatic transaxle and analyze causes of problems.
- The road test consists of the following three parts:

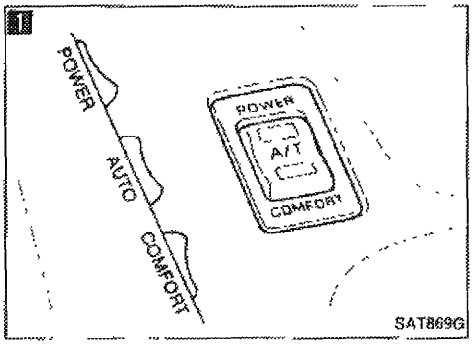
1. Check before engine is started
2. Check at idle
3. Cruise test



- Before road test, familiarize yourself with all test procedures and items to check.
- Conduct tests on all items. Troubleshoot items which check out No Good after road test. Refer to "Self-diagnosis" and "Diagnostic Procedure".

Preliminary Check (Cont'd)

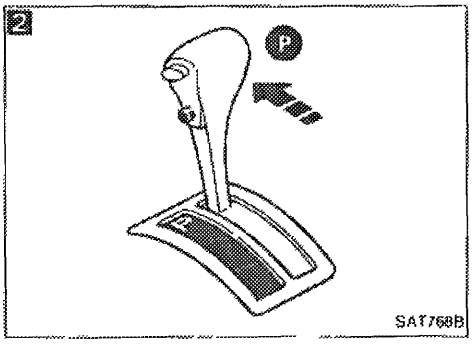
1. Check before engine is started



1 Park vehicle on flat surface.
2. Turn ignition switch to "OFF" position.

1

Set A/T mode switch to "AUTO" position.



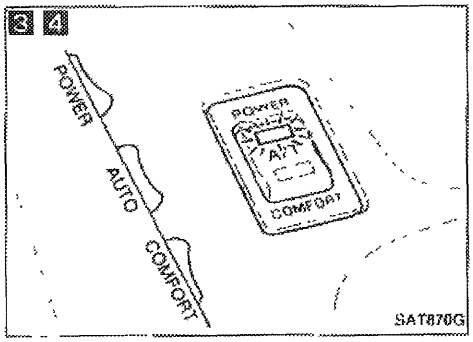
2

1. Move selector lever to "P" position
2. Turn ignition switch to "ON" position. (Do not start engine.)

3

Does power indicator lamp come on for about 2 seconds? — No → Go to Diagnostic Procedure 1.

Yes



4

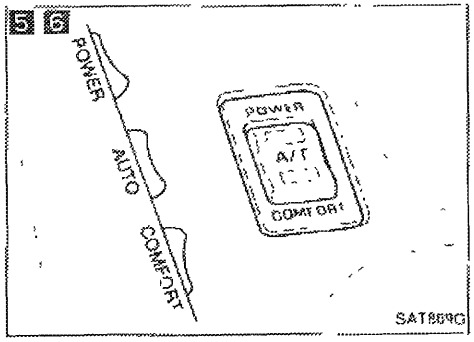
Does power indicator lamp flicker for about 8 seconds? — Yes → Perform self-diagnosis — Refer to SELF-DIAGNOSIS PROCEDURE.

No

5

1. Set A/T mode switch to "POWER" position.
2. Does power indicator lamp come on? — No → Go to Diagnostic Procedure 2.

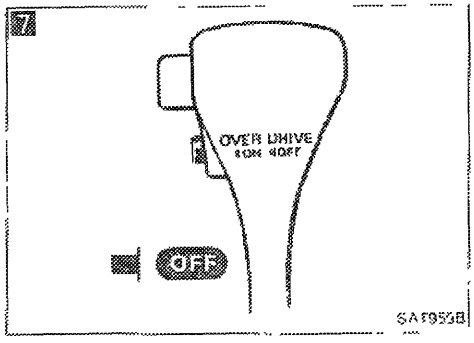
Yes



6

1. Set A/T mode switch to "COMFORT" position.
2. Does comfort indicator lamp come on? — No → Go to Diagnostic Procedure 2.

Yes

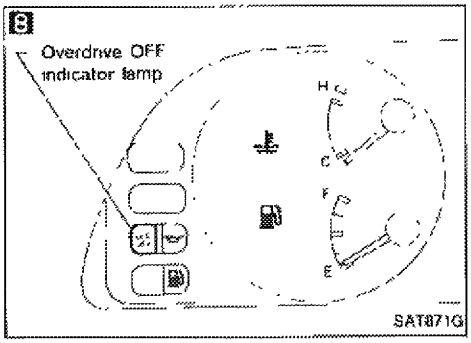


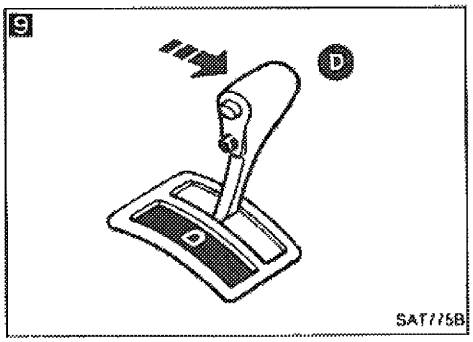
7

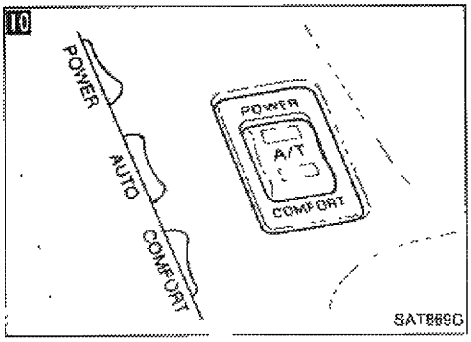
Set overdrive switch to "OFF" position.

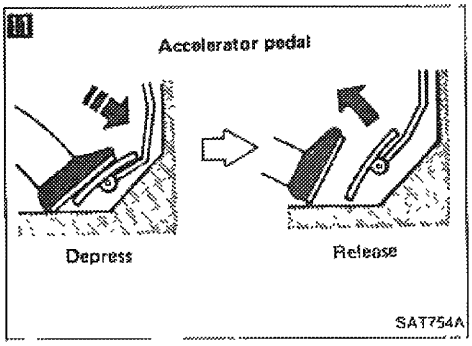
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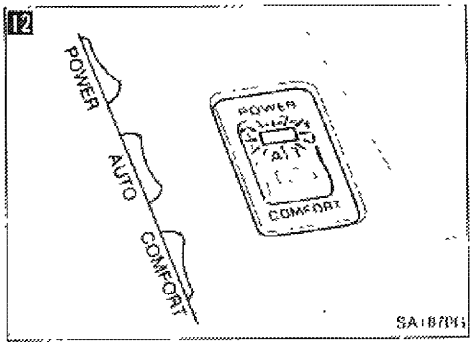
Preliminary Check (Cont'd)











(A)

8

Does O D OFF indicator lamp come on?

No → Go to Diagnostic Procedure 3.

Yes

9

Depress brake pedal and move selector lever to "D" position.

10

Set A/T mode switch to "AUTO" position

11

Depress and release accelerator pedal quickly.

12

Does power indicator lamp come on for about 3 seconds after accelerator pedal is depressed?

No → Go to Diagnostic Procedure 4.

Yes

Turn ignition switch to "OFF" position.

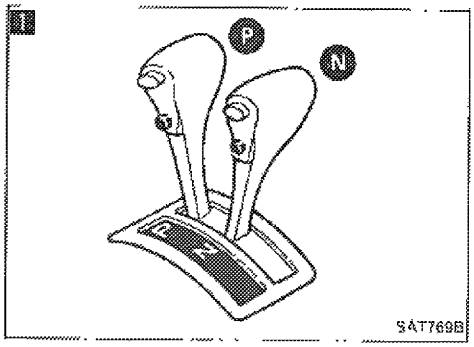
Perform self-diagnosis
— Refer to SELF-DIAGNOSIS PROCEDURE and note N.G. items

Go to "ROAD TESTING — Check at idle"

Preliminary Check (Cont'd)

2. Check at idle

1



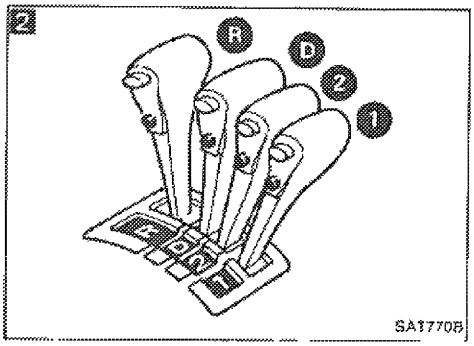
1. Park vehicle on flat surface
2. Move selector lever to "P" position.
3. Turn ignition switch to "OFF" position
4. Turn ignition switch to "START" position.

Does engine start? — No → Go to Diagnostic Procedure 5

Yes ↓

Turn ignition switch to "ACC" position.

2

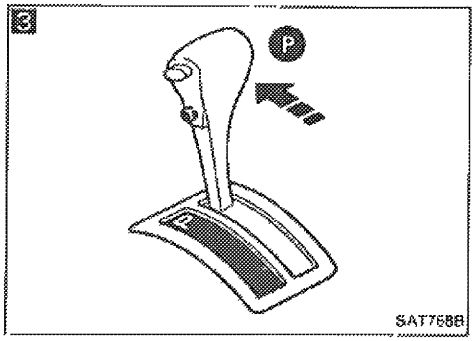


1. Move selector lever to "D", "1", "2" or "R" position.
2. Turn ignition switch to "START" position.

Does engine start? — Yes → Go to Diagnostic Procedure 5.

No ↓

3



1. Move selector lever to "P" position.
2. Turn ignition switch to "OFF" position
3. Release parking brake.

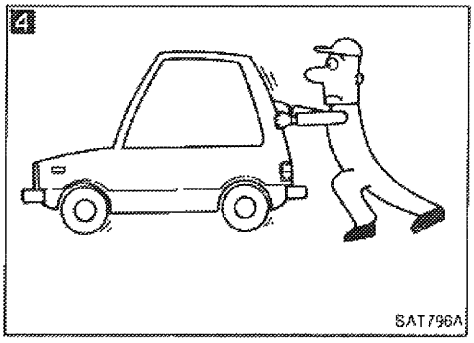
4

1. Push vehicle forward or backward.
2. Does vehicle move when it is pushed forward or backward?
3. Apply parking brake

Yes → Go to Diagnostic Procedure 6.

No ↓

5



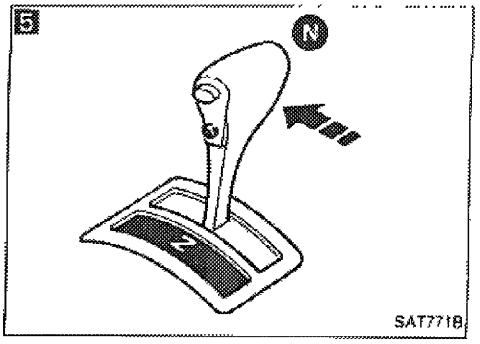
1. Move selector lever to "N" position
2. Start engine
3. Release parking brake
4. Does vehicle move forward or backward?

Yes → Go to Diagnostic Procedure 7.

No ↓

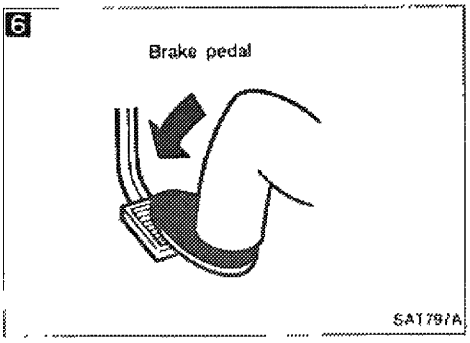
(A)

5

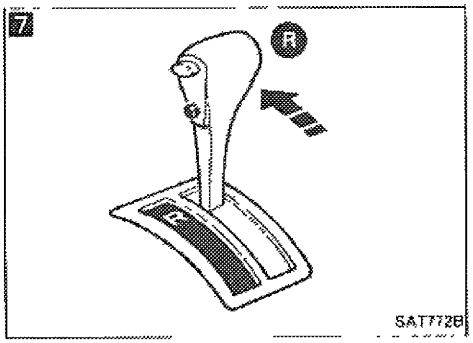


Preliminary Check (Cont'd)

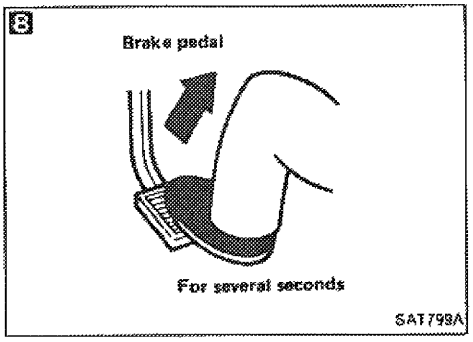
6



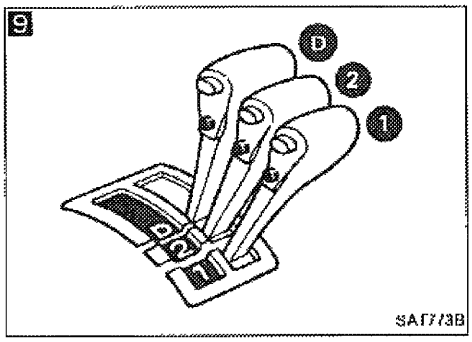
7



8



9



Ⓐ

6 Apply foot brake

7 1. Move selector lever to "R" position.
2. Is there large shock when changing from "N" to "R" position?

No → Go to Diagnostic Procedure 8.

Yes

8 1. Release foot brake for several seconds.
2. Does vehicle creep backward when foot brake is released?

No → Go to Diagnostic Procedure 9.

Yes

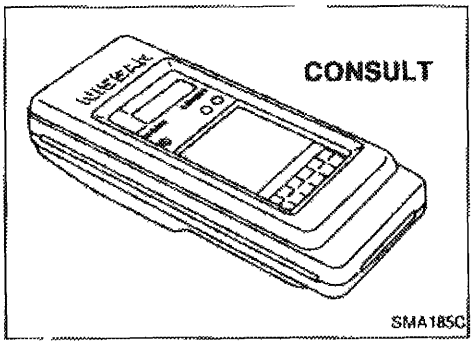
9 1. Move selector lever to "D", "2" and "1" positions and check if vehicle creeps forward
2. Does vehicle creep forward in all three ranges?

No → Go to Diagnostic Procedure 10.

Yes

Go to Cruise test.

Preliminary Check (Cont'd)

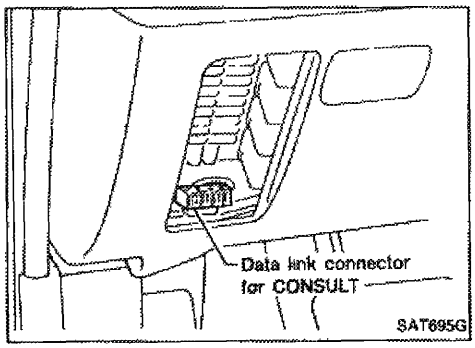


3. Cruise test

- Check all items listed in Parts 1 through 3.

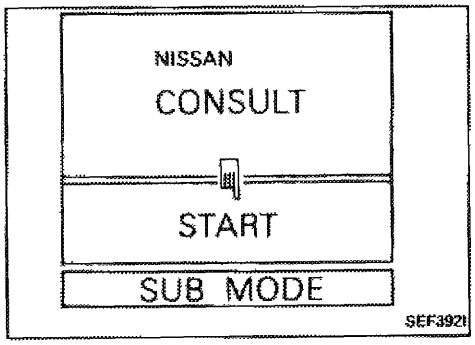
With CONSULT

- Using CONSULT, conduct a cruise test and record the result.
- Print the result and ensure that shifts and lock-ups take place as per "Shift Schedule".

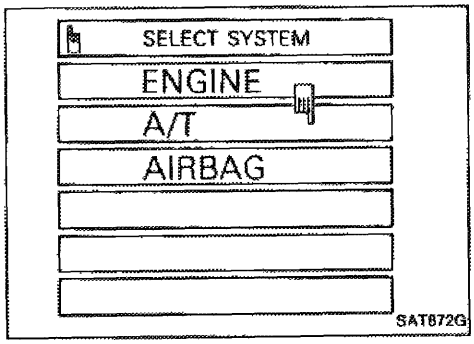


CONSULT setting procedure

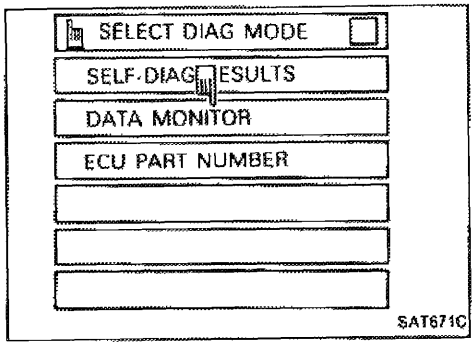
1. Turn off ignition switch.
2. Connect "CONSULT" to Data link connector for CONSULT.



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

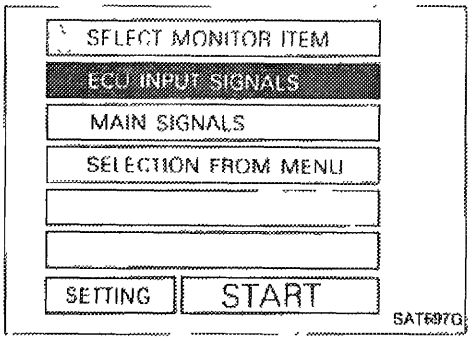


5. Touch "A/T"

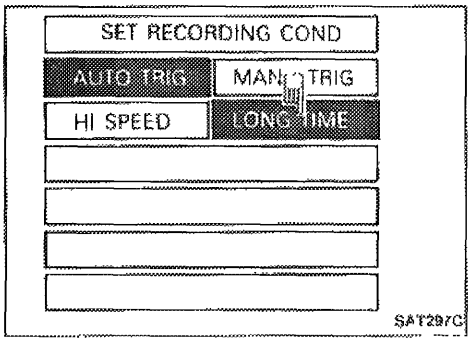


6. Touch "DATA MONITOR".

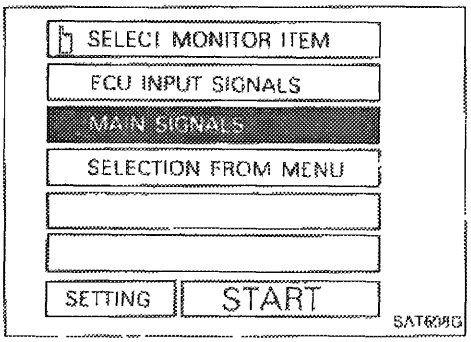
Preliminary Check (Cont'd)



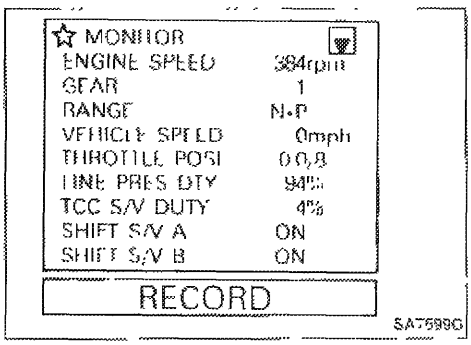
7 Touch "SETTING" to set recording condition.



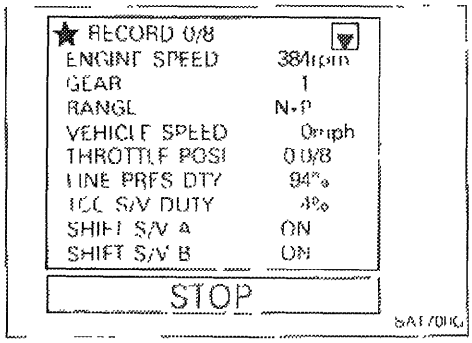
8. Touch "LONG TIME" and "ENTER" key.



9. Go back to SELECT MONITOR ITEM and touch "MAIN SIGNALS".
10. Touch "START".

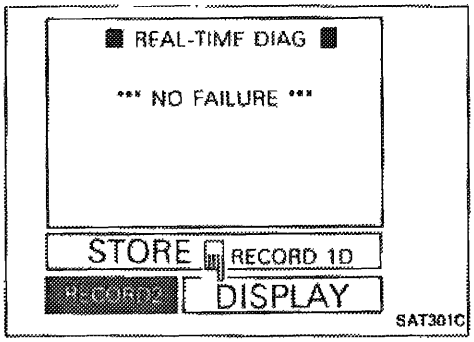


11. When performing cruise test, touch "RECORD".

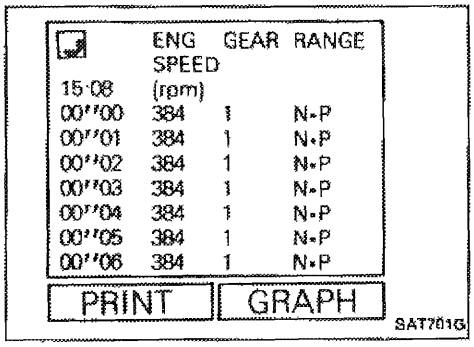


12. After finishing cruise test part 1, touch "STOP"

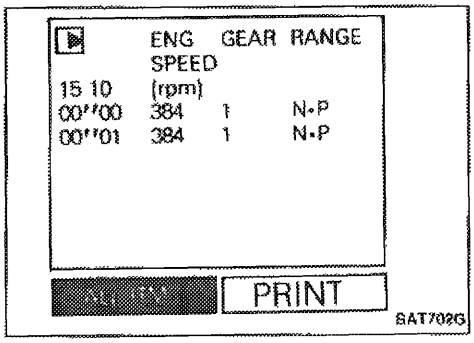
Preliminary Check (Cont'd)



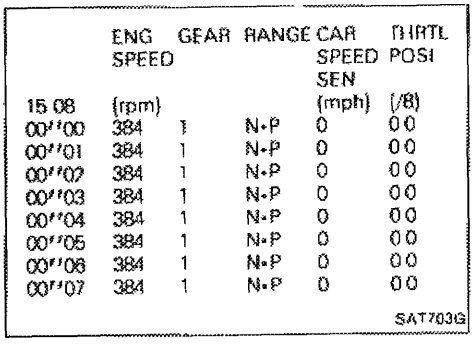
13 Touch "DISPLAY".



14. Touch "PRINT".

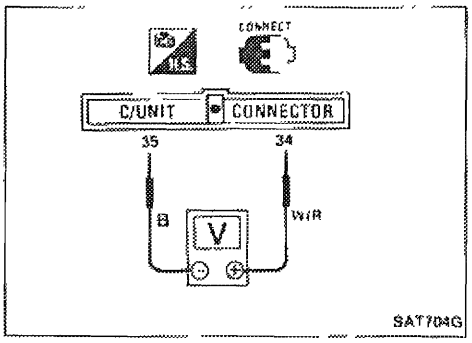


15. Touch "PRINT" again.



16. Check the monitor data printed out.
17. Continue cruise test part 2 and 3

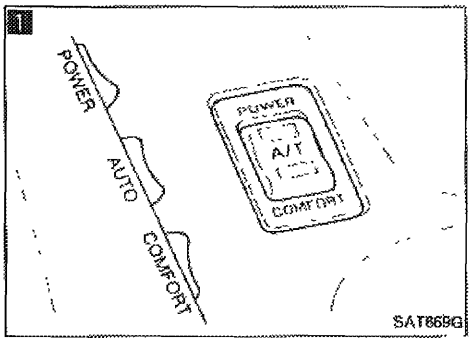
Preliminary Check (Cont'd)



Without CONSULT

- Throttle position can be controlled by voltage across terminals ㉞ and ㉟ of A/T control unit.

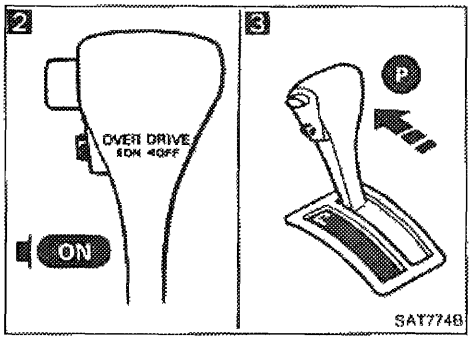
Cruise test — Part 1



1 Warm up engine until engine oil and A T.F. reach operating temperature after vehicle has been driven approx 10 minutes.
A.T.F. operating temperature:
50 - 80°C (122 - 176°F)

1

1 Park vehicle on flat surface.
2 Set A/T mode switch to "AUTO" position.

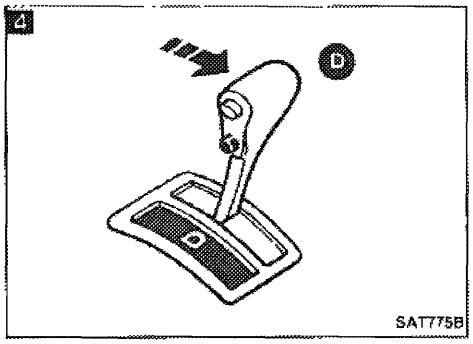


2

Set overdrive switch to "ON" position

3

1. Move selector lever to "P" position
2. Start engine.

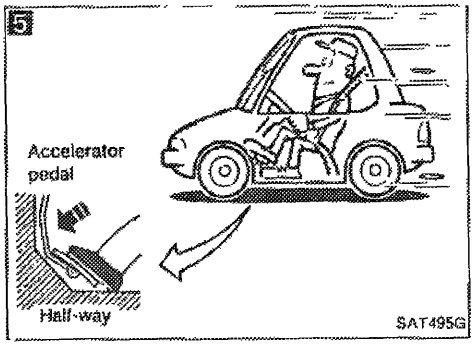


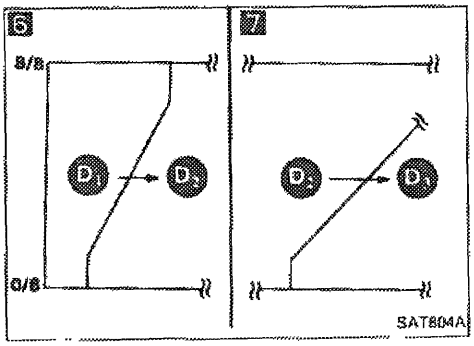
4

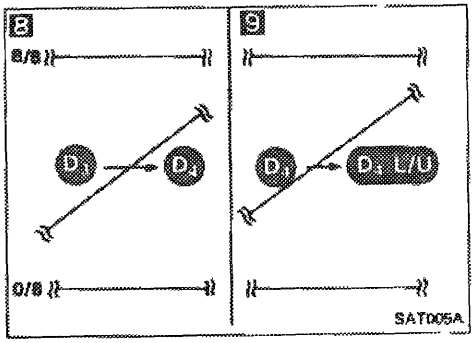
Move selector lever to "D" position

Ⓐ

Preliminary Check (Cont'd)







Ⓐ

5

Accelerate vehicle by constantly depressing accelerator pedal halfway.

Does vehicle start from D_1?
Read gear position.
No → Go to Diagnostic Procedure 11.

Yes

6

Does A/T shift from D_1 to D_2 at the specified speed?
Read gear position, throttle opening and vehicle speed.
Specified speed when shifting from D_1 to D_2:
Refer to Shift schedule.
No → Go to Diagnostic Procedure 12.

Yes

7

Does A/T shift from D_2 to D_3 at the specified speed?
Read gear position, throttle position and vehicle speed.
Specified speed when shifting from D_2 to D_3:
Refer to Shift schedule.
No → Go to Diagnostic Procedure 13.

Yes

8

Does A/T shift from D_3 to D_4 at the specified speed?
Read gear position, throttle position and vehicle speed.
Specified speed when shifting from D_3 to D_4:
Refer to Shift schedule.
No → Go to Diagnostic Procedure 14.

Yes

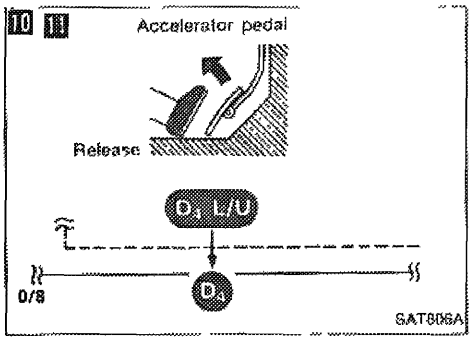
9

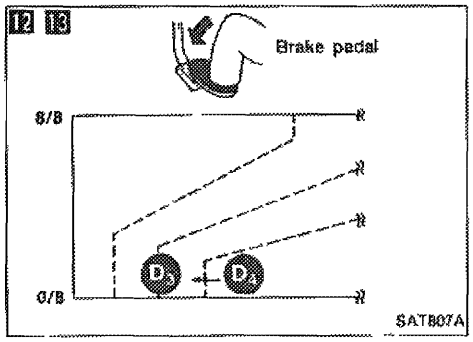
Does A/T perform lock-up at the specified speed?
Read vehicle speed, throttle position when lock-up duty becomes 94%.
Specified speed when lock-up occurs:
Refer to Shift schedule.
No → Go to Diagnostic Procedure 15.

Yes

Ⓑ

Preliminary Check (Cont'd)





(B)

Does A/T hold lock-up condition for more than 30 seconds? — No → Go to Diagnostic Procedure 16

Yes

10 11

1. Release accelerator pedal.
2. Is lock-up released when accelerator pedal is released? — No → Go to Diagnostic Procedure 17.

Yes

12 13

1. Decelerate vehicle by applying foot brake lightly.
2. Does engine speed return to idle smoothly when A/T is shifted from D_4 to D_3? — No → Go to Diagnostic Procedure 18.

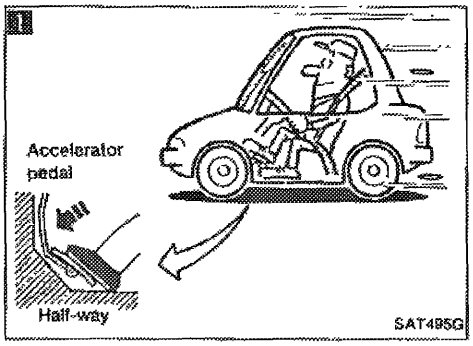
Read gear position and engine speed.

Yes

1. Stop vehicle.
2. Go to "Cruise test — Part 2".

Preliminary Check (Cont'd)

Cruise test — Part 2



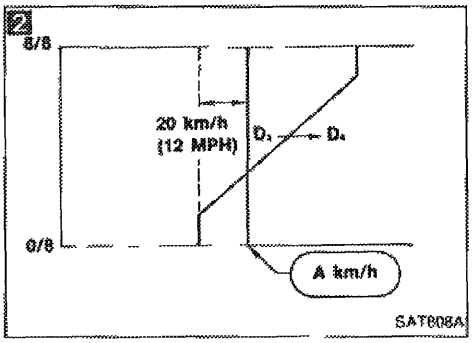
1. Confirm A/T mode switch is in "Auto" position and overdrive switch is in "ON" position
2. Confirm selector lever is in "D" position.

1

1. Accelerate vehicle by half throttle again.
2. Does vehicle start from D_1?
   Read gear position.

No → Go to Diagnostic Procedure 19.

Yes

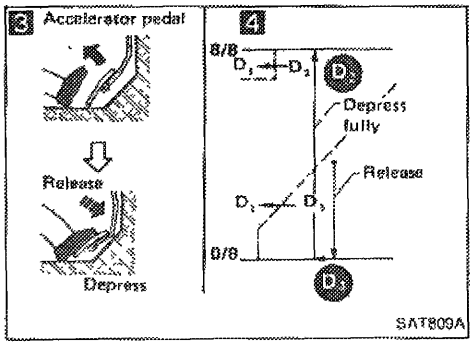


2 3 4

1. Accelerate vehicle to A km/h as shown in illustration.
2. Release accelerator pedal and then quickly depress it fully.
3. Does A/T shift from D_4 to D_2 as soon as accelerator pedal is depressed fully?
   Read gear position and throttle position.

No → Go to Diagnostic Procedure 12.

Yes



5

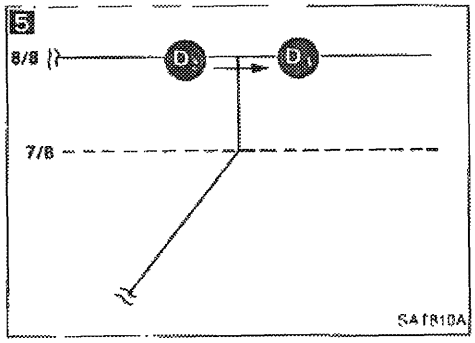
Does A/T shift from D_2 to D_3 at the specified speed?
Read gear position, throttle position and vehicle speed.
Specified speed when shifting from D_2 to D_3:
Refer to Shift schedule.

No → Go to Diagnostic Procedure 13

Yes

6

Release accelerator pedal after shifting from D_2 to D_3.



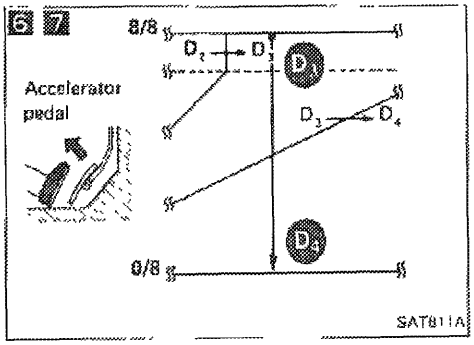
7

Does A/T shift from D_3 to D_4 and does vehicle decelerate by engine brake?
Read gear position, throttle position and vehicle speed.

No → Go to Diagnostic Procedure 14.

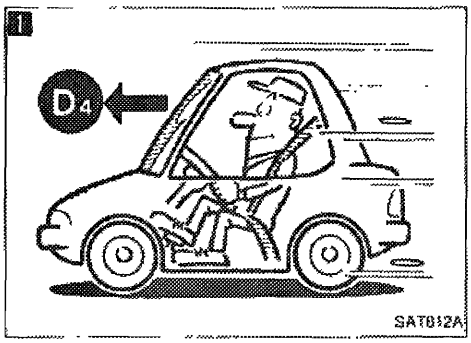
Yes

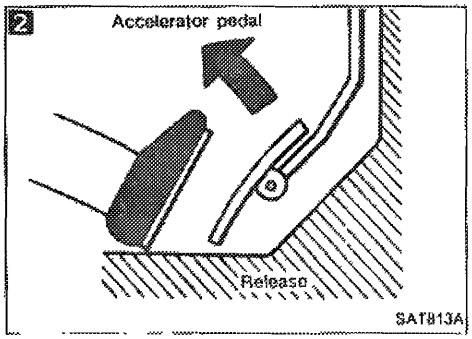
1. Stop vehicle
2. Go to "Cruise test — Part 3".

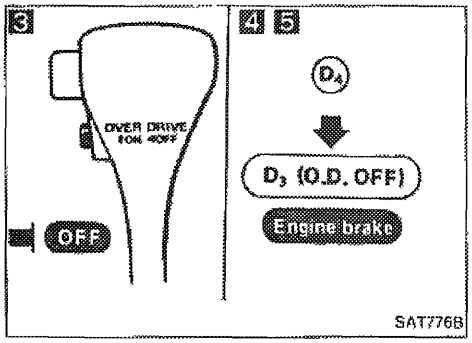


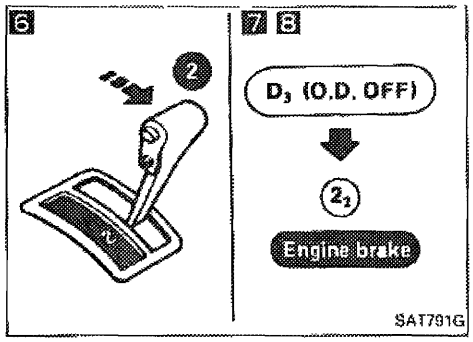
Preliminary Check (Cont'd)

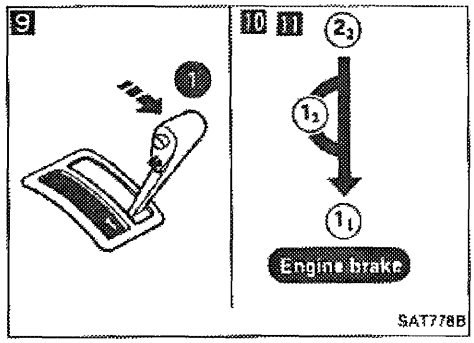
Cruise test — Part 3











1. Confirm A/T mode switch is in "Auto" position and overdrive switch is in "ON" position.
2. Confirm selector lever is in "D" position.

1 Accelerate vehicle using half-throttle to D_4

2 Release accelerator pedal

3 Set overdrive switch to "OFF" position while driving in D_4 range

4 Does A/T shift from D_4 to D_3? **Read gear position and vehicle speed.**
- No → Go to Diagnostic Procedure 20.
- Yes ↓

5 Does vehicle decelerate by engine brake?
- No → Go to Diagnostic Procedure 18.
- Yes ↓

6 Move selector lever from "D" to "2" range while driving in D_3

7 Does A/T shift from D_3 to 2_2? **Read gear position.**
- No → Go to Diagnostic Procedure 21.
- Yes ↓

8 Does vehicle decelerate by engine brake?
- No → Go to Diagnostic Procedure 18.
- Yes ↓

9 **10**
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 → Go to Diagnostic Procedure 22.
- Yes ↓

11 Does vehicle decelerate by engine brake?
- No → Go to Diagnostic Procedure 23.
- Yes ↓

1. Stop vehicle.
2. Perform self-diagnosis. — Refer to SELF-DIAGNOSTIC PROCEDURE

Preliminary Check (Cont'd)

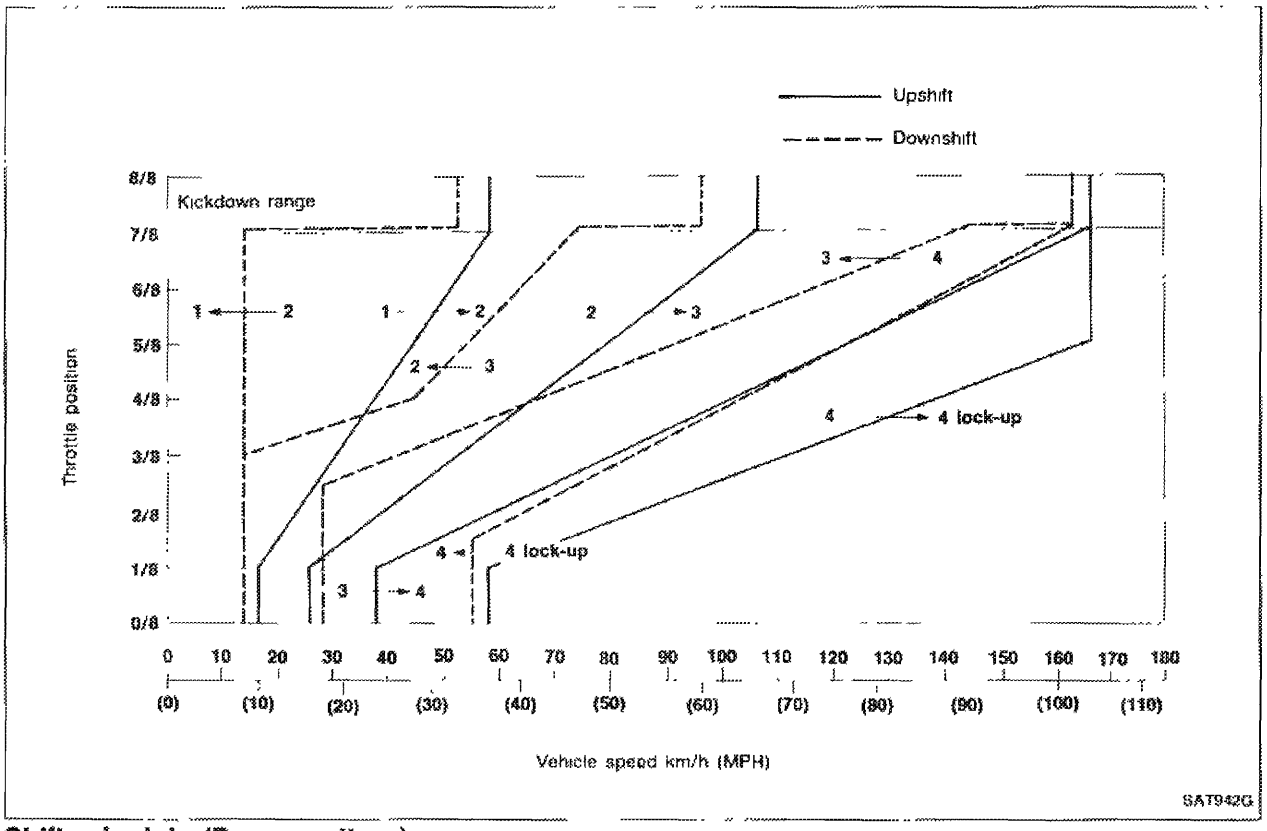
Vehicle speed when shifting gears

Throttle position	Shift pattern	Vehicle speed km/h (MPH)					
		$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_5 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	Comfort	56 - 60 (35 - 37)	102 - 110 (63 - 68)	162 - 170 (101 - 106)	158 - 166 (98 - 103)	92 - 100 (57 - 62)	50 - 54 (31 - 34)
	Power	56 - 60 (35 - 37)	102 - 110 (63 - 68)	162 - 170 (101 - 106)	158 - 166 (98 - 103)	92 - 100 (57 - 62)	50 - 54 (31 - 34)
Half throttle	Comfort	35 - 39 (22 - 24)	62 - 70 (39 - 43)	98 - 106 (61 - 66)	62 - 70 (39 - 43)	40 - 48 (25 - 30)	11 - 15 (7 - 9)
	Power	41 - 45 (25 - 28)	74 - 82 (46 - 51)	118 - 126 (73 - 78)	84 - 92 (52 - 57)	42 - 50 (26 - 31)	11 - 15 (7 - 9)

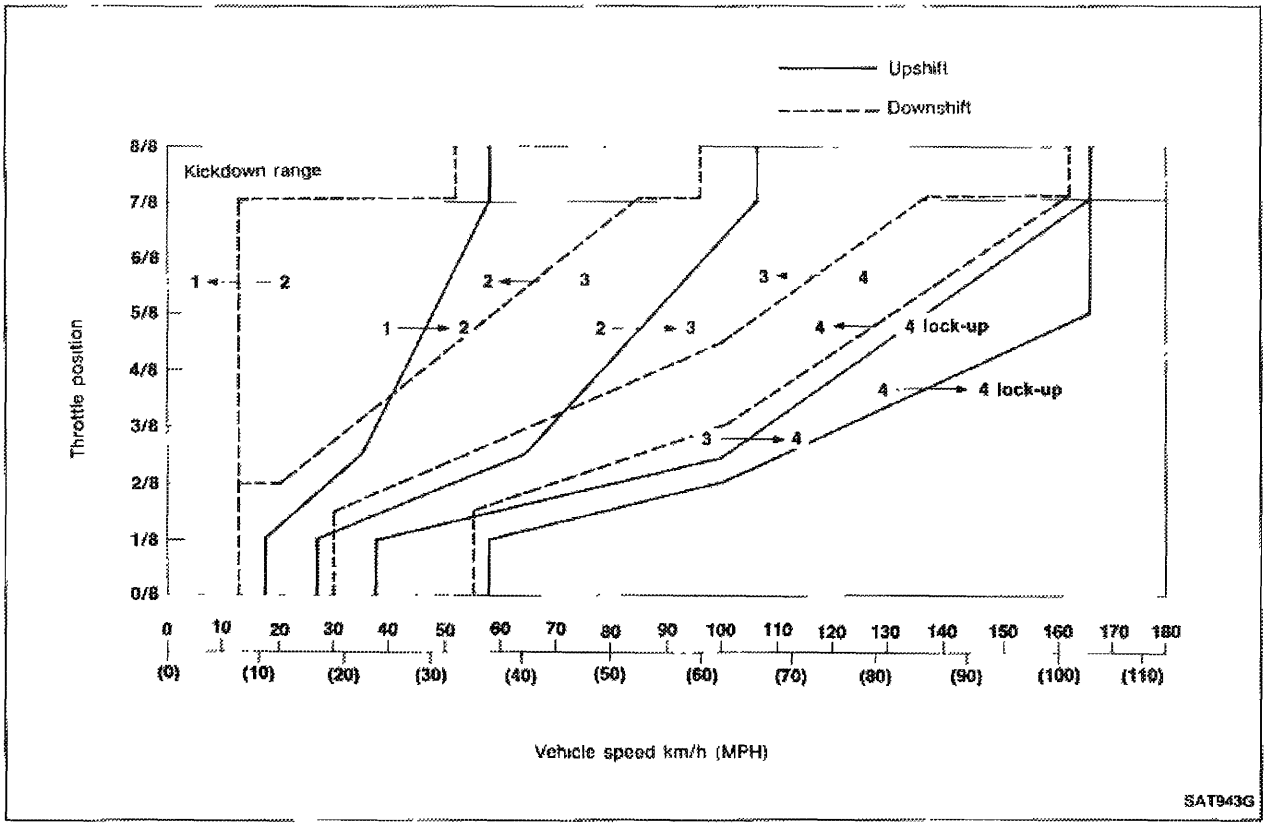
Vehicle speed when performing lock-up

Throttle position	O.D switch (Shift range)	Shift pattern	Vehicle speed km/h (MPH)	
			Lock-up "ON"	Lock-up "OFF"
2/8	ON [D_4]	Comfort	81 - 89 (50 - 55)	61 - 69 (38 - 43)
		Power	96 - 104 (60 - 65)	66 - 74 (41 - 46)
	OFF [D_5]	Comfort	86 - 94 (53 - 58)	83 - 91 (52 - 57)
		Power	86 - 94 (53 - 58)	83 - 91 (52 - 57)

Shift schedule (Comfort pattern)



Shift schedule (Power pattern)



Diagnosis by CONSULT

NOTICE

1. The CONSULT electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid). When a noticeable time difference occurs between shift timing which is manifested by shift shock and the CONSULT display, mechanical parts (except solenoids, sensors, etc.) are considered to be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
2. Shift schedule (which implies gear position) displayed on CONSULT and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:
   - Actual shift schedule has more or less tolerance or allowance,
   - Shift schedule indicated in Service Manual refers to the point where shifts starts, and
   - Gear position displayed on CONSULT indicates the point where shifts are completed.
3. Shift solenoid valve "A" or "B" is displayed on CONSULT at the start of shifting while gear position is displayed upon completion of shifting (which is computed by A/T control unit).

DATA MONITOR APPLICATION

Item	Application
Vehicle speed sensor 1 (A/T)	×
Vehicle speed sensor 2 (meter)	×
Throttle position sensor	×
Fluid temperature sensor	×
Battery voltage	×
Engine speed	×
Selector lever switch (O.D. switch)	×
A.S.C.D. — cruise signal	×
A S.C.D. — O.D. cut signal	×
Kickdown switch	–
Power shift switch (A/T mode switch — POWER)	×
Power shift lamp	×
Closed throttle position switch	×
Wide open throttle position switch	×
Shift solenoid valve A	×
Shift solenoid valve B	×

Item	Application
Overrun clutch solenoid valve	×
*Shift solenoid valve A (feedback)	×
*Shift solenoid valve B (feedback)	×
*Overrun clutch solenoid valve (feedback)	×
Hold mode switch (A/T mode switch — COMFORT)	×
1 position switch	×
2 position switch	×
D position switch	×
P/N position switch	×
R position switch	×
Gear position	×
Range position	×
Vehicle speed	×
Throttle opening	×
Line-pressure solenoid valve	×
Torque converter clutch solenoid valve	×

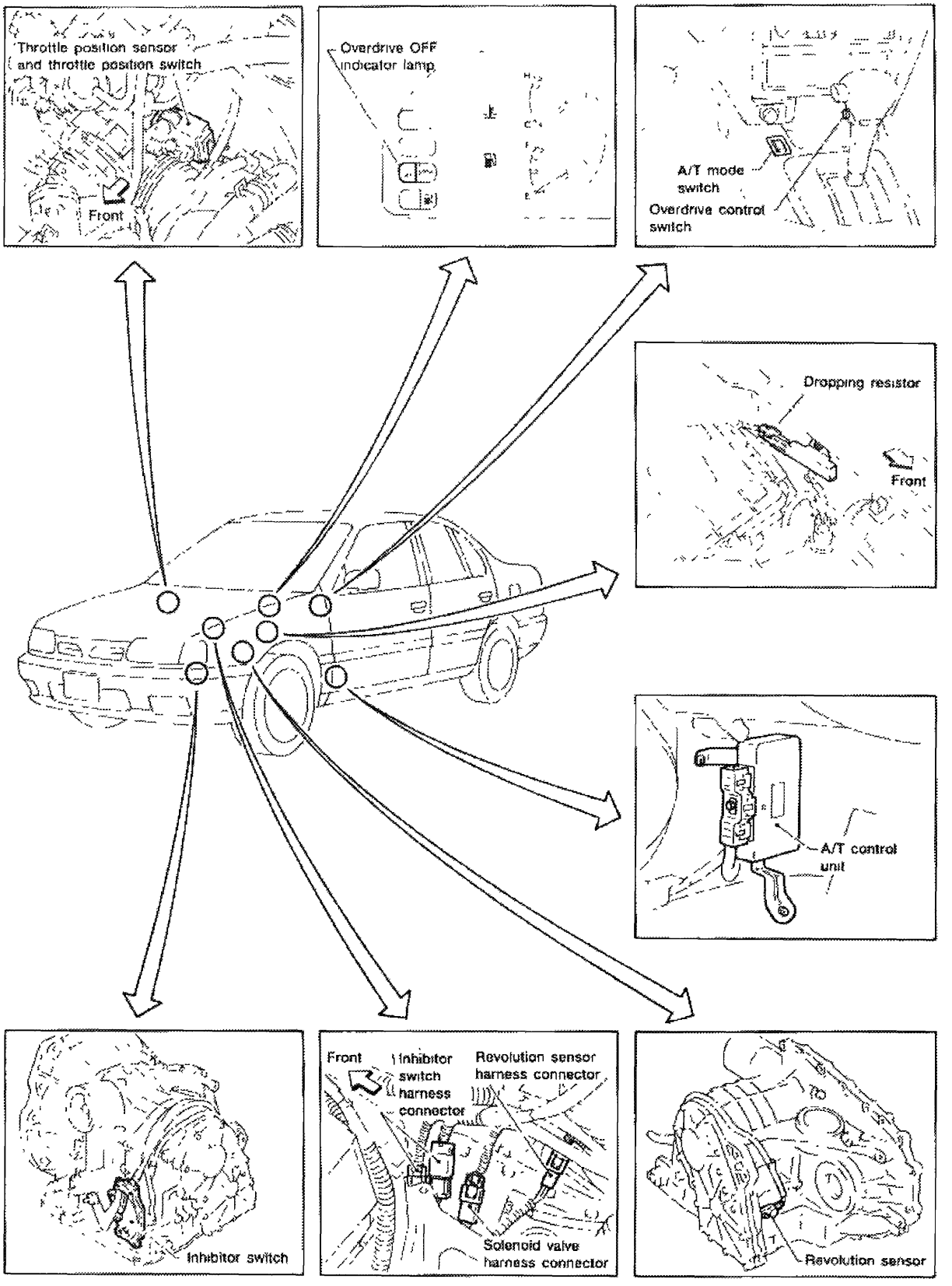
×: Applicable – : Not applicable

DATA ANALYSIS

Item	Display	Condition
Lock-up duty	Approximately 4% → Approximately 94%	Lock-up "OFF" → Lock-up "ON"
Line pressure duty	Approximately 29% → Approximately 94%	Low line-pressure (Small throttle opening) ↓ High line-pressure (Large throttle opening)
Throttle position sensor	Approximately 0.5V	Fully-closed throttle
	Approximately 4V	Fully-open throttle
Fluid temperature sensor	Approximately 1.5V → Approximately 0.5V	Cold [20°C (68°F)] → Hot [80°C (176°F)]

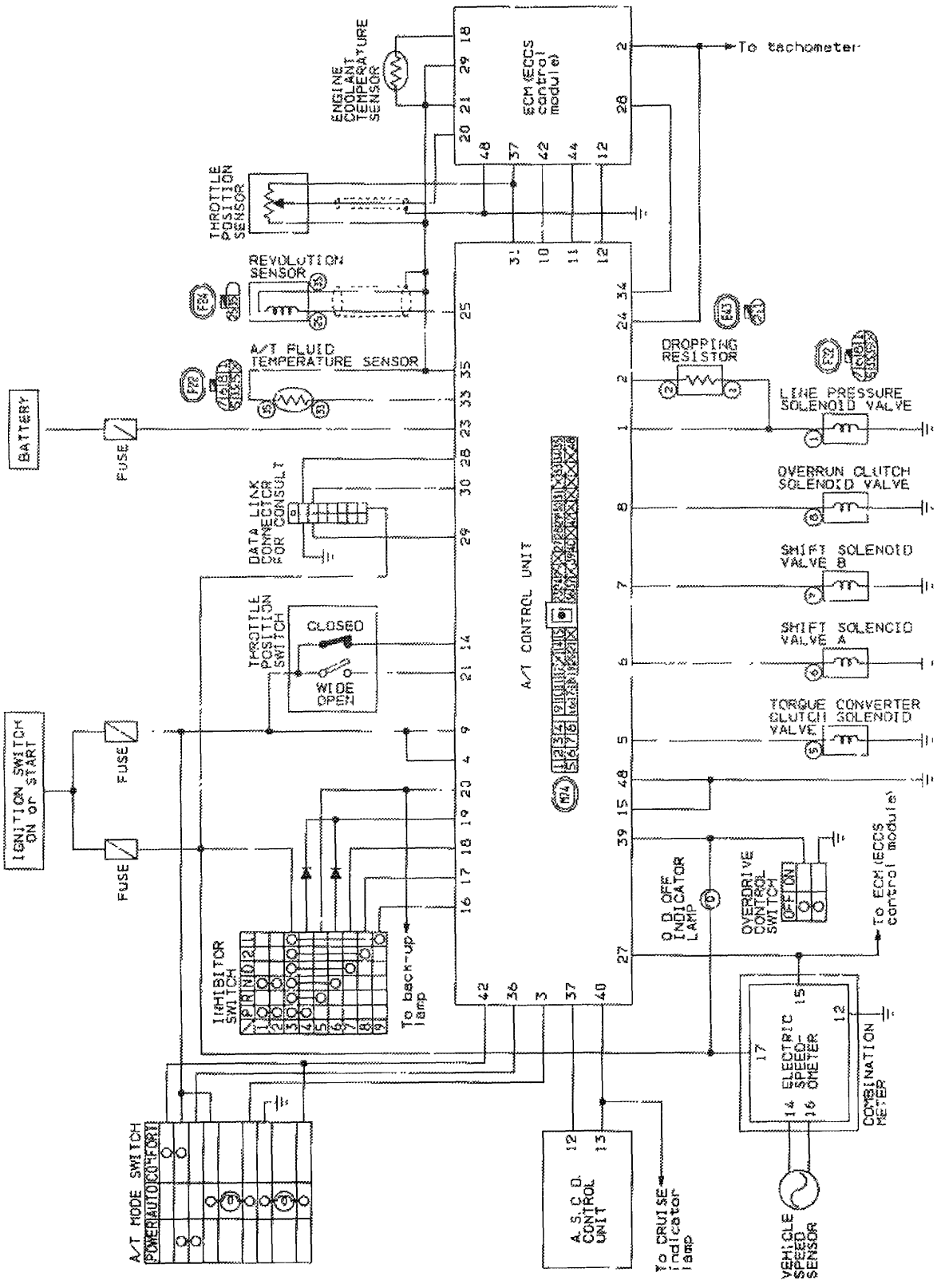
Gear position	1	2	3	4
Shift solenoid valve A	ON	OFF	OFF	ON
Shift solenoid valve B	ON	ON	OFF	OFF

A/T Electrical Parts Location



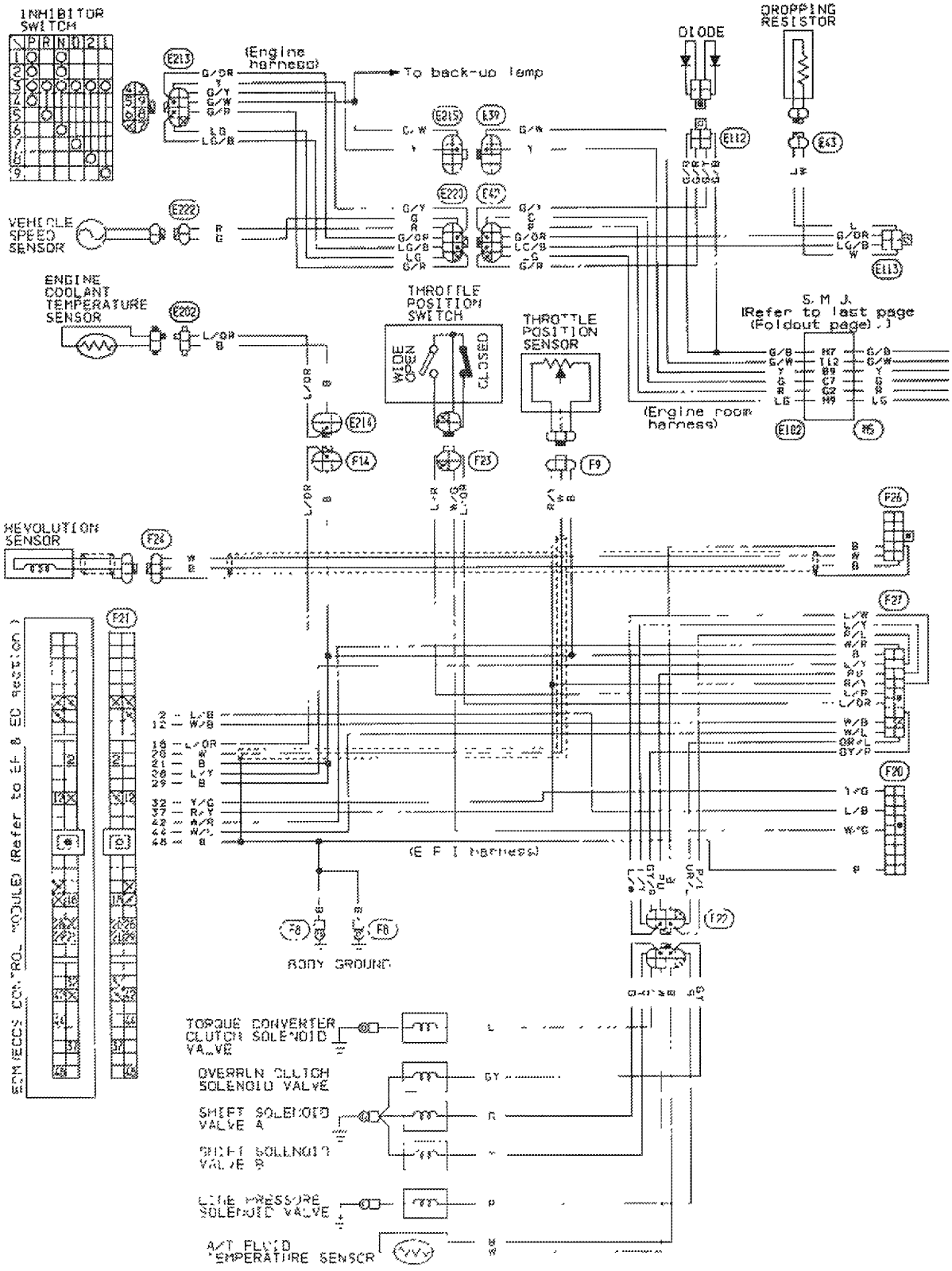
SAT901G

Circuit Diagram for Quick Pinpoint Check

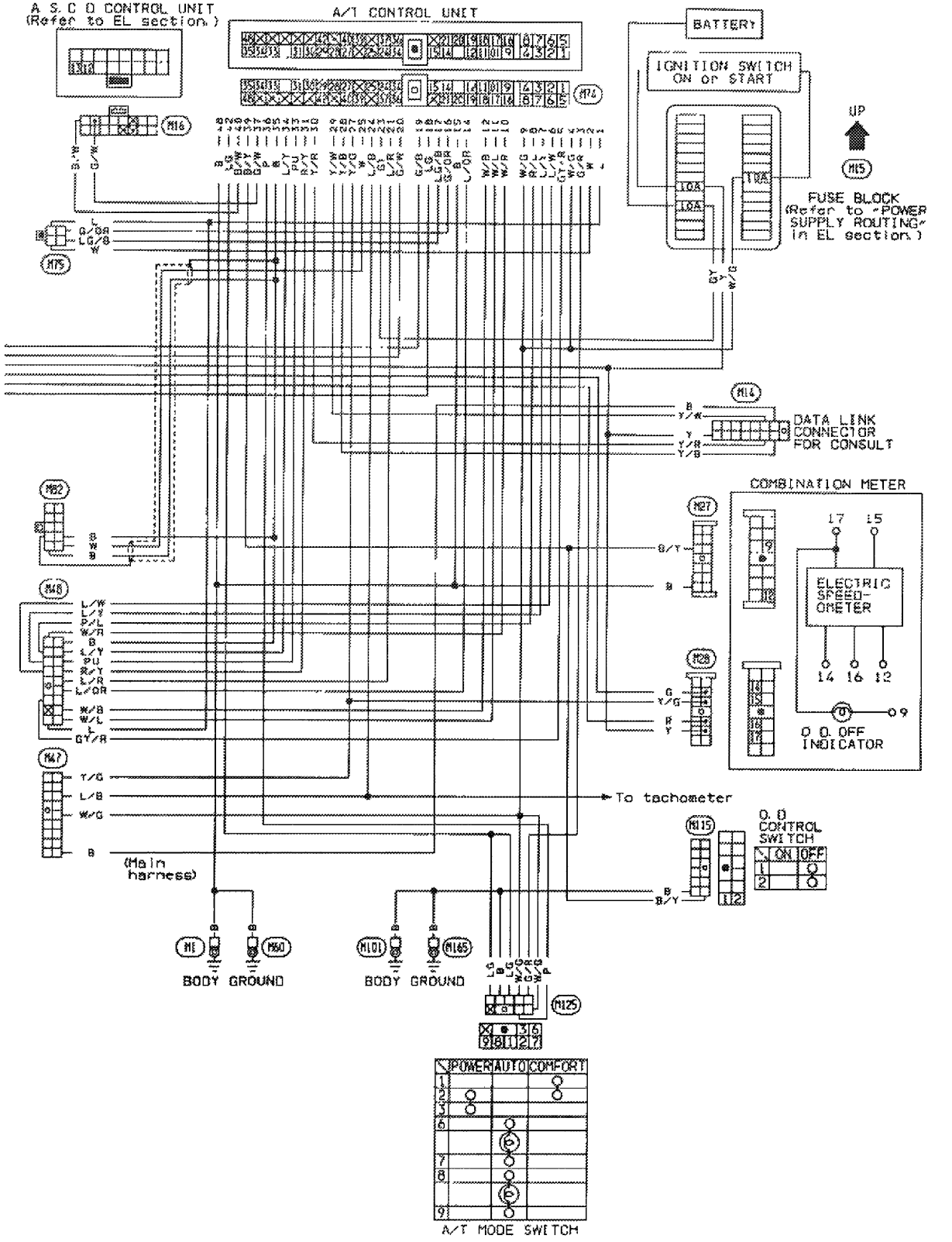


MAT29/A

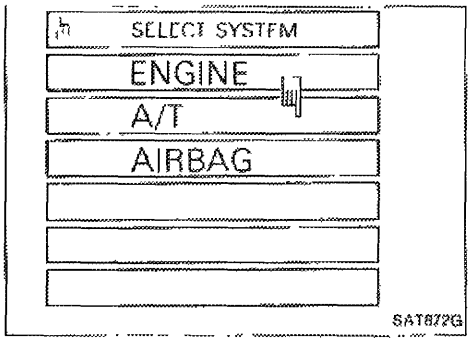
Wiring Diagram



Wiring Diagram (Cont'd)



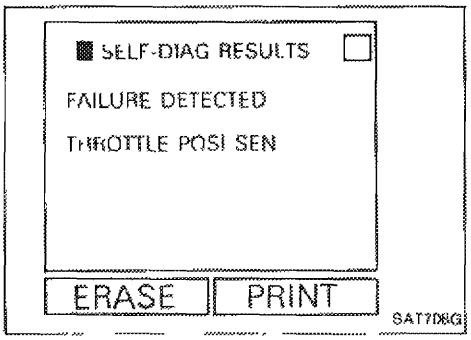
MAT298A



Self-diagnosis

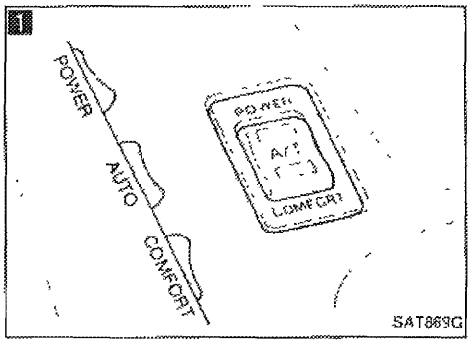
SELF-DIAGNOSTIC PROCEDURE (With CONSULT)

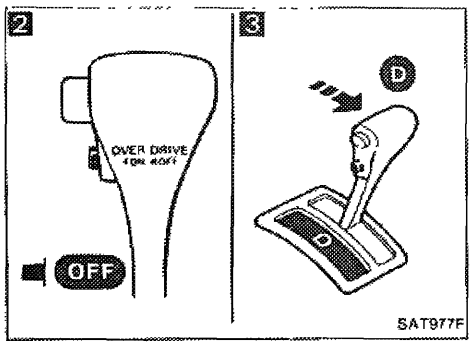
1. Turn on CONSULT.
2. Touch "A/T".



3. Touch "SELF-DIAG RESULTS".
   CONSULT performs REAL-TIME SELF-DIAGNOSIS.

SELF-DIAGNOSTIC PROCEDURE (Without CONSULT)





DIAGNOSIS START

1. Start engine and warm it up to normal engine operating temperature.
2. Turn ignition switch to "OFF" position.
3. Turn ignition switch to "ACC" position.

1

Set A/T mode switch to "AUTO" position.

2

Set overdrive switch in "OFF" position.

3

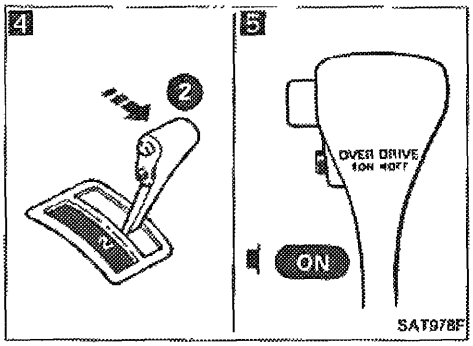
1. Move selector lever to "D" position.
2. Turn ignition switch to "ON" position. (Do not start engine.)
3. Does power indicator lamp come on for about 2 seconds?

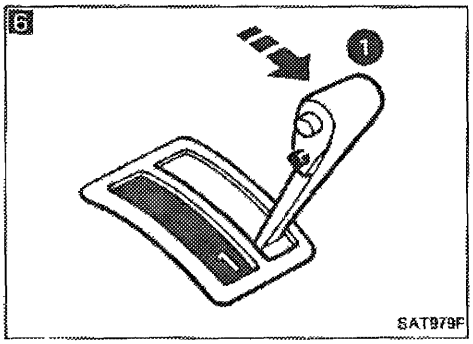
No → Go to Diagnostic Procedure 1.

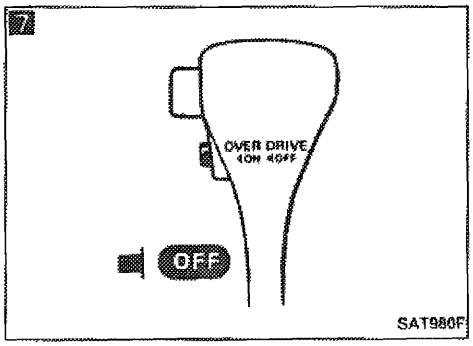
Yes

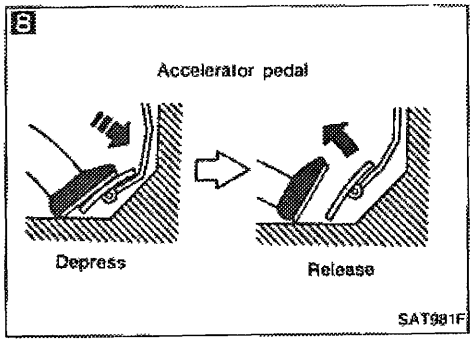
Ⓐ

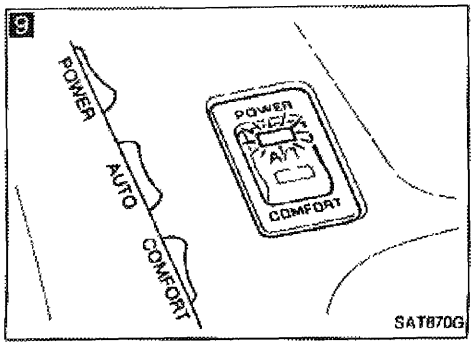
Self-diagnosis (Cont'd)











Ⓐ

4 5

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

6

Move selector lever to "1" position

7

Set overdrive switch in "OFF" position.

8

Depress accelerator pedal fully and release it.

9

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

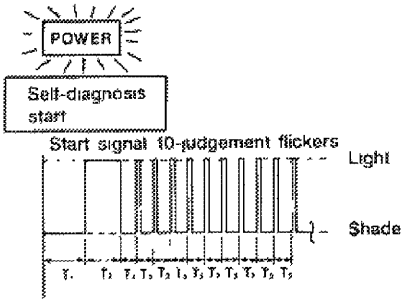
DIAGNOSIS END

Self-diagnosis (Cont'd)

JUDGEMENT OF SELF-DIAGNOSIS CODE

Power indicator lamp

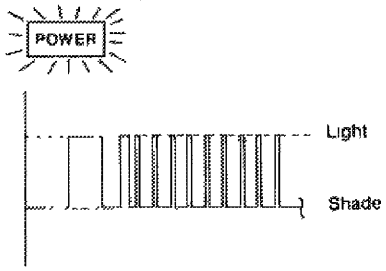
All judgement flickers are same.



All circuits that can be confirmed by self-diagnosis are

SAT755A

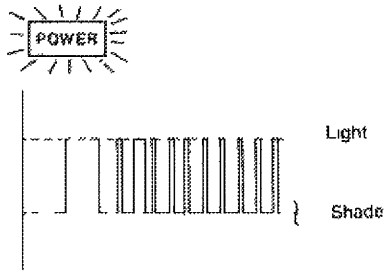
1st judgement flicker is longer than others.



Revolution sensor circuit is short-circuited or disconnected.
➡**Go to REVOLUTION SENSOR CIRCUIT CHECK.**

SAT756A

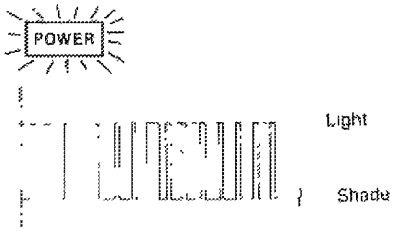
2nd judgement flicker is longer than others



Vehicle speed sensor circuit is short-circuited or disconnected.
➡**Go to VEHICLE SPEED SENSOR CIRCUIT CHECK.**

SAT757A

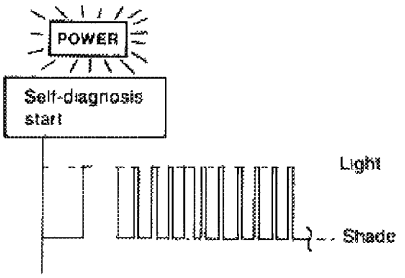
3rd judgement flicker is longer than others.



Throttle position sensor circuit is short-circuited or disconnected
➡**Go to THROTTLE POSITION SENSOR CIRCUIT CHECK.**

SAT758A

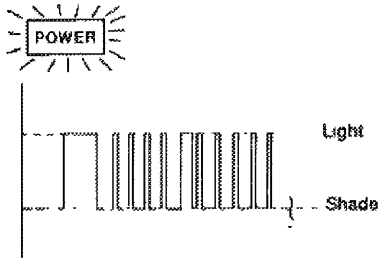
4th judgement flicker is longer than others.



Shift solenoid valve A circuit is short-circuited or disconnected.
➡**Go to SHIFT SOLENOID VALVE A CIRCUIT CHECK.**

SAT762A

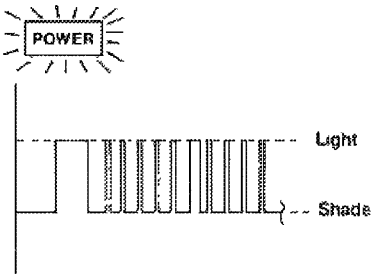
5th judgement flicker is longer than others



Shift solenoid valve B circuit is short-circuited or disconnected
➡**Go to SHIFT SOLENOID VALVE B CIRCUIT CHECK.**

SAT763A

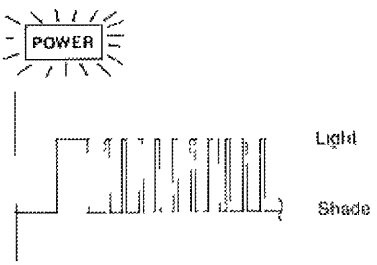
6th judgement flicker is longer than others.



Overrun clutch solenoid valve circuit is short-circuited or disconnected
➡**Go to OVERRUN CLUTCH SOLENOID VALVE CIRCUIT CHECK.**

SAT764A

7th judgement flicker is longer than others.



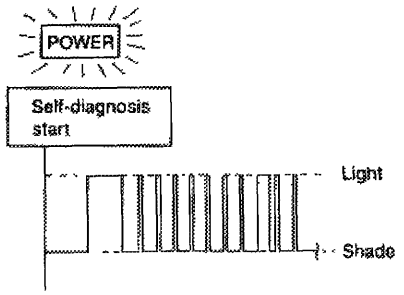
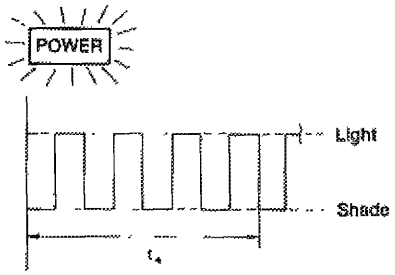
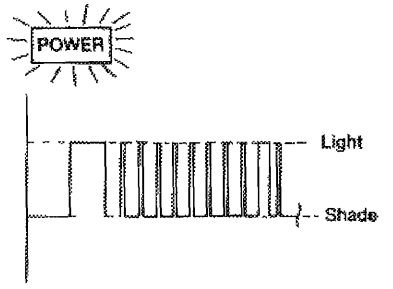
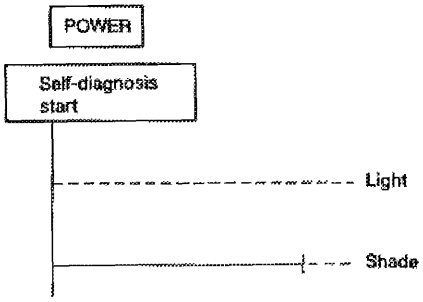
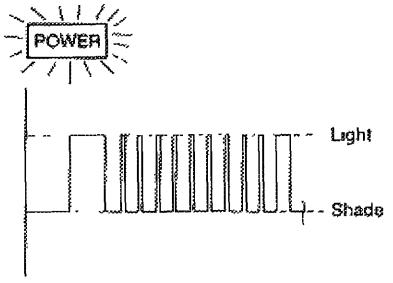
Torque converter clutch solenoid valve circuit is short-circuited or disconnected
➡**Go to TORQUE CONVERTER CLUTCH SOLENOID VALVE CIRCUIT CHECK.**

SAT765A

t_1 – 2.5 seconds t_2 – 2.0 seconds t_3 – 1.0 second

Self-diagnosis (Cont'd)

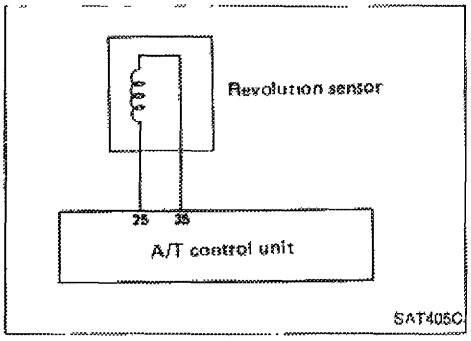
Power indicator lamp

8th judgement flicker is longer than others.  Fluid temperature sensor is disconnected or A/T control unit power source circuit is damaged ➡**Go to FLUID TEMPERATURE SENSOR AND A/T CONTROL UNIT POWER SOURCE CIRCUIT CHECKS.** SAT770A	Flickers as shown below  Battery power is low Battery has been disconnected for a long time. Battery is connected conversely. (When reconnecting A/T control unit connectors. — This is not a problem.) SAT773A
9th judgement flicker is longer than others.  Engine speed signal circuit is short-circuited or disconnected. ➡**Go to ENGINE SPEED SIGNAL CIRCUIT CHECK.** SAT771A	Does not come on.  Inhibitor switch, overdrive switch or throttle position switch circuit is disconnected or A/T control unit is damaged ➡**Go to INHIBITOR, OVERDRIVE AND THROTTLE POSITION SWITCH CIRCUIT CHECKS.** SAT146B
10th judgement flicker is longer than others.  Line pressure solenoid valve circuit is short-circuited or disconnected. ➡**Go to LINE PRESSURE SOLENOID VALVE CIRCUIT CHECK.** SAT772A	

t_4 — 10 second

Self-diagnosis (Cont'd)

REVOLUTION SENSOR CIRCUIT CHECK



CHECK REVOLUTION SENSOR. — Refer to "Electrical Components Inspection"

N G → Repair or replace revolution sensor

O K.

A

CHECK INPUT SIGNAL.

1. Turn ignition switch to "START" position and start engine
2. • Select "ECU INPUT SIGNALS" in Data Monitor
   • Read out the value of "VHCL/S SE-A/T" while driving
   • Check the value changes according to driving speed.

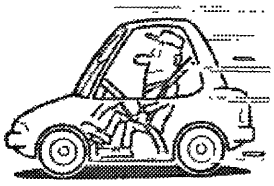
N G. → Check the following items.
- Harness continuity between A/T control unit and revolution sensor (Main harness)
- Harness continuity between revolution sensor and ECM (Main harness)
- Ground circuit for ECM — Refer to section EF & EC

OR

2. Check voltage between A/T control unit terminal ㉕ and ground while driving.
(Measure with A.C. range.)
Voltage:
At 0 km/h (0 MPH):
0V
At 30 km/h (19 MPH):
1V or more
(Voltage rises gradually in response to vehicle speed.)

O.K.

A



☆MONITOR	
VHCL/S SE•A/T	0mph
VHCL/S SE•MTR	3mph
THRTL POS SEN	0.4V
FLUID TEMP SE	1.4V
BATTERY VOLT	11.8V
ENGINE SPEED	384rpm
SLCT LEVER SW	OFF
P/N POSI SW	O N
R POSITION SW	OFF

RECORD

SAT345G

Perform self-diagnosis again after driving for a while

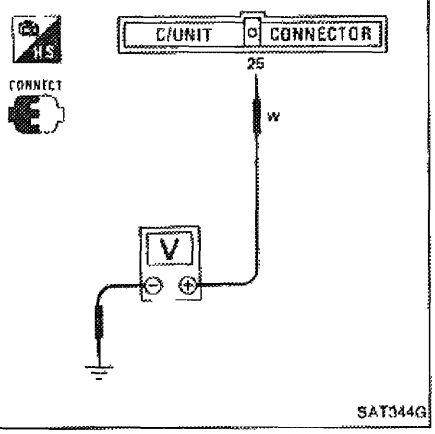
N G. → 1. Perform A/T control unit input/output signal inspection.
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

O.K.

INSPECTION END

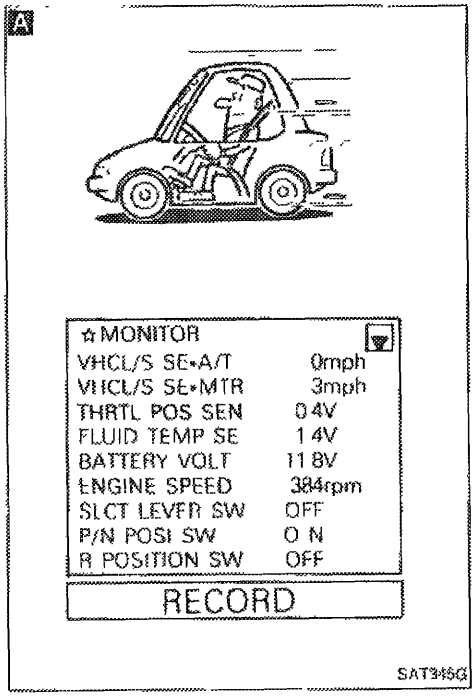
A

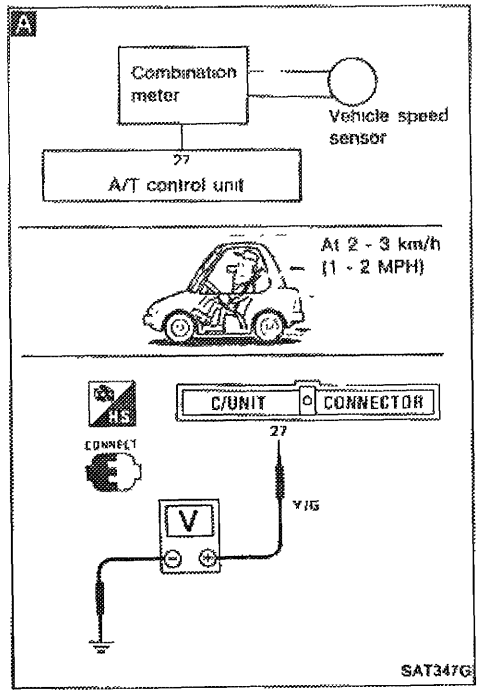




Self-diagnosis (Cont'd)

VEHICLE SPEED SENSOR CIRCUIT CHECK





A

CHECK INPUT SIGNAL.

1. Turn ignition switch to "START" position and start engine.
2. ● Select "ECU INPUT SIGNALS" in Data Monitor.
   ● Read out the value of "VHCL/S SE-MTR" while driving.
   ● Check the value changes according to driving speed.

N G → Check the following items.
- Vehicle speed sensor and ground circuit for vehicle speed sensor — Refer to section EL.
- Harness continuity between A/T control unit and vehicle speed sensor (Main harness)

OR

2. Check voltage between A/T control unit terminal ㉗ and ground while driving at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.
   Voltage:
   Varies from 0V to 5V

O K.

Perform self-diagnosis again after driving for a while.

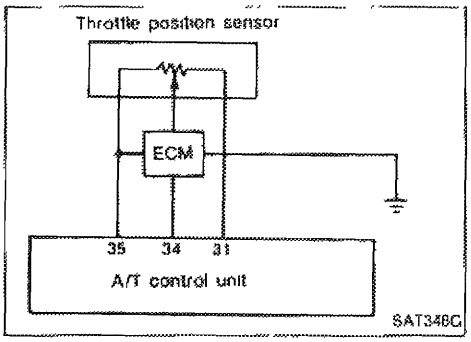
N.G. → 1. Perform A/T control unit input/output signal inspection.
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

O.K.

INSPECTION END

Self-diagnosis (Cont'd)

THROTTLE POSITION SENSOR CIRCUIT CHECK



Perform diagnostic test mode II (self-diagnostic results) for engine control

N.G. → Check throttle position sensor circuit for engine control. — Refer to section EF & EC.

O K.

A

CHECK INPUT SIGNAL.

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. ● Select "ECU INPUT SIGNALS" in Data Monitor.
   ● Read out the value of "THRTL POS SEN".
   Voltage:
   Fully-closed throttle:
   0.2 - 0.6V
   Fully-open throttle:
   2.9 - 3.9V

N G. → Check harness continuity between ECM and A/T control unit regarding throttle position sensor circuit. (Main harness)

OR

2. ● Check voltage between A/T control unit terminals ㉞ and ㉟ while accelerator pedal is depressed slowly.
   Voltage:
   Fully-closed throttle valve:
   0.2 - 0.6V
   Fully-open throttle valve:
   2.9 - 3.9V
   (Voltage rises gradually in response to throttle position)

O.K.

Perform self-diagnosis again after driving for a while.

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

O.K.

INSPECTION END

A



Depress slowly.

☆MONITOR	
VHCL/S SE-A/T	0mph
VHCL/S SE-MTR	3mph
THRTL POS SEN	0.4V
FLUID TEMP SE	1.4V
BATTERY VOLT	11.8V
ENGINE SPEED	384rpm
SLCT LEVER SW	OFF
P/N POSI SW	ON
R POSITION SW	OFF

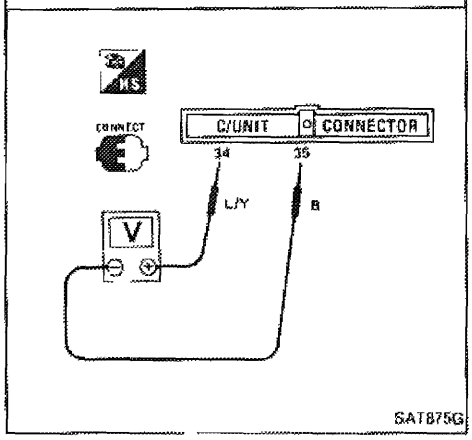
RECORD

SAT349G

A

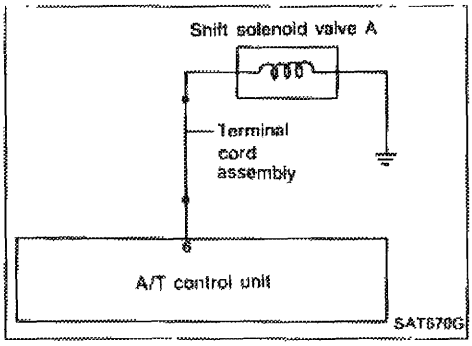


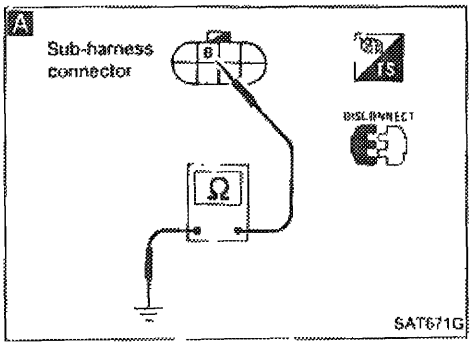
Depress slowly.

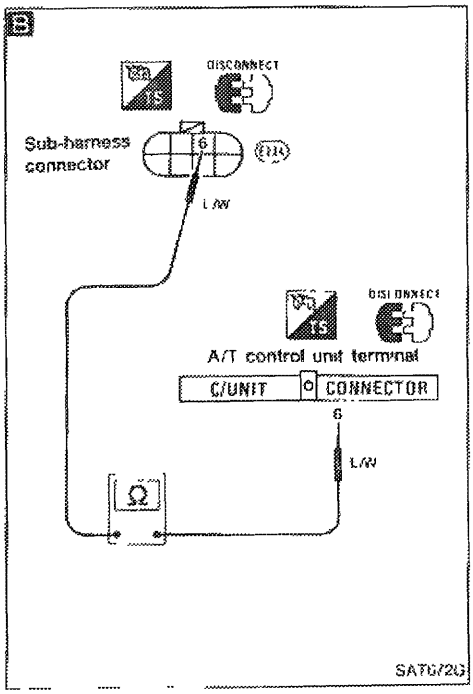


Self-diagnosis (Cont'd)

SHIFT SOLENOID VALVE A CIRCUIT CHECK







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 ⑥ and ground.
   Resistance: 20 - 30Ω

N.G →
1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE"
2. Check the following items.
- Shift solenoid valve A — Refer to "Electrical Components Inspection".
- Harness continuity of terminal cord assembly

O.K. ↓

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 ⑥ and A/T control unit terminal ⑥.
   Resistance:
   Approximately 0Ω
4. Reinstall any part removed.

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

O.K ↓

Perform self-diagnosis after driving for a while.

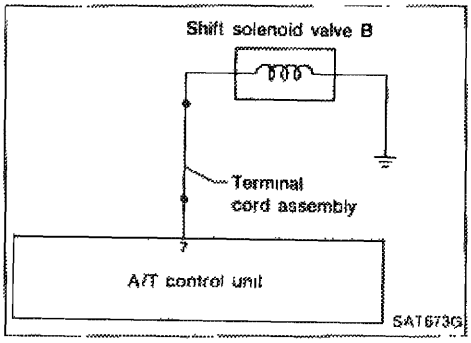
N.G →
1. Perform A/T control unit input/output signal inspection.
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

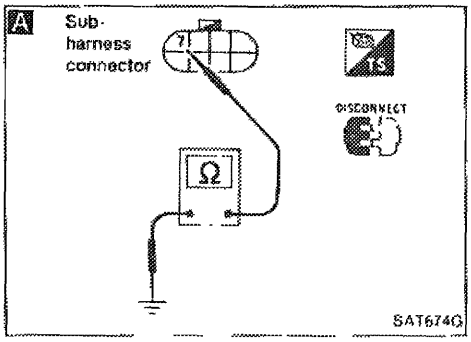
O.K ↓

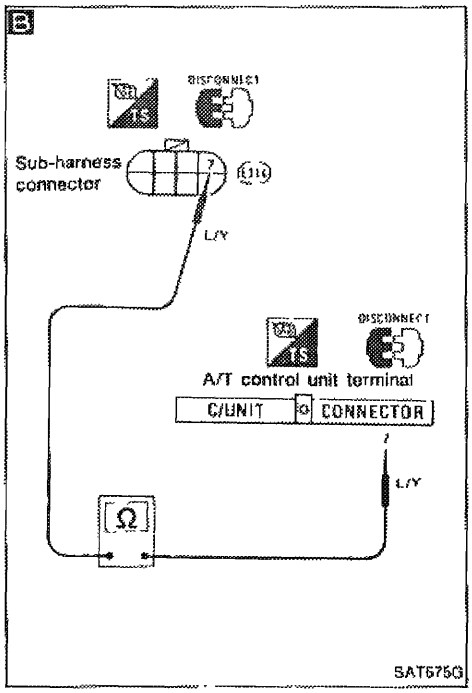
INSPECTION END

Self-diagnosis (Cont'd)

SHIFT SOLENOID VALVE B CIRCUIT CHECK







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

N.G. →
1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE".
2. Check the following items.
- Shift solenoid valve B — Refer to "Electrical Components Inspection".
- Harness continuity of terminal cord assembly

O.K. ↓

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 terminal (7)
   Resistance:
   Approximately 0Ω
4. Reinstall any part removed

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

O.K. ↓

Perform self-diagnosis after driving for a while

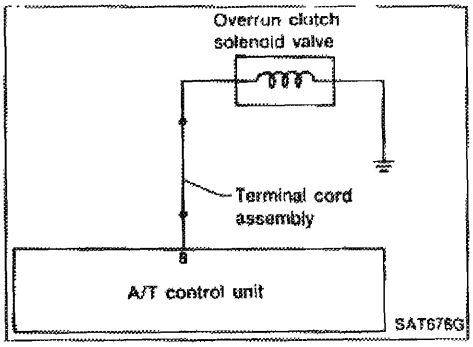
N.G. →
1. Perform A/T control unit input/output signal inspection.
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

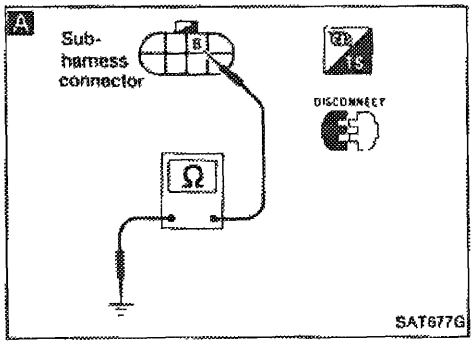
O.K. ↓

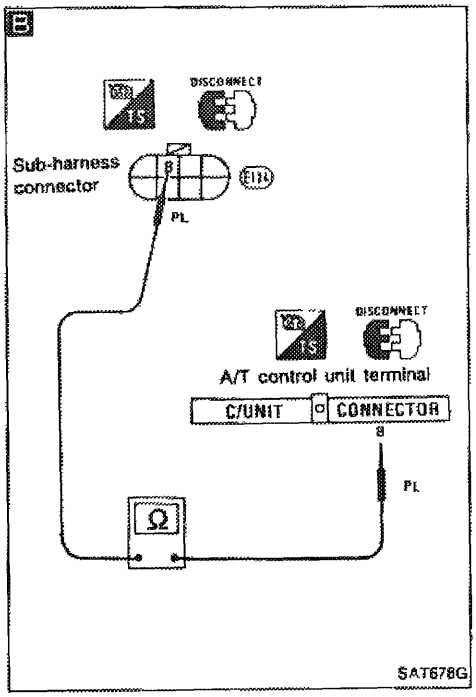
INSPECTION END

Self-diagnosis (Cont'd)

OVERRUN CLUTCH SOLENOID VALVE CIRCUIT CHECK







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 ⑧ and ground.
   Resistance: 20 - 30Ω

N.G. →
1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE".
2. Check the following items.
- Overrun clutch solenoid valve. — Refer to "Electrical Components Inspection".
- Harness continuity of terminal cord assembly

O.K. ↓

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 ⑧ and A/T control unit terminal ⑧
   Resistance:
   Approximately 0Ω
4. Reinstall any part removed.

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

O.K. ↓

Perform self-diagnosis after driving for a while.

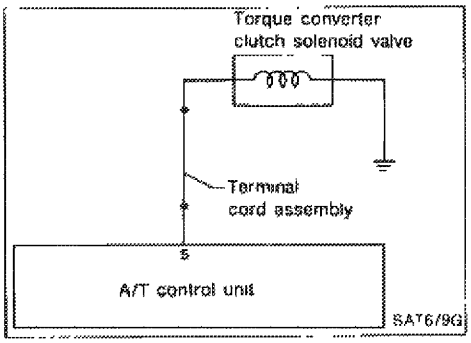
N.G. →
1. Perform A/T control unit input/output signal inspection.
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

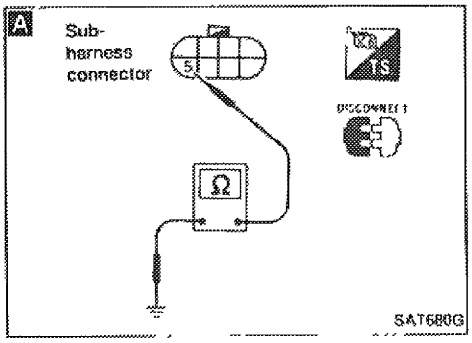
O.K. ↓

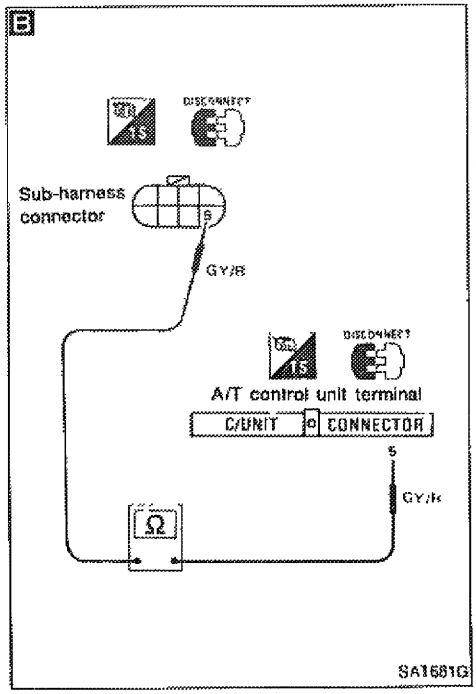
INSPECTION END

Self-diagnosis (Cont'd)

TORQUE CONVERTER CLUTCH SOLENOID VALVE CIRCUIT CHECK







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 ⑤ and ground
   Resistance: 2.5 - 5Ω

N.G →
1. Remove oil pan. — Refer to "ON-VEHICLE SERVICE"
2. Check the following items.
- Torque converter clutch solenoid valve — Refer to "Electrical Components Inspection".
- Harness continuity of terminal cord assembly

O.K. ↓

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 ⑤ and A/T control unit terminal ⑤.
   Resistance:
   Approximately 0Ω
4. Reinstall any part removed

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

O.K. ↓

Perform self-diagnosis after driving for a while.

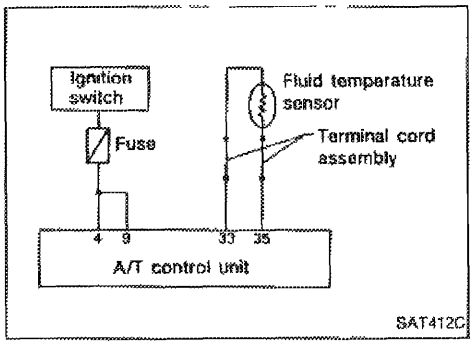
N.G →
1. Perform A/T control unit input/output signal inspection.
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector

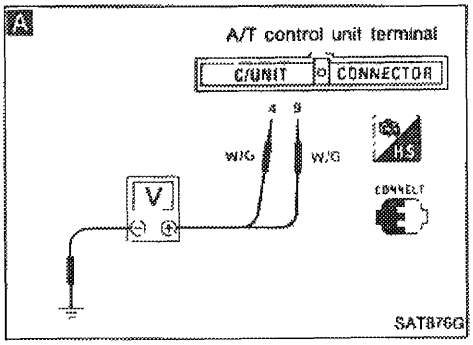
O.K ↓

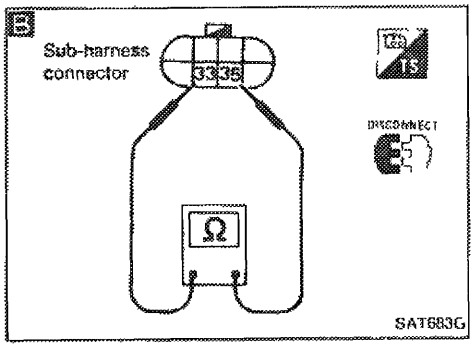
INSPECTION END

Self-diagnosis (Cont'd)

FLUID TEMPERATURE SENSOR CIRCUIT AND A/T CONTROL UNIT POWER SOURCE CIRCUIT CHECKS







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.

N.G →

Check the following items.

- Harness continuity between ignition switch and A/T control unit (Main harness)
- Ignition switch and fuse — Refer to section EL.

O.K. ↓

B

CHECK FLUID TEMPERATURE SENSOR WITH TERMINAL CORD ASSEMBLY.

1. Turn ignition switch to "OFF" position
2. Disconnect terminal cord assembly connector in engine compartment
3. Check resistance between terminals ㉝ and ㉟ when A/T is cold.

Resistance:

Cold [20°C (68°F)]

Approximately 2.5 kΩ

4. Reinstall any part removed.

N.G →

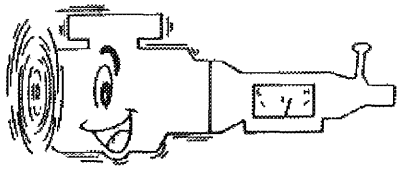
1. Remove oil pan
2. Check the following items.

- Fluid temperature sensor — Refer to "Electrical Components Inspection".
- Harness continuity of terminal cord assembly

O.K. ↓

Ⓐ

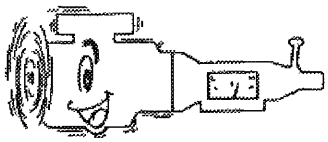
Self-diagnosis (Cont'd)



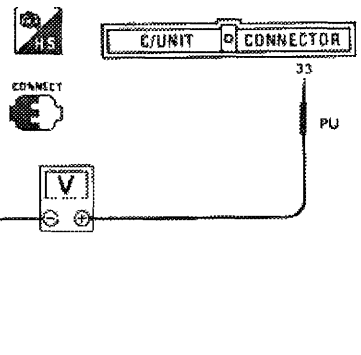
☆MONITOR	
VHCL/S SE•A/T	0mph
VHCL/S SE•MTR	3mph
THRTL POS SEN	0.4V
FLUID TEMP SE	1.4V
BATTERY VOLT	11.8V
ENGINE SPEED	384rpm
SLCT LEVER SW	OFF
P/N POSI SW	O N
R POSITION SW	OFF

RECORD

SAT684G



A/T control unit terminal



SAT685G

Ⓐ

CHECK INPUT SIGNAL OF FLUID TEMPERATURE SENSOR.

1. Turn ignition switch to "ON" position, and start engine
2. ● Select "ECU INPUT SIGNALS" in Data Monitor.
   ● Read out the value of "FLUID TEMP SE".

Voltage:
Cold [20°C (68°F)] →
Hot [80°C (176°F)]:
Approximately
1.5V → 0.5V

N.G. → Check the following items.
- Harness continuity between A/T control unit and terminal cord assembly (Main harness)

OR

2. ● Check voltage between A/T control unit terminal 33 and ground while warming up A/T

Voltage:
Cold [20°C (68°F)] →
Hot [80°C (176°F)]:
Approximately
1.5V → 0.5V

O.K.

Perform self-diagnosis after driving for a while

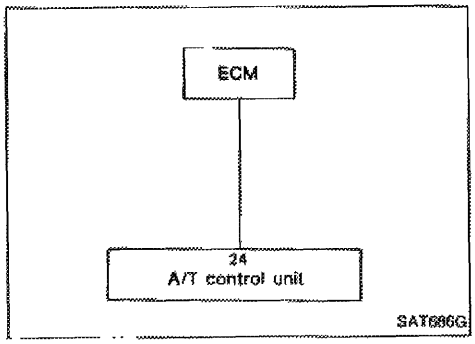
N.G. → 1. Perform A/T control unit input/output signal inspection.
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

O K.

INSPECTION END

Self-diagnosis (Cont'd)

ENGINE SPEED SIGNAL CIRCUIT CHECK



Perform diagnostic test mode II (self-diagnostic results) for engine control. Check ignition signal circuit condition.

N.G. → Check ignition signal circuit for engine control. — Refer to section EF & EC.

O.K.

A

CHECK INPUT SIGNAL.

1. Turn ignition switch to "ON" position and start engine.
2. ● Select "ECU INPUT SIGNALS" in Data Monitor.
   ● Read out the value of "ENGINE SPEED".
   ● Check engine speed changes according to throttle position.

OR

● Check voltage between A/T control unit terminal ㉔ and ground
Voltage: 0.9 - 4.5V

N.G → Check the following items
● Harness continuity between A/T control unit and ignition coil.
● Resistor
● Ignition coil — Refer to section EF & EC

O.K.

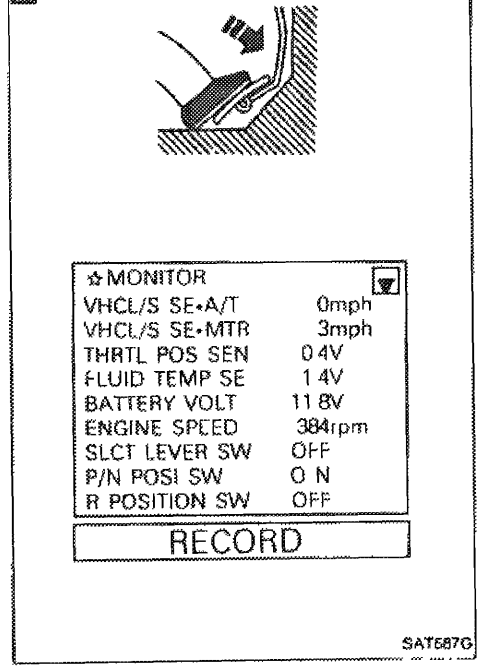
Perform self-diagnosis again after driving for a while.

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

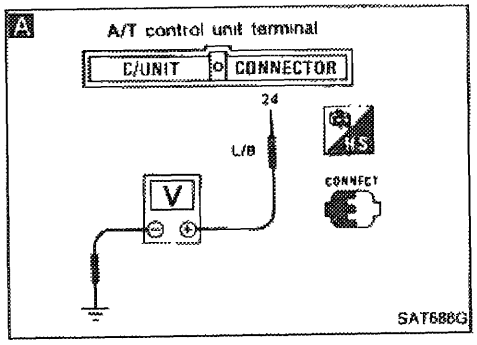
O.K.

INSPECTION END

A

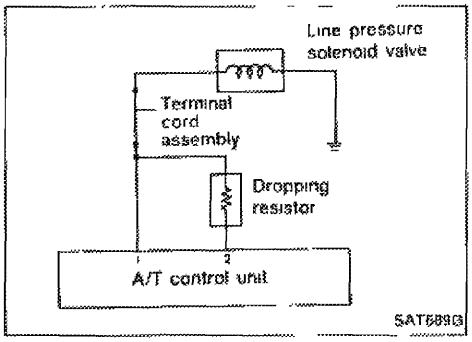


A

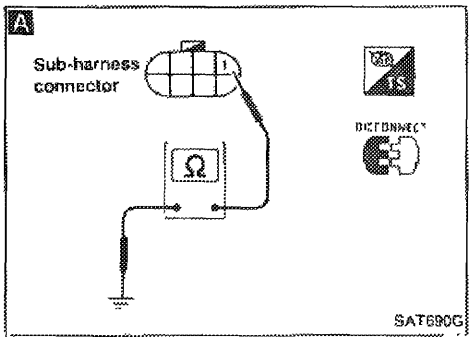


Self-diagnosis (Cont'd)

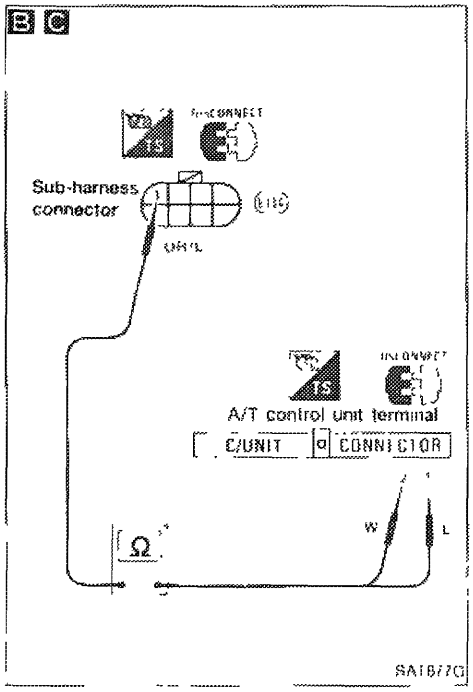
LINE PRESSURE SOLENOID VALVE CIRCUIT CHECK



A



B **C**



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 ① and ground.
   Resistance: 2.5 - 5Ω

N.G →
1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE".
2. Check the following items.
   - Line pressure solenoid valve — Refer to "Electrical Components Inspection".
   - Harness continuity of terminal cord assembly

O.K. ↓

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 ① and A/T control unit terminal ②.
   Resistance: 11.2 - 12.8Ω

N.G. →
Check the following items.
- Dropping resistor — Refer to "Electrical Components Inspection".
- Harness continuity between A/T control unit ② and terminal cord assembly (Main harness)

O.K. ↓

C

CHECK POWER SOURCE CIRCUIT.

1. Turn ignition switch to "OFF" position
2. Check resistance between terminal ① and A/T control unit terminal ①.
   Resistance:
   Approximately 0Ω
3. Reinstall any part removed.

N.G. →
Repair or replace harness between A/T control unit ① and terminal cord assembly.

O.K. ↓

Perform self-diagnosis after driving for a while

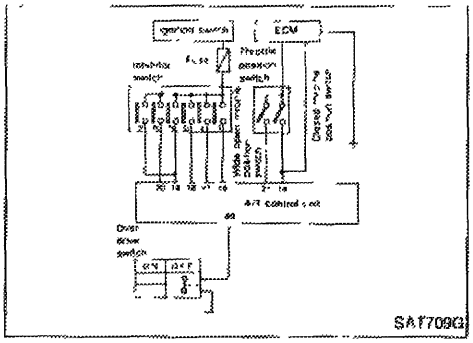
N.G →
1. Perform A/T control unit input/output signal inspection.
2. If N.G, recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector

O.K. ↓

INSPECTION END

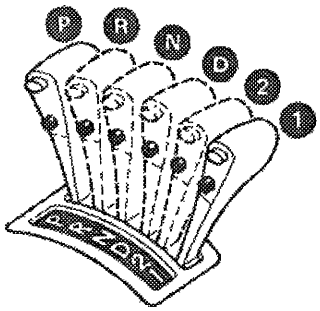
Self-diagnosis (Cont'd)

INHIBITOR, OVERDRIVE AND THROTTLE POSITION SWITCH CIRCUIT CHECKS



SAT709G

A

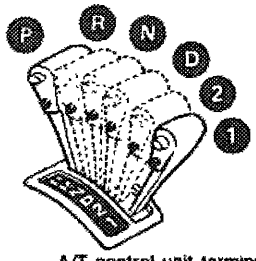


☆MONITOR	
VHCL/S SE-A/T	0mph
VHCL/S SE-MTR	3mph
THRTL POS SEN	0.4V
FLUID TEMP SE	1.4V
BATTERY VOLT	11.8V
ENGINE SPEED	384rpm
SLCT LEVER SW	OFF
P/N POSI SW	ON
R POSITION SW	OFF

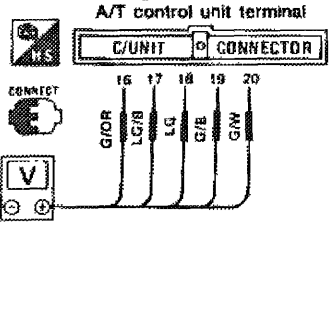
RECORD

SAT711G

A



A/T control unit terminal



SAT710G

A

CHECK INHIBITOR SWITCH CIRCUIT.

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. ● Select "ECU INPUT SIGNALS" in Data Monitor.
   ● 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.

OR

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

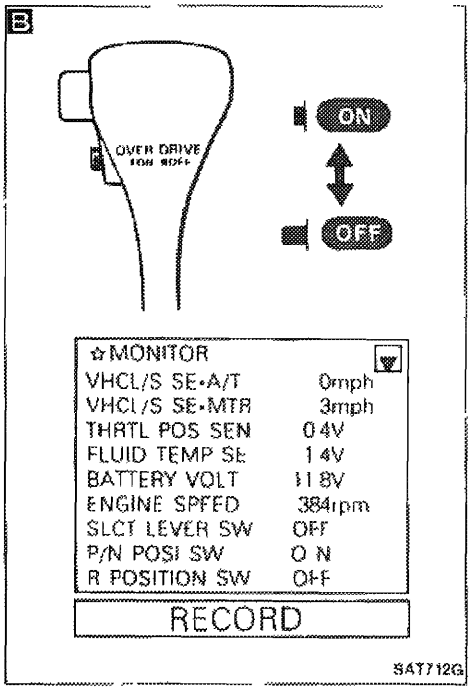
0: 0V

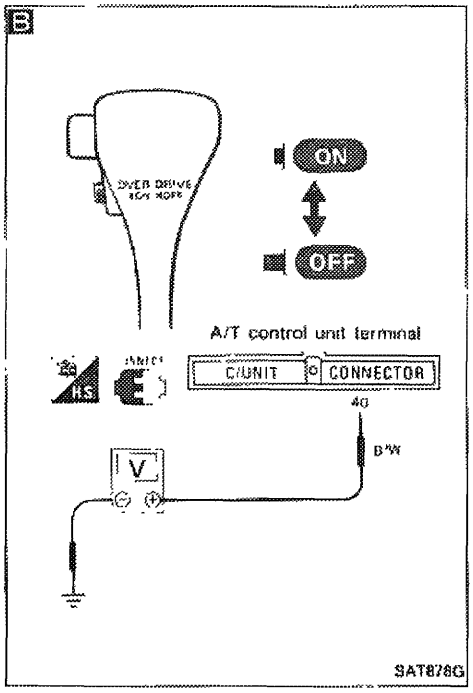
Lever position	Terminal No. ⑯	⑳	⑱	⑰	⑯
P, N	B	0	0	0	0
R	0	B	0	0	0
D	0	0	B	0	0
2	0	0	0	B	0
1	0	0	0	0	B

N.G. → Check the following items.
- Inhibitor switch — Refer to "Electrical Components Inspection".
- Harness continuity between ignition switch and inhibitor switch (Main harness)
- Harness continuity between inhibitor switch and A/T control unit (Main harness)

O.K. → Ⓐ

Self-diagnosis (Cont'd)





Ⓐ

B

CHECK OVERDRIVE SWITCH CIRCUIT.

1. Turn ignition switch to "ON" position (Do not start engine.)
2. ● Select "ECU INPUT SIGNALS" in Data Monitor
   ● Read out "SLCT LEVER SW (Overdrive switch)".
   ● Check the signal of the selector lever switch is indicated properly.
   (Selector lever switch "ON" displayed on CONSULT means overdrive "OFF".)

OR

2. ● Check voltage between A/T control unit terminal 40 and ground when overdrive switch is in "ON" position and in "OFF" position.

Switch position	Voltage
ON	Battery voltage
OFF	1V or less

O.K

Ⓑ

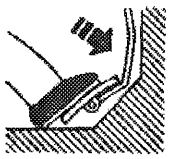
N G

Check the following items.

- Overdrive switch — Refer to "Electrical Components Inspection".
- Harness continuity between A/T control unit and overdrive switch (Main harness)
- Harness continuity of ground circuit for overdrive switch (Main harness)

Self-diagnosis (Cont'd)

C D



☆MONITOR	☆NO FAIL
D POSITION SW	OFF
2 POSITION SW	OFF
1 POSITION SW	OFF
ASCD-CRUISE	OFF
ASCD-OD CUT	OFF
KICKDOWN SW	OFF
POWERSHIFT SW	OFF
CLOSED THL/SW	O N
W/O THRL/P-SW	OFF

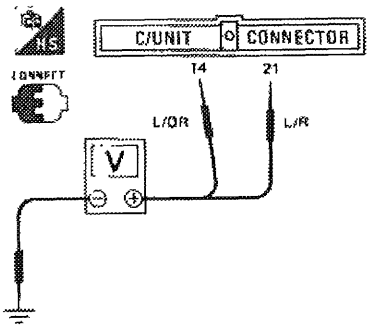
RECORD

SAT714G

C D



A/T control unit terminal



SAT879G

(B)

C

CHECK WIDE OPEN THROTTLE POSITION SWITCH CIRCUIT.

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. ● Select "ECU INPUT SIGNALS" in Data Monitor.
   ● Read out "W/O THRL/P-SW" depressing accelerator pedal fully
   ● Check the signal of wide open throttle position switch is indicated properly.

N.G → Check harness continuity between A/T control unit and wide open throttle position switch.

OR

2. ● Check voltage between A/T control unit terminal ㉑ and ground while depressing accelerator pedal slowly (after warming up engine)

Voltage:

When releasing accelerator pedal:

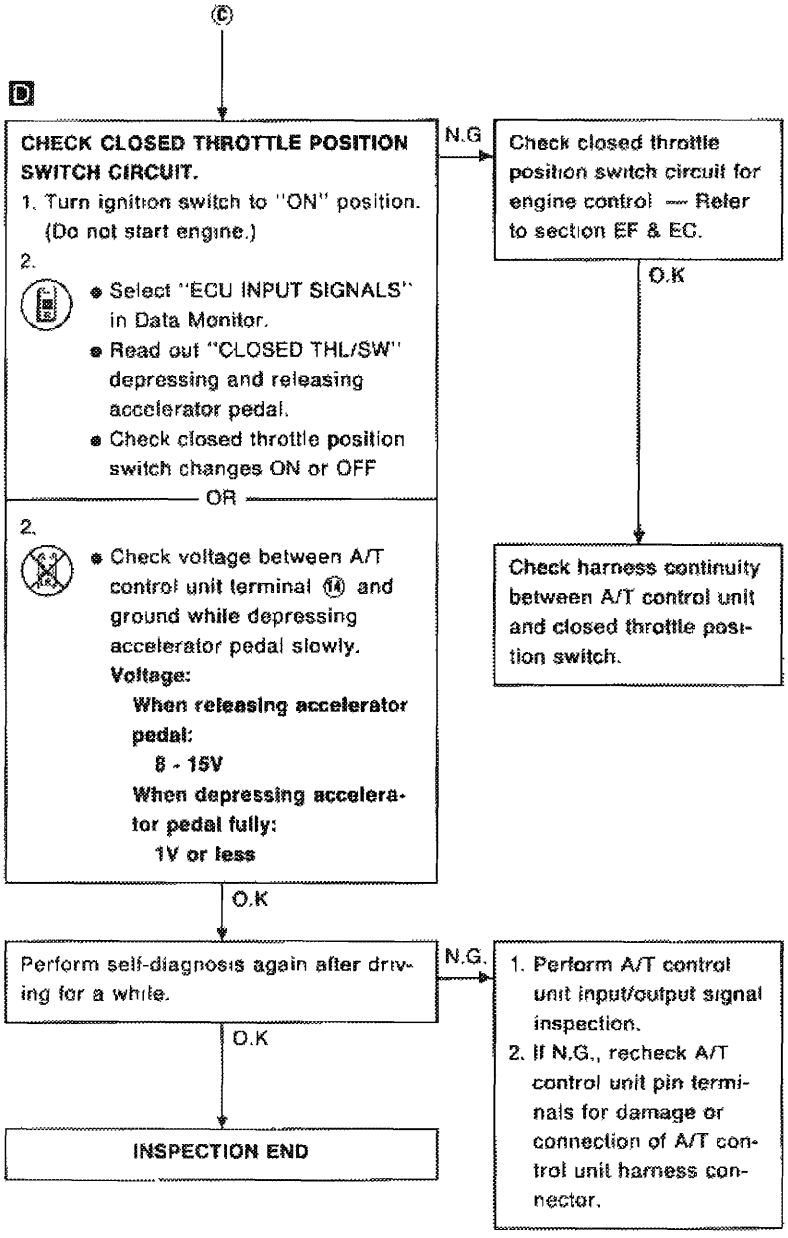
1V or less

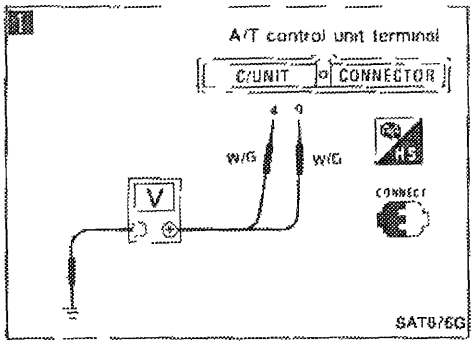
When depressing accelerator pedal fully:

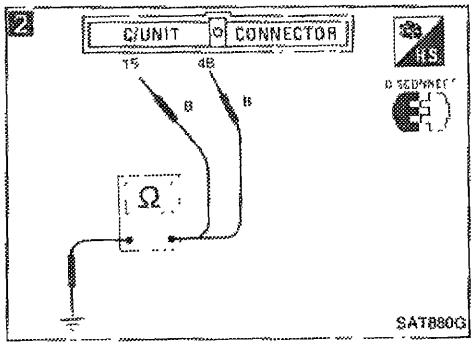
8 - 15V

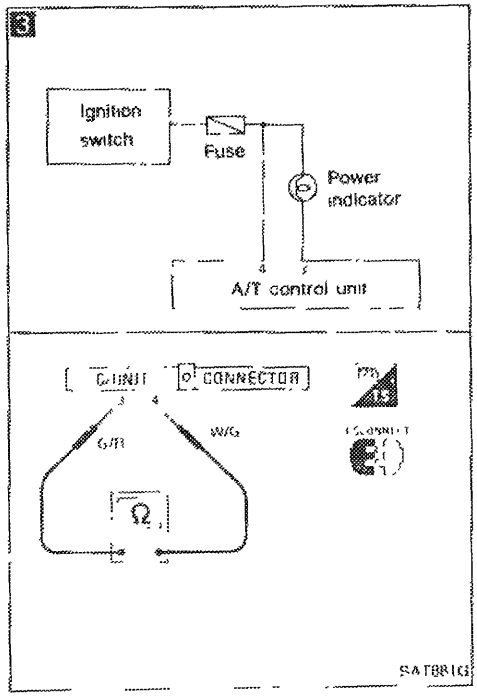
O.K → (C)

Self-diagnosis (Cont'd)









Diagnostic Procedure 1

SYMPTOM:
Power indicator lamp does not come on for about 2 seconds when turning ignition switch to "ON".

1

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.

N.G. → Check the following items.
- Harness continuity between ignition switch and A/T control unit (Main harness)
- Ignition switch and fuse — Refer to section EL.

O.K.

2

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 terminals ⑮, ㊽ and ground.
Resistance:
Approximately 0Ω

N.G. → Check harness continuity between A/T control unit and ground.

O.K.

3

CHECK LAMP CIRCUIT.
1. Turn ignition switch to "OFF" position
2. Check resistance between A/T control unit terminals ③ and ④
Resistance: 50 - 100Ω
3. Reinstall any part removed

N.G. → Check the following items
- Power indicator lamp — Refer to section EL.
- Harness continuity between ignition switch and power indicator lamp (Main harness)
- Harness continuity between power indicator lamp and A/T control unit

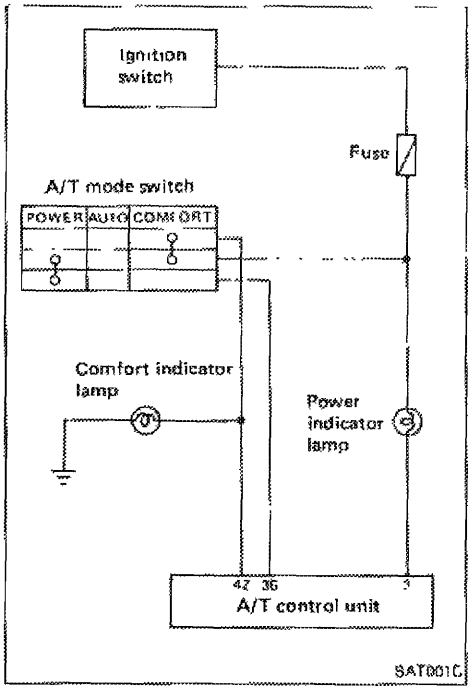
O.K.

Check again

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

O.K.

INSPECTION END



Diagnostic Procedure 2

SYMPTOM:

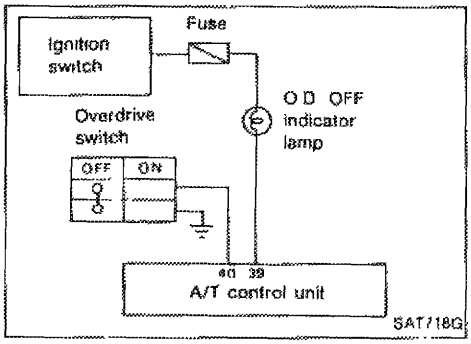
Power indicator lamp or comfort indicator lamp does not come on when turning A/T mode switch to the appropriate position.

Is Diagnostic Procedure 1 O.K.? — No → Go to Diagnostic Procedure 1.

Yes ↓

Check the following items.
- A/T mode switch
- Comfort indicator lamp
- Harness continuity between ignition switch and A/T mode switch
- Harness continuity between A/T mode switch and A/T control unit

N G → Repair or replace damaged parts.



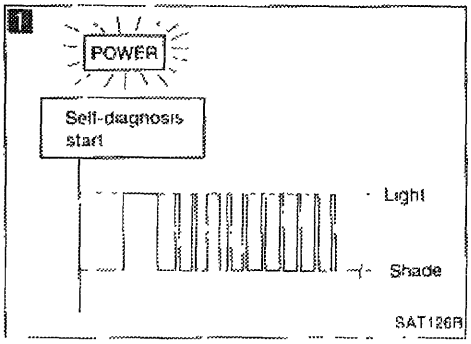
Diagnostic Procedure 3

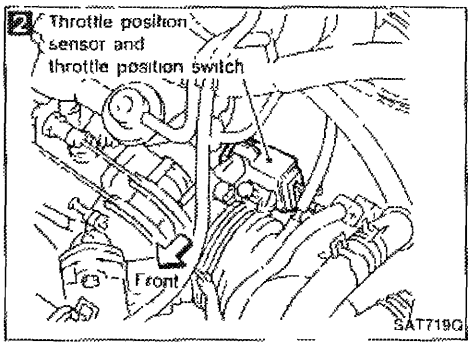
SYMPTOM:

O.D. OFF indicator lamp does not come on when setting overdrive switch to "OFF" position.

Check the following items.
- Overdrive switch
- O.D. OFF indicator lamp
- Harness continuity between ignition switch and O.D. OFF indicator lamp

N.G. → Repair or replace damaged parts





Diagnostic Procedure 4

SYMPTOM:

Power indicator lamp does not come on for about 3 seconds when depressing and releasing accelerator pedal fully.

1

Does self-diagnosis show damage to throttle position sensor circuit? — No → Check throttle position sensor circuit — Refer to "Self-diagnosis".

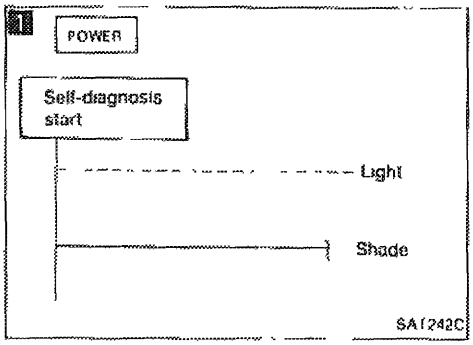
Yes ↓

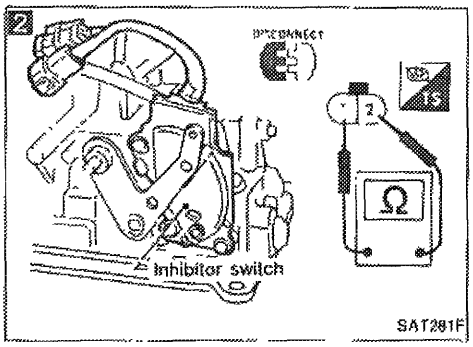
2

Check throttle position sensor — Refer to section EF & EC — N G → Repair or replace throttle position sensor

O.K. ↓

1. Perform A/T control unit input/output signal inspection
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector





Diagnostic Procedure 5

SYMPTOM:

Engine cannot be started with selector lever in "P" or "N" position or engine can be started with selector lever in "D", "2", "1" or "R" position.

Does "ECU INPUT SIGNALS" in Data Monitor show damage to inhibitor switch circuit?
- Yes → Check inhibitor switch circuit. — Refer to "Self-diagnosis".

OR

1

Does self-diagnosis show damage to inhibitor switch circuit?

No

2

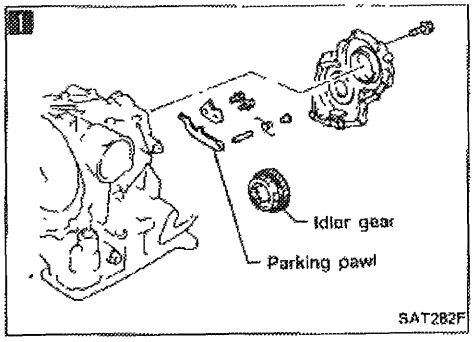
Check continuity of inhibitor switch 2-pin connector — Refer to "Electrical Components Inspection".
- N.G. → Repair or replace inhibitor switch

O.K.

Check starting system. — Refer to section EL.
- N.G. → Repair or replace damaged parts

O.K.

INSPECTION END



Diagnostic Procedure 6

SYMPTOM:

Vehicle moves when it is pushed forward or backward with selector lever in "P" position.

1

Check parking components. — Refer to "DISASSEMBLY" and "ASSEMBLY".
- N.G. → Repair or replace damaged parts

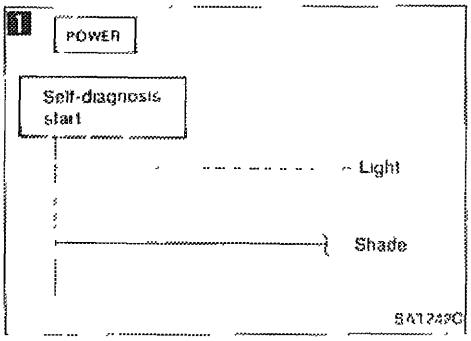
O.K.

INSPECTION END

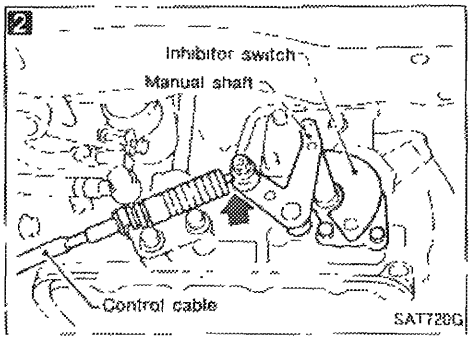
Diagnostic Procedure 7

SYMPTOM:
Vehicle moves forward or backward when selecting "N" position.

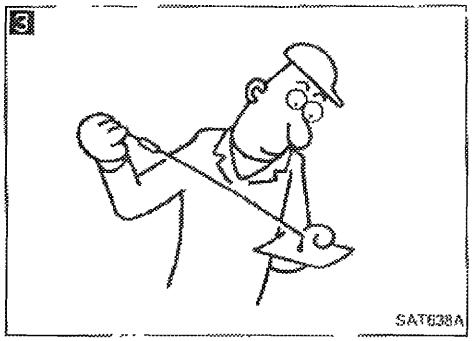
1



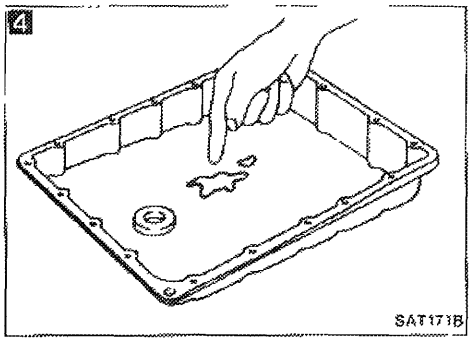
2



3



4



Does "ECU INPUT SIGNALS" in Data Monitor show damage to inhibitor switch circuit? — Yes → Check inhibitor switch circuit — Refer to "Self-diagnosis".

OR

1 Does self-diagnosis show damage to inhibitor switch circuit?

No

2 Check control cable. — Refer to "ON-VEHICLE SERVICE" — N G → Adjust control cable. — Refer to "ON-VEHICLE SERVICE".

O.K

3 Check A/T fluid level again. — N.G → Refill A.T.F.

O.K.

4 1. Remove oil pan
2. Check A/T fluid condition — N.G → 1. Disassemble A/T. 2. Check the following items.
- Forward clutch assembly
- Overrun clutch assembly
- Reverse clutch assembly

O K

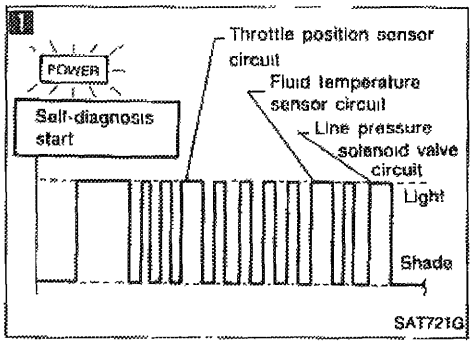
Check again. — N.G. → 1. Perform A/T control unit input/output signal inspection. 2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

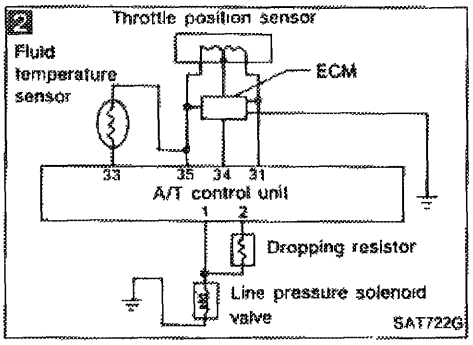
O K

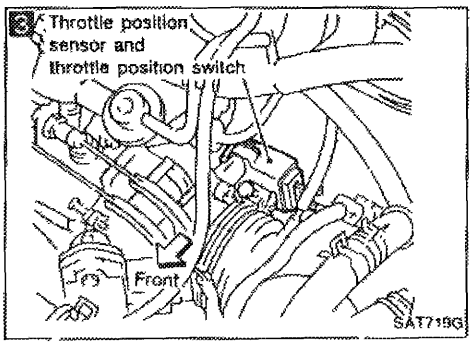
INSPECTION END

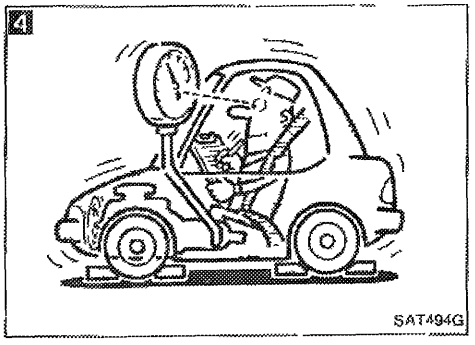
Diagnostic Procedure 8

SYMPTOM:
There is large shock when changing from "N" to "R" position.









1 Does self-diagnosis show damage to throttle position sensor, line pressure solenoid valve or fluid temperature sensor circuit?
- Yes → 2 Check damaged circuit. — Refer to "Self-diagnosis".
- No → 3

3 Check throttle position sensor. — Refer to section EF & EC.
- N.G. → Repair or replace throttle position sensor
- O.K. → 4

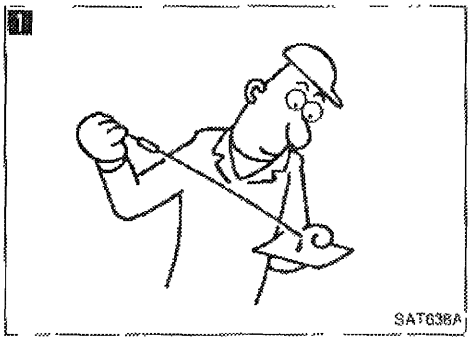
4 Check line pressure at idle with selector lever in "D" position — Refer to "PRESSURE TESTING".
- N.G. →
  1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE".
  2 Check the following items.
  - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
  - Line pressure solenoid valve
- O.K. →

Check again
- N.G. →
  1. Perform A/T control unit input/output signal inspection.
  2 If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.
- O.K. → **INSPECTION END**

Diagnostic Procedure 9

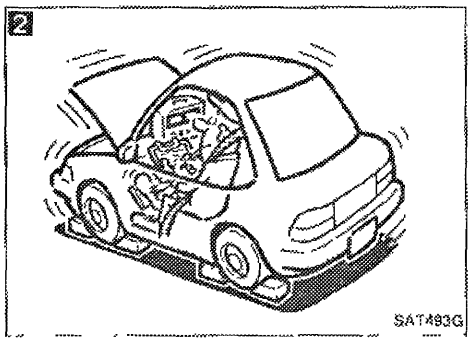
SYMPTOM:
Vehicle does not creep backward when selecting "R" position.

1



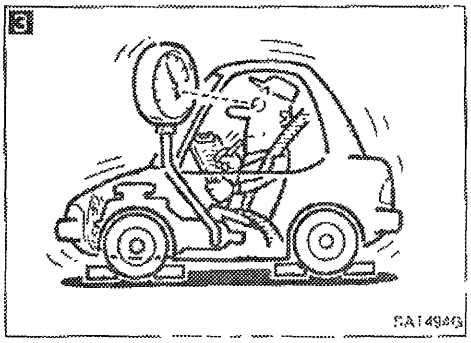
SAT636A

2



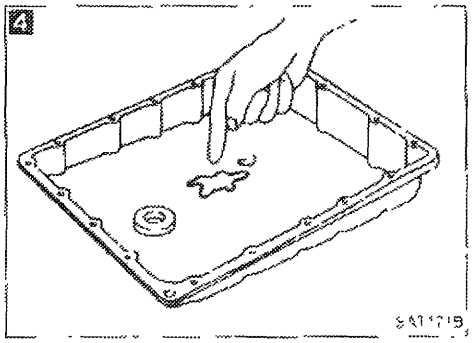
SAT493G

3



SAT494G

4



SAT717B

1

Check A/T fluid level again. — N.G. → Refill A.T.F.

O K

N.G in both "1" and "R" positions

2

Check stall revolution with selector lever in "1" and "R" positions.

O.K.

O K in "1" position
N G, in "R" position

3

Check line pressure at idle with selector lever in "R" position. — Refer to "PRESSURE TESTING" — N.G

O K.

4

1. Remove oil pan
2. Check fluid condition. — N G

O K

Check again. — N G

O K

INSPECTION END

N.G →

1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE".
2. Check the following items.
   - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
   - Line pressure solenoid valve
3. Disassemble A/T
4. Check the following items.
   - Oil pump assembly
   - Torque converter
   - Reverse clutch assembly
   - High clutch assembly
   - Low & reverse brake assembly
   - Low one way clutch

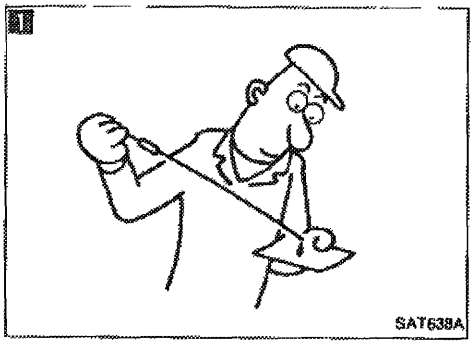
N G →

1. Perform A/T control unit input/output signal inspection
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector

Diagnostic Procedure 10

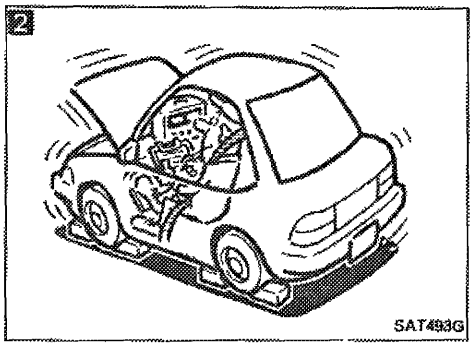
SYMPTOM:
Vehicle does not creep forward when selecting "D", "2" or "1" position.

1



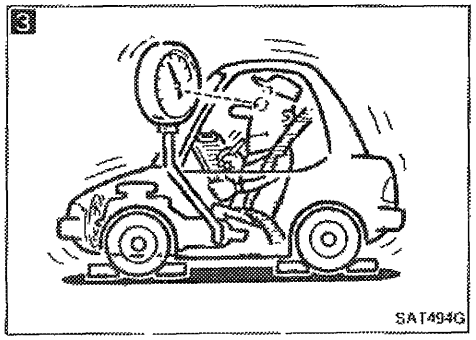
SAT638A

2



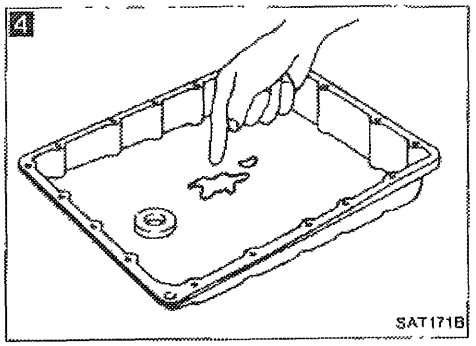
SAT493G

3



SAT494G

4



SAT171B

1

Check A/T fluid level again.

N.G. → Refill A.T.F.

O.K. ↓

2

Check stall revolution with selector lever in "D" position. — Refer to "STALL TESTING".

N.G. →
1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE".
2. Check the following items.
* Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
* Line pressure solenoid valve
3. Disassemble A/T
4. Check the following items
* Oil pump assembly
* Forward clutch assembly
* Forward one-way clutch
* Low one-way clutch
* Low & reverse brake assembly
* Torque converter

O.K. ↓

3

Check line pressure at idle with selector lever in "D" position. — Refer to "PRESSURE TESTING"

N.G. → (same items as above)

O.K. ↓

4

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

N.G. → (same items as above)

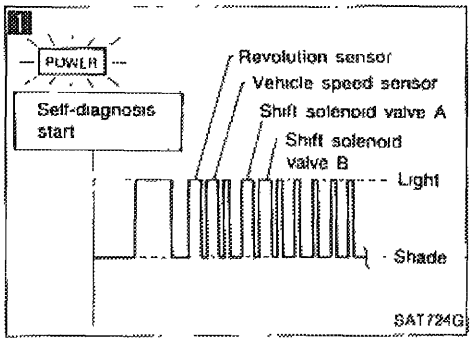
O.K. ↓

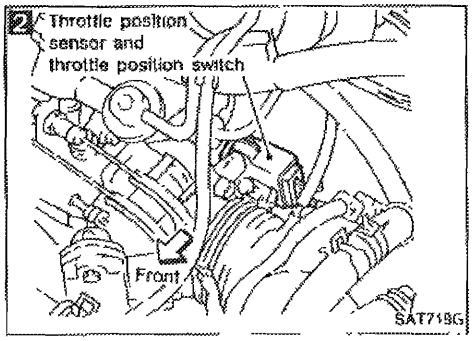
Check again.

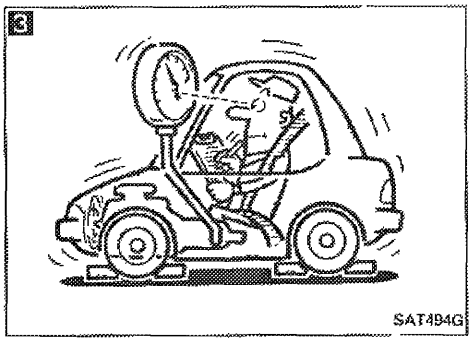
N.G →
1. Perform A/T control unit input/output signal inspection
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

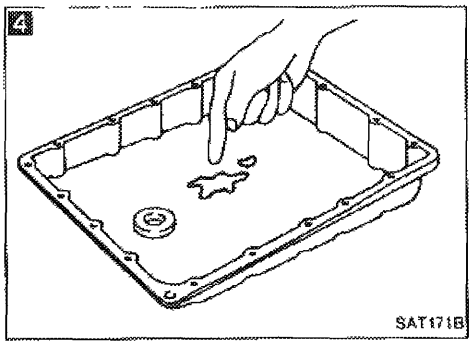
O.K. ↓

INSPECTION END









Diagnostic Procedure 11

SYMPTOM:

Vehicle cannot be started from D_1 on Cruise test — Part 1.

Is Diagnostic Procedure 9 O.K ? — No → Go to Diagnostic Procedure 9.

Yes ↓

1 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".

No ↓

2 Check throttle position sensor. — Refer to section EF & EC — N.G → Repair or replace throttle position sensor.

O K ↓

3 Check line pressure at stall point with selector lever in "D position — Refer to "PRESSURE TESTING" — N.G. →

1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE".
2. Check the following items.
   - Shift valve A
   - Shift valve B
   - Shift solenoid valve A
   - Shift solenoid valve B
   - Pilot valve
   - Pilot filter

O.K ↓

4 1. Remove oil pan. 2 Check A/T fluid condition. — O.K. → (Pilot filter)

N.G ↓

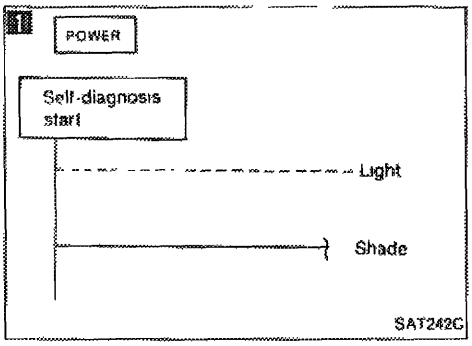
3. Disassemble A/T.
4. Check the following items.
   - Forward clutch assembly
   - Forward one-way clutch
   - Low one-way clutch
   - High clutch assembly
   - Torque converter
   - Oil pump assembly

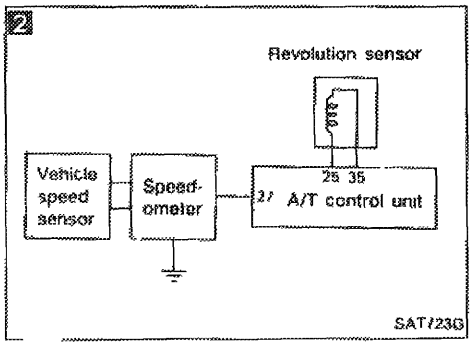
O.K. ↓

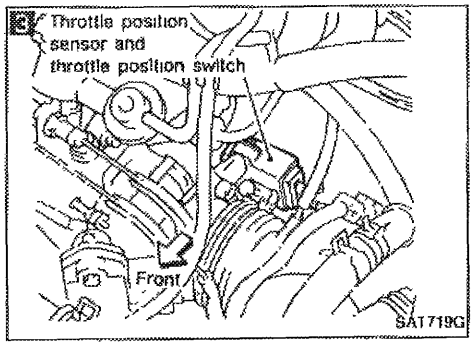
Check again. — N.G. → 1. Perform A/T control unit input/output signal inspection. 2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector

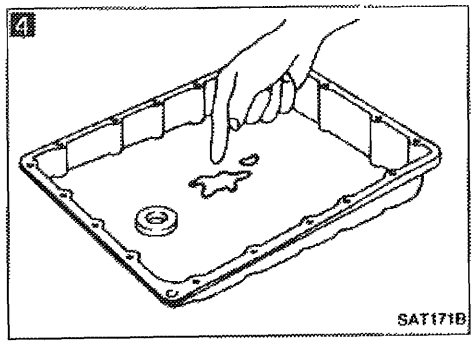
O.K. ↓

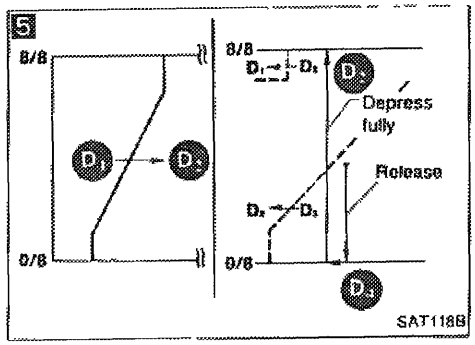
INSPECTION END











Diagnostic Procedure 12

SYMPTOM:

A/T does not shift from D_1 to D_2 at the specified speed.
A/T does not shift from D_4 to D_2 when depressing accelerator pedal fully at the specified speed.

Are Diagnostic Procedures 10 and 11 O.K.? — No → Go to Diagnostic Procedure 10 or 11

Yes ↓

Does "ECU INPUT SIGNALS" in Data Monitor show damage to inhibitor switch circuit? — Yes → Check inhibitor switch circuit — Refer to "Self-diagnosis"

OR

1 Does self-diagnosis show damage to inhibitor switch circuit?

No ↓

2 Check revolution sensor and vehicle speed sensor circuit. — Refer to "Self-diagnosis" — N.G. → Repair or replace revolution sensor and vehicle speed sensor circuits

O.K. ↓

3 Check throttle position sensor. — Refer to section EF & EC. — N.G. → Repair or replace throttle position sensor.

O.K ↓

4 1. Remove oil pan
2 Check A/T fluid condition — N.G. → 1. Remove control valve. — Refer to "ON-VEHICLE SERVICE"
2. Check the following items.
- Shift valve A
- Shift solenoid valve A
- Pilot valve
- Pilot filter

O.K. ↓

3 Disassemble A/T.
4. Check the following items.
- Servo piston assembly
- Brake band
- Oil pump assembly

O.K ↓

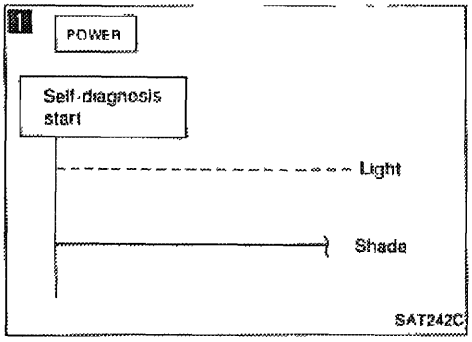
5 Check again. — N.G. → 1. Perform A/T control unit input/output signal inspection.
2 If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

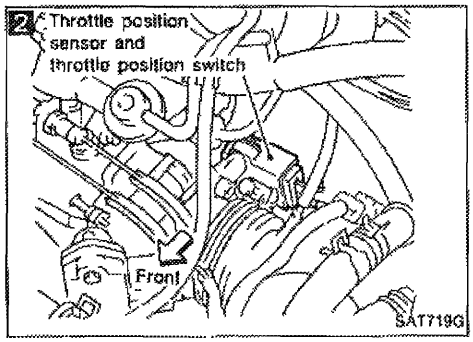
O.K. ↓

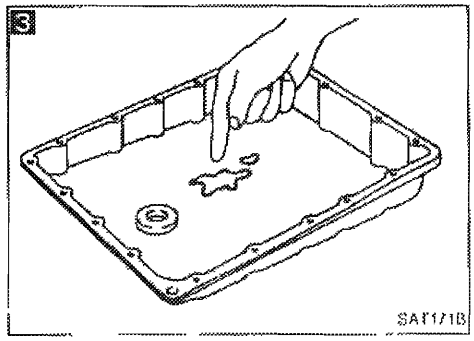
INSPECTION END

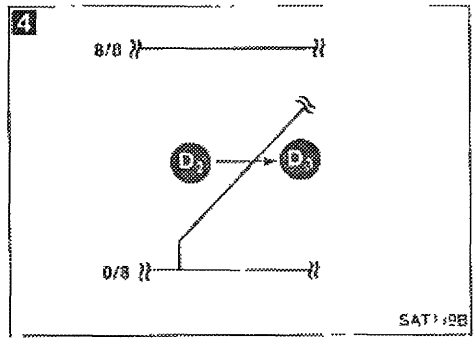
Diagnostic Procedure 13

SYMPTOM:
A/T does not shift from D_2 to D_3 at the specified speed.









Are Diagnostic Procedures 10 and 11 O.K.? — No → Go to Diagnostic Procedure 10 or 11.

Yes ↓

Does "ECU INPUT SIGNALS" in Data Monitor show damage to inhibitor switch circuit? — Yes → Check inhibitor switch circuit. — Refer to "Self-diagnosis".

OR

1 Does self-diagnosis show damage to inhibitor switch circuit?

No ↓

2 Check throttle position sensor. — Refer to section EF & EC. — N.G → Repair or replace throttle position sensor.

O.K. ↓

3 1. Remove oil pan
2. Check A/T fluid condition — N.G. → 1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE".
2. Check the following items
- Shift valve B
- Shift solenoid valve B
- Pilot valve
- Pilot filter

O.K → O.K

3. Disassemble A/T
4. Check the following items.
- Servo piston assembly
- High clutch assembly
- Oil pump assembly

O.K ↓

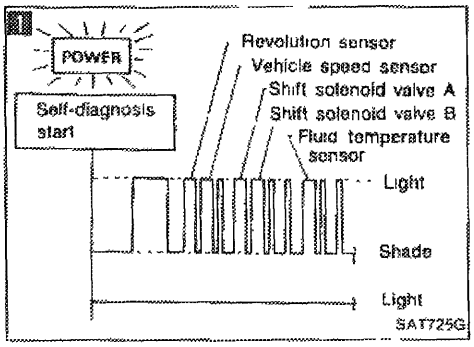
4 Check again. — N.G. → 1. Perform A/T control unit input/output signal inspection.
2. If N.G., recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector.

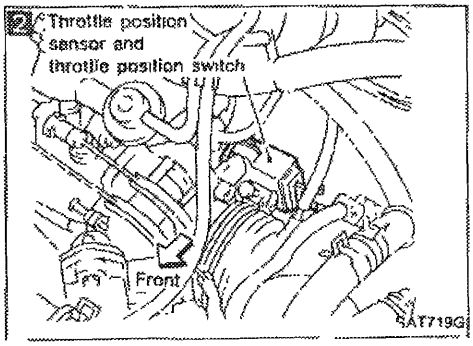
O.K ↓

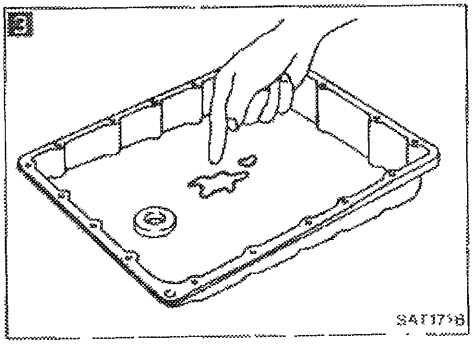
INSPECTION END

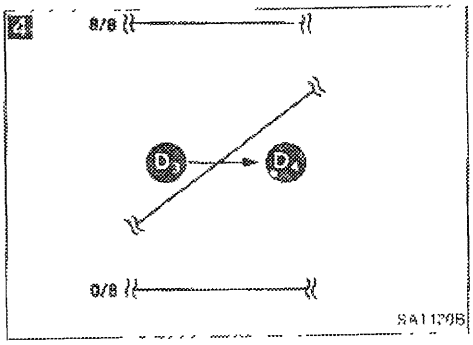
Diagnostic Procedure 14

SYMPTOM:
A/T does not shift from D_3 to D_4 at the specified speed.
A/T must be warm before D_3 to D_4 shift will occur.









Are Diagnostic Procedure 10 and 11 O.K.? — No → Go to Diagnostic Procedure 10 or 11.

Yes ↓

1 Does self-diagnosis show damage to inhibitor switch, overdrive switch, shift solenoid valve A, B, revolution sensor, vehicle speed sensor or fluid temperature sensor circuit after cruise test? — Yes → Check damaged circuit. — Refer to "Self-diagnosis".

No ↓

2 Check throttle position sensor — Refer to section EF & EC — N G → Repair or replace throttle position sensor

O.K. ↓

3 1. Remove oil pan
2. Check A/T fluid condition. — N.G. →
1 Remove control valve assembly — Refer to "ON-VEHICLE SERVICE"
2 Check the following items
- Shift valve B
- Overrun clutch control valve
- Shift solenoid valve B
- Pilot valve
- Pilot filter

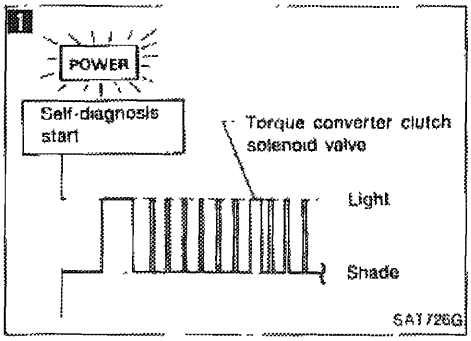
O.K. ↓ (O K →)

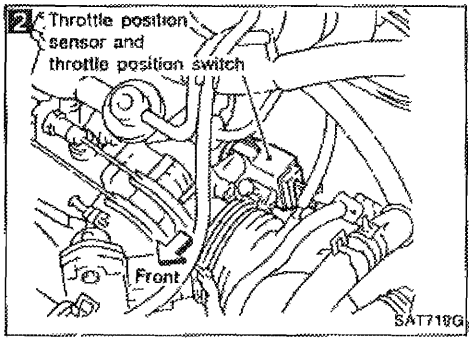
3 Disassemble A/T
4 Check the following items
- Servo piston assembly
- Brake band
- Torque converter
- Oil pump assembly

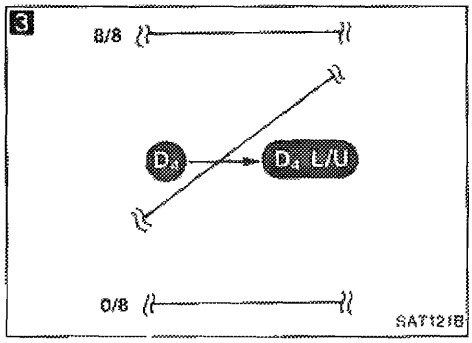
4 Check again — N G → 1 Perform A/T control unit input/output signal inspection
2 If N G, recheck A/T control unit pin terminals for damage or connection of A/T control unit harness connector

O K ↓

INSPECTION END







Diagnostic Procedure 15

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

1

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

Yes → Check torque converter clutch solenoid valve circuit — Refer to "Self-diagnosis".

No ↓

2

Check throttle position sensor. — Refer to section EF & EC.

N.G. → Repair or replace throttle position sensor.

O.K. ↓

1. Remove control valve — Refer to "ON-VEHICLE SERVICE".
2. Check following items.
   - Lock-up control valve
   - Torque converter relief valve
   - Torque converter clutch solenoid valve
   - Pilot valve
   - Pilot filter

N.G. → Repair or replace damaged parts.

O.K. ↓

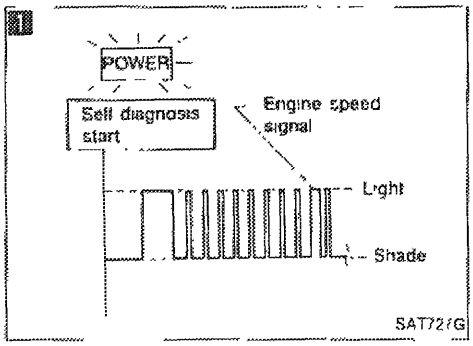
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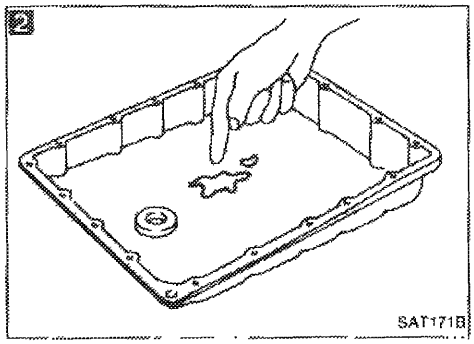
Check again

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

O.K. ↓

INSPECTION END





Diagnostic Procedure 16

SYMPTOM:

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

1

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

Yes → Check engine speed signal circuit. — Refer to "Self-diagnosis".

No

2

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

N.G. →
1. Remove control valve assembly — Refer to "ON-VEHICLE SERVICE".
2. Check the following items
   - Lock-up control valve
   - Pilot valve
   - Pilot filter
3. Disassemble A/T.
4. Check torque converter and oil pump assembly.

O.K. → (Lock-up control valve, Pilot valve, Pilot filter)

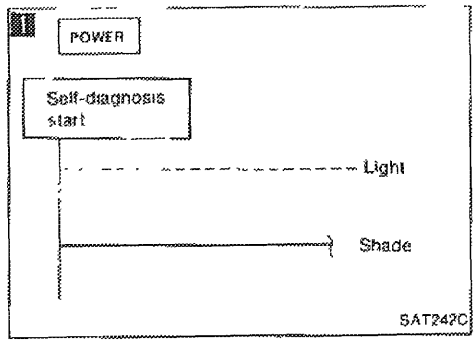
O.K. → (Disassemble A/T, Check torque converter and oil pump assembly)

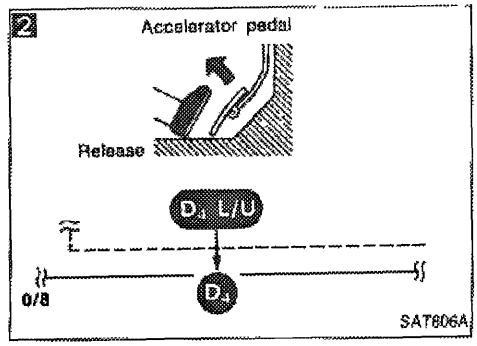
Check again

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

O.K.

INSPECTION END





Diagnostic Procedure 17

SYMPTOM:

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

Does "ECU INPUT SIGNALS" in Data Monitor show damage to closed throttle position switch circuit?

Yes → Check closed throttle position switch circuit. — Refer to "Self-diagnosis".

OR

1

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

No

2

Check again.

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

O.K.

INSPECTION END

Diagnostic Procedure 18

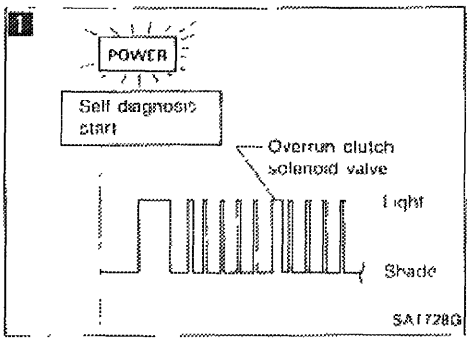
SYMPTOM:

Engine speed does not return to idle smoothly when A/T is shifted from D_4 to D_3 with accelerator pedal released.

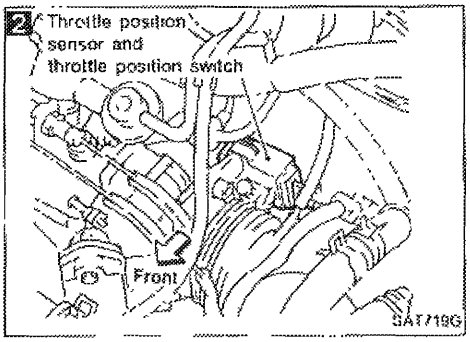
Vehicle does not decelerate by engine brake when changing overdrive switch to "OFF" position with accelerator pedal released.

Vehicle does not decelerate by engine brake when changing selector lever from "D" to "2" position with accelerator pedal released.

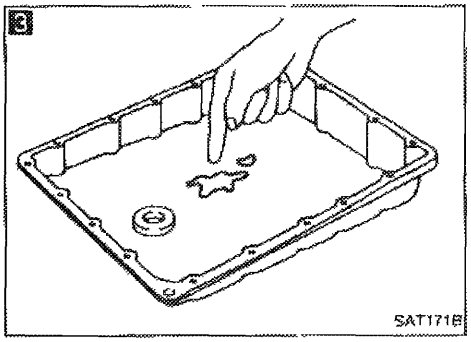
1



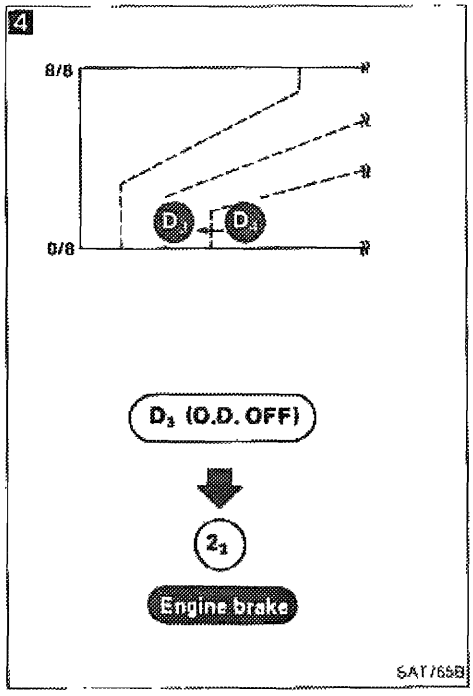
2



3



4



1

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

Yes → Check overrun clutch solenoid valve circuit — Refer to "Self-diagnosis".

No ↓

2

Check throttle position sensor. — Refer to section EF & EC

N G → Repair or replace throttle position sensor.

O.K. ↓

3

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

N G → 1. Remove control valve assembly. — Refer to "ON-VEHICLE SERVICE"
2. Check the following items.
- Overrun clutch control valve
- Overrun clutch reducing valve
- Overrun clutch solenoid valve

O.K. →

O.K. → 3. Disassemble A/T.
4. Check the following items.
- Overrun clutch assembly
- Oil pump assembly

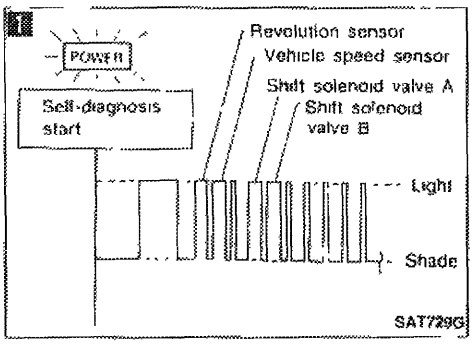
4

Check again.

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

O.K. ↓

INSPECTION END



Diagnostic Procedure 19

SYMPTOM:

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

1

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".

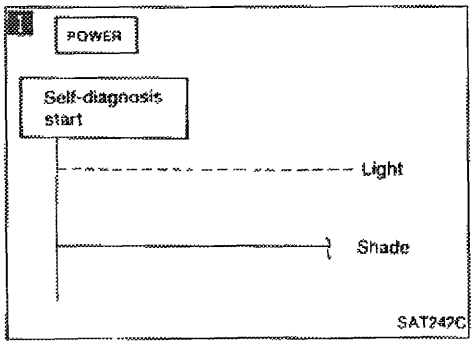
No ↓

Check again.

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

O.K. ↓

Go to Diagnostic Procedure 11.



Diagnostic Procedure 20

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"

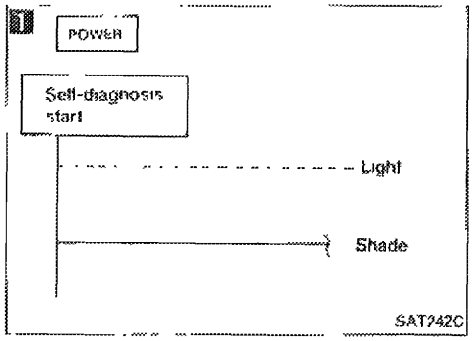
OR

1

Does self-diagnosis show damage to overdrive switch circuit?

No ↓

Go to Diagnostic Procedure 13.



Diagnostic Procedure 21

SYMPTOM:

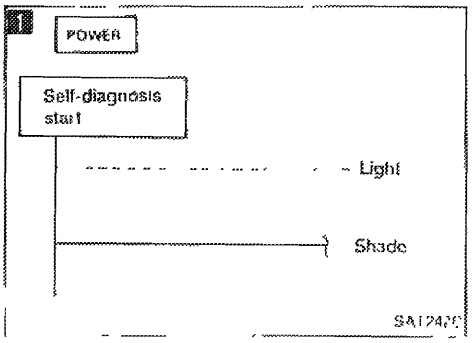
A/T does not shift from D_3 to 2_2 when changing selector lever from "D" to "2" position.

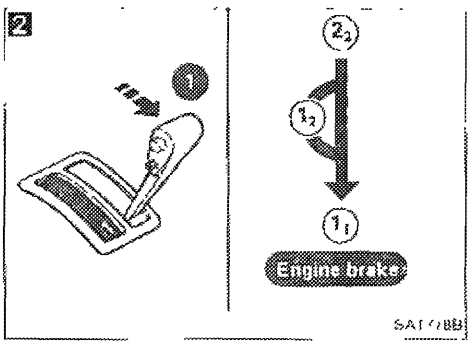
Does "ECU INPUT SIGNALS" in Data Monitor show damage to inhibitor switch circuit? — Yes → Check inhibitor switch circuit — Refer to "Self-diagnosis".

OR

1 Does self-diagnosis show damage to inhibitor switch circuit?

No → Go to Diagnostic Procedure 12





Diagnostic Procedure 22

SYMPTOM:

A/T does not shift from 2_2 to 1_1 when changing selector lever from "2" to "1" position.

Does "ECU INPUT SIGNALS" in Data Monitor show damage to inhibitor switch circuit? — Yes → Check inhibitor switch circuit — Refer to "Self-diagnosis".

OR

1 Does self-diagnosis show damage to inhibitor switch circuit?

No

2 Check again.

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

O K → INSPECTION END

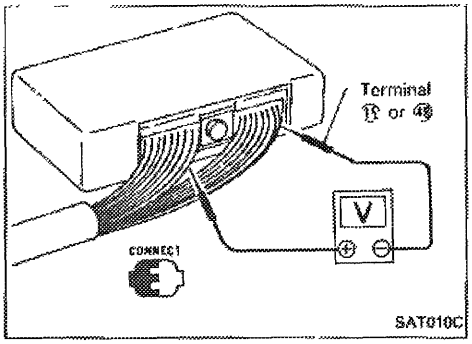
Diagnostic Procedure 23

SYMPTOM:

Vehicle does not decelerate by engine brake when shifting from 2_2 (1_2) to 1_1.

Is Diagnostic Procedure 9 O K ? — No → Go to Diagnostic Procedure 9

Yes → Go to Diagnostic Procedure 18

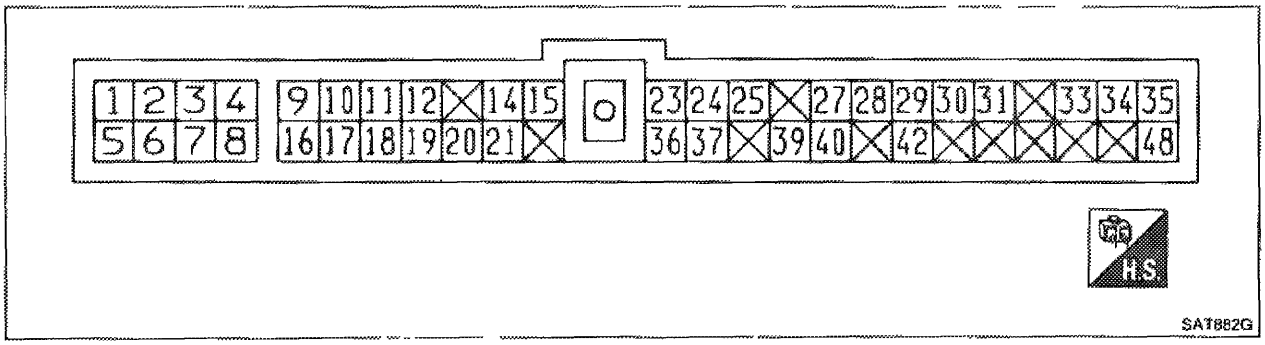


Electrical Components Inspection

INSPECTION OF A/T CONTROL UNIT

- Measure voltage between each terminal and terminal ⑮ or ⑱ by following "A/T CONTROL UNIT INSPECTION TABLE".

- Pin connector terminal layout.

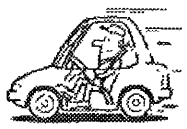


A/T CONTROL UNIT INSPECTION TABLE

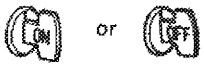
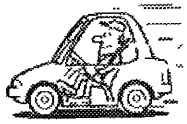
(Data are reference values.)

Terminal No.	Item	Condition		Judgement standard
1	Line pressure solenoid valve		When releasing accelerator pedal after warming up engine.	1.5 - 2.5V
			When depressing accelerator pedal fully after warming up engine.	0.5V or less
2	Line pressure solenoid valve (with dropping resistor)		When releasing accelerator pedal after warming up engine	8 - 14V
			When depressing accelerator pedal fully after warming up engine	0.5V or less
3	Power indicator lamp		When setting A/T mode switch in "POWER" position.	1V or less
			When setting A/T mode switch except in "POWER" position	Battery voltage
4	Power source		When turning ignition switch to "ON"	Battery voltage
			When turning ignition switch to "OFF"	1V or less

Electrical Components Inspection (Cont'd)

Terminal No.	Item	Condition		Judgement standard
5	Torque converter clutch solenoid valve		When A/T performs lock-up	8 - 15V
			When A/T does not perform lock-up.	1V or less
6	Shift solenoid valve A		When shift solenoid valve A operates (When driving in "D_1" or "D_4".)	Battery voltage
			When shift solenoid valve A does not operate. (When driving in "D_2" or "D_3".)	1V or less
7	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in "D_1" or "D_2".)	Battery voltage
			When shift solenoid valve B does not operate. (When driving in "D_3" or "D_4".)	1V or less
8	Overrun clutch solenoid valve		When overrun clutch solenoid valve operates.	Battery voltage
			When overrun clutch solenoid valve does not operate.	1V or less
9	Power source		Same as No. 4	
10	—		—	—
11	—		—	—
12	—		—	—
13	—		—	—
14	Closed throttle position switch (in throttle position switch)		When releasing accelerator pedal after warming up engine.	8 - 15V
			When depressing accelerator pedal after warming up engine.	1V or less
15	Ground		—	—
16	Inhibitor "1" position switch		When setting selector lever to "1" position	Battery voltage
			When setting selector lever to other positions.	1V or less
17	Inhibitor "2" position switch		When setting selector lever to "2" position	Battery voltage
			When setting selector lever to other positions	1V or less
18	Inhibitor "D" position switch		When setting selector lever to "D" position.	Battery voltage
			When setting selector lever to other positions.	1V or less

Electrical Components Inspection (Cont'd)

Terminal No.	Item	Condition		Judgement standard
19	Inhibitor "N" or "P" position switch		When setting selector lever to "N" position	Battery voltage
			When setting selector lever to other positions	1V or less
20	Inhibitor "R" position switch		When setting selector lever to "R" position.	Battery voltage
			When setting selector lever to other positions	1V or less
21	Wide open throttle position switch (In throttle position switch)		When depressing accelerator pedal more than half-way after warming up engine.	8 - 15V
			When releasing accelerator pedal after warming up engine	1V or less
22	—		—	—
23	Power source (Back-up)		When turning ignition switch to "OFF".	Battery voltage
			When turning ignition switch to "ON".	Battery voltage
24	Engine speed signal		When engine runs at idle speed.	0.6V
			When engine runs at 4,000 rpm.	Approximately 2.2V
25	Revolution sensor (Measure in AC position)		When vehicle cruises at 30 km/h (19 MPH).	1V or more Voltage rises gradually in response to vehicle speed.
			When vehicle parks.	0V
26	—		—	—
27	Vehicle speed sensor		When moving vehicle at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.	Vary from 0 to 5V
28*	—		—	—
29*	—		—	—
30*	—		—	—
31	Throttle position sensor (Power source)		—	4.5 - 5.5V
32	—		—	—

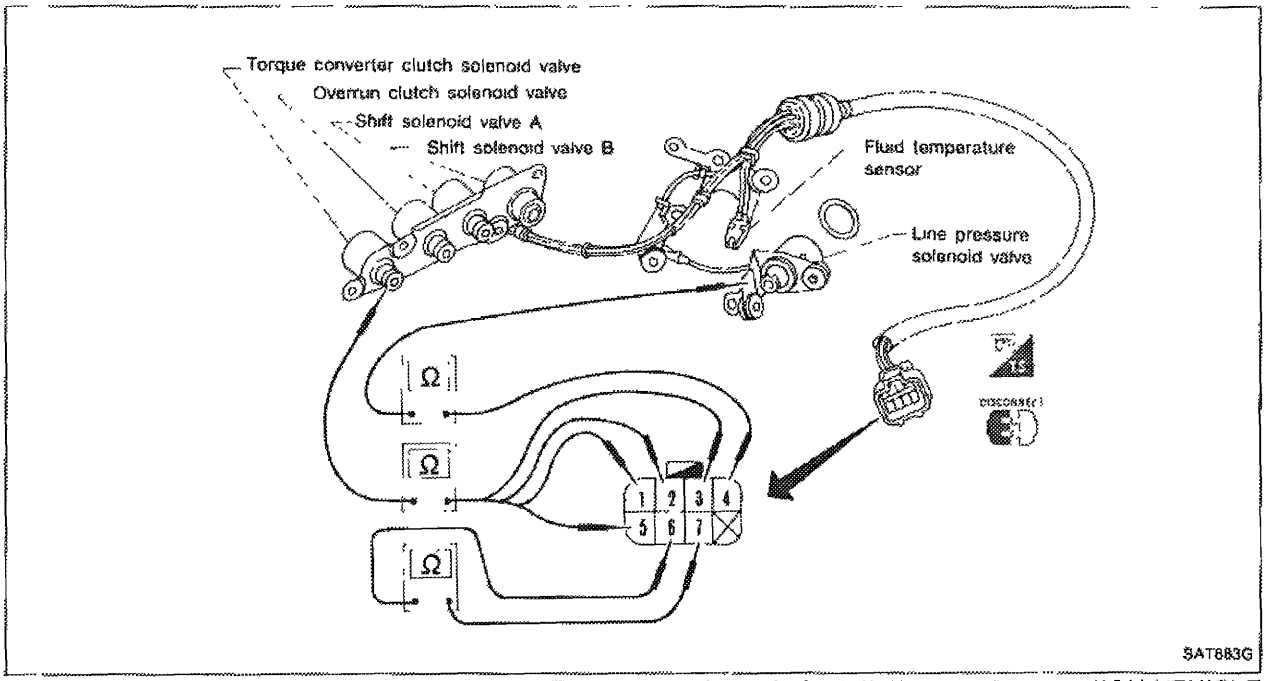
*: These terminals are connected to the data link connector for CONSULT.

Electrical Components Inspection (Cont'd)

Terminal No.	Item	Condition		Judgement standard
33	Fluid temperature sensor		When A.T.F. temperature is 20°C (68°F).	1.56V
			When A.T.F. temperature is 80°C (176°F)	0.45V
34	Throttle position sensor		When depressing accelerator pedal slowly after warming up engine (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: 0.2 - 0.6V Fully-open throttle: 2.9 - 3.9V
35	Throttle position sensor (Ground)		—	—
36	A/T mode switch "POWER"		When setting A/T mode switch in "POWER" position	Battery voltage
			When setting A/T mode switch except in "POWER" position	1V or less
37	A.S.C.D. cruise signal		When A.S.C.D. cruise is being performed. ("CRUISE" light comes on.)	Battery voltage
			When A.S.C.D. cruise is not being performed. ("CRUISE" light does not comes on.)	1V or less
38	—		—	—
39	Overdrive OFF indicator lamp		When setting overdrive switch in "ON" position	Battery voltage
			When setting overdrive switch in "OFF" position	1V or less
40	A.S.C.D. O.D. cut signal		When "ACCEL" set switch on A.S.C.D. cruise is released	5 - 8V
			When "ACCEL" set switch on A.S.C.D. cruise is applied.	1V or less
41	—		—	—
42	A/T mode switch "COMFORT"		When setting A/T mode switch in "COMFORT" position	Battery voltage
			When setting A/T mode switch except in "COMFORT" position	1V or less
43	—		—	—
44	—		—	—
45	—		—	—
46	—		—	—
47	—		—	—
48	Ground		—	—

Electrical Components Inspection (Cont'd)

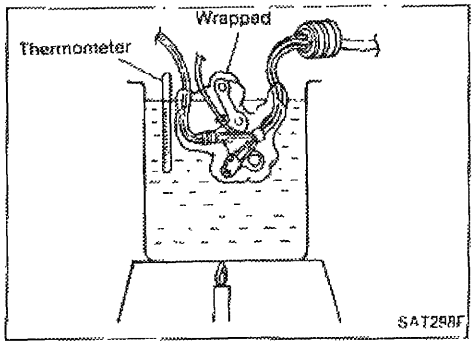
SOLENOID VALVES AND FLUID TEMPERATURE SENSOR



- For removal and installation, refer to "ON-VEHICLE SERVICE".
- Check resistance between two terminals.

Solenoid valves

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve A	②	Ground (Bracket)	25Ω
Shift solenoid valve B	①		
Overrun clutch solenoid valve	③		
Line pressure solenoid valve	④		3.2Ω
Torque converter clutch solenoid valve	⑤		13.4Ω

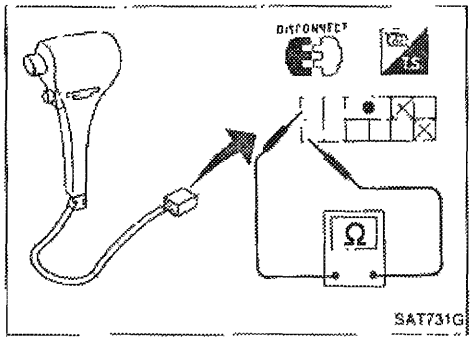


Fluid temperature sensor

Check resistance between terminals ⑥ and ⑦ while changing temperature as shown at left.

Temperature °C (°F)	Resistance (Approx.)
20 (68)	2.5 kΩ
80 (176)	0.3 kΩ

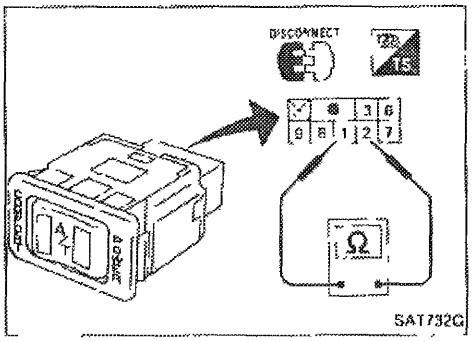
Electrical Components Inspection (Cont'd)



OVERDRIVE SWITCH

- Check continuity between two terminals.

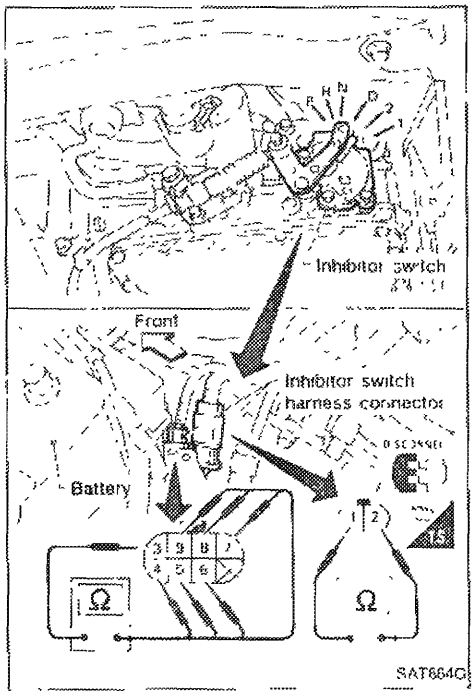
O.D switch position	Continuity
ON	No
OFF	Yes



A/T MODE SWITCH

- Check continuity between A/T mode switch terminals.

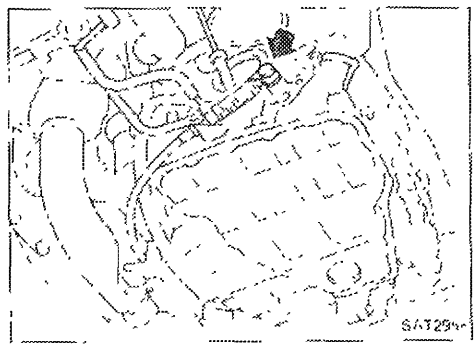
A/T mode switch position	Continuity
POWER	② - ③
AUTO	No
COMFORT	① - ②



INHIBITOR SWITCH

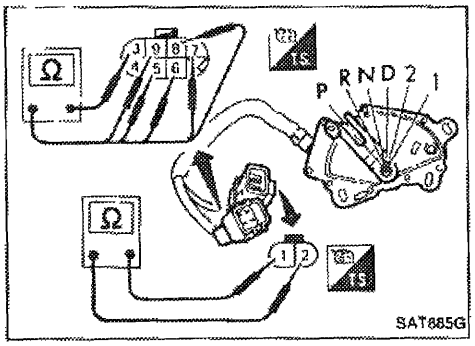
1. Check continuity between terminals ① and ② and between terminals ③ and ④, ⑤, ⑥, ⑦, ⑧, ⑨ while moving selector lever through each range.

Lever position	Terminal No								
	①	②	③	④	⑤	⑥	⑦	⑧	⑨
P	○								
R			○		○				
N			○						
D			○				○		
2			○					○	
1			○					○	○

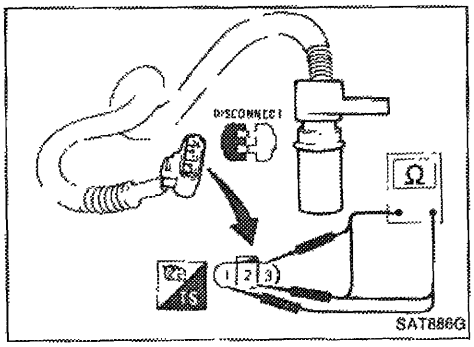


2. If N.G., check again with control cable disconnected from manual shaft of A/T assembly. ⋯ Refer to step 1.
3. If O.K. on step 2, adjust control cable. — Refer to "ON-VEHICLE SERVICE".

Electrical Components Inspection (Cont'd)



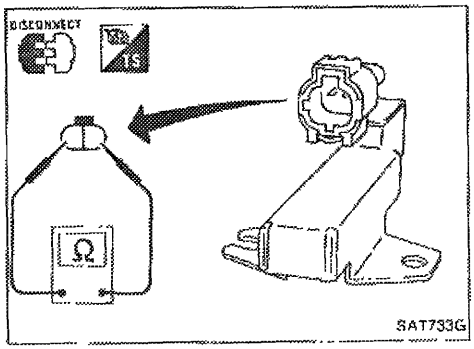
4. If N.G. on step 2, remove inhibitor switch from A/T and check continuity of inhibitor switch terminals. — Refer to step 1.
5. If O.K. on step 4, adjust inhibitor switch. — Refer to "ON-VEHICLE SERVICE".
6. If N.G. on step 4, replace inhibitor switch.



REVOLUTION SENSOR

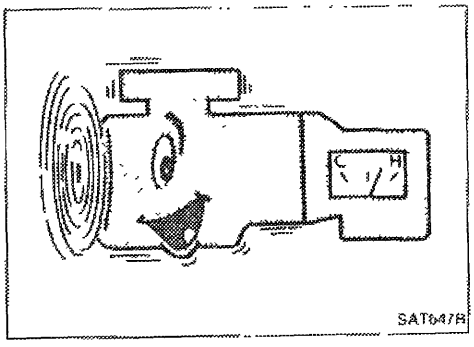
- For removal and installation, refer to "ON-VEHICLE SERVICE".
- Check resistance between terminals ①, ② and ③.

Terminal No.		Resistance
①	②	500 - 650Ω
②	③	No continuity
①	③	No continuity



DROPPING RESISTOR

- Check resistance between two terminals.
  Resistance: 11.2 - 12.8Ω

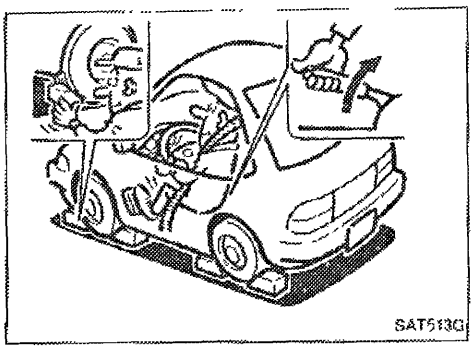


Final Check

STALL TESTING

Stall test procedure

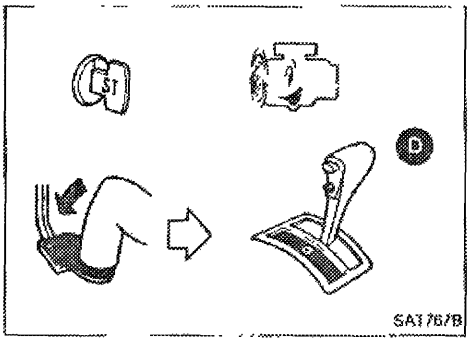
1. Check A/T and engine fluid levels. If necessary, add.
2. Warm up engine until engine oil and A.T.F. reach operating temperature after vehicle has been driven approx. 10 minutes.
   A.T.F. operating temperature:
   50 - 80°C (122 - 176°F)



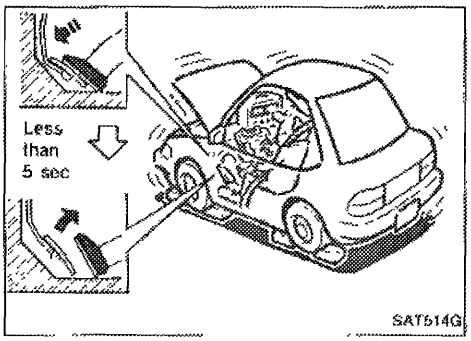
3. Set parking brake and block wheels.
4. Install a tachometer where it can be seen by driver during test

- **It is good practice to put a mark on point of specified engine rpm on indicator.**

Final Check (Cont'd)



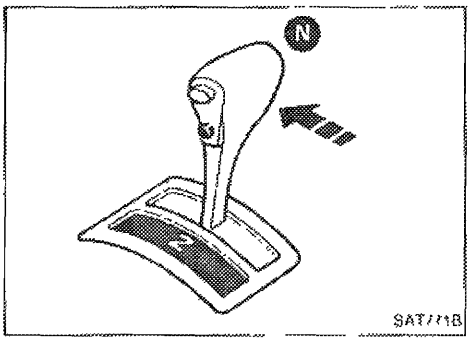
5. Start engine, apply foot brake, and place selector lever in "D" position.



6. Accelerate to wide-open throttle gradually while applying foot brake.
7. Quickly note the engine stall revolution and immediately release throttle.

- **During test, never hold throttle wide-open for more than 5 seconds.**

Stall revolution:
1,900 - 2,200 rpm



8 Shift selector lever to "N" position
9. Cool off A.T.F

- **Run engine at idle for at least one minute.**

10. Perform stall tests in the same manner as in steps 5 through 9 with selector lever in "2", "1" and "R" positions, respectively.

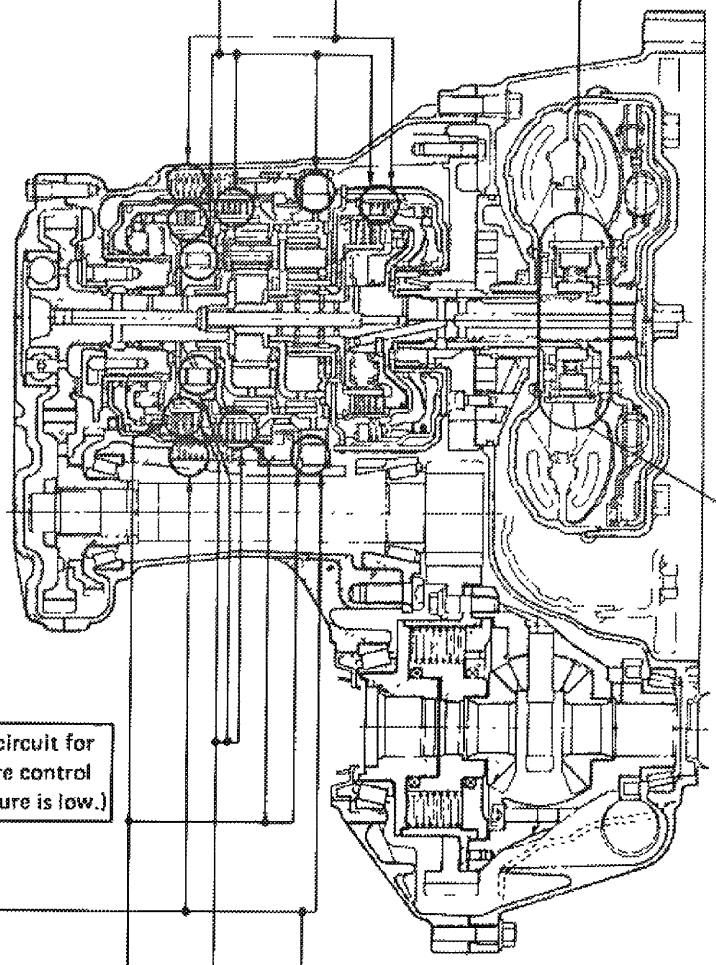
Final Check (Cont'd)

Judgement of stall test

Selector lever position	Judgement		
D	H	O	L
2	H	O	L
1	O	O	L
R	H	H	L

O : Stall revolution is normal.
H : Stall revolution is higher than specified.
L : Stall revolution is lower than specified.

Damaged components



Engine

Torque converter one-way clutch

Hydraulic circuit for line pressure control (Line pressure is low.)

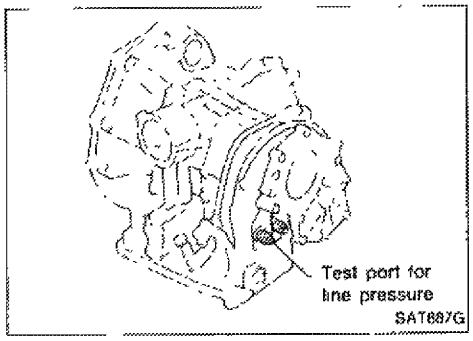
Clutch and brakes except high clutch and brake band are O.K. (Condition of high clutch and brake band cannot be confirmed by stall test.)

Selector lever position	Judgement			
D	H	H	H	O
2	H	H	H	O
1	O	H	H	O
R	O	O	H	O

SAT300F

Final Check (Cont'd)

PRESSURE TESTING

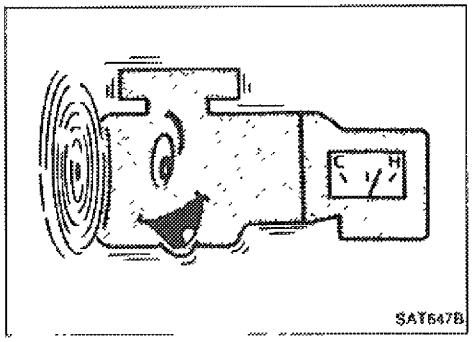


- Location of pressure test ports.
- **Always replace pressure plugs as they are self-sealing bolts.**

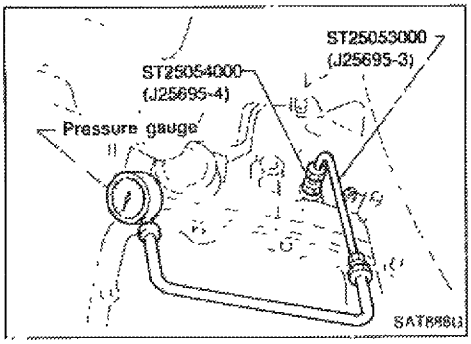
Line pressure test procedure

1. Check A/T and engine fluid levels. If necessary, add fluid.
2. Warm up engine until engine oil and A.T.F. reach operating temperature after vehicle has been driven approx. 10 minutes.

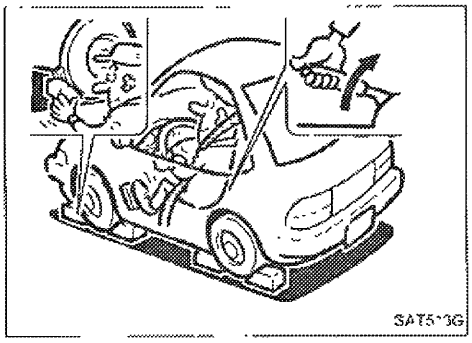
   A.T.F. operating temperature:
   50 - 80°C (122 - 176°F)



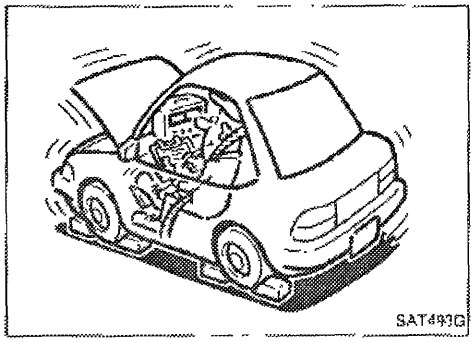
3. Install pressure gauge to corresponding line pressure port.



4. Set parking brake and block wheels.
- **Continue to depress brake pedal fully while line pressure test is being performed at stall speed.**



Final Check (Cont'd)



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 S.D.S.

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
	Line pressure is low in particular position	• Fluid pressure leakage between manual valve and particular clutch • For example If line pressure is low in "R" and "1" positions but is normal in "D" and "2" positions, fluid leakage exists at or around low & reverse brake circuit
	Line pressure is high	• Mal-adjustment 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
At stall speed	Line pressure is low	• Mal-adjustment 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

Symptom Chart

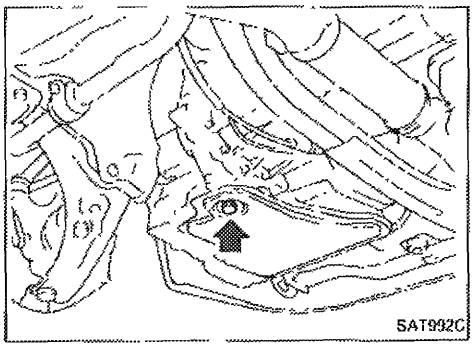
Reference page (AT-)	Numbers are arranged in order of probability. Perform inspections starting with number one and work up. Circled numbers indicate that the transaxle must be removed from the vehicle	ON vehicle: Fluid level	Control cable	Inhibitor switch	Throttle position sensor (Adjustment)	Revolution sensor and vehicle speed sensor	Engine speed signal	Engine idling rpm	Line pressure	Control valve assembly	Shift solenoid valve A	Shift solenoid valve B	Line pressure solenoid valve	Torque converter clutch solenoid valve	Overrun clutch solenoid valve	Fluid temperature sensor	Accumulator N-D	Accumulator servo release	Ignition switch and starter	OFF vehicle: Torque converter	Oil pump	Reverse clutch	High clutch	Forward clutch	Forward one-way clutch	Overrun clutch	Low one-way clutch	Low & reverse brake	Brake band	Parking components
Reference page		14 84		84		38, 39, 87		48		41, 63		42, 48		43, 44		45, 83		83		94, 110		129, 133		138, 148		138		144, 157		—
55	Engine does not start in "N", "P" positions		2	3														1												
55	Engine starts in positions other than "N" and "P"		1	2																										
—	Transaxle noise in "P" and "N" positions	1			3	4	5		2											(7)	(6)									
55	Vehicle moves when changing into "P" position or parking gear does not disengage when shifted out of "P" position		1																											(2)
56	Vehicle runs in "N" position		1																			(3)		(2)		(4)				
56	Vehicle will not run in "R" position (but runs in "D", "2" and "1" positions). Clutch slips. Very poor acceleration		1						2	4			3									(5)	(6)	(7)		(8)		(9)		
—	Vehicle braked when shifting into "R" position	1	2						1	5			4										(6)	(8)		(9)			(7)	
—	Sharp shock in shifting from "N" to "D" position				2		5	1	3	7			6			4	8							(9)						
—	Vehicle will not run in "D" and "2" positions (but runs in "1" and "R" positions)		1																							(2)				
59	Vehicle will not run in "D", "1", "2" positions (but runs in "R" position). Clutch slips. Very poor acceleration	1							2	4			3				5					(6)	(7)	(8)	(9)		(10)			
—	Clutches or brakes slip somewhat in starting	1	2		3				4	6			5				7			(12)	(11)	(9)		(8)				(10)		
-	Excessive creep							1																						
58, 59	No creep at all	1							2	3										(5)	(5)			(4)						
—	Failure to change gear from "D_1" to "D_2"		2	1		5				4	3																	(6)		
—	Failure to change gear from "D_2" to "D_3"		2	1		5				4		3											(6)					(7)		
—	Failure to change gear from "D_3" to "D_4"		2	1		4					3					5												(6)		
61, 62, 63	Too high a gear change point from "D_1" to "D_2", from "D_2" to "D_3", from "D_3" to "D_4"				3	2					3	4																		
	Gear change directly from "D_1" to "D_4" occurs	1																2											(3)	
—	Engine stops when shifting lever into "R", "D", "2" and "1"							1		3			2							(4)										
—	Too sharp a shock in change from "D_1" to "D_2"								2	4						5		3											(6)	
—	Too sharp a shock in change from "D_2" to "D_3"				1				2	3													(4)						(5)	

Symptom Chart (Cont'd)

		ON vehicle									OFF vehicle					
Reference page (AT-)		14, 84	84	38, 39, 41	48	41, 83	42, 48	43, 44	45, 83	81	94, 110	129, 133	138, 148	138	144, 157	—
Reference page (AT-)	Numbers are arranged in order of probability. Perform inspections starting with number one and work up. Circled numbers indicate that the transaxle must be removed from the vehicle.	Fluid level / Control cable	Inhibitor switch	Throttle position sensor (Adjustment) / Revolution sensor and vehicle speed sensor / Engine speed signal	Engine idling rpm / Line pressure	Control valve assembly / Shift solenoid valve A	Shift solenoid valve B / Line pressure solenoid valve	Torque converter clutch solenoid valve / Overrun clutch solenoid valve	Fluid temperature sensor / Accumulator N-D	Accumulator servo release / Ignition switch and starter	Torque converter / Oil pump	Reverse clutch / High & low clutch	Forward clutch / Forward one-way clutch	Overrun clutch / Low one-way clutch	Low & reverse brake / Brake band	Parking components
—	Too sharp a shock in change from "D_3" to "D_2"		1		2	3								(5)	(4)	
—	Almost no shock or clutches slipping in change from "D_4" to "D_3"	1	2		3	5				4					(6)	
—	Almost no shock or slipping in change from "D_3" to "D_2"	1	2		3	4						(5)			(6)	
—	Almost no shock or slipping in change from "D_2" to "D_1"	1	2		3	4						(5)			(6)	
—	Vehicle braked by gear change from "D_4" to "D_3"	1										(2) (4)		(5)	(3)	
—	Vehicle braked by gear change from "D_3" to "D_2"	1													(2)	
—	Vehicle braked by gear change from "D_2" to "D_1"	1										(4)	(3)	(2)		
—	Maximum speed not attained. Acceleration poor	1	2			6 3	4				(11) (10)	(9) (7)			(8) (8)	
—	Failure to change gear from "D_4" to "D_3"	1	2			6 4	5	3						(8)	(7)	
—	Failure to change gear from "D_3" to "D_2" or from "D_4" to "D_2"	1	2			5 3	4					(6)			(7)	
—	Failure to change gear from "D_2" to "D_1" or from "D_3" to "D_1"	1	2			5 3	4					(7)		(6)	(8)	
—	Gear change shock felt during deceleration by releasing accelerator pedal		1		2	4		3								
—	Too high a change point from "D_4" to "D_3", from "D_3" to "D_2", from "D_2" to "D_1"		1	2												
—	Kickdown does not operate when depressing pedal in "D_4" within kickdown vehicle speed		1	2		3	4									
—	Kickdown operates or engine overruns when depressing pedal in "D_4" beyond kickdown vehicle speed limit		2	1		3	4									
—	Races extremely fast or slips in changing from "D_4" to "D_3" when depressing pedal	1	2		3	5	4					(6)	(5)			
—	Races extremely fast or slips in changing from "D_4" to "D_2" when depressing pedal	1	2		3	6 5	4						(8)		(7)	
—	Races extremely fast or slips in changing from "D_3" to "D_2" when depressing pedal	1	2		3	5	4		6			(8)	(7)		(6)	
—	Races extremely fast or slips in changing from "D_4" or "D_3" to "D_1" when depressing pedal	1	2		3	6	4						(8) (7)	(8)		
—	Vehicle will not run in any position	1 2			3		4				(9) (5)	(6)			(6) (7)	(10)
—	Transaxle noise in "D", "2", "1" and "R" positions	1									(2)					

Symptom Chart (Cont'd)

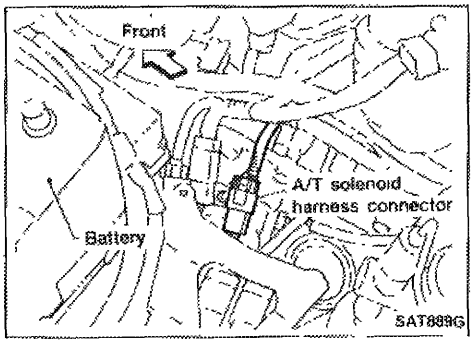
Reference page (AT--)		ON vehicle										OFF vehicle					
		14, 84	84	38, 39, 41	48	41, 83	42, 48	43, 44	45, 83	83	94, 110	129, 133	138, 148	138	144, 157	---
Reference page (AT--)	Numbers are arranged in order of probability. Perform inspections starting with number one and work up. Circled numbers indicate that the transaxle must be removed from the vehicle.	Fluid level / Control cable	Inhibitor switch / Throttle position sensor (Adjustment)	Revolution sensor and vehicle speed sensor / Engine speed signal	Engine idling rpm / Line pressure	Control valve assembly / Shift solenoid valve A	Shift solenoid valve B / Line pressure solenoid valve	Torque converter clutch solenoid valve / Overrun clutch solenoid valve	Fluid temperature sensor / Accumulator N-D	Accumulator servo release / Ignition switch and starter	Torque converter / Oil pump	Reverse clutch / High clutch	Forward clutch / Forward one-way clutch	Overrun clutch / Low one-way clutch	Low & reverse brake / Brake band	Parking components
66	Failure to change from "D_1" to "2_1" when changing lever into "2" position	7	1 2			5 6	4	3						⑨	⑨	
—	Gear change from "2_2" to "2_3" in "2" position		1													
68	Engine brake does not operate in "1" position	2	1 3	4		5 5		7						⑧	⑥	
--	Gear change from "1_1" to "1_2" in "1" position	2	1													
—	Does not change from "1_2" to "1_1" in "1" position		1	2		4 3		5						⑩	⑦	
—	Large shock changing from "1_2" to "1_1" in "1" position					1									⑧	
-	Transaxle overheats	1	3		2 4	6	5				⑩ ⑦	⑧ ⑨	⑪	⑫	⑪ ⑩	
---	ATF shoots out during operation. White smoke emitted from exhaust pipe during operation	1						1				② ③	⑤	⑥	⑦ ④	
—	Offensive smell at fluid charging pipe	1									② ③	④ ⑤	⑦	⑥	⑨ ⑤	
---	Torque converter is not locked up		3 1	2 4	6	6		7	5		⑨					
---	Lock-up piston slip	1	2		3	6	5	4			⑦					
64	Lock-up point is extremely high or low		1	2		4		3								
--	A/T does not shift to "D_4" when driving with overdrive switch "ON"		2 1	3	8	6 4		5	7					⑩	⑨	
—	Engine is stopped at "R", "D", "2" and "1" positions	1				5 4	3	2								



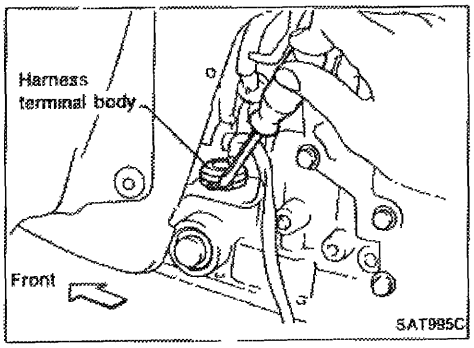
Control Valve Assembly and Accumulator

REMOVAL

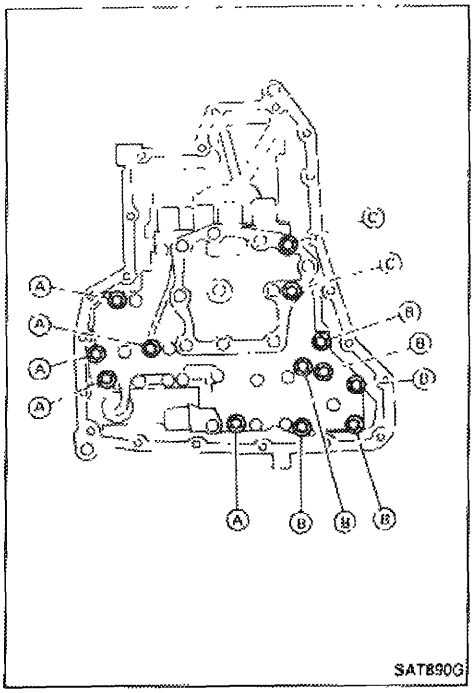
1. Drain A.T.F. from transaxle.
2. Remove oil pan and gasket.



3. Disconnect A/T solenoid harness connector.



4. Remove stopper ring from A/T solenoid harness terminal body.
5. Remove A/T solenoid harness by pushing terminal body into transmission case.



6. Remove control valve assembly by removing fixing bolts.

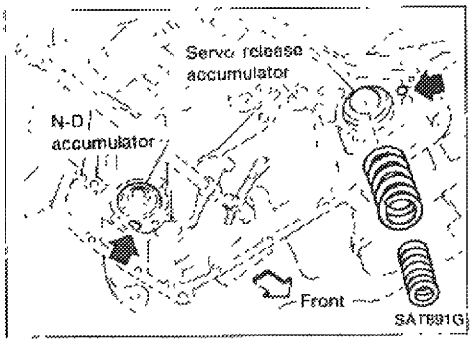
Bolt length, number and location:

Bolt symbol	A	B	C
Bolt length "ℓ" mm (in)	40.0 (1.575)	33.0 (1.299)	43.5 (1.713)
Number of bolts	5	6	2

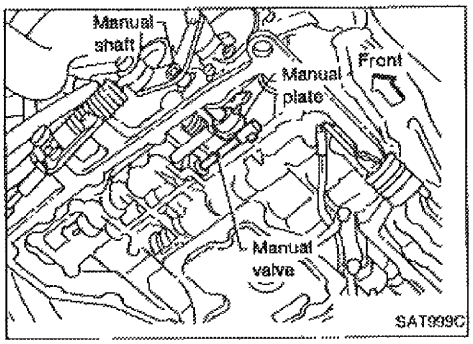
- **Be careful not to drop manual valve and servo release accumulator return springs.**

7. Disassemble and inspect control valve assembly if necessary — Refer to "REPAIR FOR COMPONENT PARTS".

Control Valve Assembly and Accumulator (Cont'd)



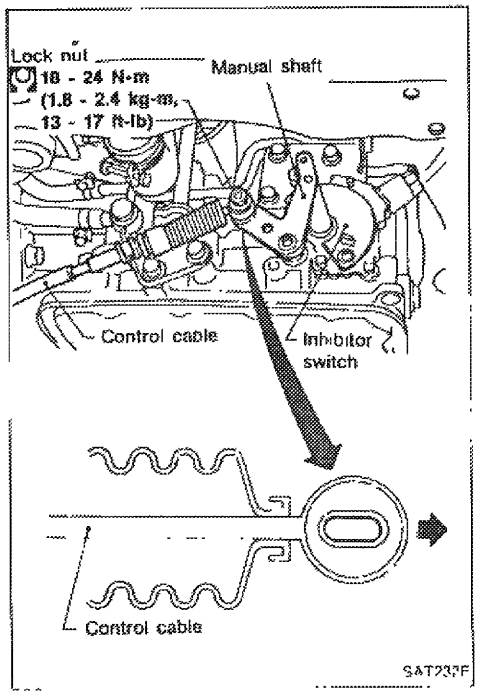
8. Remove servo release and N-D accumulators by applying compressed air if necessary.
   - **Hold each piston with a rag.**



INSTALLATION

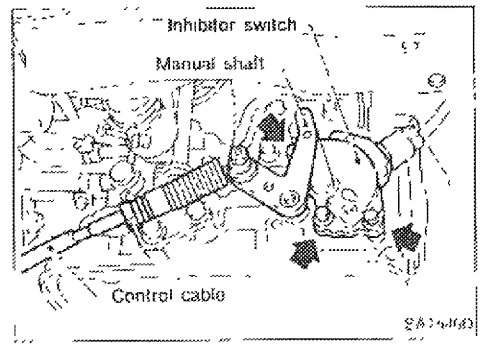
- **Set manual shaft in Neutral position, then align manual plate with groove in manual valve.**
- **After installing control valve assembly to transmission case, make sure that selector lever can be moved to all positions.**

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.

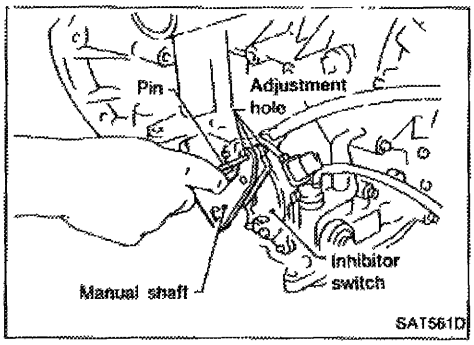
1. Place selector lever in "P" position.
2. Loosen control cable lock nut and place manual shaft in "P" position.
3. Pull control cable in the direction of the arrow shown in the illustration by specified force.
   Specified force: 6.9 N (0.7 kg, 1.5 lb)
4. Return control cable in the opposite direction of the arrow for 1.0 mm (0.039 in).
5. Tighten control cable lock nut.
6. Move selector lever from "P" position to "1" position and make sure that selector lever can be moved smoothly and without any sliding noise.
7. Apply grease to contacting areas of selector lever and control cable. Install any part removed.



Inhibitor Switch Adjustment

1. Remove control cable end from manual shaft.
2. Set manual shaft in "N" position.
3. Loosen inhibitor switch fixing bolts

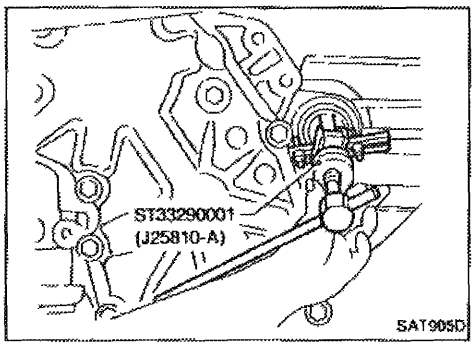
Inhibitor Switch Adjustment (Cont'd)

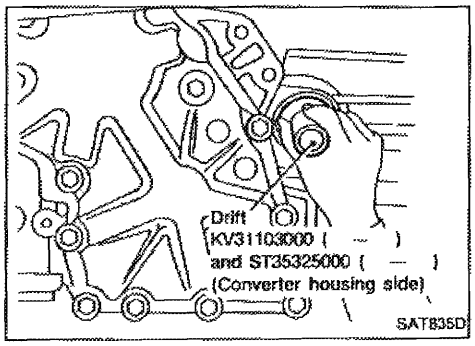


4. Insert 4.0 mm (0.157 in) dia pin into adjustment hole in both inhibitor switch and manual shaft as near vertically as possible.
5. Tighten inhibitor switch fixing bolts.
6. Remove pin from adjustment hole after adjusting inhibitor switch.
7. Reinstall any part removed.
8. Adjust control cable — Refer to "Control Cable Adjustment".
9 Check continuity of inhibitor switch — Refer to "TROUBLE DIAGNOSES".

Differential Side Oil Seal Replacement

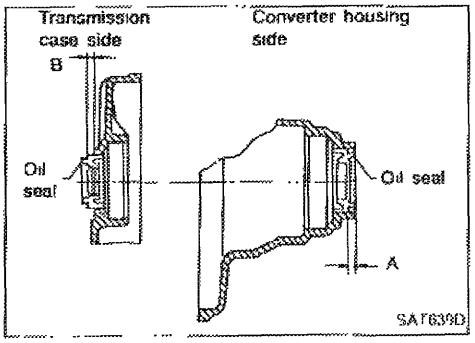
1. Remove drive shaft assemblies. — Refer to section FA.
2. Remove oil seals.





3. Install oil seals.

- **Apply A.T.F. to oil seal surface before installing.**



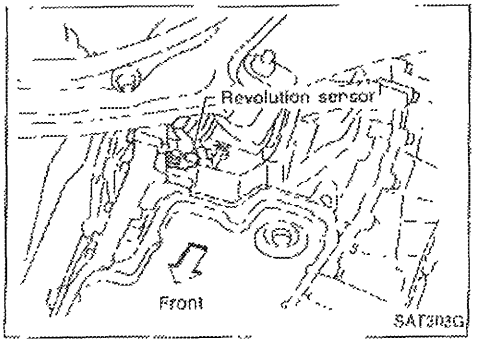
- **Install oil seals so that dimensions "A" and "B" are within specifications.**

Unit: mm (in)

A	B
5.5 - 6.5 (0.217 - 0.256)	0.5 (0.020) or less

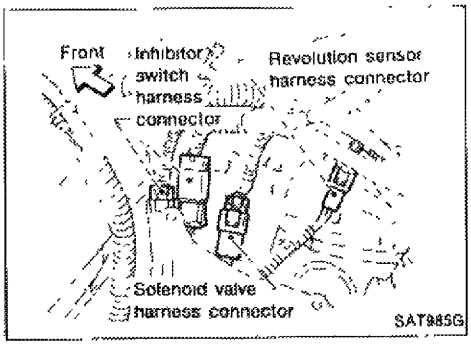
4. Reinstall any part removed.

Revolution Sensor Replacement



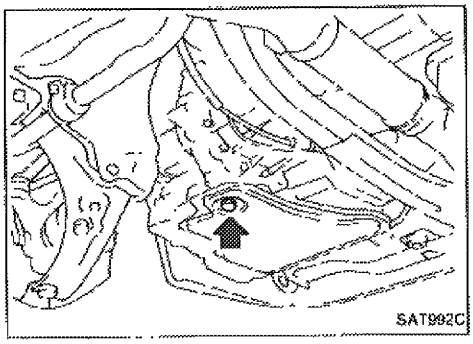
1. Disconnect revolution sensor harness connector.
2. Remove revolution sensor from A/T.
3. Reinstall any part removed.

Always use new sealing parts.

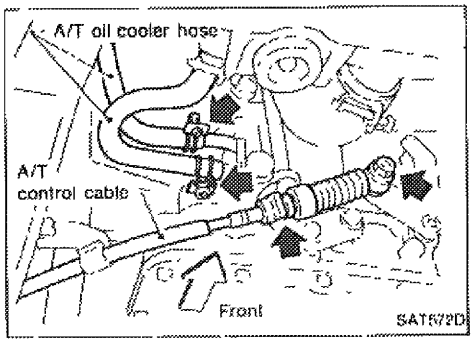


Removal

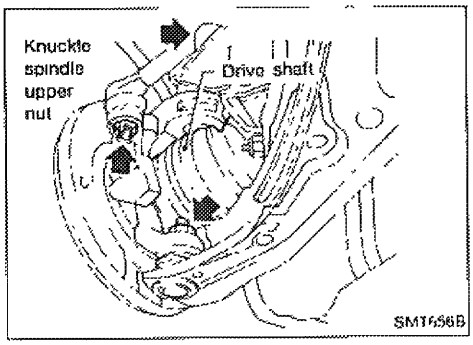
- Remove battery and bracket.
- Remove air duct
- Disconnect solenoid valve harness connector, inhibitor switch harness connector and revolution sensor harness connector.



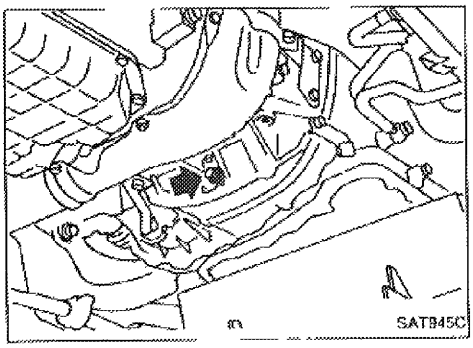
- Drain A T.F. from transaxle.



- Disconnect control cable from transaxle.
- Disconnect oil cooler hoses.



- Remove drive shafts — Refer to "Section FA".
- Remove front exhaust tube.
- Remove starter motor from transaxle



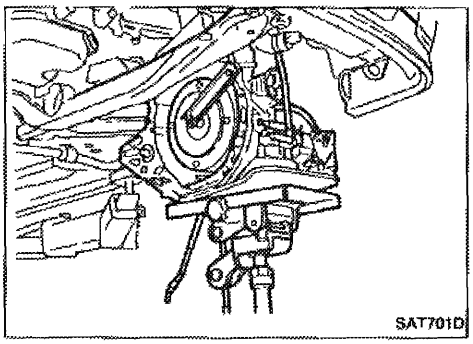
- Remove rear plate cover.
- Remove bolts securing torque converter to drive plate.

Rotate crankshaft for access to securing bolts.

- Support engine by placing a jack under oil pan.

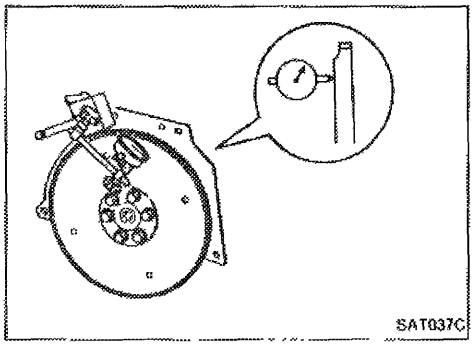
Do not place jack under oil pan drain plug.

Removal (Cont'd)

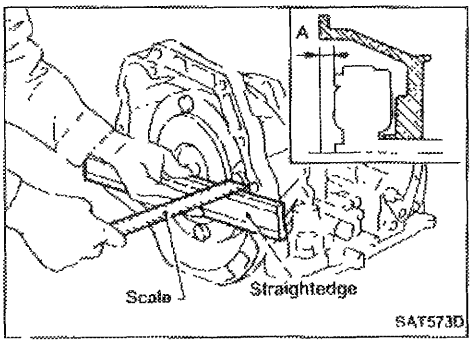


- Support transaxle with a jack.
- Remove mountings from transaxle.
- Remove bolts fixing A/T to engine.
- Lower transaxle while supporting it with a jack.

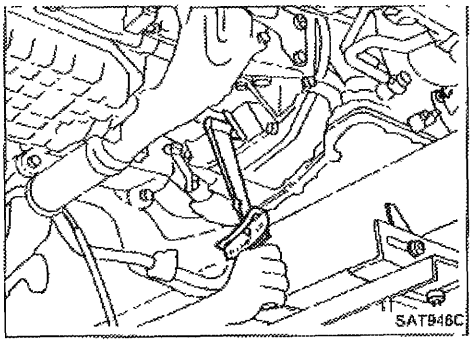
Installation



- Drive plate runout
  Maximum allowable runout:
  0.2 mm (0.008 in)
  If this runout is out of specification, replace drive plate with ring gear.

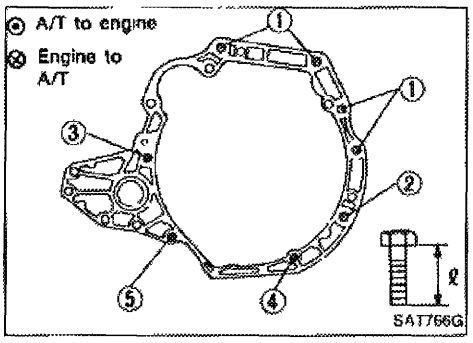


- When connecting torque converter to transaxle, measure distance "A" to be certain that they are correctly assembled.
  Distance "A":
  15.9 mm (0.626 in) or more



- Install torque converter to drive plate.
- **After installing converter to drive plate, rotate crankshaft several turns and check to be sure that transaxle rotates freely without binding.**

Installation (Cont'd)

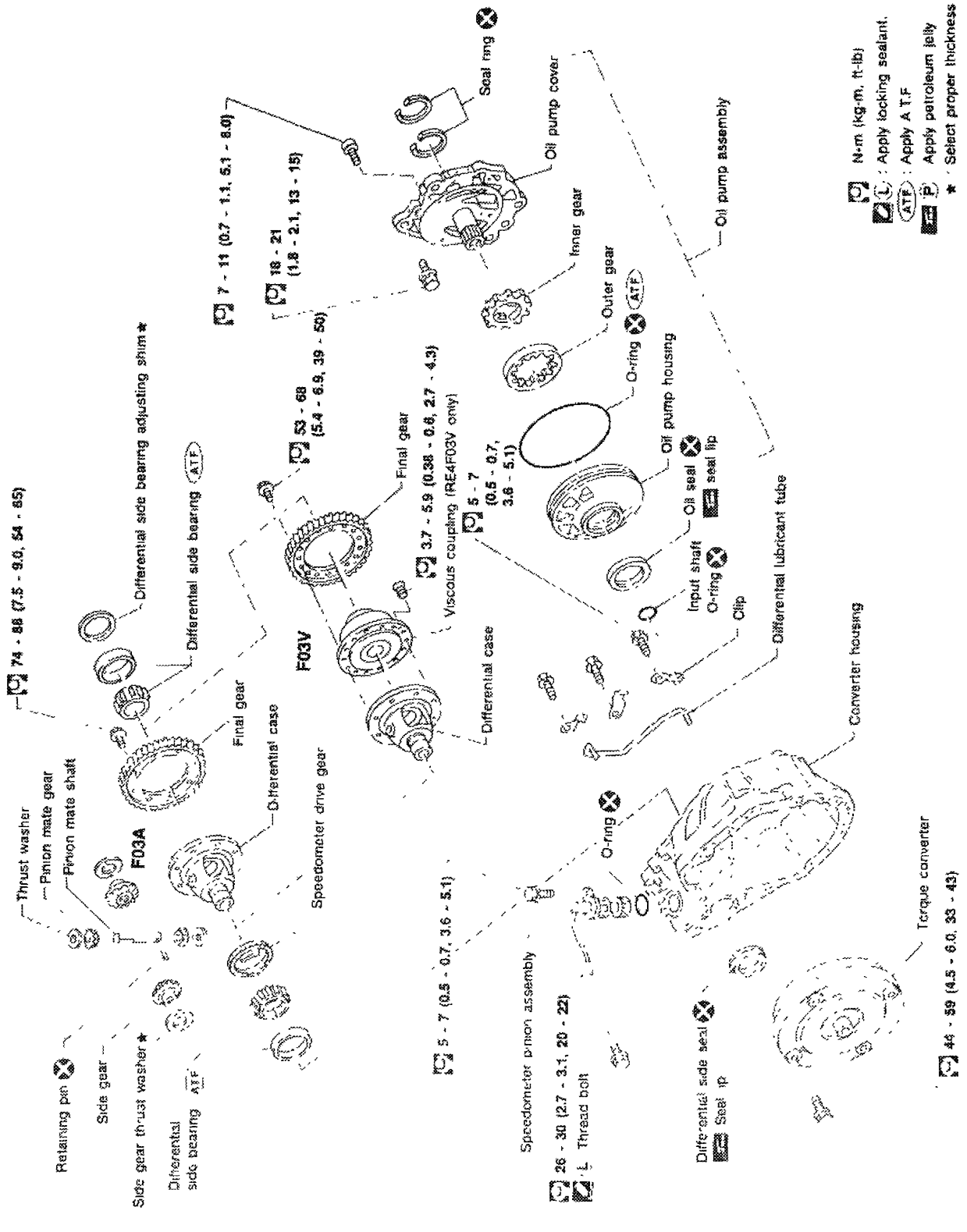


- Tighten bolts fixing transaxle

Bolt No.	Tightening torque N·m (kg-m, ft-lb)	Bolt length "ℓ" mm (in)
①	70 - 79 (7.1 - 8.1, 51 - 59)	55 (2.17)
②	70 - 79 (7.1 - 8.1, 51 - 59)	50 (1.97)
③	70 - 79 (7.1 - 8.1, 51 - 59)	65 (2.56)
④	16 - 21 (1.6 - 2.1, 12 - 15)	35 (1.38)
⑤	16 - 21 (1.6 - 2.1, 12 - 15)	45 (1.77)

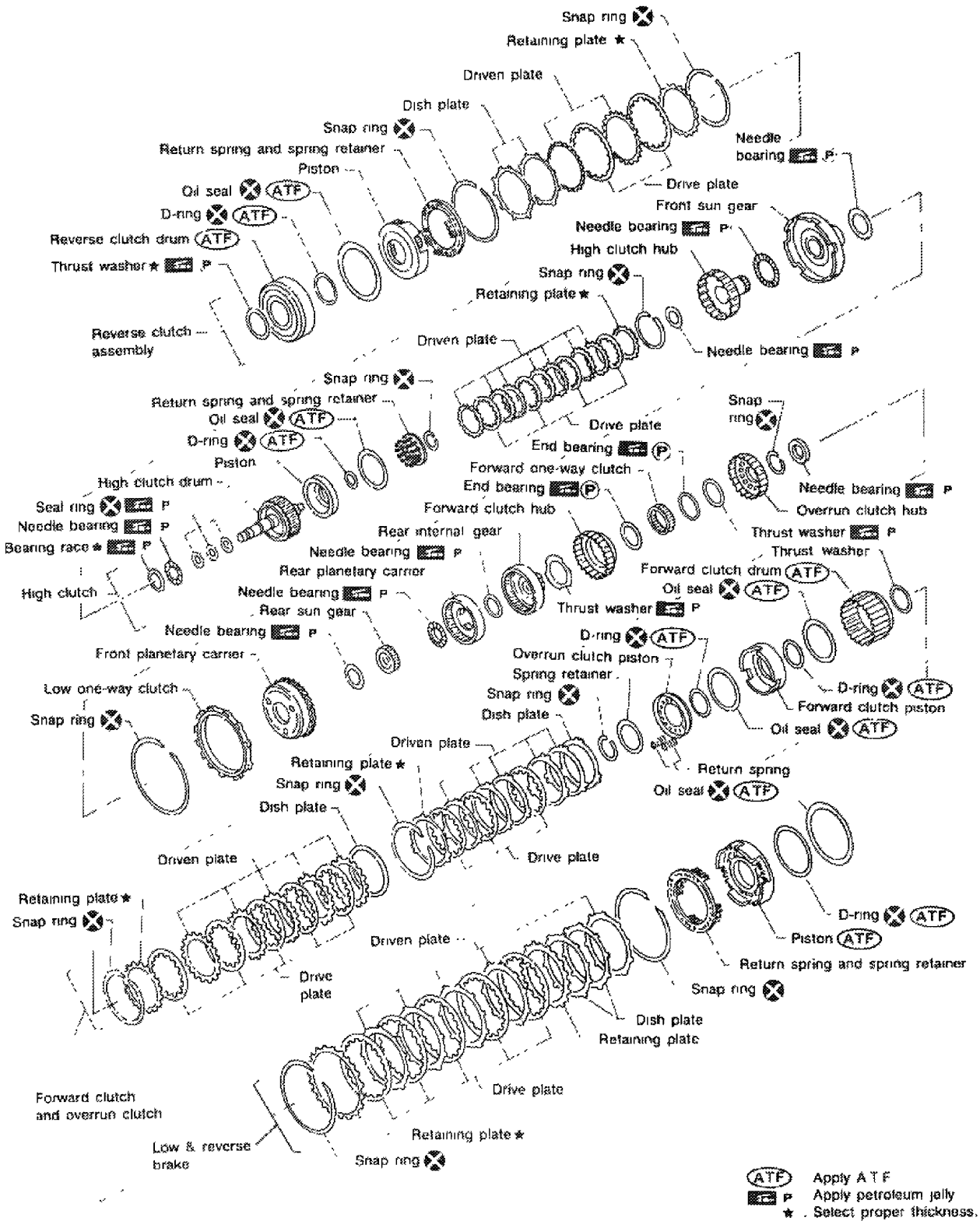
- Reinstall any part removed.
- Adjust control cable. Refer to ON-VEHICLE SERVICE.
- Check continuity of inhibitor switch. Refer to TROUBLE DIAGNOSES.
- Refill transaxle with A.T.F. and check fluid level.
- Move selector lever through all positions to be sure that transaxle operates correctly. With parking brake applied, idle engine. Move selector lever through "N" to "D", to "2", to "1" and "R" positions. A slight shock should be felt through the hand gripping the selector each time the transaxle is shifted.
- Perform road test — Refer to "ROAD TESTING".

RE4F03A and RE4F03V



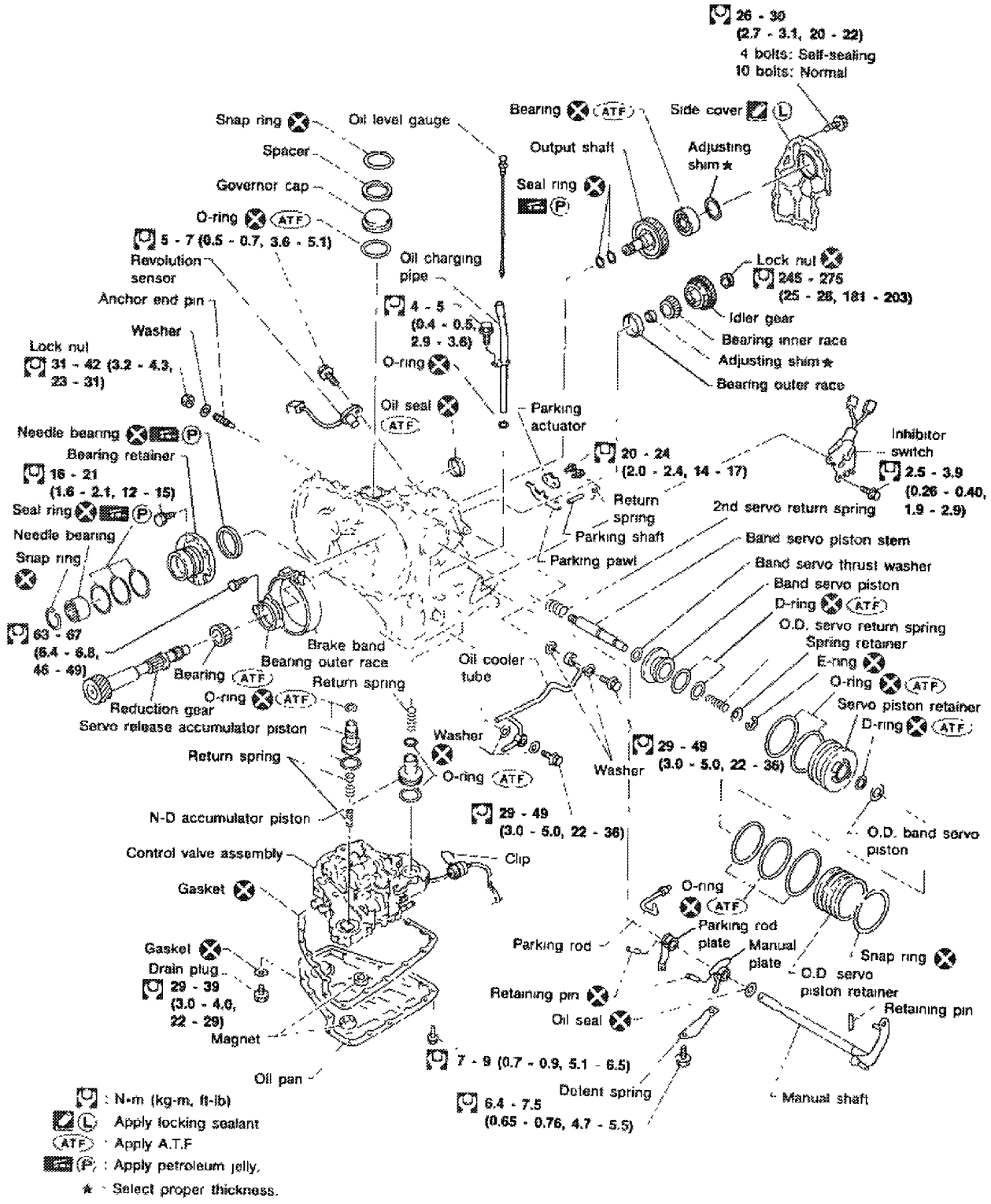
SAT947G

RE4F03A and RE4F03V (Cont'd)



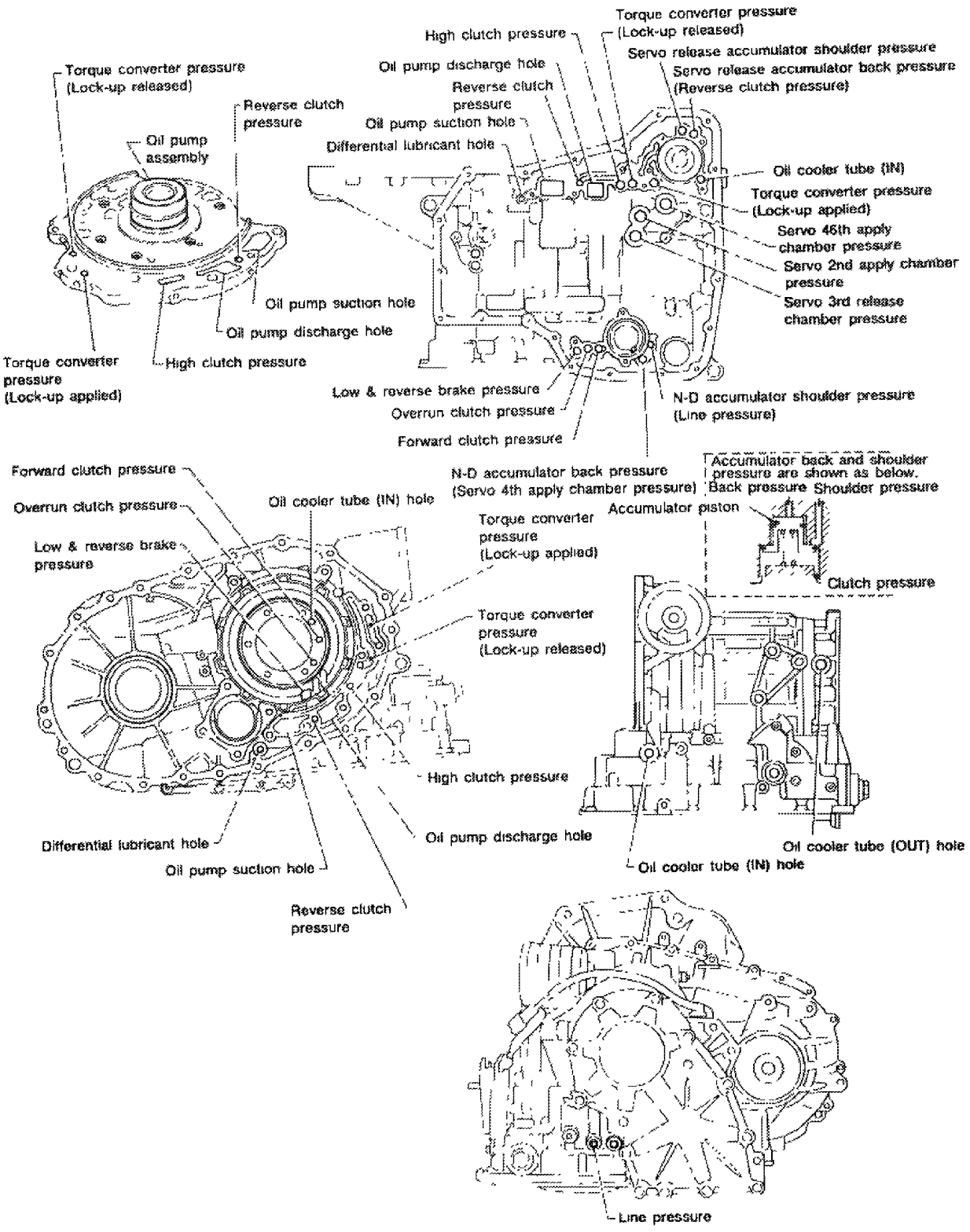
SAT948G

RE4F03A and RE4F03V (Cont'd)



SAT949G

Oil Channel



SAT894G

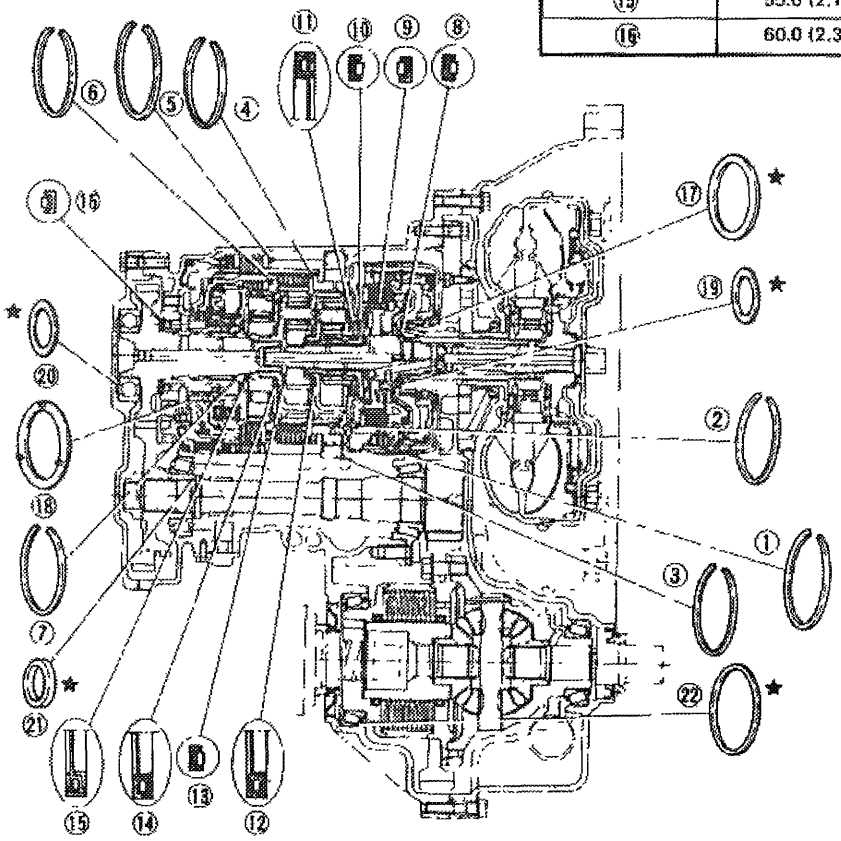
Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

Outer diameter and color of thrust washers

Item number	Outer diameter mm (in)	Color
⑰	72.0 (2.835)	Black
⑱	78.5 (3.091)	

Outer & inner diameter of needle bearings

Item number	Outer diameter mm (in)	Inner diameter mm (in)
⑧	47.0 (1.850)	32.0 (1.260)
⑨	35.0 (1.378)	20.0 (0.787)
⑩	60.0 (2.362)	42.0 (1.654)
⑪	60.0 (2.362)	45.0 (1.772)
⑫	47.0 (1.850)	30.0 (1.181)
⑬	42.6 (1.677)	26.0 (1.024)
⑭	48.0 (1.890)	33.5 (1.319)
⑮	55.0 (2.165)	40.5 (1.594)
⑯	60.0 (2.362)	40.0 (1.575)



★: Select proper thickness

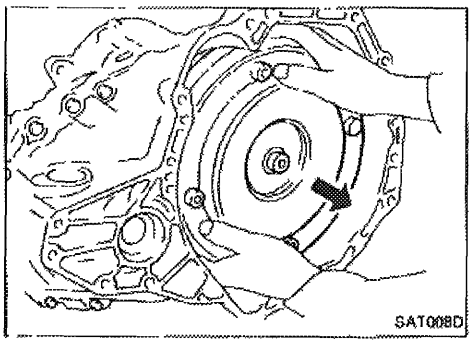
Outer & inner diameter of bearing race and adjusting shims

Item number	Outer diameter mm (in)	Inner diameter mm (in)
⑲	48.0 (1.890)	33.0 (1.299)
⑳	72.0 (2.835)	61.0 (2.402)
㉑	34.5 (1.358)	26.1 (1.028)
㉒	105.0 (4.13)	96.0 (3.78)

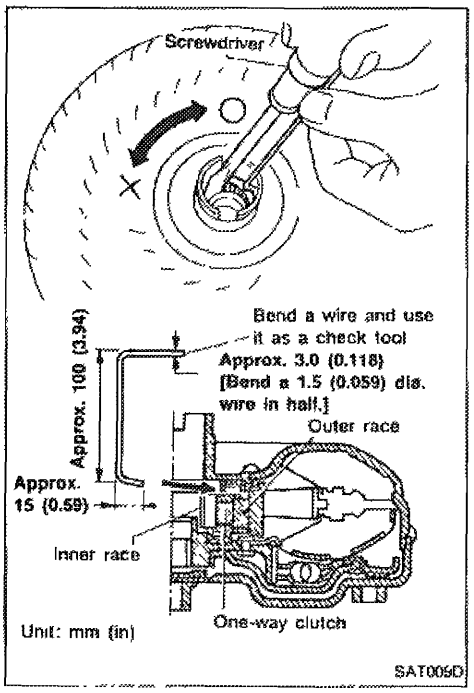
Outer diameter of snap rings

Item number	Out diameter mm (in)
①	142.0 (5.59)
②	113.0 (4.45)
③	162.4 (6.39)
④	135.4 (5.33)
⑤	159.0 (6.26)
⑥	126.0 (4.96)
⑦	40.5 (1.594)

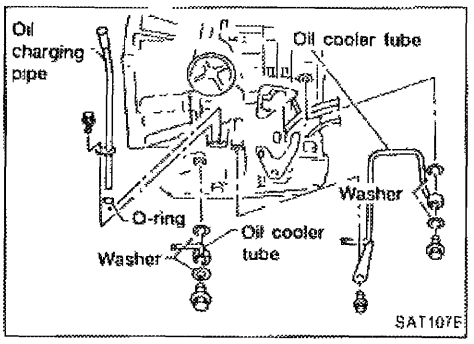
SAT325G



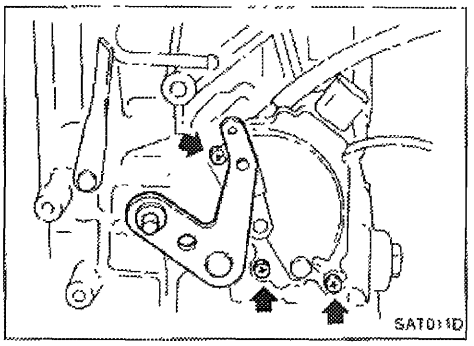
1. Drain A.T.F. through drain plug
2. Remove torque converter.



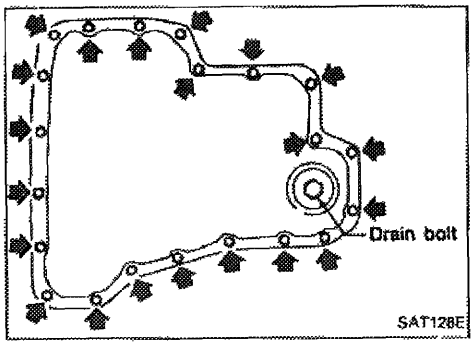
3. Check torque converter one-way clutch using check tool as shown at left.
a. Insert check tool into the groove of bearing support built into one-way clutch outer race.
b. While fixing bearing support with check tool, rotate one-way clutch spline using flat-bladed screwdriver.
c. Check inner race rotates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



4. Remove oil charging pipe and oil cooler tube.



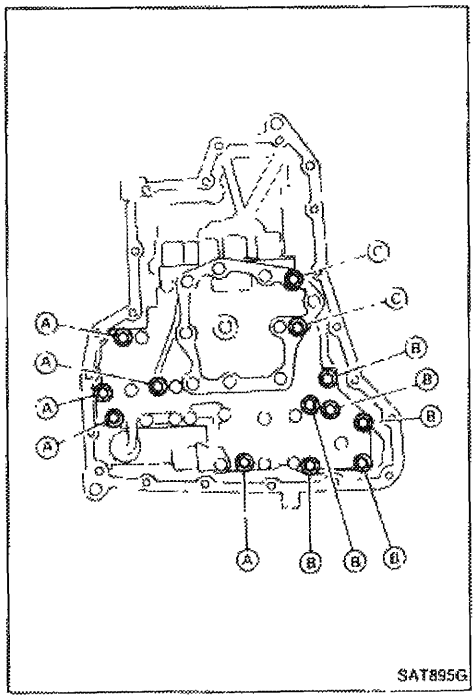
5. Set manual lever to "P" position.
6. Remove inhibitor switch.



7. Remove oil pan and oil pan gasket.

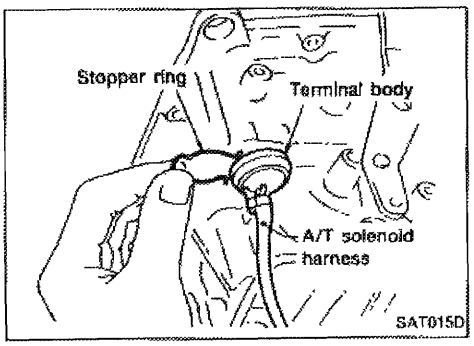
- **Do not reuse oil pan bolts.**

8. Check foreign materials in oil pan to help determine cause of malfunction. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up which can cause valves, servo, and clutches to stick and may inhibit pump pressure.

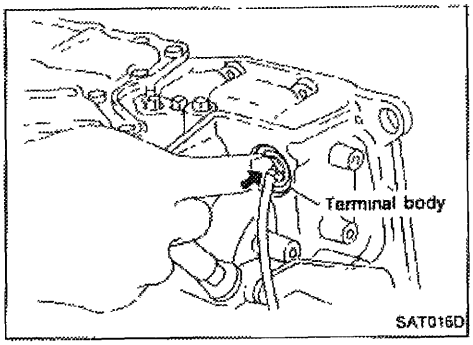


9. Remove control valve assembly according to the following procedures.

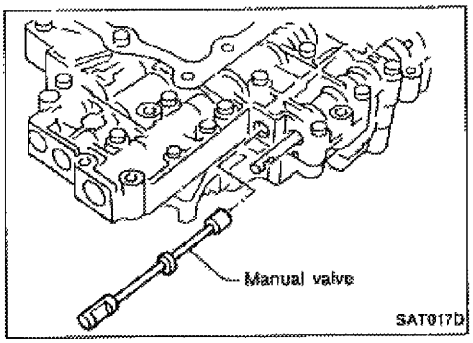
a. Remove control valve assembly mounting bolts Ⓐ, Ⓑ and Ⓒ.



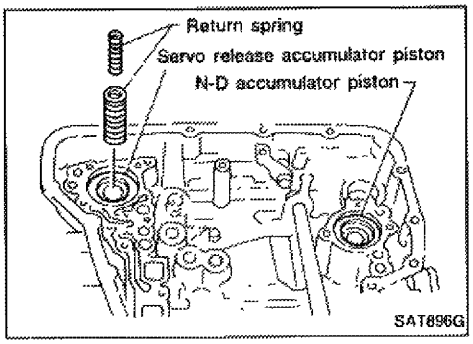
b. Remove stopper ring from terminal body.



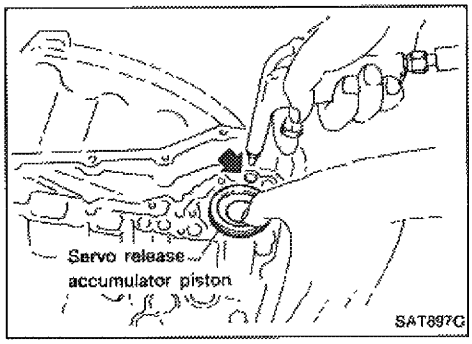
c Push terminal body into transmission case and draw out solenoid harness.



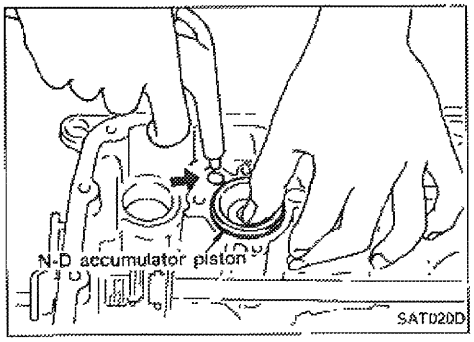
10. Remove manual valve from control valve assembly as a precaution.



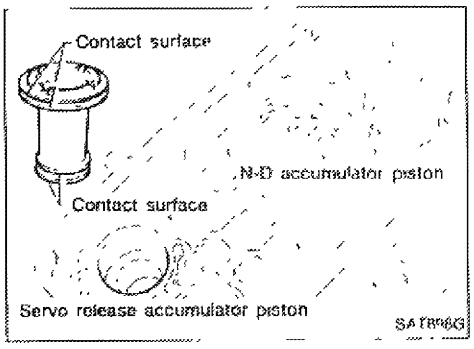
11. Remove return spring from servo release accumulator piston.



12. Remove servo release accumulator piston with compressed air.
13. Remove O-rings from servo release accumulator piston.



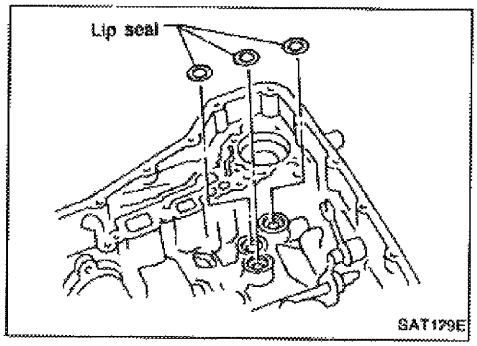
14. Remove N-D accumulator piston and return spring with compressed air.
15. Remove O-rings from N-D accumulator piston.



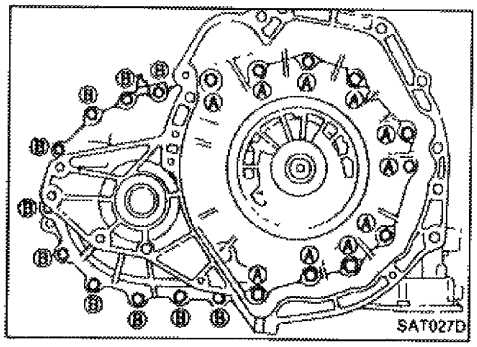
16. Check accumulator pistons and contact surface of transmission case for damage.
17. Check accumulator return springs for damage and free length.

Unit: mm (in)

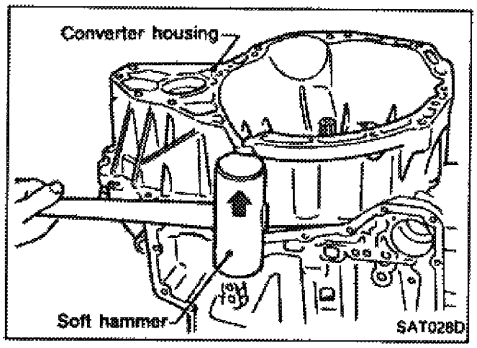
Spring		Free length	Outer diameter
Servo release accumulator spring	Outer	52.5 (2.067)	21.1 (0.831)
	Inner	52.0 (2.047)	13.1 (0.516)
N-D accumulator spring		43.5 (1.713)	28.0 (1.102)



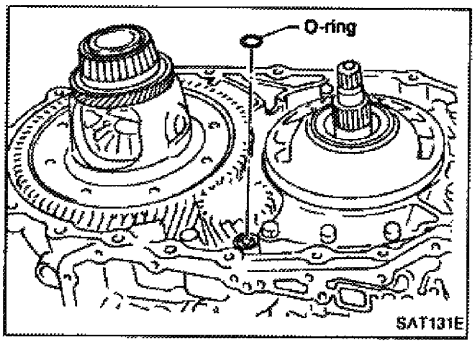
18. Remove lip seals from band servo oil port.



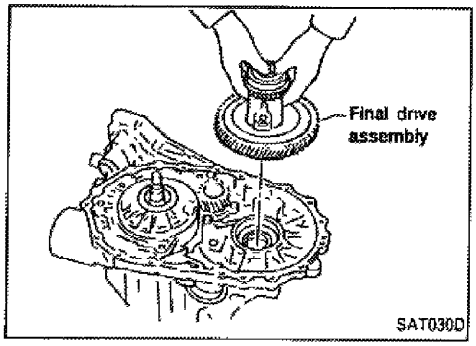
19. Remove converter housing according to the following procedures.
a. Remove converter housing mounting bolts Ⓐ and Ⓑ.



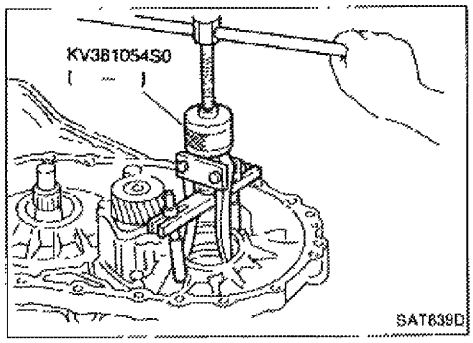
b. Remove converter housing.



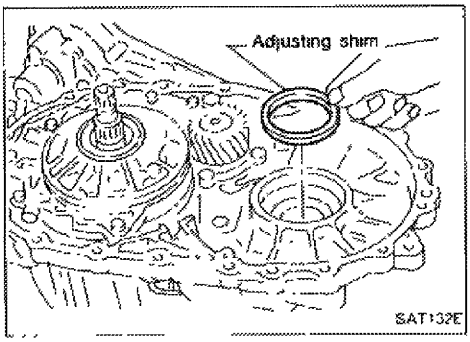
c. Remove O-ring from differential oil port.



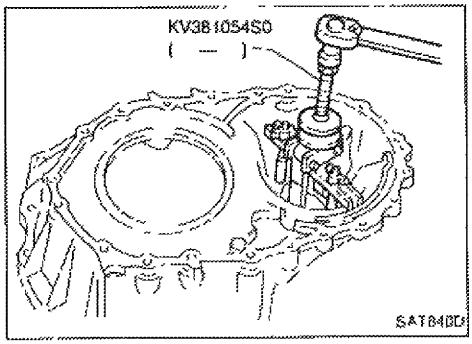
20. Remove final drive assembly from transmission case.



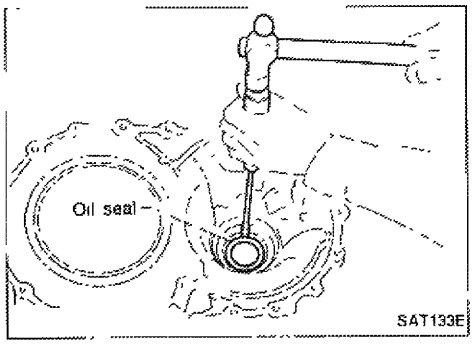
21. Remove differential side bearing outer race from transmission case.



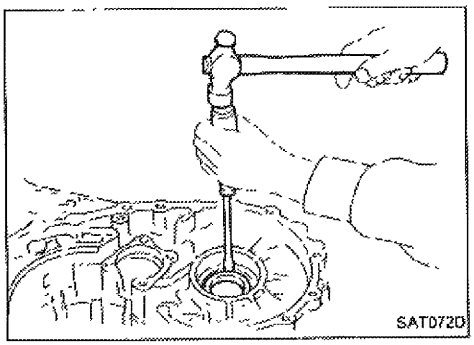
22. Remove differential side bearing adjusting shim from transmission case.



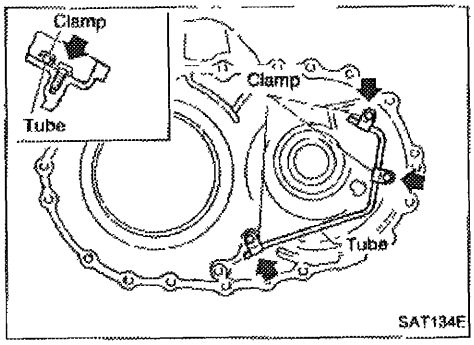
23. Remove differential side bearing outer race from converter housing.



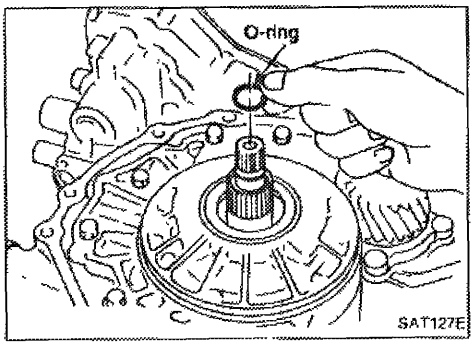
24. Remove oil seal from converter housing using a screwdriver.
- **Be careful not to damage case.**



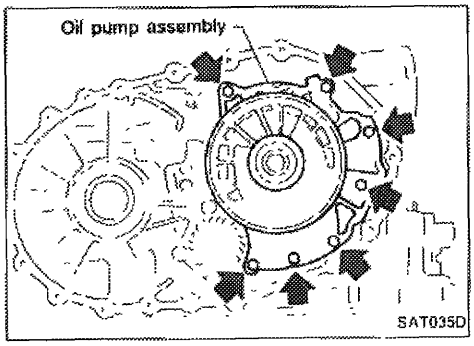
25. Remove side oil seal from transmission case using a screwdriver



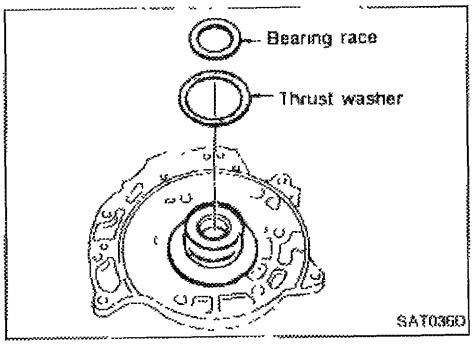
26. Remove oil tube from converter housing.



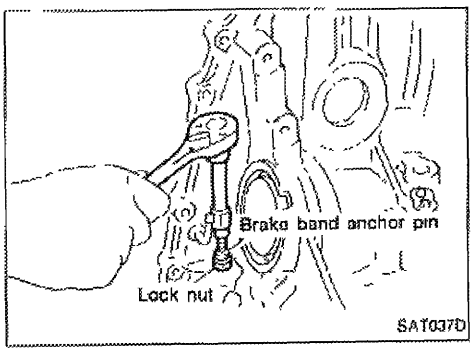
27. Remove oil pump according to the following procedures.
a. Remove O-ring from input shaft.



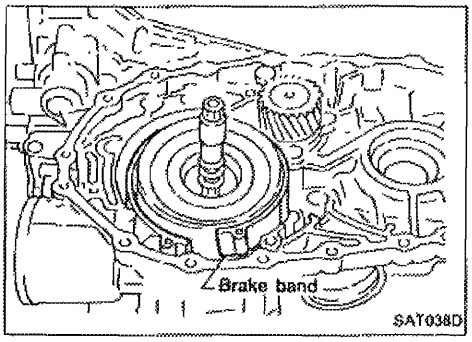
b. Remove oil pump assembly from transmission case



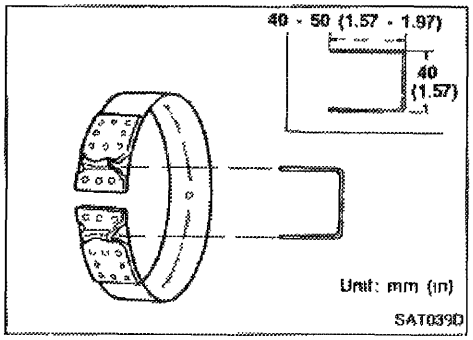
c. Remove thrust washer and bearing race from oil pump assembly



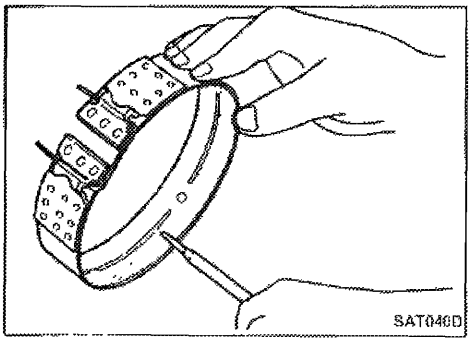
28. Remove brake band according to the following procedures.
a. Loosen lock nut, then back off band servo anchor end pin.



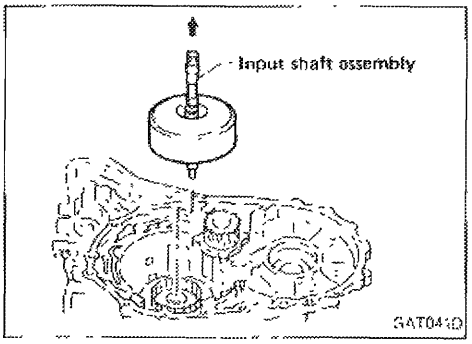
b. Remove brake band from transmission case.



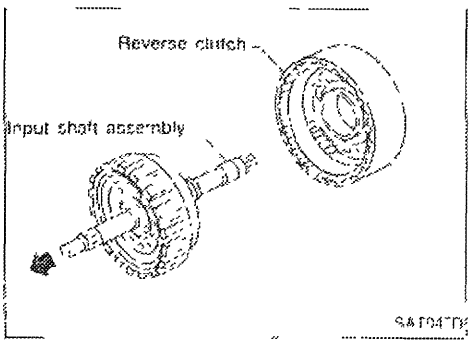
- **To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at left.**
  Leave the clip in position after removing the brake band.



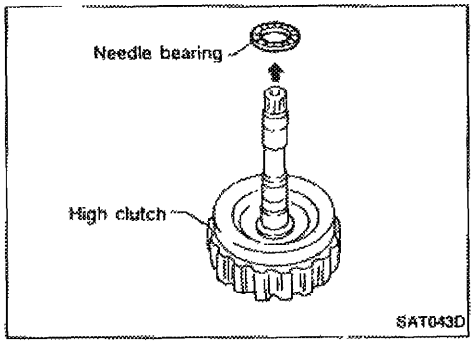
c. Check brake band facing for damage, cracks, wear or burns.



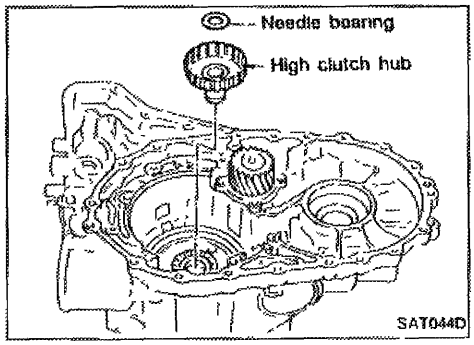
29. Remove input shaft assembly (high clutch) and reverse clutch according to the following procedures.
a. Remove input shaft assembly (high clutch) with reverse clutch.



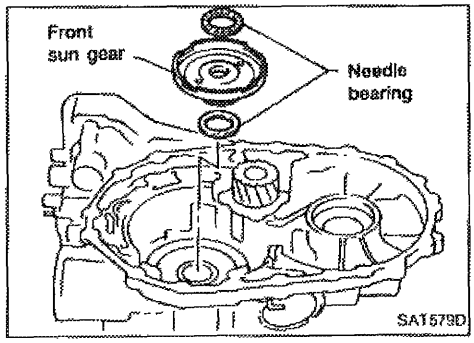
b Remove input shaft assembly (high clutch) from reverse clutch.



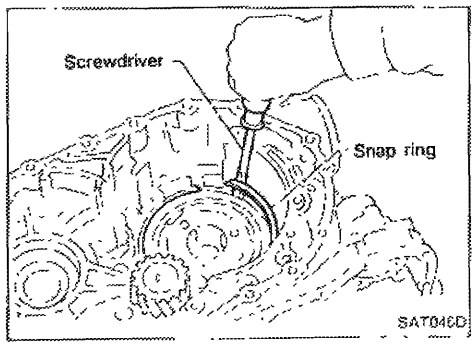
c. Remove needle bearing from high clutch drum.
d. Check input shaft assembly and needle bearing for damage or wear.



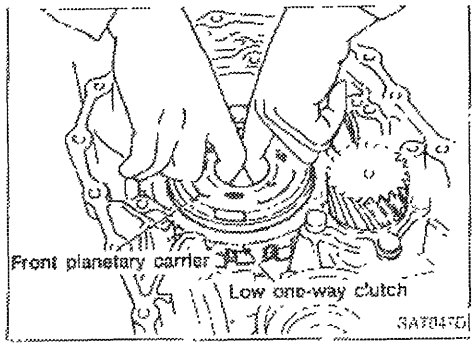
30. Remove high clutch hub and needle bearing from transmission case.
31. Check high clutch hub and needle bearing for damage or wear.



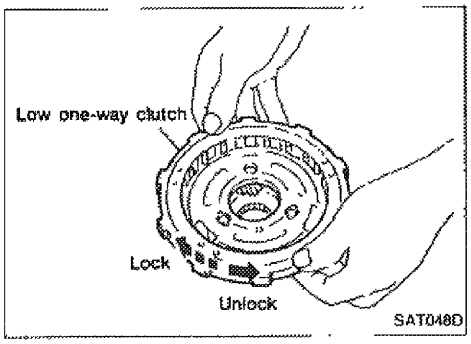
32. Remove front sun gear and needle bearings from transmission case.
33. Check front sun gear and needle bearings for damage or wear.



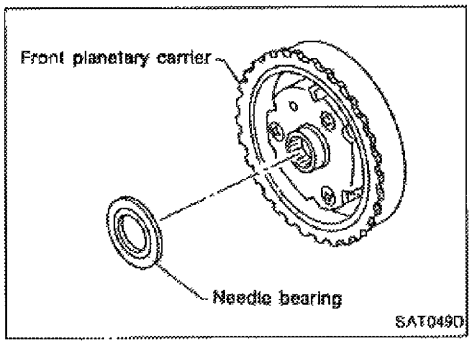
34. Remove front planetary carrier assembly and low one-way clutch according to the following procedures.
a. Remove snap ring using a screwdriver.



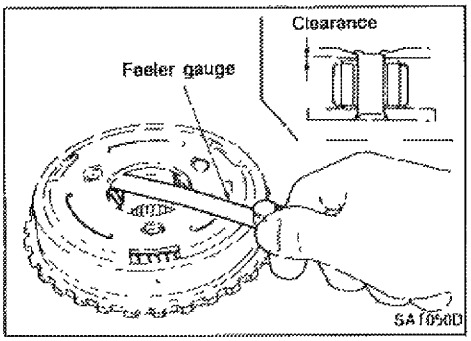
b. Remove front planetary carrier with low one-way clutch.



c. Check that low one-way clutch rotates in the direction of the arrow and locks in the opposite direction.
d. Remove low one-way clutch from front planetary carrier by rotating it in the direction of unlock.



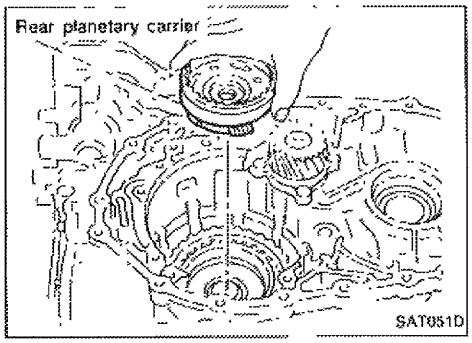
e. Remove needle bearing from front planetary carrier.



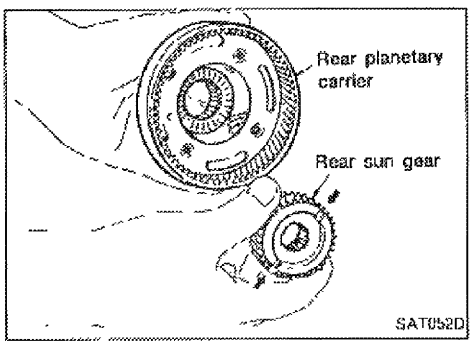
f. Check front planetary carrier, low one-way clutch and needle bearing for damage or wear.
g. Check clearance between pinion washer and planetary carrier using feeler gauge.

Standard clearance:
0.15 - 0.70 mm (0.0059 - 0.0276 in)
Allowable limit:
0.80 mm (0.0315 in)

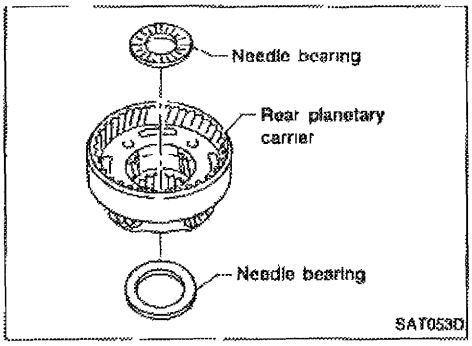
Replace front planetary carrier if the clearance exceeds allowable limit.



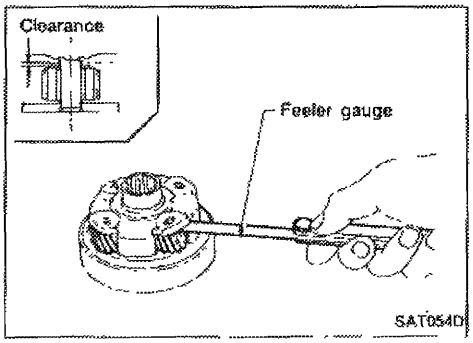
35. Remove rear planetary carrier assembly and rear sun gear according to the following procedures.
a. Remove rear planetary carrier assembly from transmission case.



b. Remove rear sun gear from rear planetary carrier.



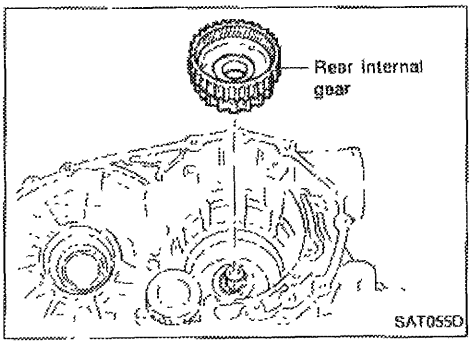
c. Remove needle bearings from rear planetary carrier assembly.



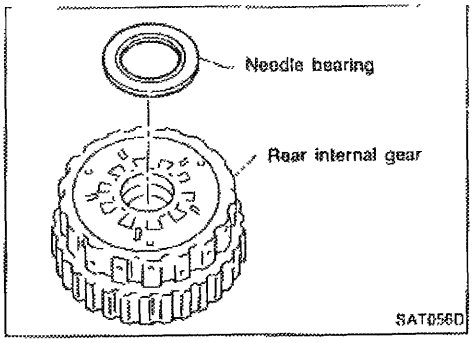
d. Check rear planetary carrier, rear sun gear and needle bearings for damage or wear.
e. Check clearance between pinion washer and rear planetary carrier using feeler gauge.

Standard clearance:
0.15 - 0.70 mm (0.0059 - 0.0276 in)
Allowable limit:
0.80 mm (0.0315 in)

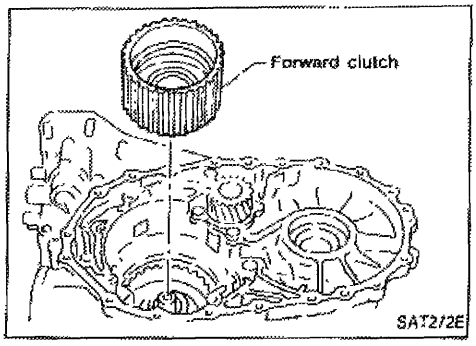
Replace rear planetary carrier if the clearance exceeds allowable limit.



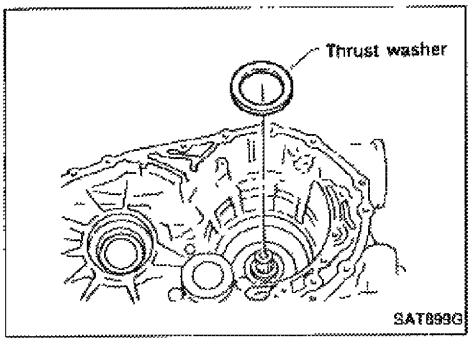
36. Remove rear internal gear from transmission case.



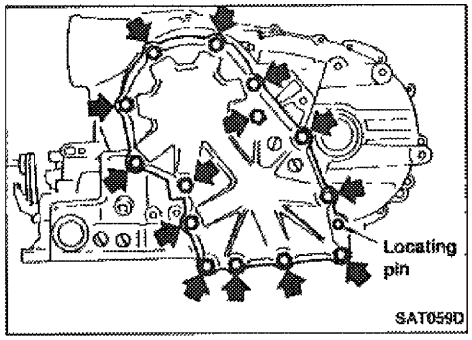
37. Remove needle bearing from rear internal gear.
38 Check needle bearing for damage or wear.



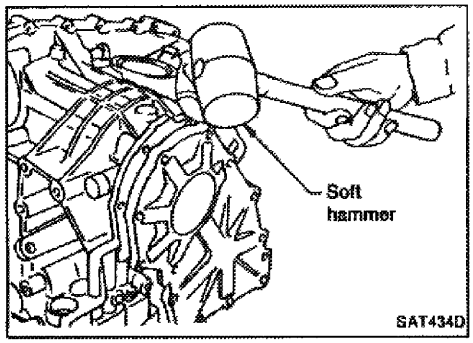
39. Remove forward clutch assembly from transmission case.



40. Remove thrust washer from transmission case.

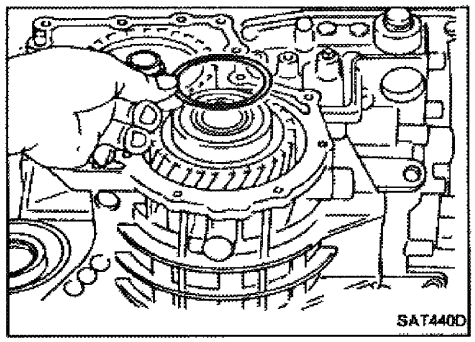


41. Remove output shaft assembly according to the following procedures.
a. Remove side cover bolts.

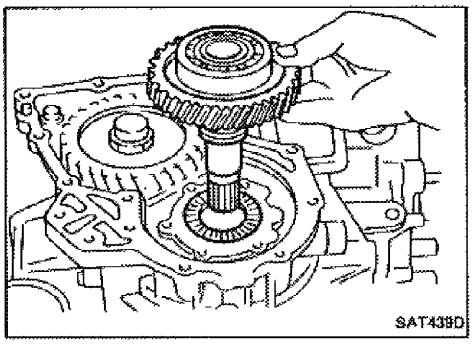


b. Remove side cover by lightly tapping it with a soft hammer.

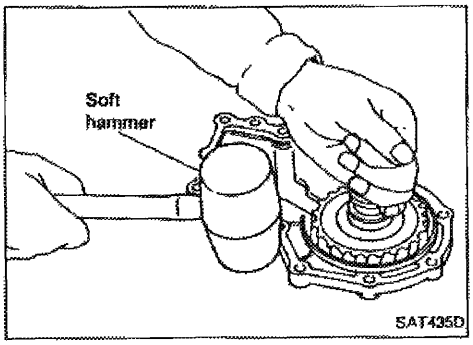
- **Be careful not to drop output shaft assembly as output shaft assembly may be removed together with side cover.**



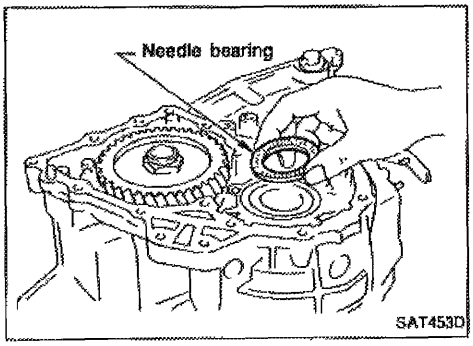
c. Remove adjusting shim.



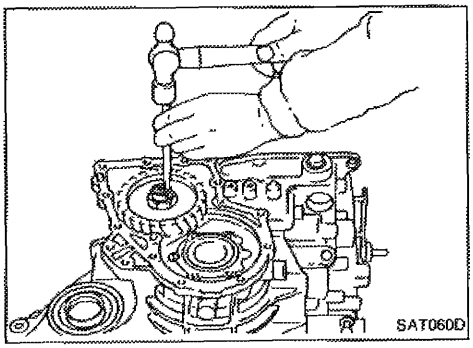
d. Remove output shaft assembly.



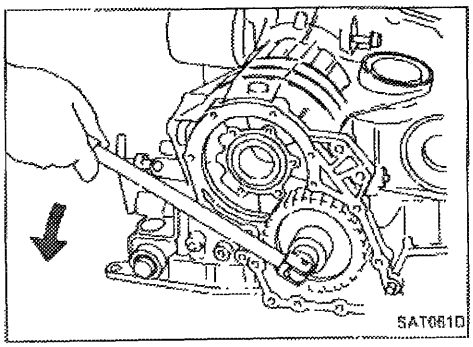
- If output shaft assembly was removed together with side cover, remove side cover by tapping it lightly with a soft hammer.



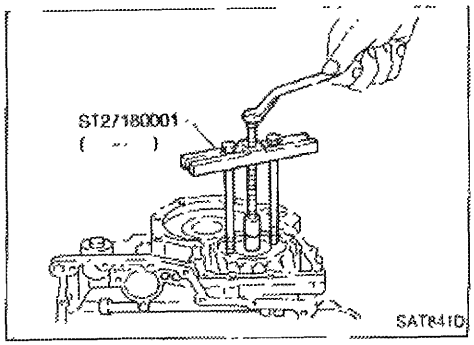
e. Remove needle bearing.



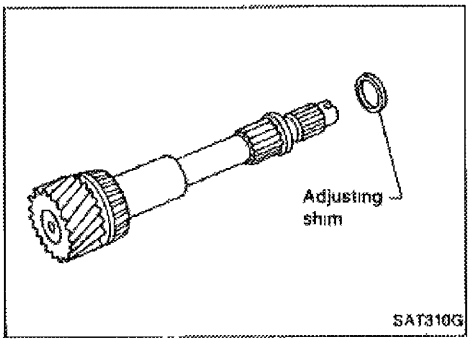
42. Disassemble reduction gear according to the following procedures.
a. Set manual shaft to position "P" to fix idler gear.
b. Unlock idler gear lock nut using a pin punch.



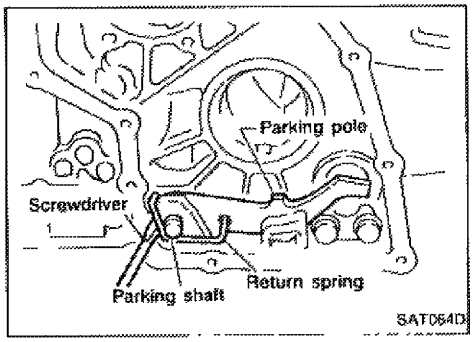
c. Remove idler gear lock nut.
- **Do not reuse idler gear lock nut.**



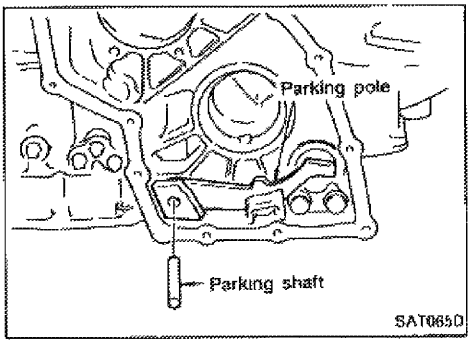
d. Remove idler gear with puller.



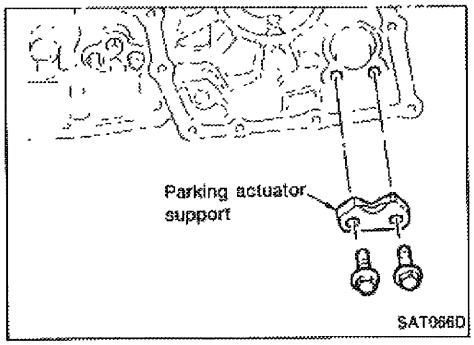
e. Remove reduction gear.
f. Remove adjusting shim from reduction gear.



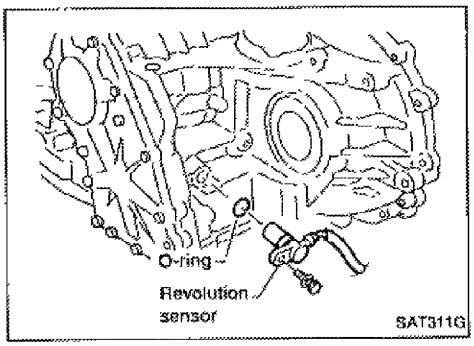
43. Remove return spring from parking shaft using a screwdriver.



44. Draw out parking shaft and remove parking pole from transmission case.
45. Check parking pole and shaft for damage or wear.

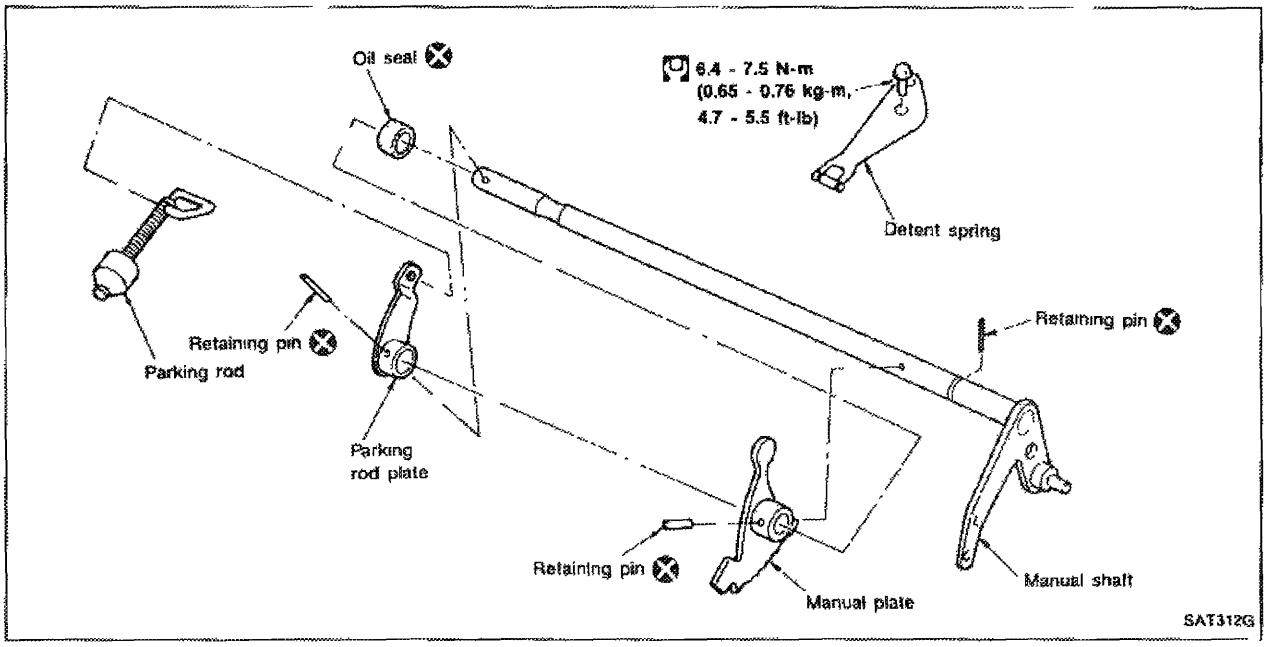


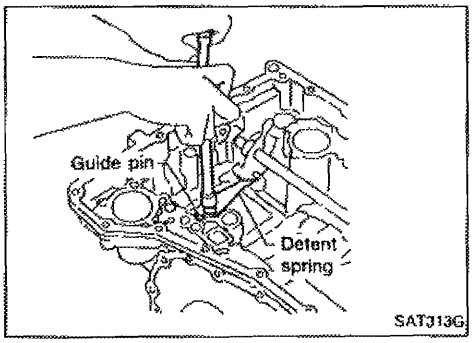
46. Remove parking actuator support from transmission case.
47. Check parking actuator support for damage or wear.



48. Remove revolution sensor from transmission case.

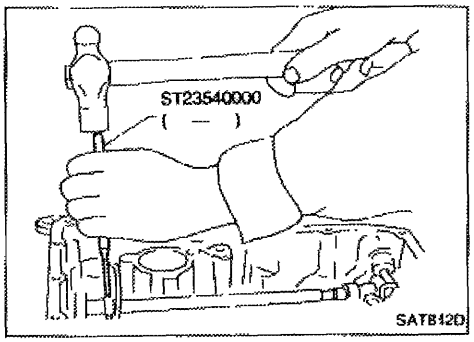
Manual Shaft



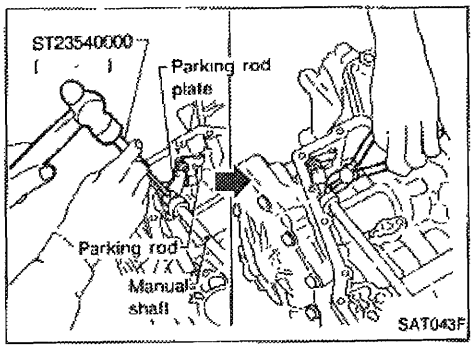


REMOVAL

1. Remove detent spring from transmission case.

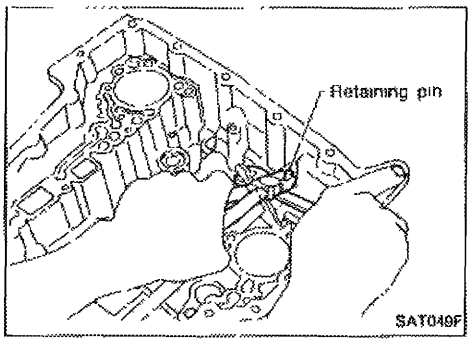


2. Drive out manual plate retaining pin.

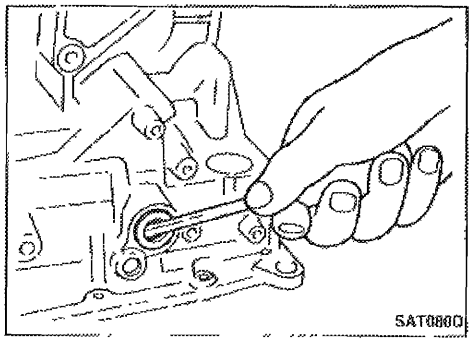


3. Drive and pull out parking rod plate retaining pin.
4. Remove parking rod plate from manual shaft
5. Draw out parking rod from transmission case.

Manual Shaft (Cont'd)



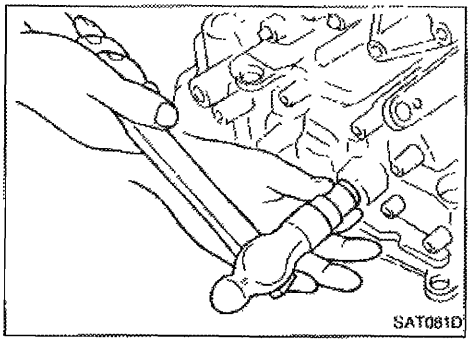
6. Pull out manual shaft retaining pin.
7. Remove manual shaft and manual plate from transmission case.



8. Remove manual shaft oil seal.

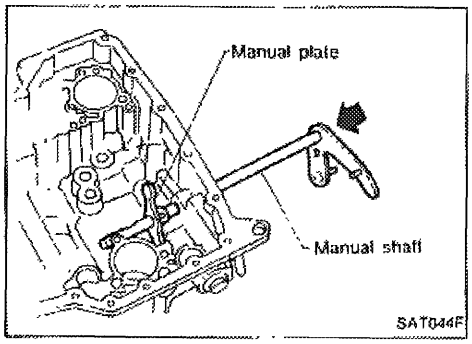
INSPECTION

- Check component parts for wear or damage. Replace if necessary.



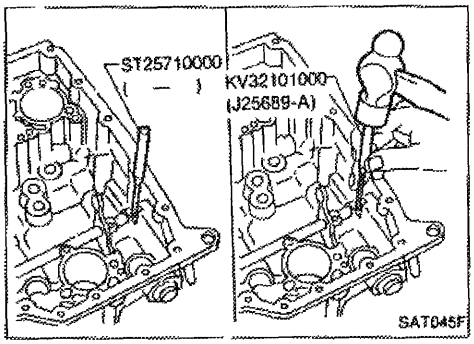
INSTALLATION

1. Install manual shaft oil seal.
- **Apply A.T.F. to outer surface of oil seal.**

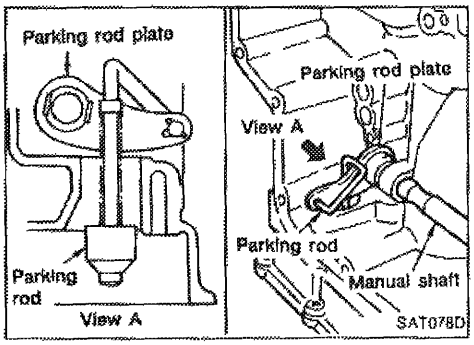


2. Install manual shaft and manual plate.

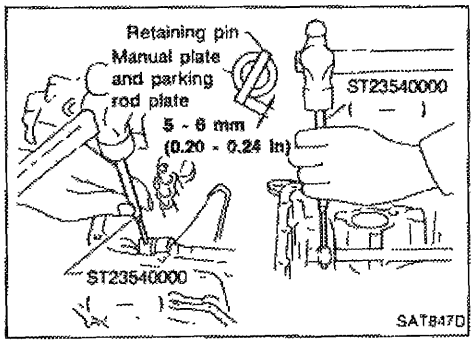
Manual Shaft (Cont'd)



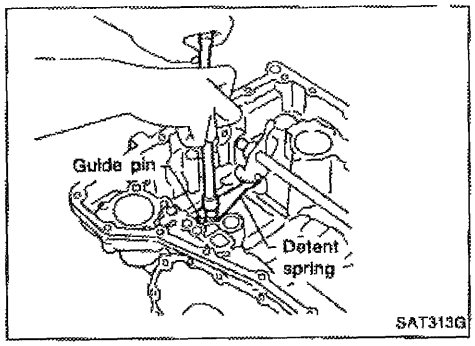
3. Align groove of manual shaft and hole of transmission case.
4. Install manual shaft retaining pin.



5. Install parking rod to parking rod plate.
6. Set parking rod assembly onto manual shaft.

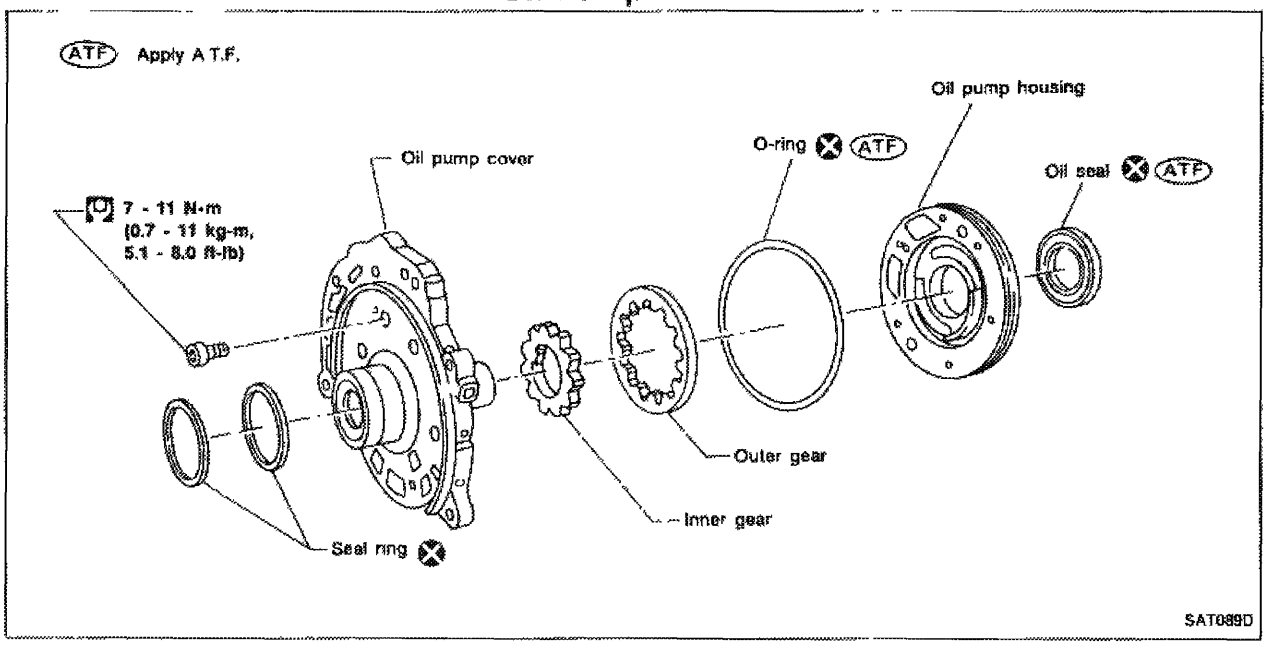


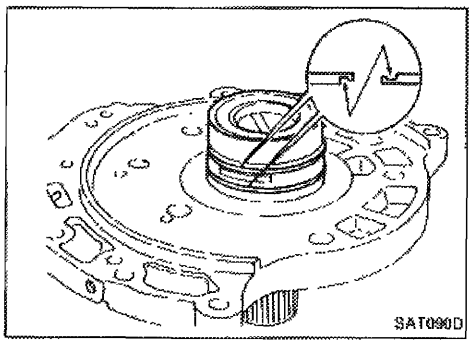
7. Drive in manual plate retaining pin and parking rod plate retaining pin.



8. Install detent spring.

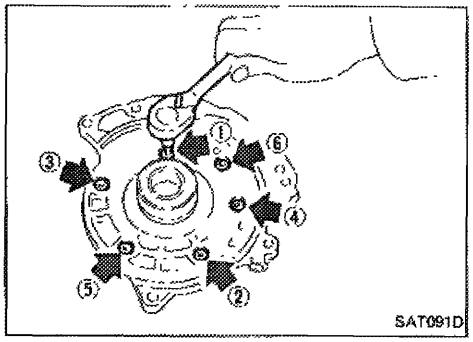
Oil Pump



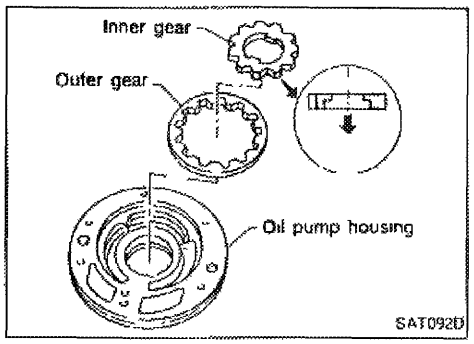


DISASSEMBLY

1. Remove seal rings by undoing hooks.

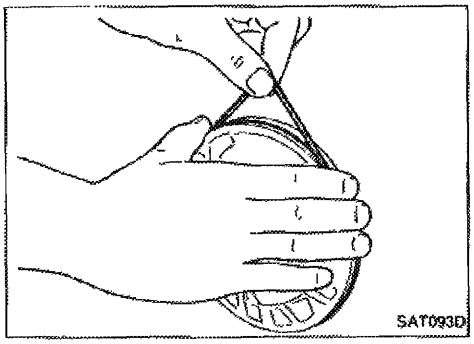


2. Loosen bolts in numerical order and remove oil pump cover.

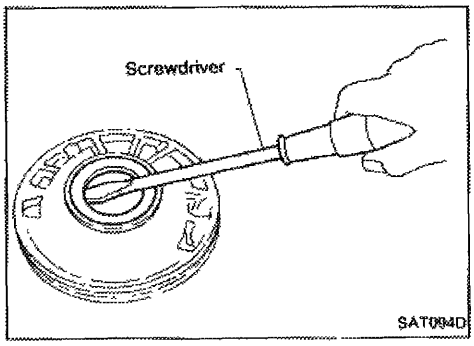


3 Remove inner and outer gear from oil pump housing.

Oil Pump (Cont'd)



4. Remove O-ring from oil pump housing.

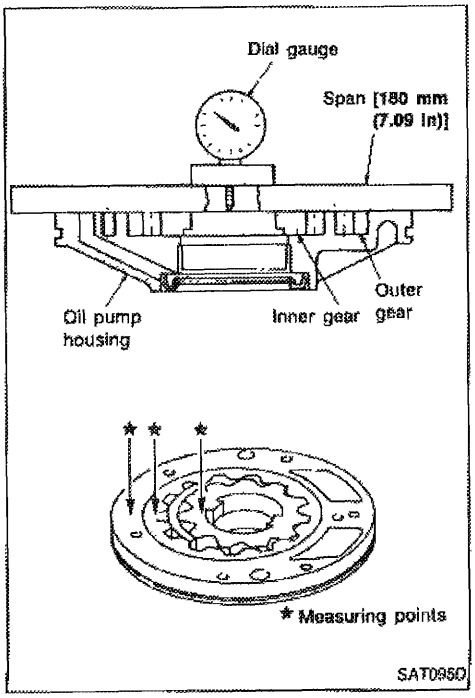


5. Remove oil pump housing oil seal.

INSPECTION

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

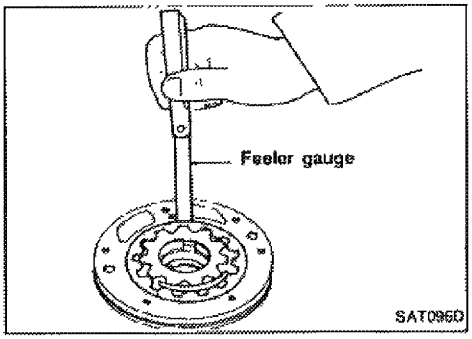
- Check for wear or damage.



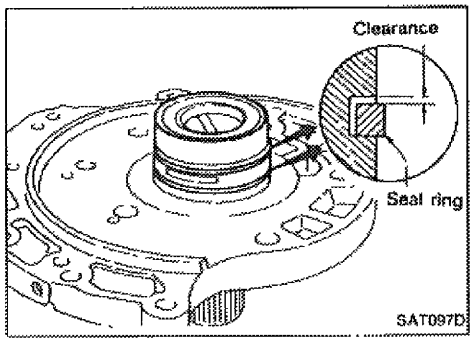
Side clearance

- Measure side clearance between end of oil pump housing and inner and outer gears in at least four places along their circumferences. Maximum measured values should be within specified range.
  Standard clearance:
  0.02 - 0.04 mm (0.0008 - 0.0016 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 S.D.S.
- If clearance is more than standard, replace whole oil pump assembly except oil pump cover.

Oil Pump (Cont'd)

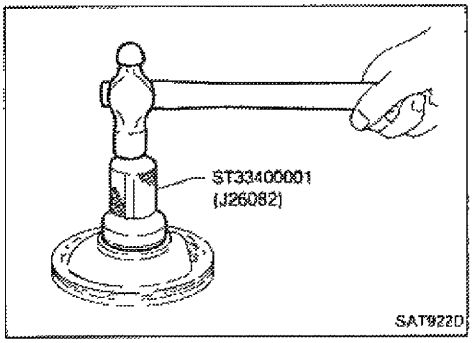


- Measure clearance between outer gear and oil pump housing.
  Standard clearance:
  0.08 - 0.15 mm (0.0031 - 0.0059 in)
  Allowable limit:
  0.15 mm (0.0059 in)
- If not within allowable limit, replace whole oil pump assembly except oil pump cover.



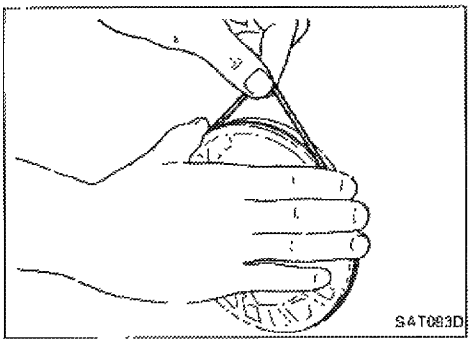
Seal ring clearance

- Install new seal rings onto oil pump cover.
- 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.

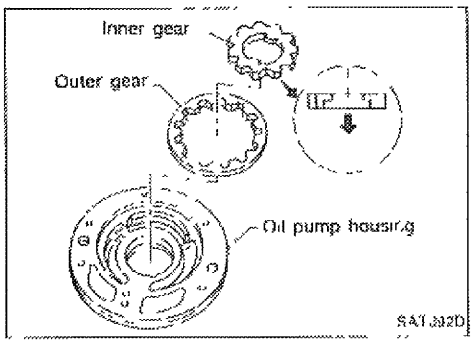


ASSEMBLY

1. Install oil seal on oil pump housing.

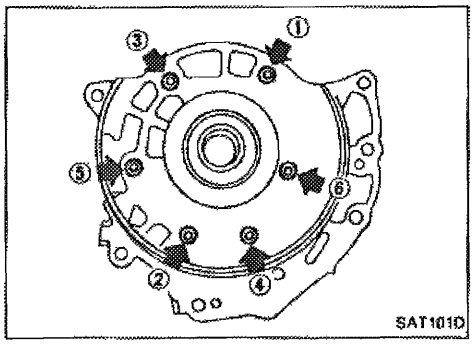


2. Install O-ring on oil pump housing.
- **Apply A.T.F. to O-ring.**

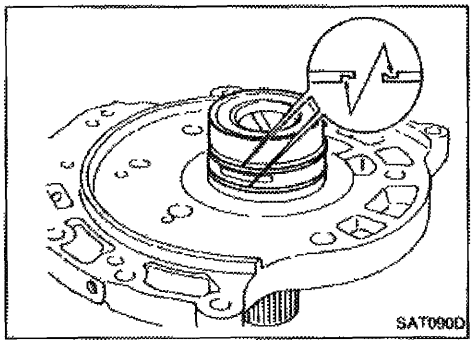


3. Install inner and outer gears on oil pump housing.
- **Take care with the direction of the inner gear.**

Oil Pump (Cont'd)



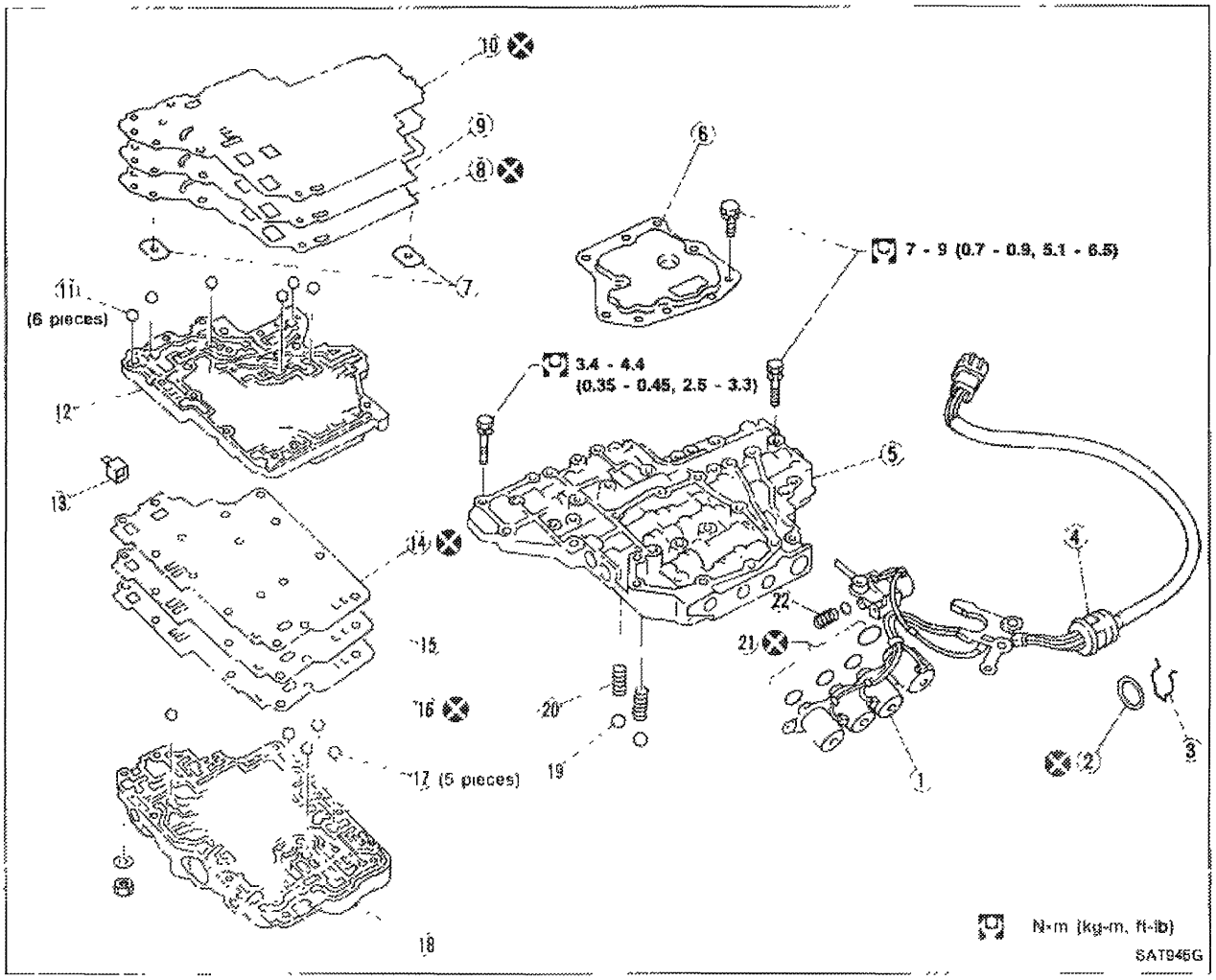
4. Install oil pump cover on oil pump housing.
a. Wrap masking tape around splines of oil pump cover assembly to protect seal. Position oil pump cover assembly on oil pump housing assembly, then remove masking tape.
b. Tighten bolts in numerical order.



5. Install new seal rings carefully after packing ring groove with petroleum jelly and connect hooks.

- **Do not spread gap of seal ring excessively while installing. It may deform the ring.**

Control Valve Assembly



(1) Solenoid valve assembly
(2) O-ring
(3) Clip
(4) Terminal body
(5) Control valve lower body
(6) Oil strainer
(7) Support plate
(8) Lower inter separating gasket
(9) Separating plate
(10) Lower separating gasket
(11) Steel ball
(12) Control valve inter body
(13) Pilot filter
(14) Upper inter separating gasket
(15) Separating plate
(16) Upper separating gasket
(17) Steel ball
(18) Control valve upper body
(19) Check ball
(20) Oil cooler relief valve spring
(21) O-ring
(22) Line pressure solenoid valve spring

DISASSEMBLY

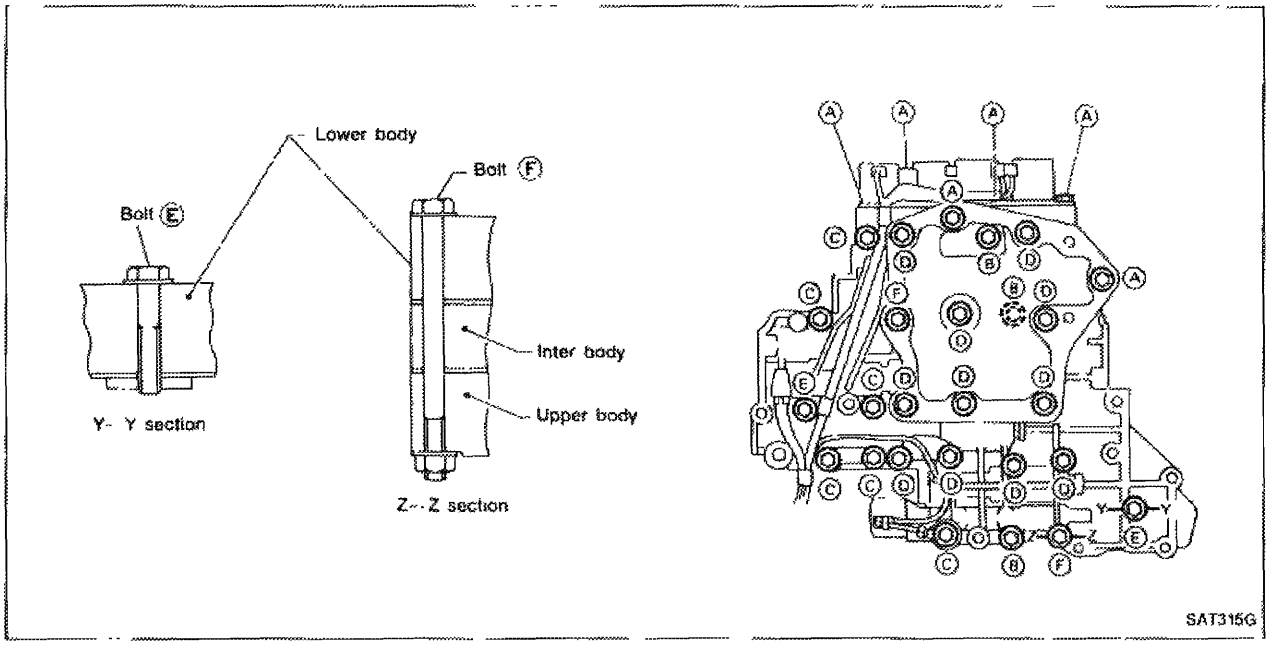
- Disassemble upper, inter and lower bodies

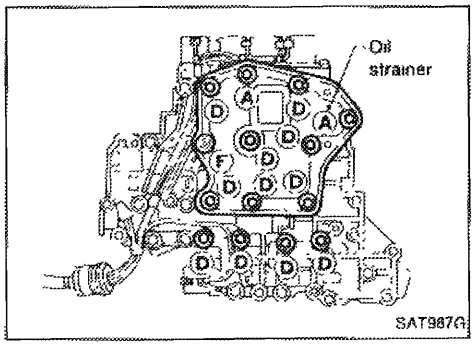
Bolt length, number and location:

Bolt symbol	A	B	C	D	E	F
Bolt length "ℓ" mm (in)	13.5 (0.531)	58.0 (2.283)	40.0 (1.575)	66.0 (2.598)	33.0 (1.299)	78.0 (3 071)
Number of bolts	6	3	6	11	2	2

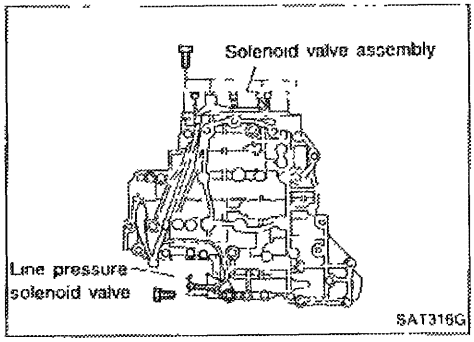
F Reamer bolt with nut

Control Valve Assembly (Cont'd)



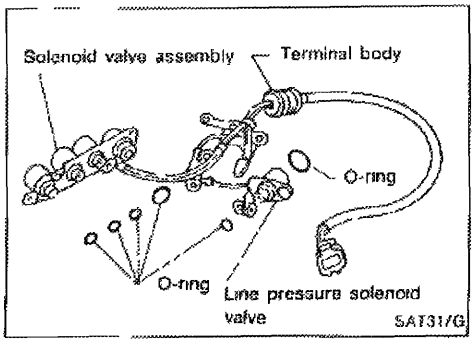


a. Remove bolts Ⓐ, Ⓓ and Ⓕ, and remove oil strainer from control valve assembly.



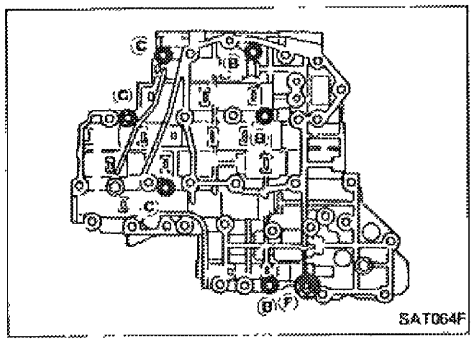
b. Remove solenoid valve assembly and line pressure solenoid valve from control valve assembly

* **Be careful not to lose the line pressure solenoid valve spring.**

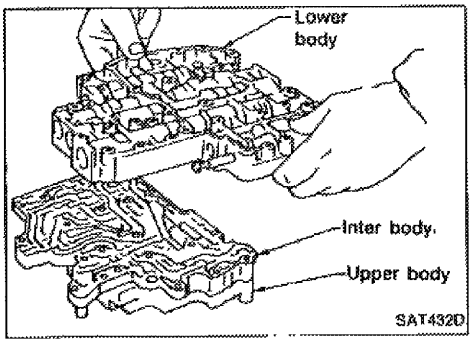


c. Remove O-rings from solenoid valves and terminal body.

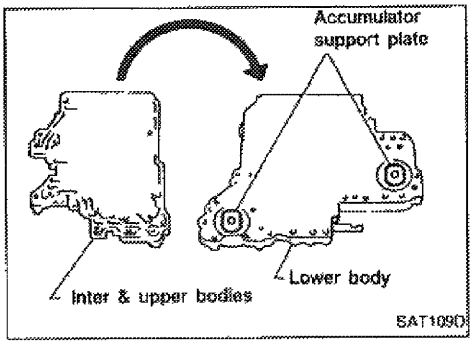
Control Valve Assembly (Cont'd)



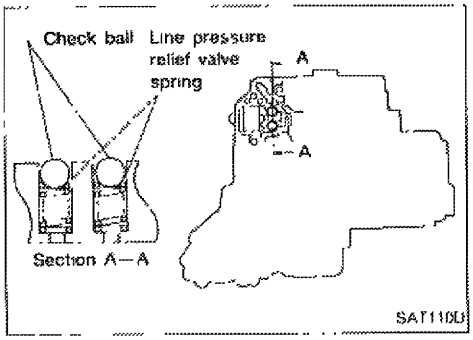
d. Place upper body facedown, and remove bolts Ⓑ, Ⓒ and Ⓕ.



e. Remove lower body from inter body.

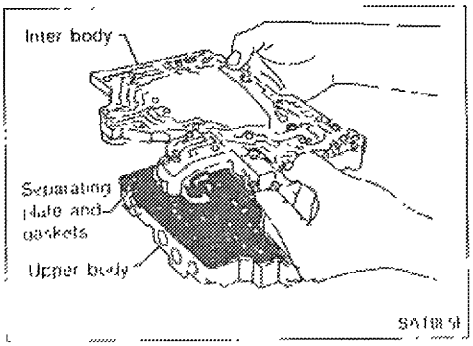


f. Turn over lower body, and accumulator support plates.



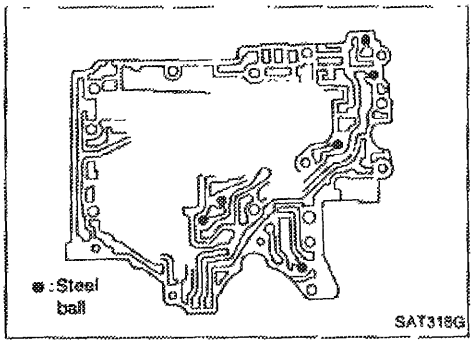
g. Remove bolts Ⓔ, separating plate and separating gaskets from lower body.
h. Remove steel balls and relief valve springs from lower body.

- **Be careful not to lose steel balls and relief valve springs.**



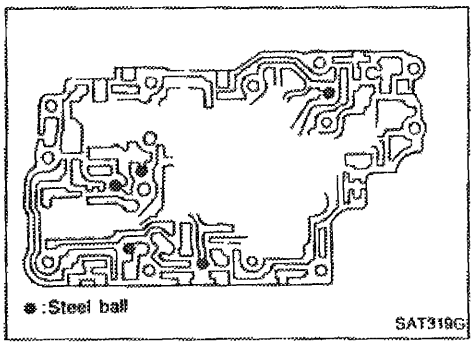
i. Remove inter body from upper body.
j. Remove pilot filter, separating plate and gaskets from upper body.

Control Valve Assembly (Cont'd)



k. Check to see that steel balls are properly positioned in inter body and then remove them from inter body.

- **Be careful not to lose steel balls.**

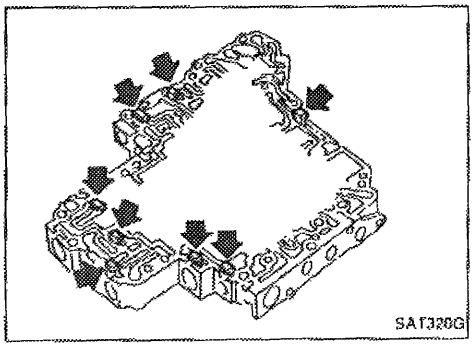


l. Check to see that steel balls are properly positioned in upper body and then remove them from upper body.

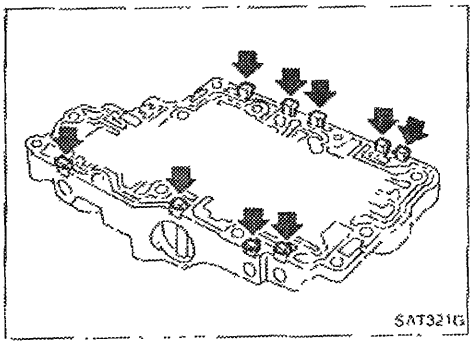
- **Be careful not to lose steel balls.**

INSPECTION

Lower and upper bodies

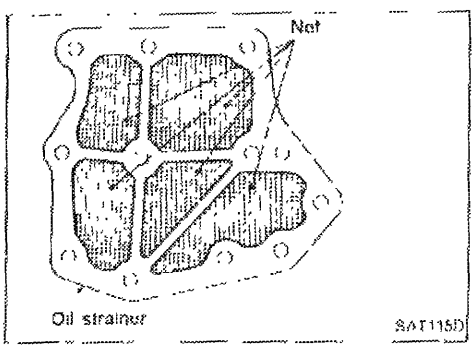


- Check to see that retainer plates are properly positioned in lower body.



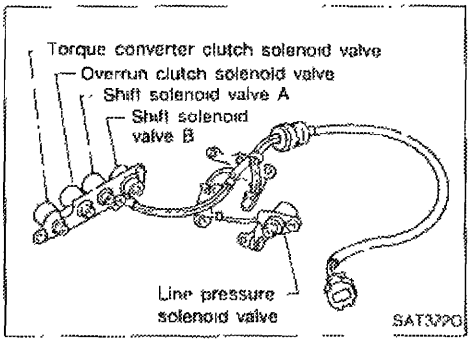
- Check to see that retainer plates are properly positioned in upper body.

Oil strainer



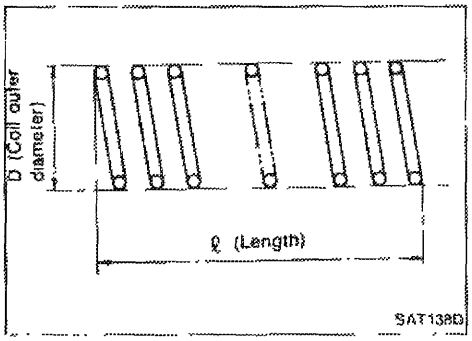
- Check wire netting of oil strainer for damage.

Control Valve Assembly (Cont'd)



Shift solenoid valves A and B, line pressure solenoid valve, torque converter clutch solenoid valve and overrun clutch solenoid valve

- Measure resistance — Refer to "TROUBLE DIAGNOSES"



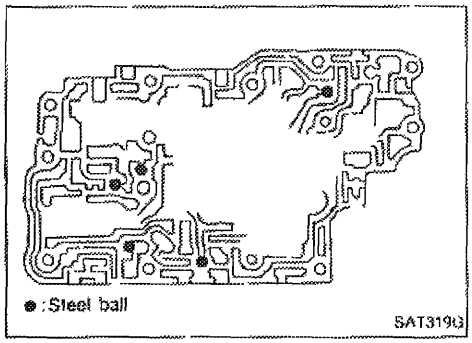
Oil cooler relief valve spring

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

Inspection standard:

Unit: mm (in)

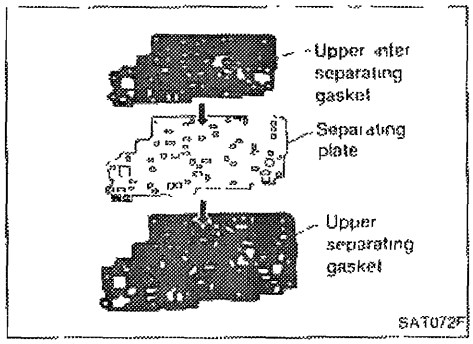
Part No.	ℓ	D
31872 31X00	17.02 (1.6701)	8.0 (0.315)



ASSEMBLY

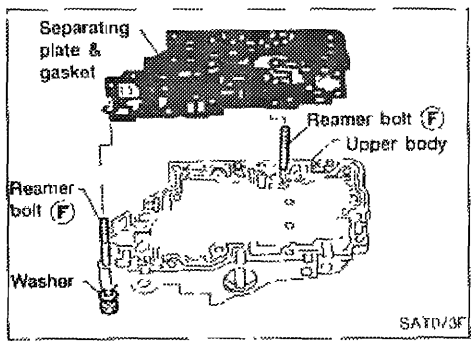
1. Install upper, inter and lower body.

a. Place oil circuit of upper body face up. Install steel balls in their proper positions.



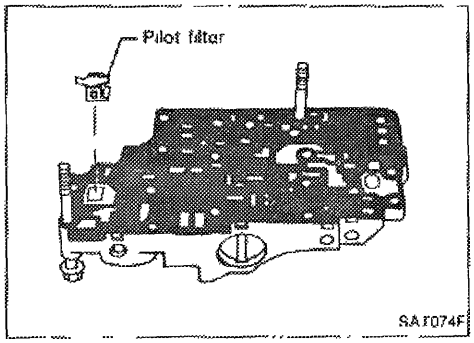
b Install upper separating gasket, upper inter separating gasket and upper separating plate in order shown in illustration.

- **Always use new gaskets.**

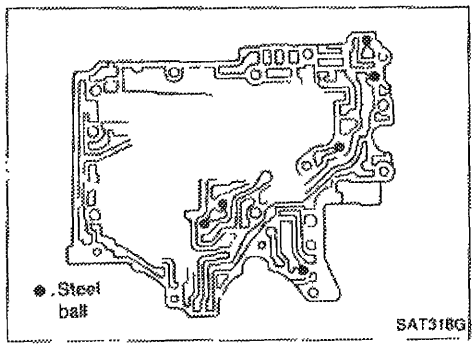


c. Install reamer bolts (F) from bottom of upper body and install separating plate and gaskets as a set on upper body using reamer bolts as guides.

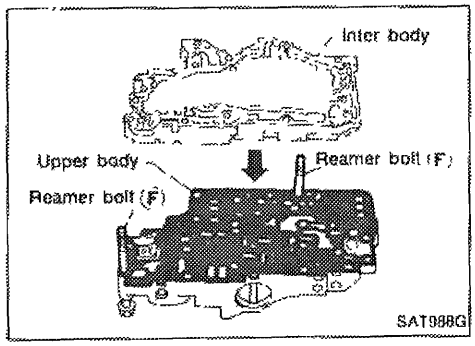
Control Valve Assembly (Cont'd)



d. Install pilot filter.

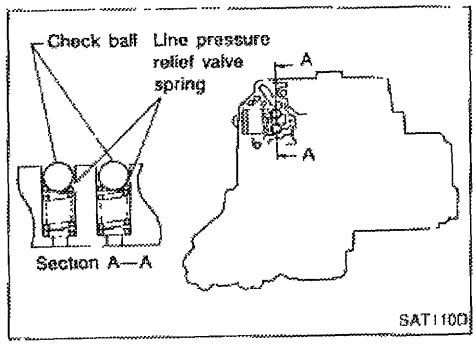


e. Place inter body as shown in the illustration. Install steel balls in their proper positions.

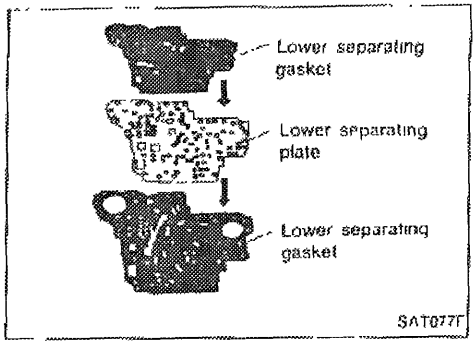


f. Install inter body on upper body using reamer bolts (F) as guides

- **Be careful not to dislocate or drop steel balls.**

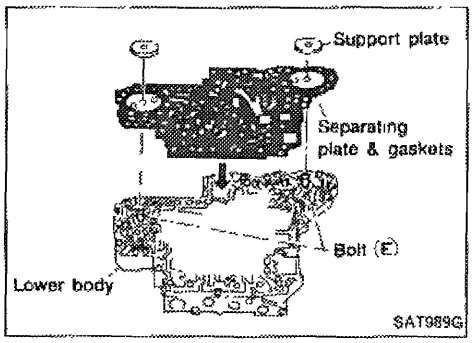


g. Install steel balls and relief valve springs in their proper positions in lower body



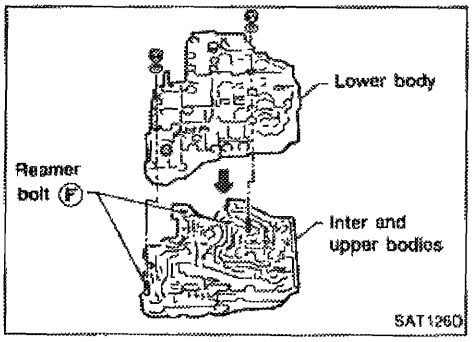
h. Install lower separating gasket, inner separating gasket and lower separating plate in order shown in the illustration.

Control Valve Assembly (Cont'd)

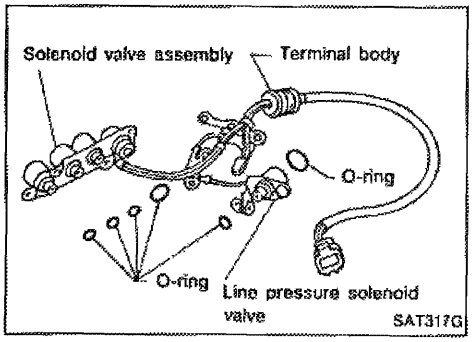


i. Install bolts (E) from bottom of lower body and install separating plate and gaskets as a set on lower body using bolts (E) as guides.

j. Install support plates on lower body.



k. Install lower body on inter body using reamer bolts (F) as guides and tighten reamer bolts (F) slightly.



2. Install O-rings to solenoid valves and terminal body.

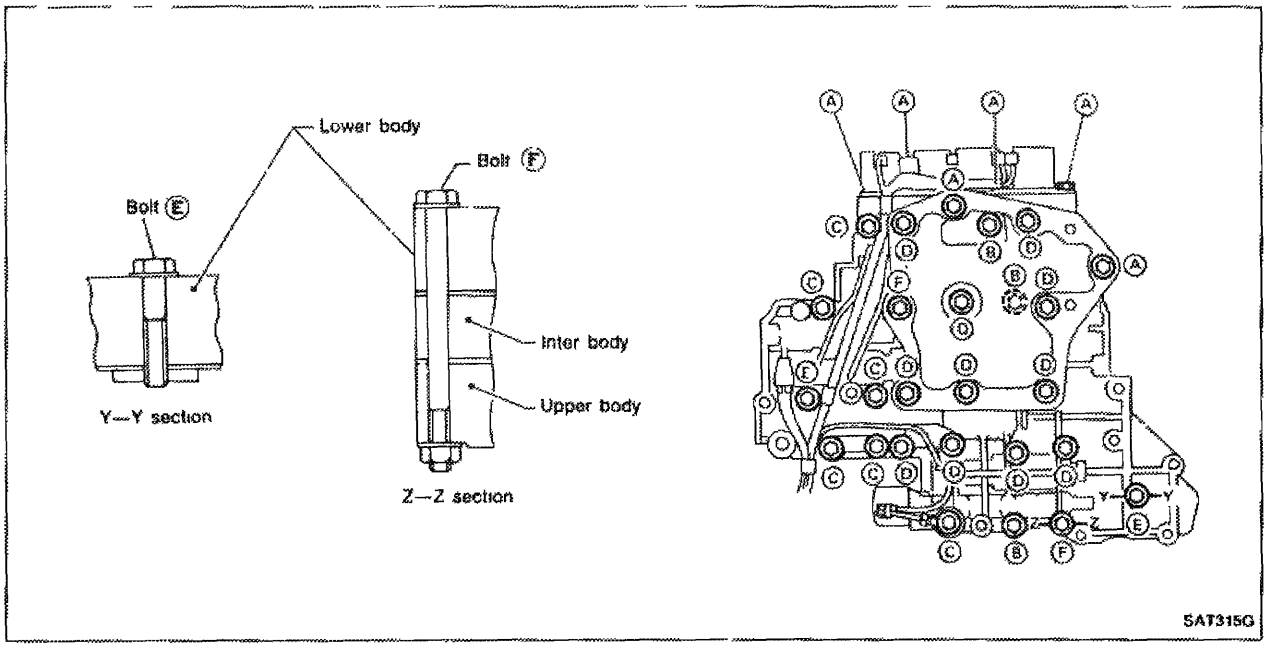
- **Apply A.T.F. to O-rings.**

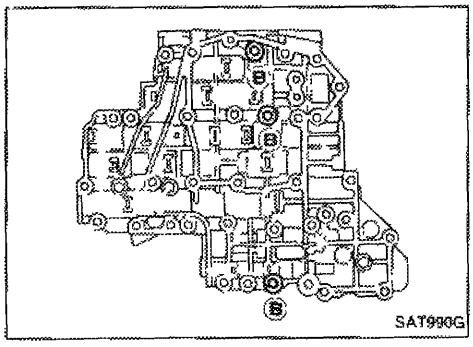
3. Install and tighten bolts.

Bolt length, number and location:

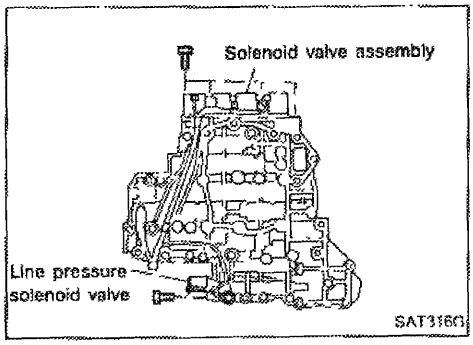
Bolt symbol	A	B	C	D	E	F
Bolt length "ℓ" mm (in)	13.5 (0.531)	58.0 (2.283)	44.0 (1.732)	66.0 (2.598)	33.0 (1.299)	78.0 (3.071)
Number of bolts	6	3	6	11	2	2

Control Valve Assembly (Cont'd)

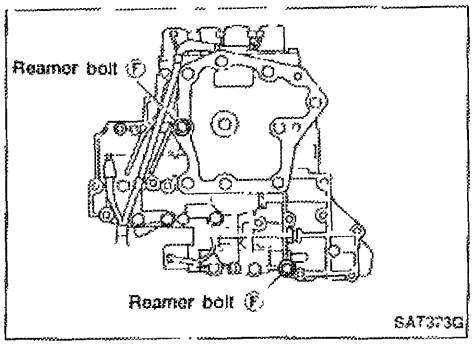




a. Install and tighten bolts (B) to specified torque.

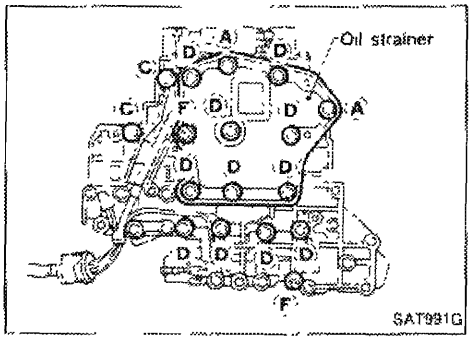


b. Install solenoid valve assembly and line pressure solenoid valve to lower body.

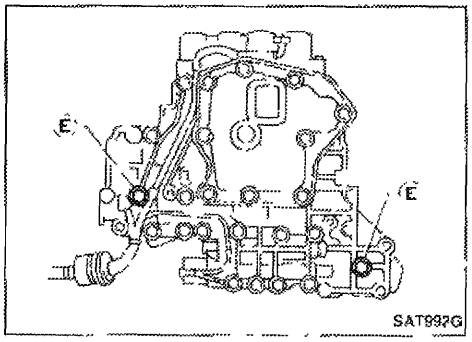


c. Remove reamer bolts (F) and set oil strainer on control valve assembly.
d. Reinstall reamer bolts (F) from lower body side.

Control Valve Assembly (Cont'd)

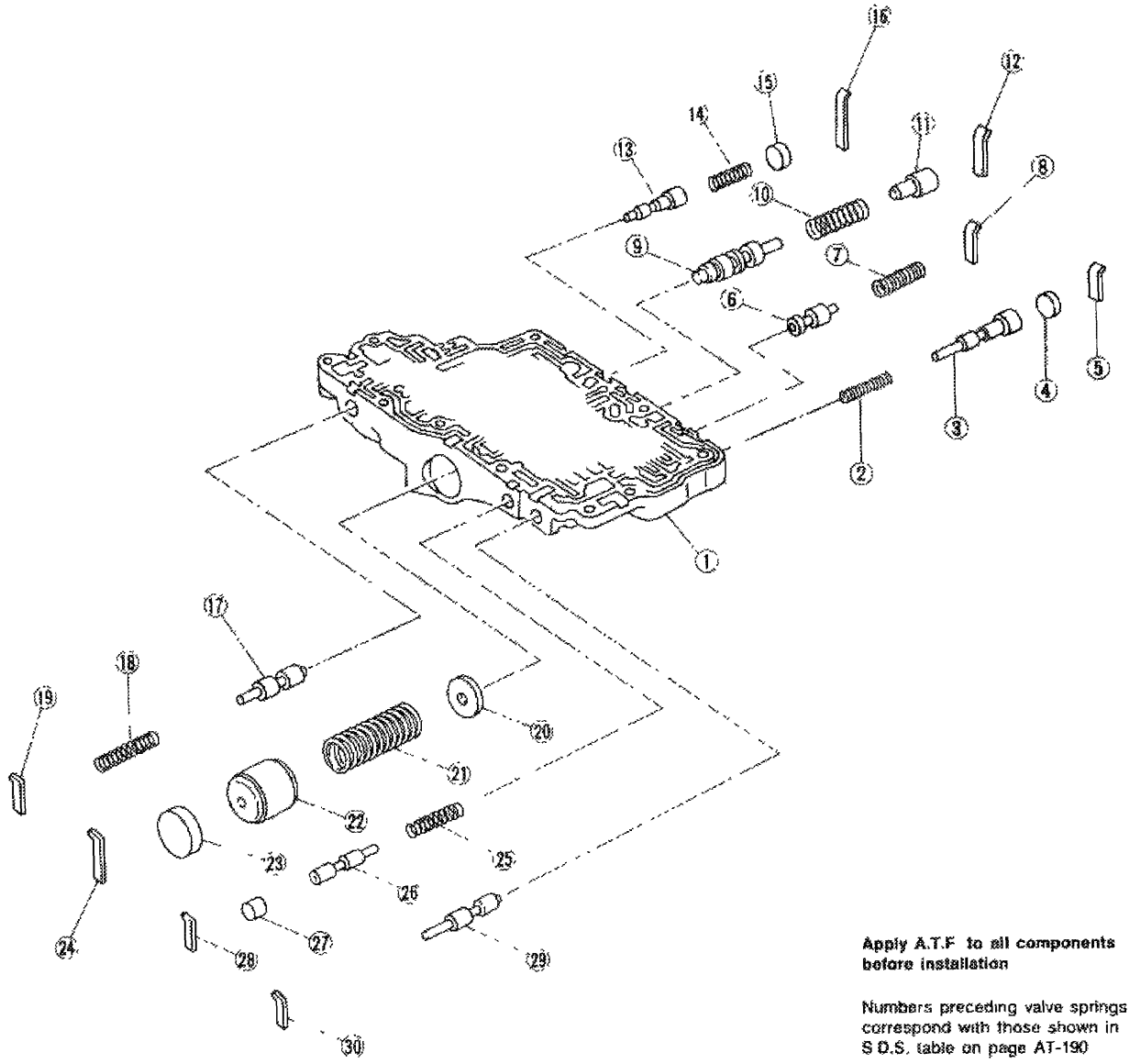


e. Tighten bolts Ⓐ, Ⓒ, Ⓓ and Ⓕ to specified torque.



f. Tighten bolts Ⓔ to specified torque.

Control Valve Upper Body



Apply A.T.F to all components before installation

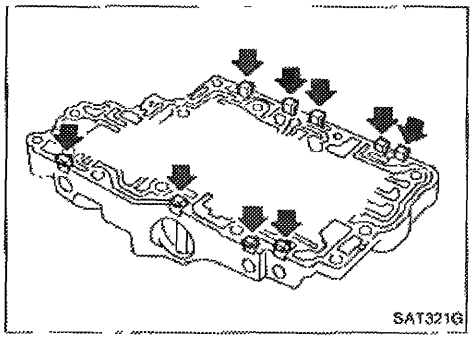
Numbers preceding valve springs correspond with those shown in S.D.S. table on page AT-190

SAT944G

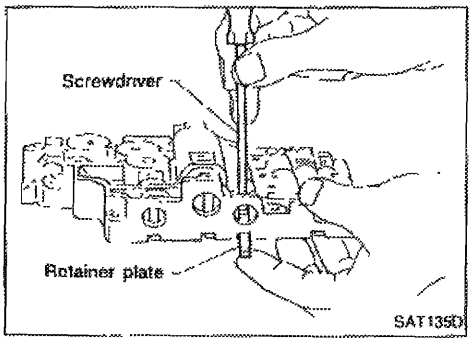
(1) Control valve upper body
(2) Return spring
(3) Overrun clutch reducing valve
(4) Plug
(5) Retainer plate
(6) Torque converter relief valve
(7) Return spring
(8) Retainer plate
(9) Lock-up control valve
(10) Return spring
(11) Plug
(12) Retainer plate
(13) 1-2 accumulator valve
(14) Return spring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

Control Valve Upper Body (Cont'd)

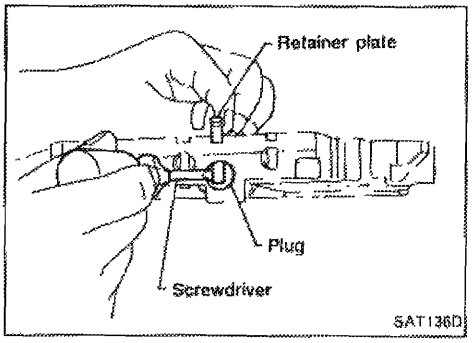
DISASSEMBLY



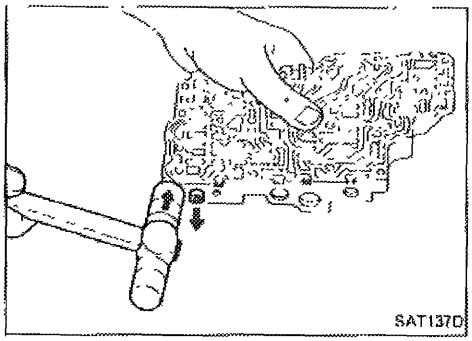
1. Remove valves at retainer plates.
- **Do not use a magnetic "hand".**



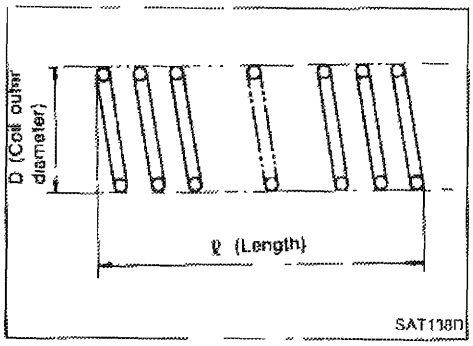
a. Use a screwdriver to pry out retainer plates.



b. Remove retainer plates while holding spring, plugs or sleeves.
- **Remove plugs slowly to prevent internal parts from jumping out.**



c Place mating surface of valve body face down, and remove internal parts.
- **If a valve is hard to remove, place valve body face down and lightly tap it with a soft hammer.**
- **Be careful not to drop or damage valves and sleeves.**



INSPECTION

Valve spring

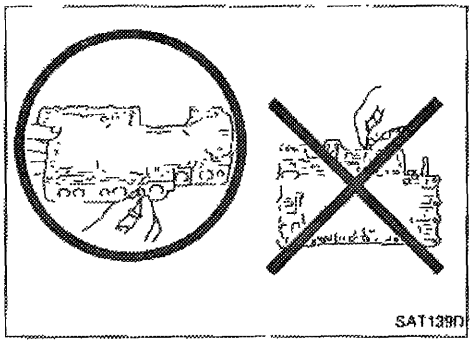
- Measure free length and outer diameter of each valve spring. Also check for damage or deformation.
  Inspection standard: Refer to S.D.S.
- Replace valve springs if deformed or fatigued.

Control valves

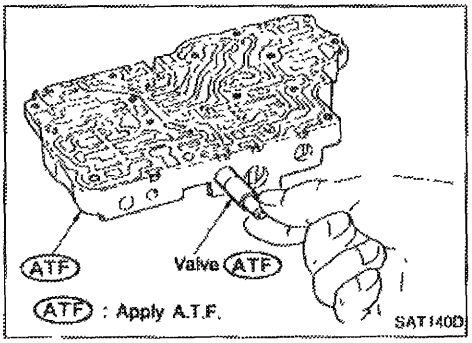
- Check sliding surfaces of valves, sleeves and plugs.

Control Valve Upper Body (Cont'd)

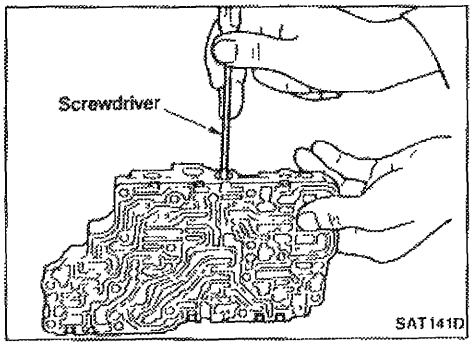
ASSEMBLY



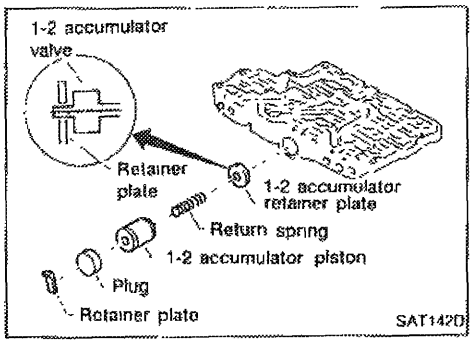
- **Lay control valve body down when installing valves. Do not stand the control valve body upright.**



1. Lubricate the control valve body and all valves with A.T.F. Install control valves by sliding them carefully into their bores.
- **Be careful not to scratch or damage valve body.**

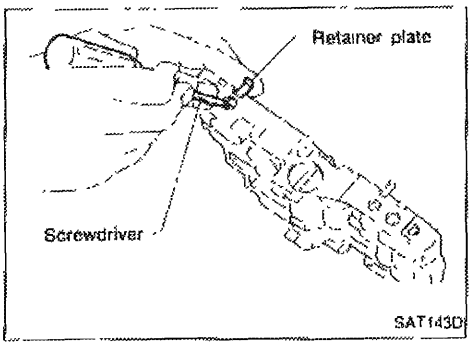


- Wrap a small screwdriver with vinyl tape and use it to insert the valves into their proper positions.



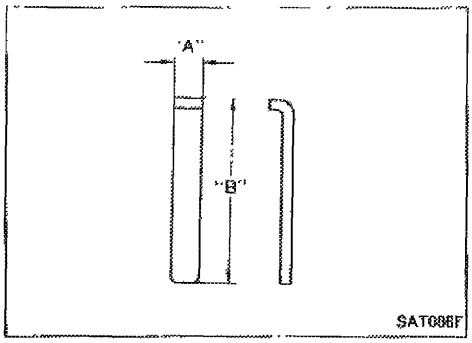
1-2 accumulator valve

- Install 1-2 accumulator valve and then align 1-2 accumulator retainer plate with 1-2 accumulator valve from opposite side of control valve body.
- Install return spring, 1-2 accumulator piston and plug.



2. Install retainer plates
- Install retainer plate while pushing plug or return spring.

Control Valve Upper Body (Cont'd)



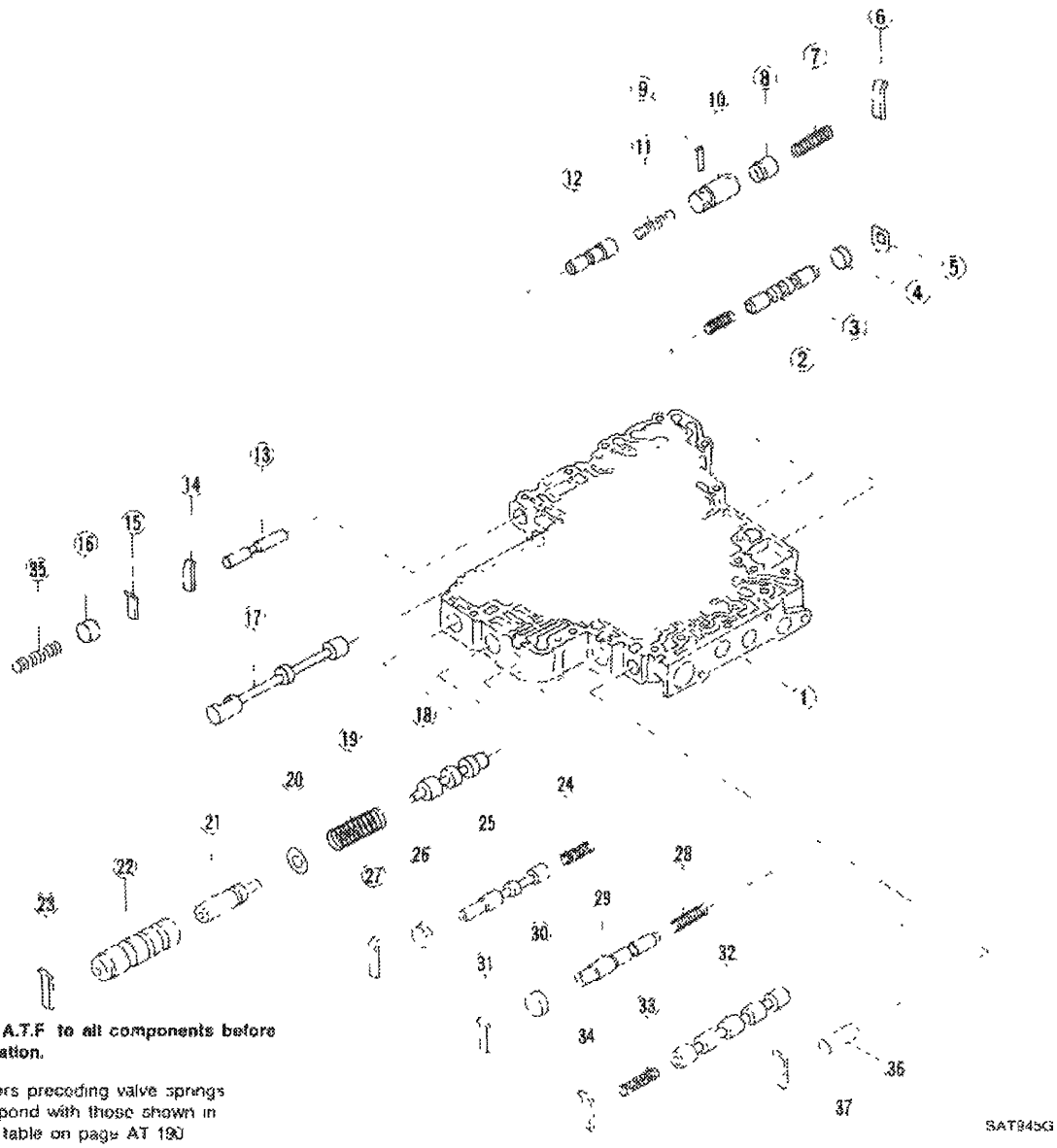
Retainer plate

Unit: mm (in)

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

- Install proper retainer plates.

Control Valve Lower Body



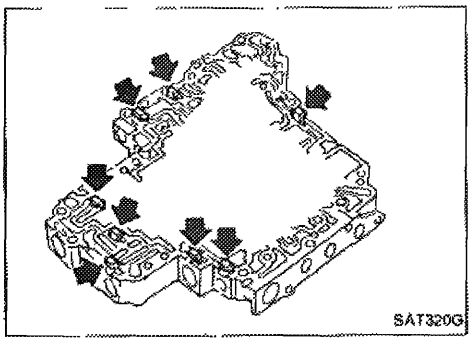
Apply A.T.F to all components before installation.

Numbers preceding valve springs correspond with those shown in S.D.S. table on page AT 190

SAT945G

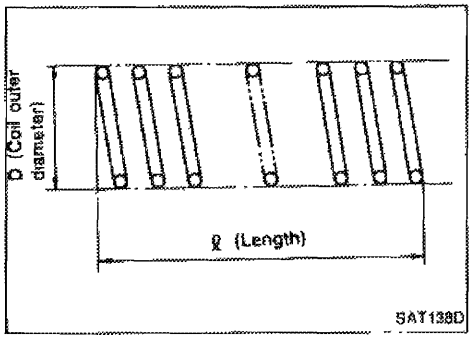
(1) Control valve lower body
(2) Return spring
(3) Shift valve B
(4) Plug
(5) Retainer plate
(6) Retainer plate
(7) Return spring
(8) Piston
(9) Parallel pin
(10) Sleeve
(11) Return spring
(12) Pressure modifier valve
(13) Accumulator shift valve
(14) Retainer plate
(15) Retainer plate
(16) Plug
(17) Manual valve
(18) Pressure regulator valve
(19) Return spring
(20) Spring seat
(21) Plug
(22) Sleeve
(23) Retaining plate
(24) Return spring
(25) Overrun clutch control valve
(26) Plug
(27) Retaining plate
(28) Return spring
(29) Accumulator control valve
(30) Plug
(31) Retainer plate
(32) Shift valve A
(33) Return spring
(34) Retainer plate
(35) Return spring
(36) Plug
(37) Retainer plate

Control Valve Lower Body (Cont'd)


SAT320G

DISASSEMBLY

Remove valves at retainer plate.
For removal procedures, refer to "DISASSEMBLY" of Control Valve Upper Body.



SAT138D

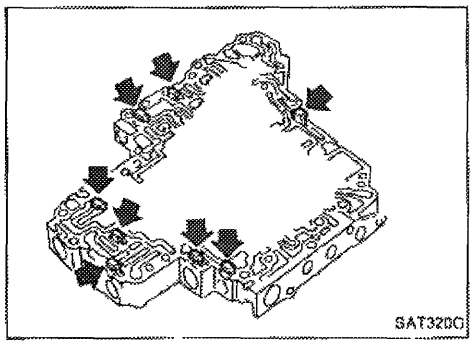
INSPECTION

Valve springs

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

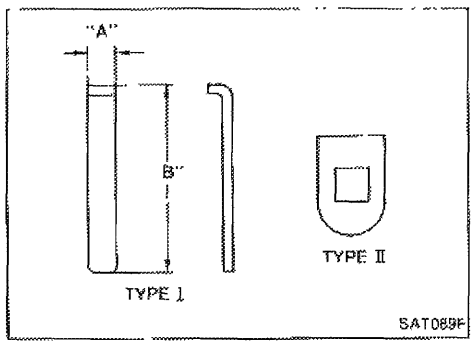
Control valves

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


SAT320G

ASSEMBLY

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



SAT089F

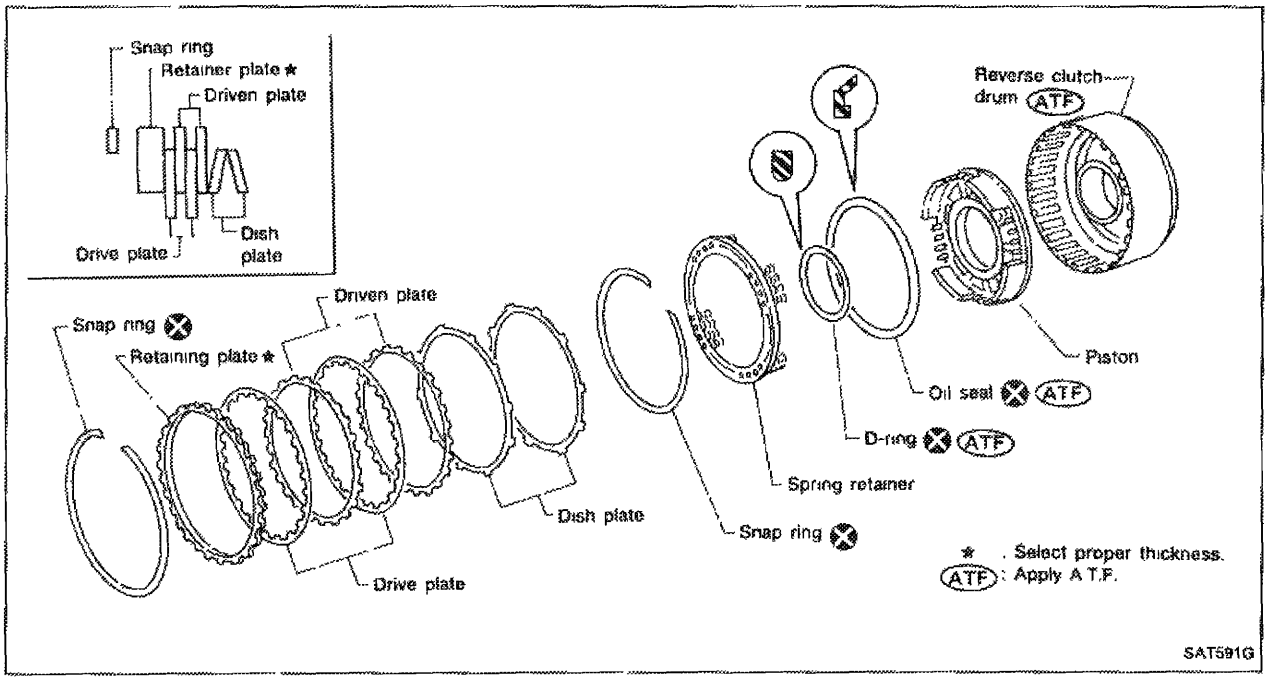
Retainer plate

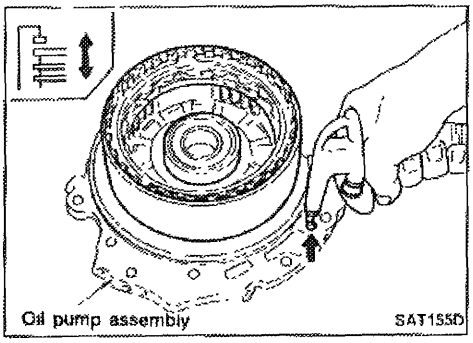
Unit: mm (in)

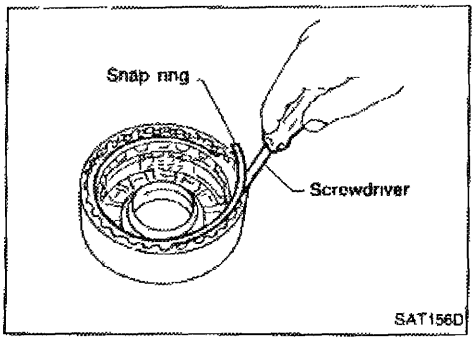
Name of control valve	Length A	Length B	Type
Accumulator shift valve	60 (0.236)	19.5 (0.768)	I
Pressure regulator valve		28.0 (1.102)	
Pressure clutch control			
Accumulator control valve			
Shift valve A			
Overrun clutch control valve			
Pressure modifier valve			
Shift valve B	—	—	II

- Install proper retainer plates

Reverse Clutch



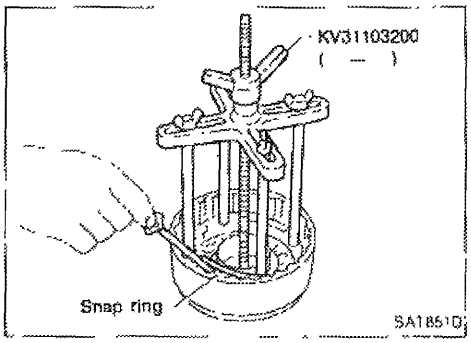




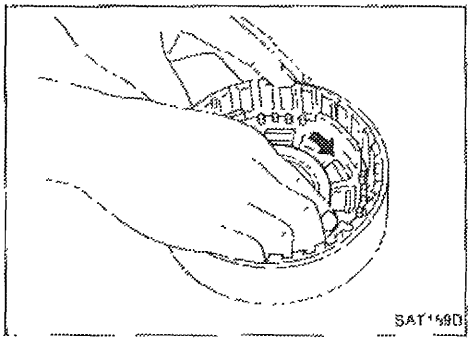
DISASSEMBLY

1. Check operation of reverse clutch
   a. Install seal ring onto drum support of oil pump cover and install reverse clutch assembly. Apply compressed air to oil hole.
   b. Check to see that retaining plate moves to snap ring.
   c. If retaining plate does not move to snap ring, D-ring or oil seal may be damaged or fluid may be leaking at piston check ball.
2. Remove snap ring.
3. Remove drive plates, driven plates, retaining plate, and dish plates.

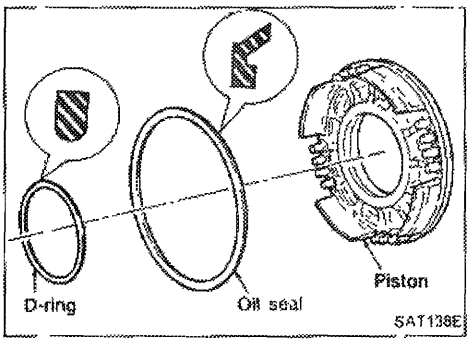
Reverse Clutch (Cont'd)



4. Set Tool on spring retainer and remove snap ring from reverse clutch drum while compressing return springs.
   - **Set Tool directly above springs.**
   - **Do not expand snap ring excessively.**
5. Remove spring retainer and return springs.
   - **Do not remove return springs from spring retainer.**



6. Remove piston from reverse clutch drum by turning it

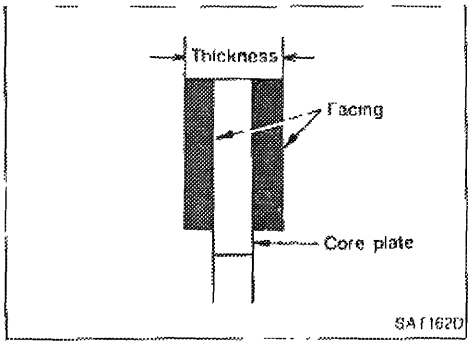


7. Remove D-ring and oil seal from piston.

INSPECTION

Reverse clutch snap ring, spring retainer and return springs

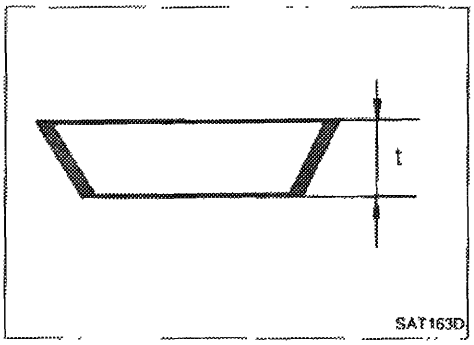
- Check for deformation, fatigue or damage.
- Replace if necessary.
- **When replacing spring retainer and return springs, replace them as a set.**



Reverse clutch drive plates

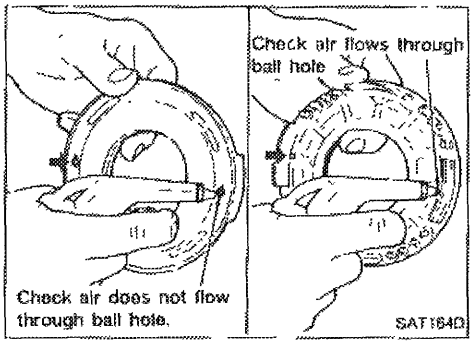
- Check facing for burns, cracks or damage.
- Measure thickness of facing.
  Thickness of drive plate:
  Standard value: 2.0 mm (0.079 in)
  Wear limit: 1.8 mm (0.071 in)
- If not within wear limit replace.

Reverse Clutch (Cont'd)



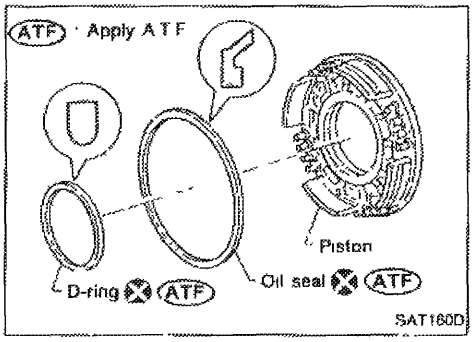
Reverse clutch dish plates

- Check for deformation or damage.
- Measure thickness of dish plate.
  Thickness of dish plate "t": 2.8 mm (0.110 in)
- If deformed or fatigued, replace



Reverse clutch piston

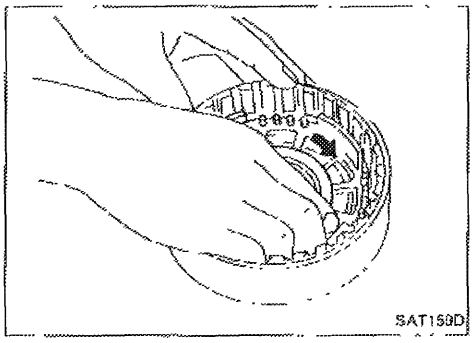
- Make sure check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring to make sure that there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure air leaks past ball.



ASSEMBLY

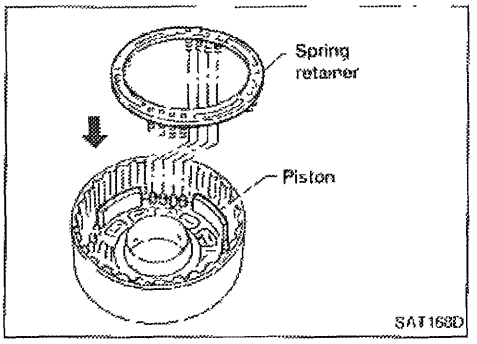
1 Install D-ring and oil seal on piston.

- **Take care with the direction of the oil seal.**
- **Apply A.T.F. to both parts.**



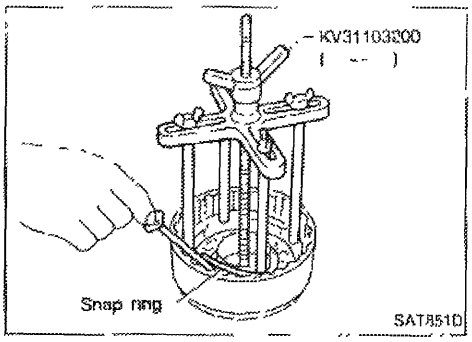
2. Install piston assembly by turning it slowly.

- **Apply A.T.F. to inner surface of drum.**

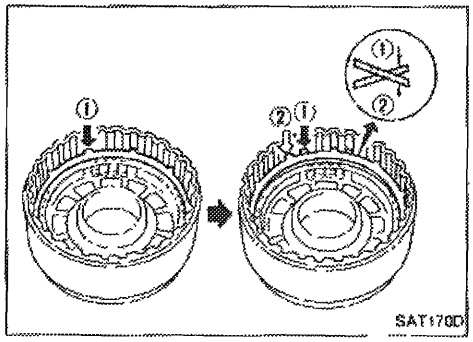


3. Install return springs and spring retainer on piston.

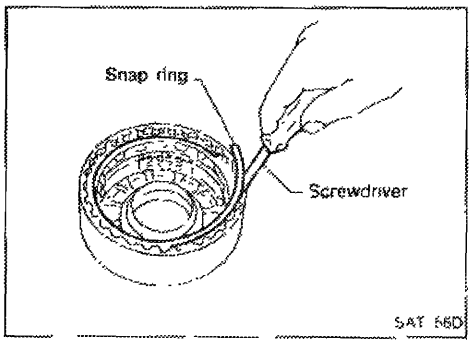
Reverse Clutch (Cont'd)



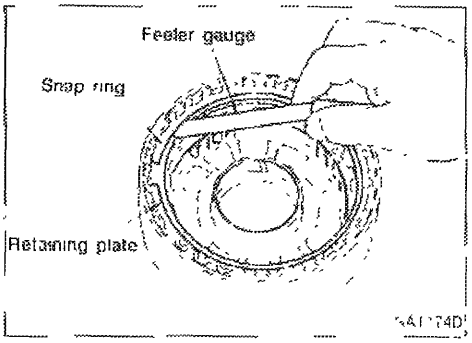
4. Set Tool on spring retainer and install snap ring while compressing return springs.
- **Set Tool directly above return springs.**



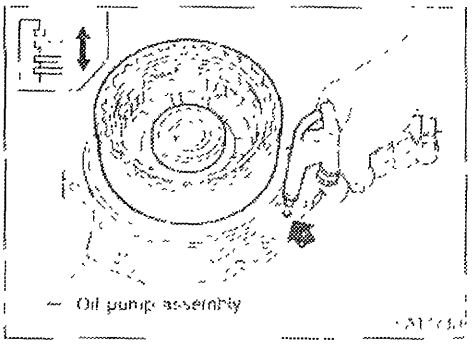
5. Install drive plates, driven plates, retaining plate and dish plates.
- **Do not align the projections of any two dish plates.**
- **Take care with the order and direction of plates.**



6. Install snap ring.

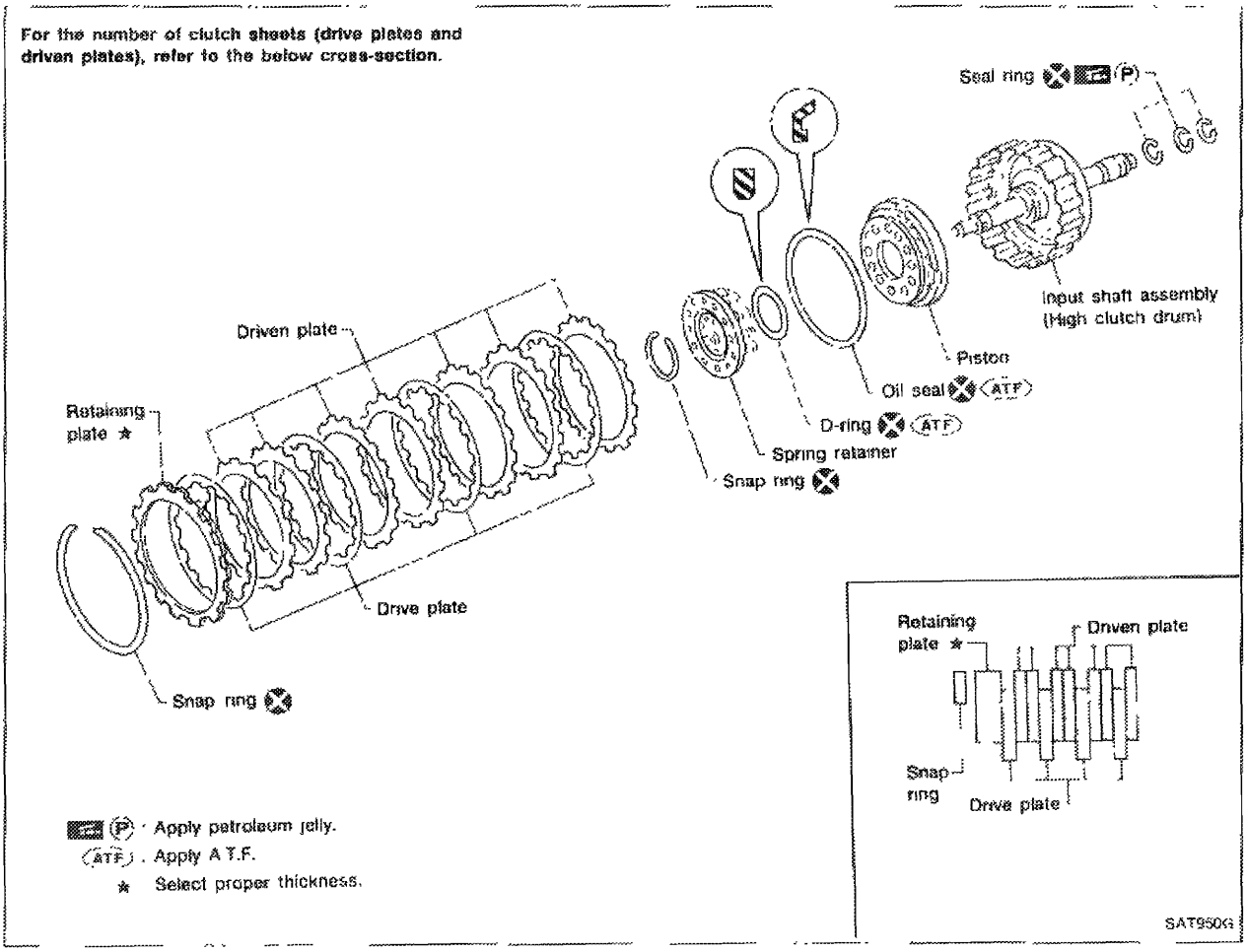


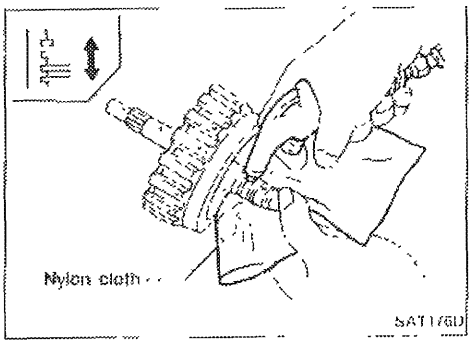
7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.
   Specified clearance:
   Standard: 0.5 - 0.8 mm (0.020 - 0.031 in)
   Allowable limit: 1.2 mm (0.047 in)
   Retaining plate: Refer to S.D.S.



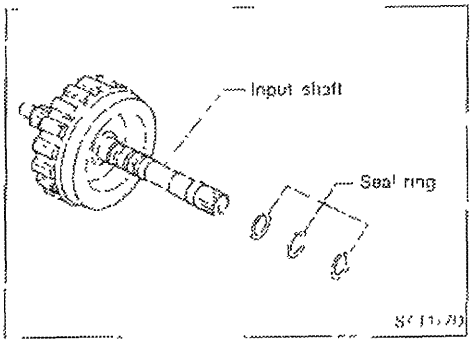
8. Check operation of reverse clutch.
   Refer to "DISASSEMBLY" in "Reverse Clutch."

High Clutch



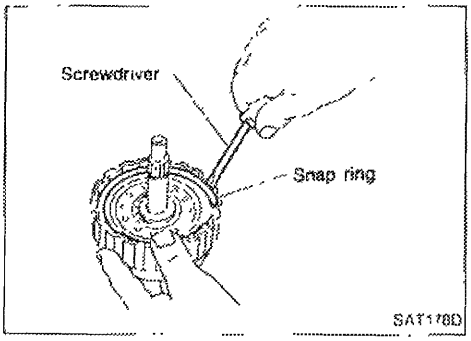


1. Check operation of high clutch
   a. Apply compressed air to oil hole of input shaft.
   ● **Stop up a hole on opposite side of input shaft.**
   b. Check to see that retaining plate moves to snap ring.
   c. If retaining plate does not move to snap ring, D-ring or oil seal may be damaged or fluid may be leaking at piston check ball

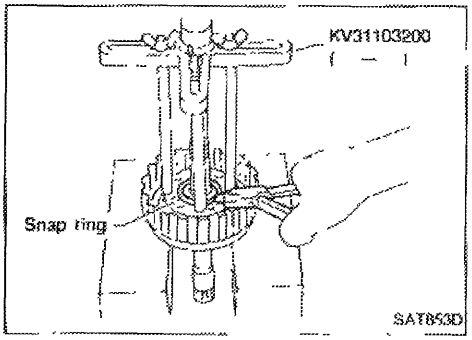


2. Remove seal rings from input shaft

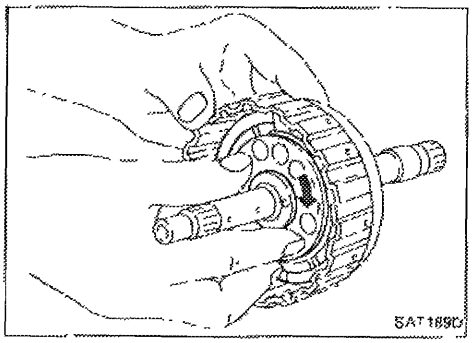
High Clutch (Cont'd)



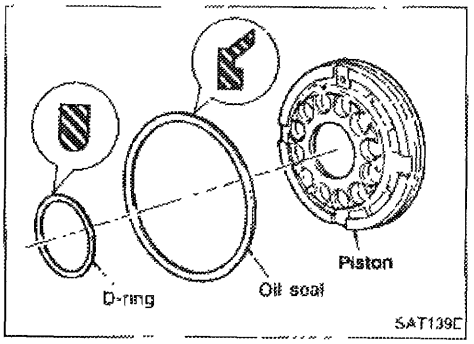
3. Remove snap ring.
4. Remove drive plates, driven plates, retaining plate and dish plate.



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



7. Remove piston from high clutch drum by turning it.



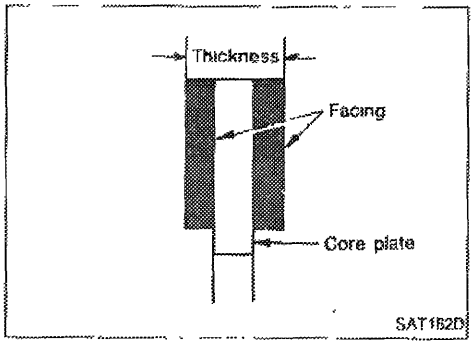
8. Remove D-ring and oil seal from piston.

INSPECTION

Reverse clutch snap ring, spring retainer and return springs

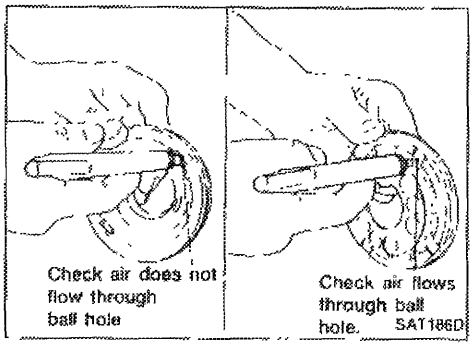
- Check for deformation, fatigue or damage.
- Replace if necessary
- **When replacing spring retainer and return springs, replace them as a set.**

High Clutch (Cont'd)



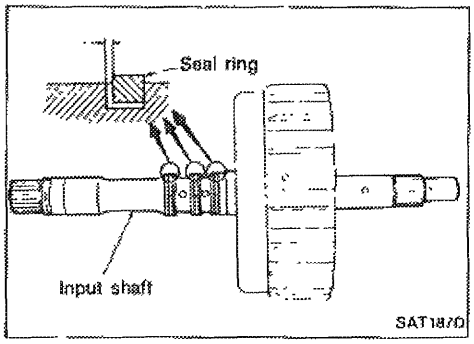
High clutch drive plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing
  Thickness of drive plate:
  Standard value: 1.6 mm (0.063 in)
  Wear limit: 1.4 mm (0.055 in)
- If not within wear limit, replace.



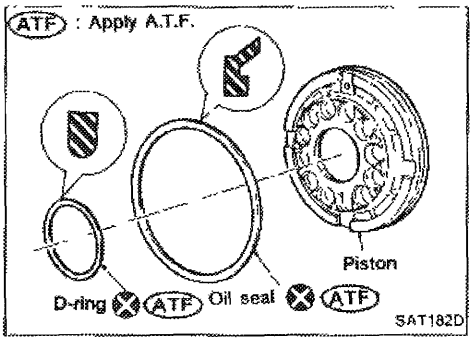
High clutch piston

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



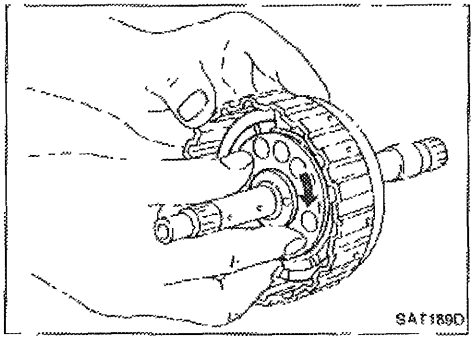
Seal ring clearance

- Install new seal rings onto input shaft
- Measure clearance between seal ring and ring groove.
  Standard clearance:
  0.08 - 0.23 mm (0.0031 - 0.0091 in)
  Allowable limit:
  0.23 mm (0.0091 in)
- If not within wear limit, replace input shaft assembly.



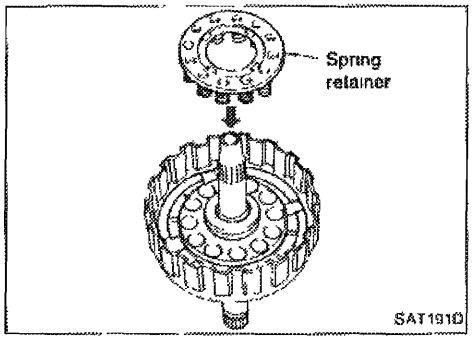
ASSEMBLY

1. Install D-ring and oil seal on piston.
   - **Take care with the direction of the oil seal.**
   - **Apply A.T.F. to both parts.**

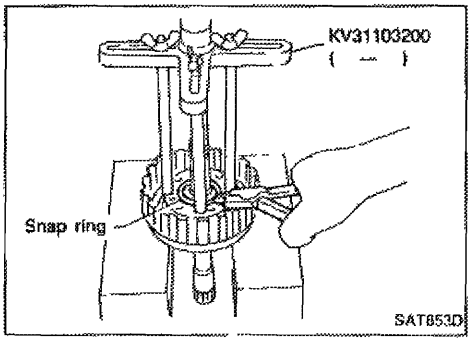


2. Install piston assembly by turning it slowly.
   - **Apply A.T.F. to inner surface of drum.**

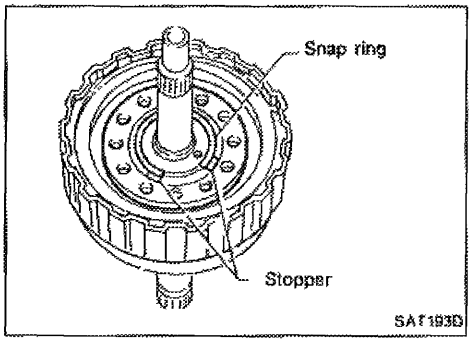
High Clutch (Cont'd)



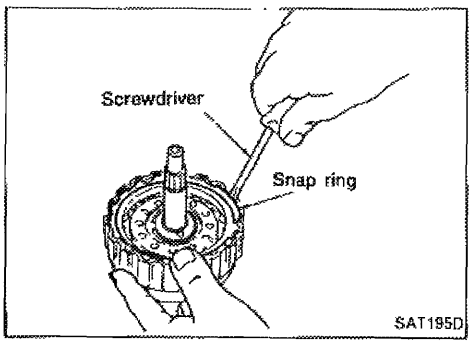
3. Install return springs and spring retainer on piston.



4. Set Tool on spring retainer and install snap ring while compressing return springs.
   - **Set Tool directly above return springs.**



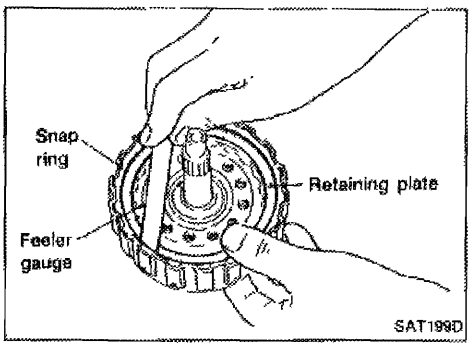
- **Do not align snap ring gap with spring retainer stopper.**



5. Install drive plates, driven plates, retaining plate and dish plate.

Take care with the order and direction of plates.

6. Install snap ring.



7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

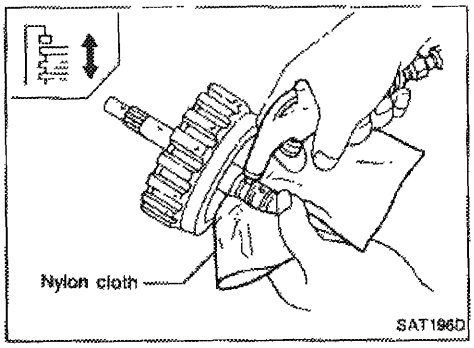
   Specified clearance:

   Standard: 1.4 - 1.8 mm (0.055 - 0.071 in)

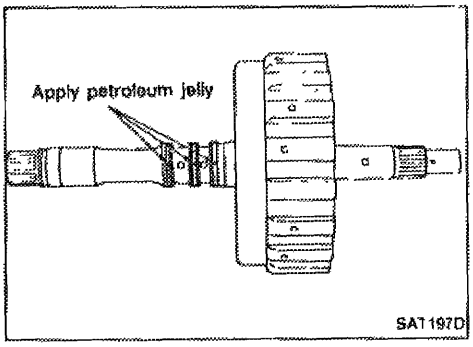
   Allowable limit: 2.6 mm (0.102 in)

   Retaining plate: Refer to S.D.S.

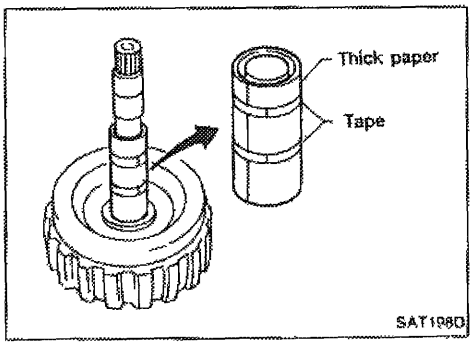
High Clutch (Cont'd)



8. Check operation of high clutch.
   Refer to "DISASSEMBLY" in "High Clutch".

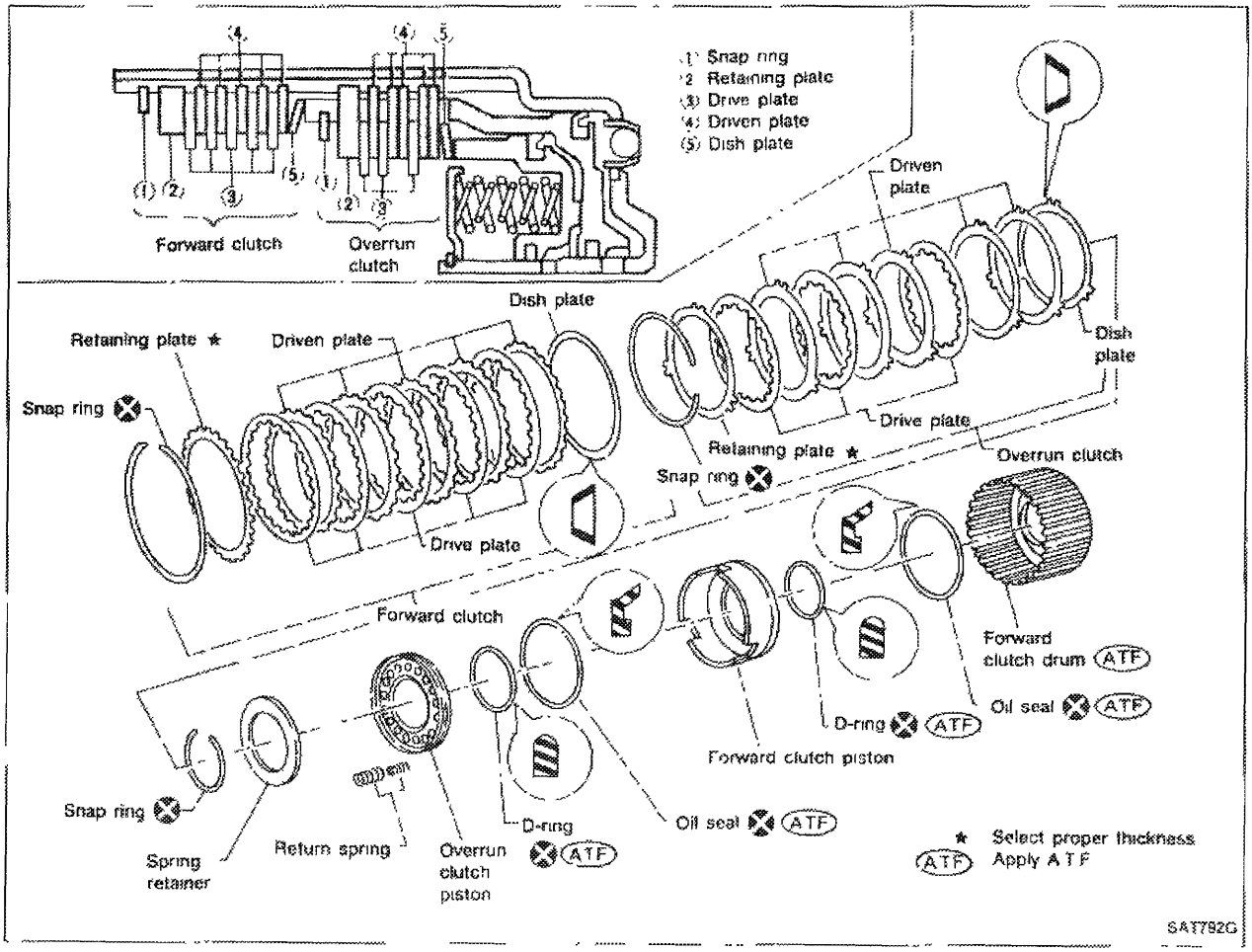


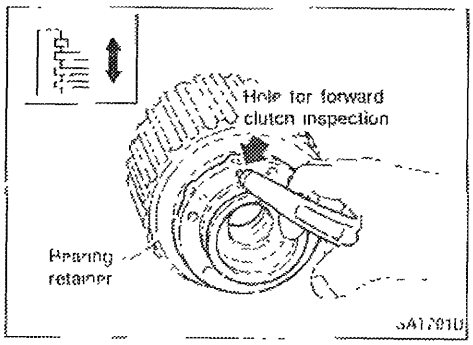
9. Install seal rings to input shaft.
   - **Apply petroleum jelly to seal rings.**

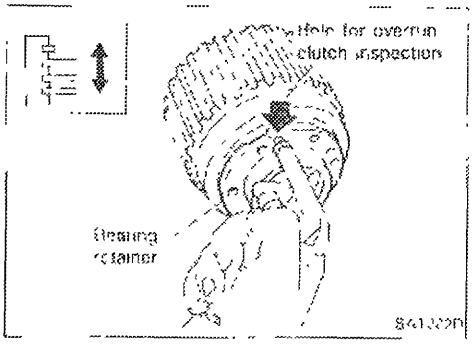


- **Roll paper around seal rings to prevent seal rings from spreading.**

Forward Clutch and Overrun Clutch





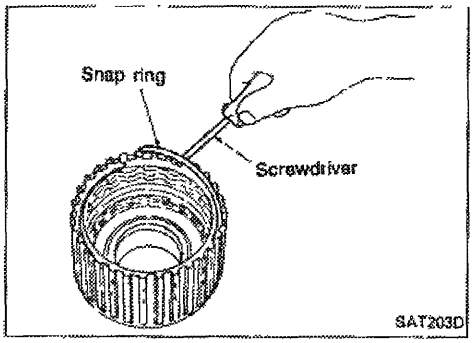


DISASSEMBLY

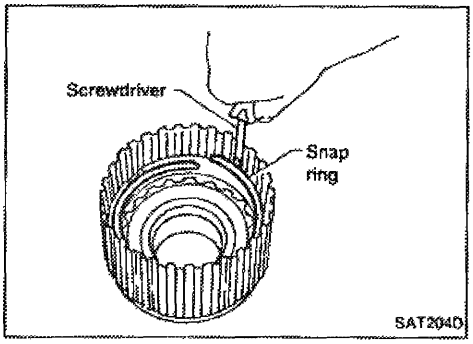
1. Check operation of forward clutch and overrun clutch.
a. Install bearing retainer on forward clutch drum.
b. Apply compressed air to oil hole of forward clutch drum.
c. Check to see that retaining plate moves to snap ring.

d If retaining plate does not move to snap ring, D-ring or oil seal may be damaged or fluid may be leaking at piston check ball.

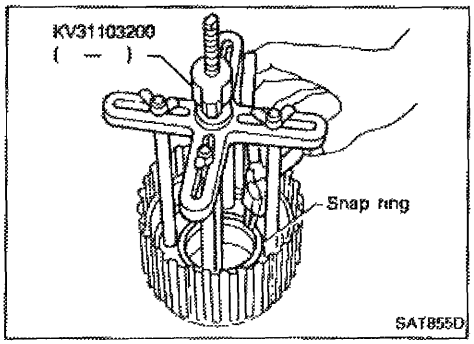
Forward Clutch and Overrun Clutch (Cont'd)



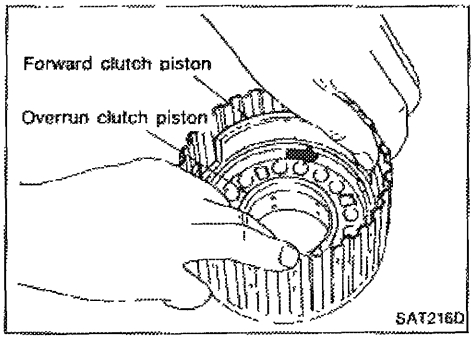
2. Remove snap ring for forward clutch.
3. Remove drive plates, driven plates, retaining plate and dish plate for forward clutch.



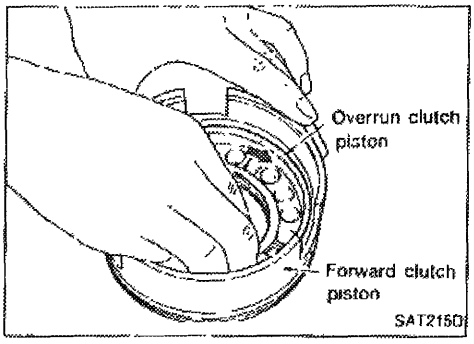
4. Remove snap ring for overrun clutch.
5. Remove drive plates, driven plates, retaining plate and dish plate for overrun clutch.



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

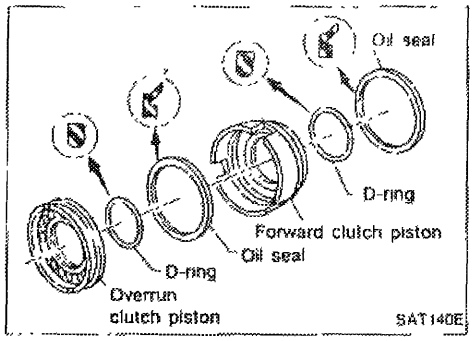


8. Remove forward clutch piston with overrun clutch piston from forward clutch drum by turning it.



9. Remove overrun clutch piston from forward clutch piston by turning it.

Forward Clutch and Overrun Clutch (Cont'd)

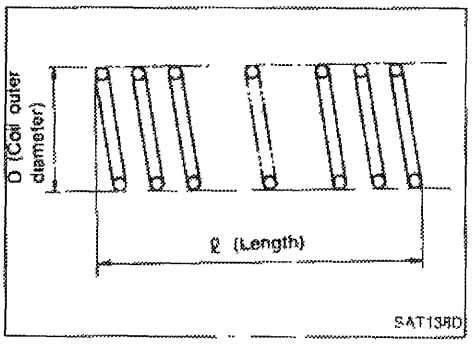


10. Remove D-rings and oil seals from forward clutch piston and overrun clutch piston.

INSPECTION

Snap rings and spring retainer

- Check for deformation, fatigue or damage.



Forward clutch and overrun clutch return springs

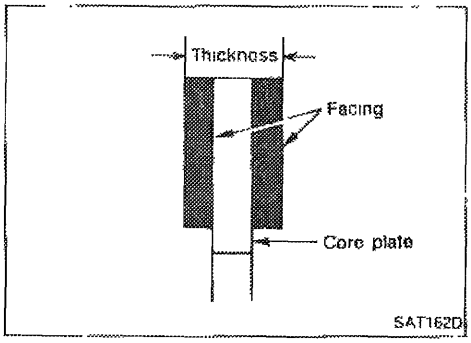
- Check for deformation or damage.
- Measure free length and outer diameter.

Inspection standard:

Unit: mm (in)

Parts		Part No	ℓ	D
Return spring	Inner	31505-31X03	26.3 (1.035)	7.7 (0.303)
	Outer	31505-31X02	26.6 (1.047)	10.6 (0.417)

- Replace if deformed or fatigued.



Forward clutch and overrun clutch drive plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing

  Thickness of drive plate:

  Forward clutch

  Standard value: 1.8 mm (0.071 in)

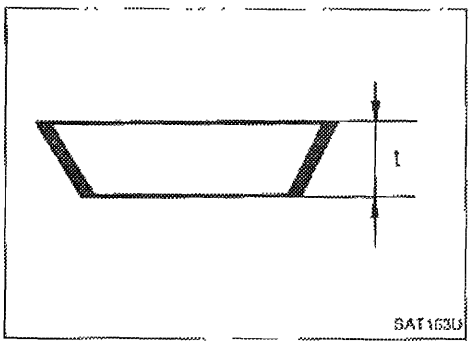
  Wear limit: 1.6 mm (0.063 in)

  Overrun clutch

  Standard value: 1.6 mm (0.063 in)

  Wear limit: 1.4 mm (0.055 in)

- If not within wear limit, replace.



Forward clutch and overrun clutch dish plates

- Check for deformation or damage.
- Measure thickness of dish plate.

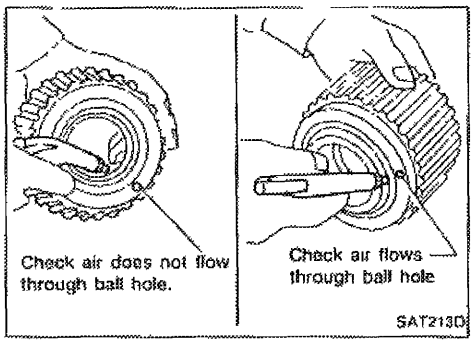
  Thickness of dish plate "t":

  Forward clutch: 2.5 mm (0.098 in)

  Overrun clutch: 2.15 mm (0.0846 in)

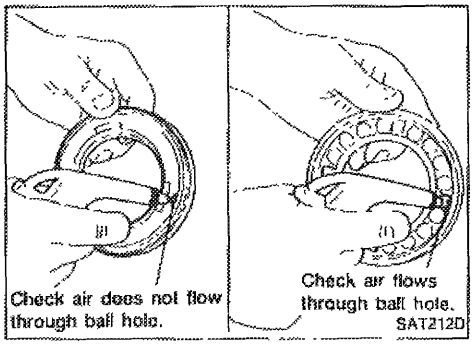
- If deformed or fatigued, replace.

Forward Clutch and Overrun Clutch (Cont'd)



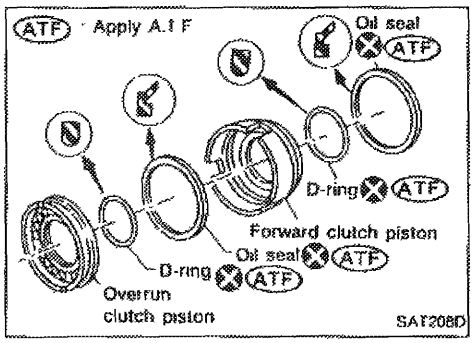
Forward clutch drum

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



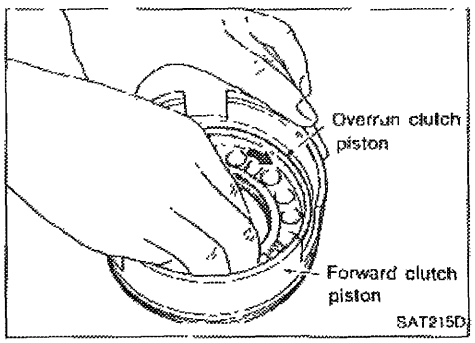
Overrun clutch piston

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

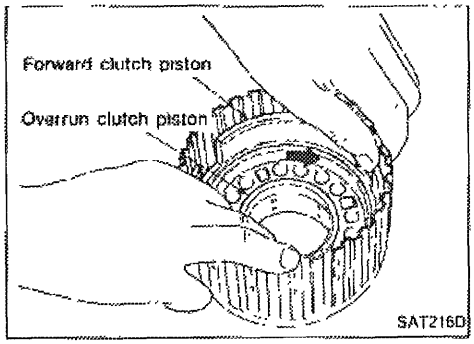


ASSEMBLY

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

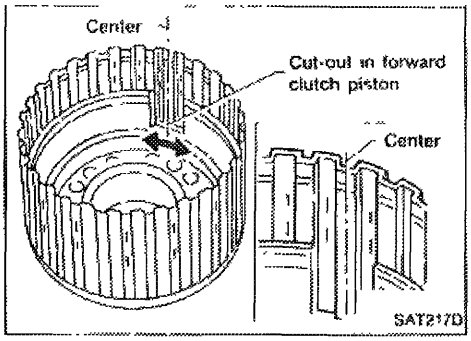


2. Install overrun clutch piston assembly on forward clutch piston while turning it slowly.
   - **Apply A.T.F. to inner surface of forward clutch piston.**

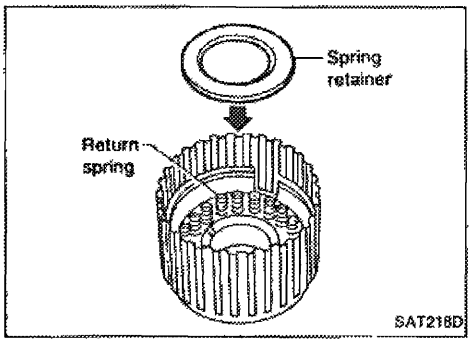


3. Install forward clutch piston assembly on forward clutch drum while turning it slowly.
   - **Apply A.T.F. to inner surface of drum.**

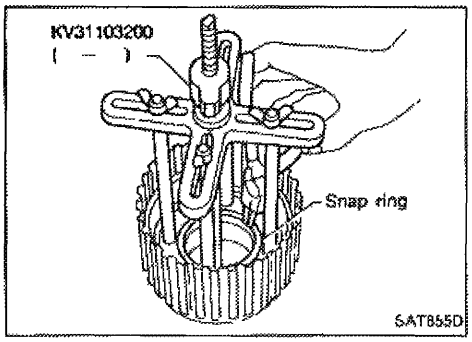
Forward Clutch and Overrun Clutch (Cont'd)



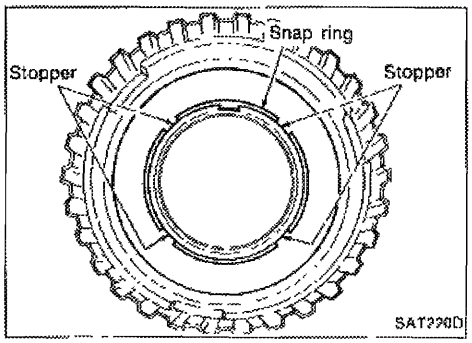
4. Align notch in forward clutch piston with groove in forward clutch drum.



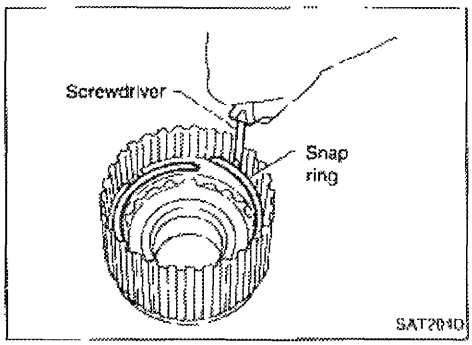
5. Install return spring on piston.
6. Install spring retainer on return springs.



7. Set Tool on spring retainer and install snap ring while compressing return springs.
- **Set Tool directly above return springs.**

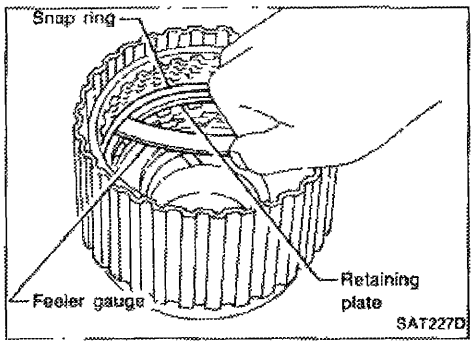


- **Do not align snap ring gap with spring retainer stopper.**

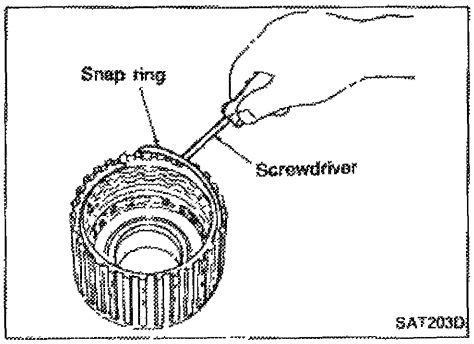


8. Install drive plates, driven plates, retaining plate and dish plate for overrun clutch.
9. Install snap ring for overrun clutch.

Forward Clutch and Overrun Clutch (Cont'd)



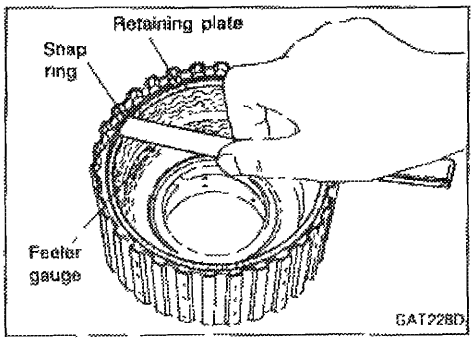
10. Measure clearance between overrun clutch retaining plate and snap ring.
    If not within allowable limit, select proper retaining plate.
    Specified clearance:
    Standard: 1.0 - 1.4 mm (0.039 - 0.055 in)
    Allowable limit: 2.0 mm (0.079 in)
    Overrun clutch retaining plate: Refer to S.D.S.



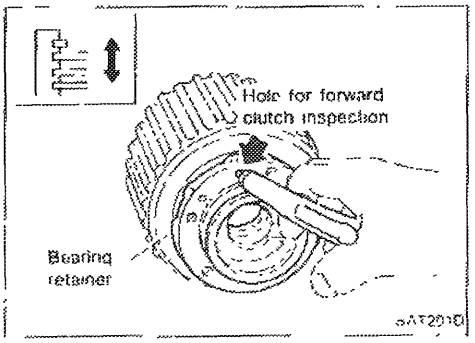
11. Install drive plates, driven plates, retaining plate and dish plate for forward clutch.

Take care with the order and direction of plates.

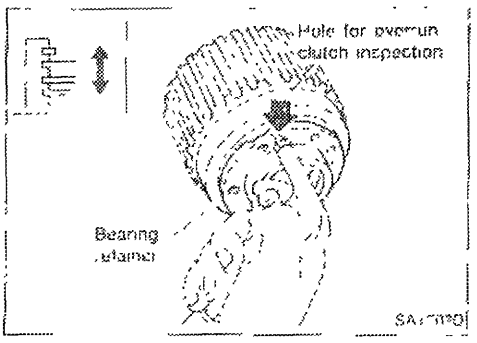
12. Install snap ring for forward clutch.



13. Measure clearance between forward clutch retaining plate and snap ring
    If not within allowable limit, select proper retaining plate.
    Specified clearance:
    Standard: 0.45 - 0.85 mm (0.0177 - 0.0335 in)
    Allowable limit: 1.85 mm (0.0728 in)
    Forward clutch retaining plate: Refer to S.D.S.

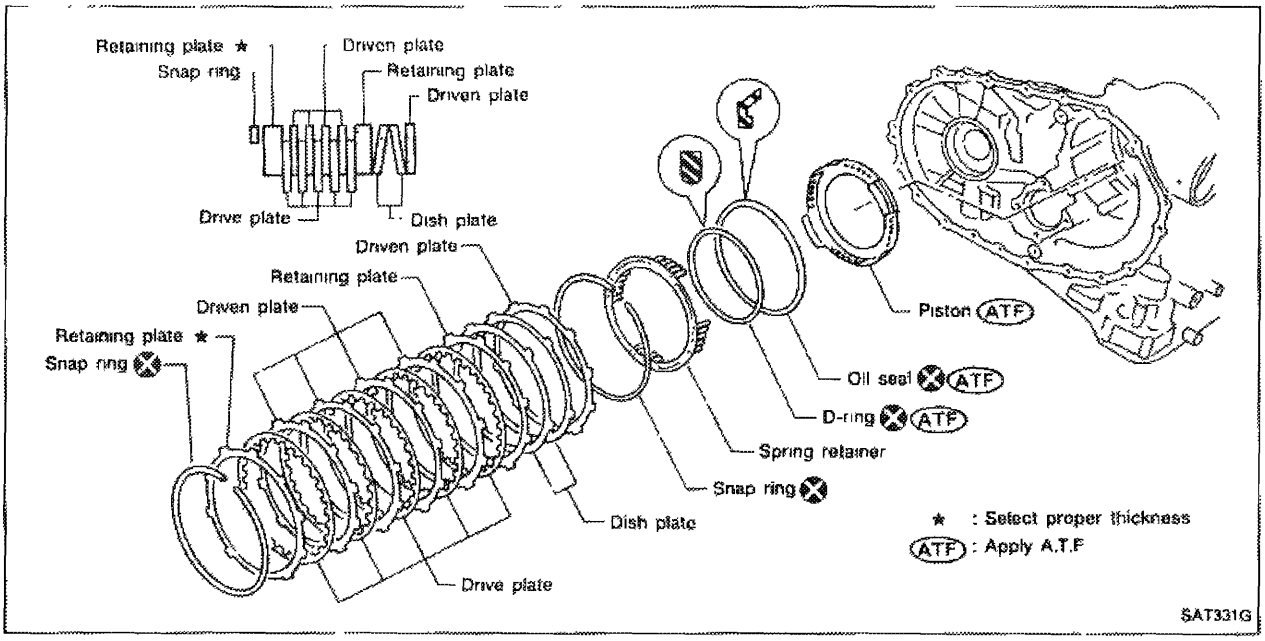


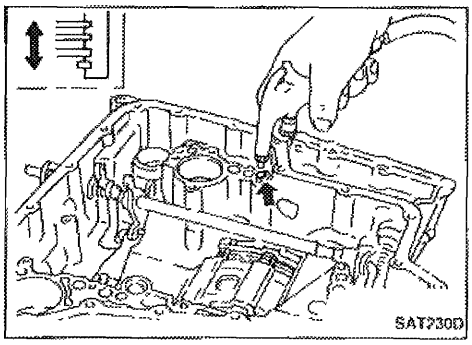
14. Check operation of forward clutch.
    Refer to "DISASSEMBLY" in "Forward Clutch and Overrun Clutch."



15. Check operation of overrun clutch.
    Refer to "DISASSEMBLY" in "Forward Clutch and Overrun Clutch."

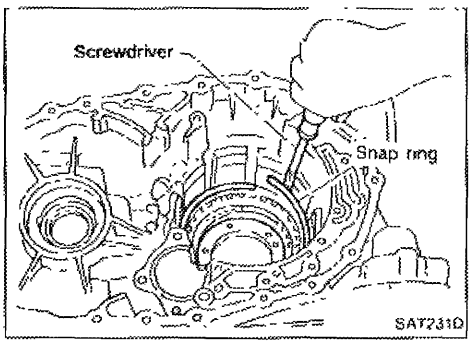
Low & Reverse Brake



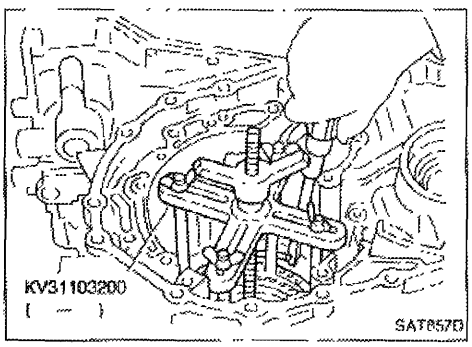


DISASSEMBLY

1. Check operation of low & reverse brake.
a. Apply compressed air to oil hole of transmission case.
b. Check to see that retaining plate moves to snap ring.
c. If retaining plate does not move to snap ring, D-ring or oil seal may be damaged or fluid may be leaking at piston check ball.



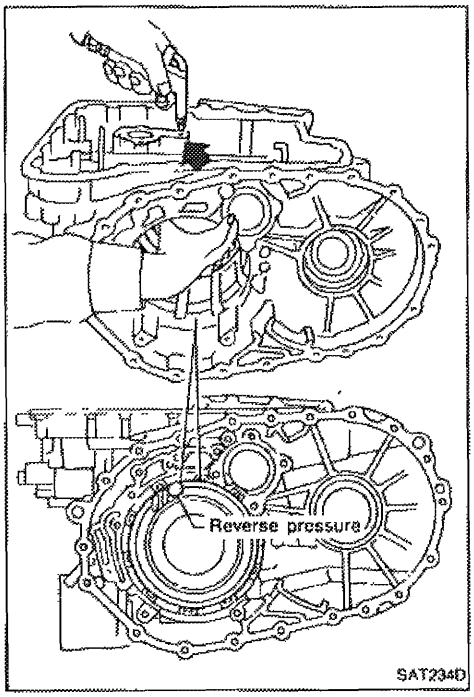
2. Stand transmission case.
3. Remove snap ring.
4. Remove drive plates, driven plates, retaining plate from transmission case.



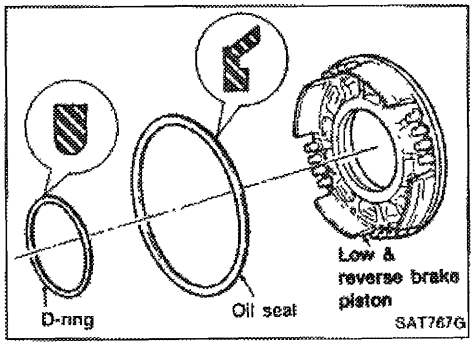
5. Set Tool on spring retainer and remove snap ring while compressing return springs.
- **Set Tool directly above return springs.**
- **Do not expand snap ring excessively.**

6. Remove spring retainer and return springs.
- **Do not remove return springs from spring retainer.**

Low & Reverse Brake (Cont'd)



7. Apply compressed air to oil hole of transmission case while holding piston.
8. Remove piston from transmission case by turning it.

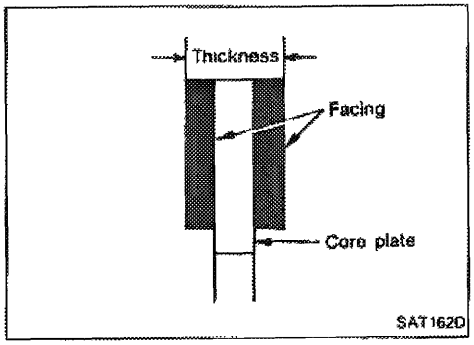


9. Remove D-ring and oil seal from piston.

INSPECTION

Low & reverse clutch snap ring, spring retainer and return springs

- Check for deformation, fatigue or damage.
- Replace if necessary.
- **When replacing spring retainer and return springs, replace them as a set.**

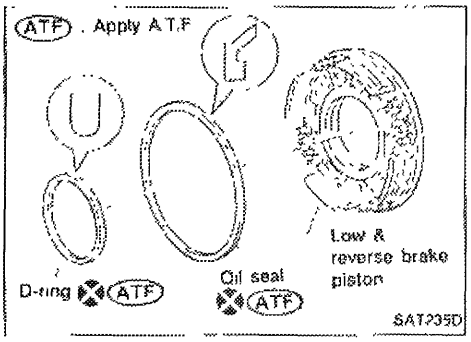


Low & reverse brake drive plate

- Check facing for burns, cracks or damage.
- Measure thickness of facing.
  Thickness of drive plate:
  Standard value: 2.0 mm (0.079 in)
  Wear limit: 1.8 mm (0.071 in)
- If not within wear limit, replace.

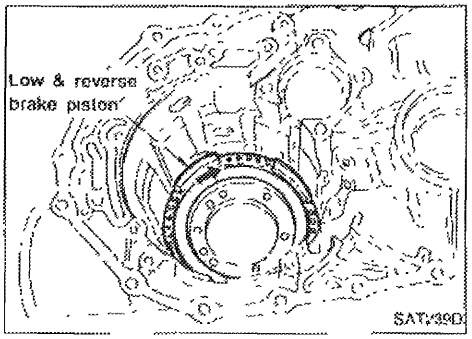
Low & Reverse Brake (Cont'd)

ASSEMBLY



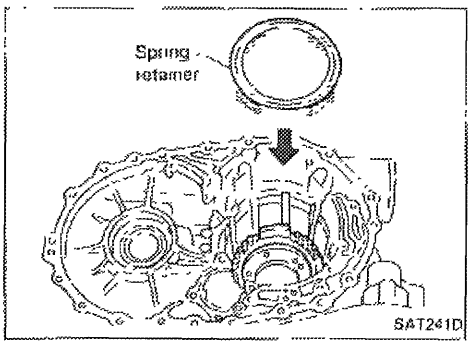
1 Install D-ring and oil seal on piston.

- **Take care with the direction of the oil seal.**
- **Apply A.T.F. to both parts.**

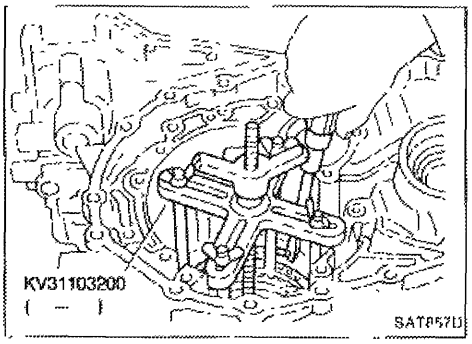


2. Stand transmission case.
3. Install piston assembly on transmission case while turning it slowly.

- **Apply A.T.F. to inner surface of transmission case.**

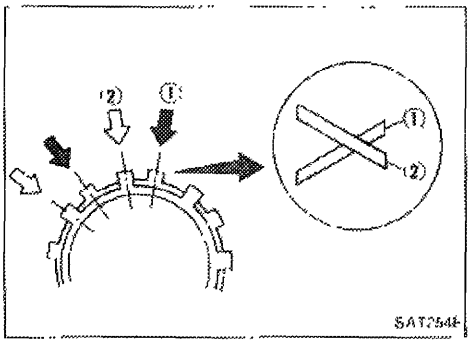


4. Install return springs and spring retainer on piston.



5. Install snap ring while compressing return springs.

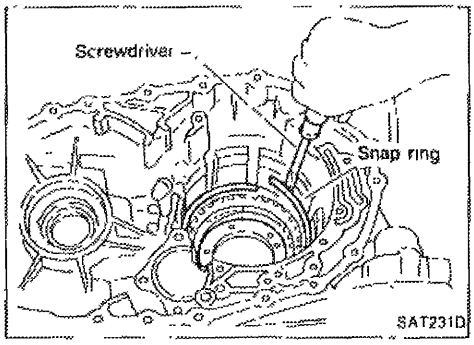
- **Set Tool directly above return springs.**



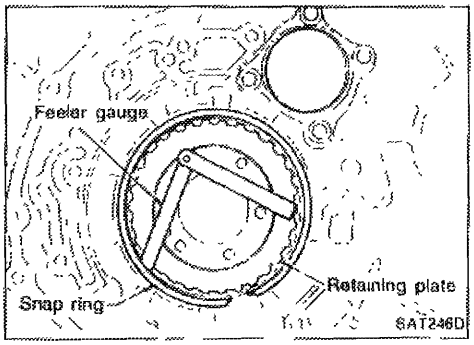
6. Install drive plates, driven plates, retaining plates and dished plates.

- **Do not align the projections on the two dished plates.**
- **Make sure to put the plates in the correct order and direction.**

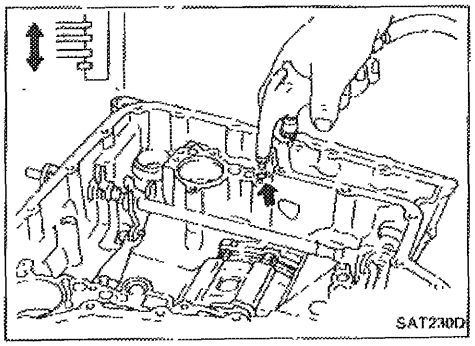
Low & Reverse Brake (Cont'd)



7. Install snap ring.

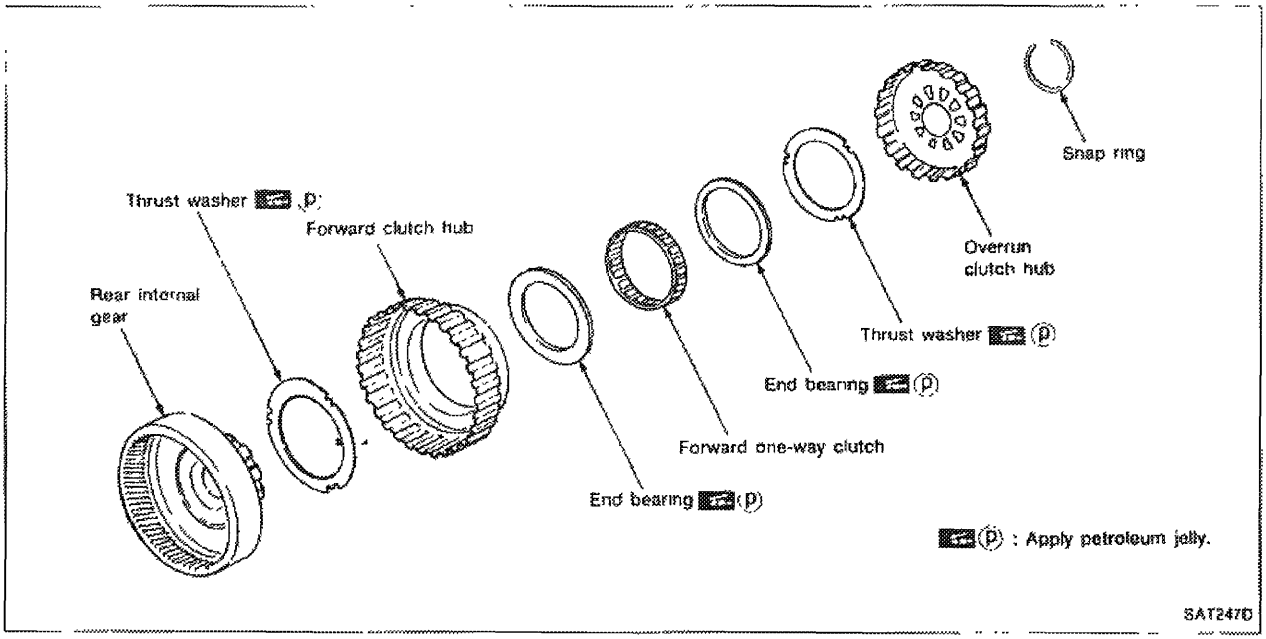


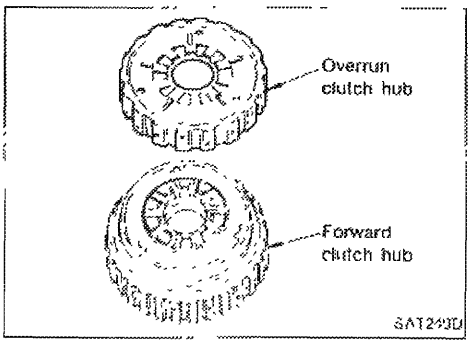
8. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate (front side).
   Specified clearance:
   Standard: 1.4 - 1.8 mm (0.055 - 0.071 in)
   Allowable limit:
   2.8 mm (0.110 in)
   Retaining plate: Refer to S.D.S.



9. Check operation of low & reverse brake
   Refer to "DISASSEMBLY" in "Low & Reverse Brake."

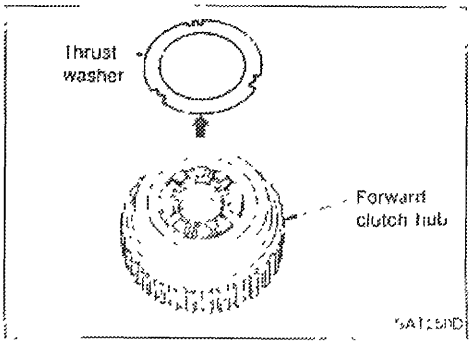
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub





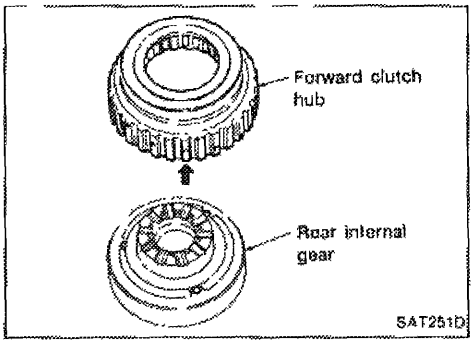
DISASSEMBLY

1. Remove snap ring from overrun clutch hub.
2. Remove overrun clutch hub from forward clutch hub.

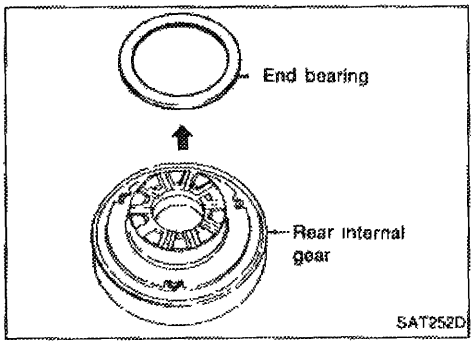


3. Remove thrust washer from forward clutch hub

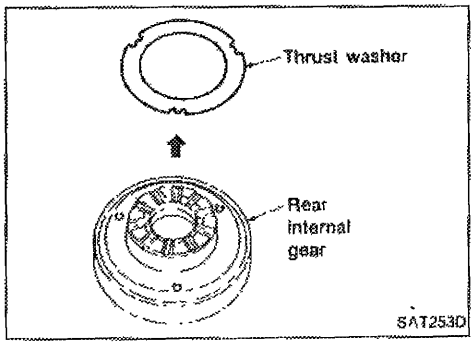
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub (Cont'd)



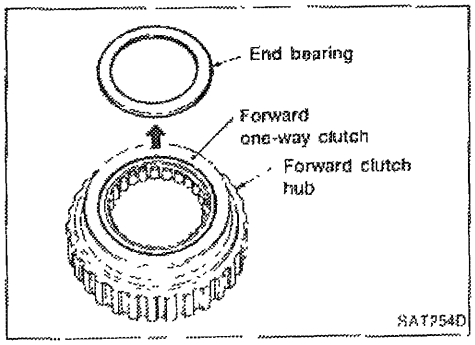
4. Remove forward clutch hub from rear internal gear.



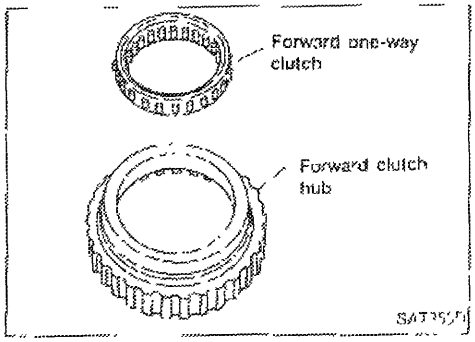
5. Remove end bearing from rear internal gear.



6. Remove thrust washer from rear internal gear.



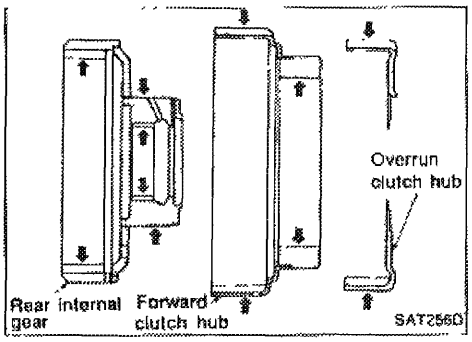
7. Remove end bearing from forward one-way clutch.



8 Remove one-way clutch from forward clutch hub.

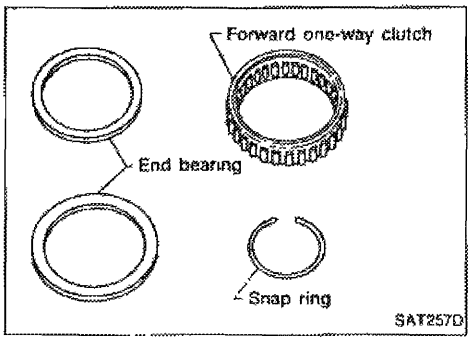
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub (Cont'd)

INSPECTION



Rear internal gear, forward clutch hub and overrun clutch hub

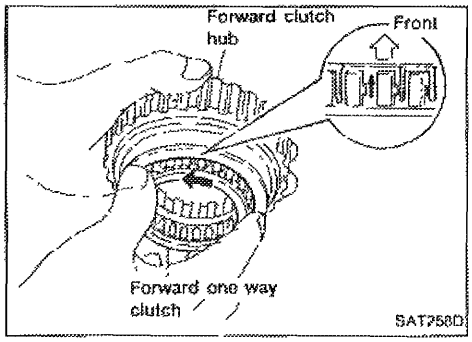
- Check rubbing surface for wear or damage.



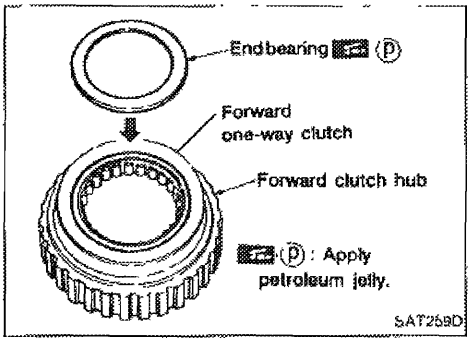
Snap ring, end bearings and forward one-way clutch

- Check snap ring and end bearings for deformation and damage.
- Check forward one-way clutch for wear and damage.

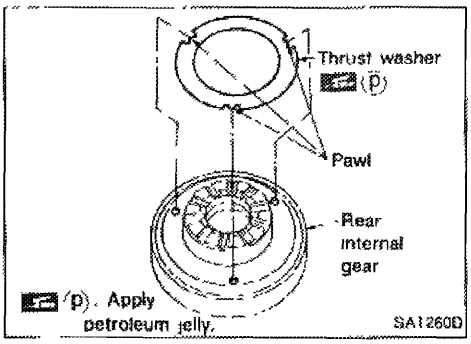
ASSEMBLY



1. Install forward one-way clutch on forward clutch.
- **Take care with the direction of the forward one-way clutch.**

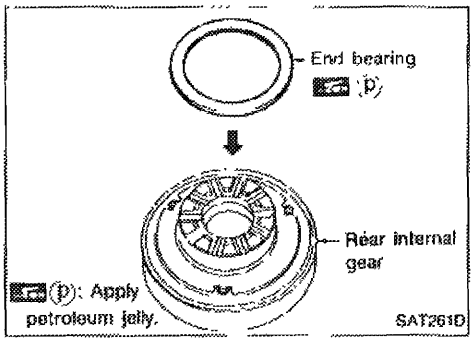


2 Install end bearing on forward one-way clutch.
- **Apply petroleum jelly to end bearing.**

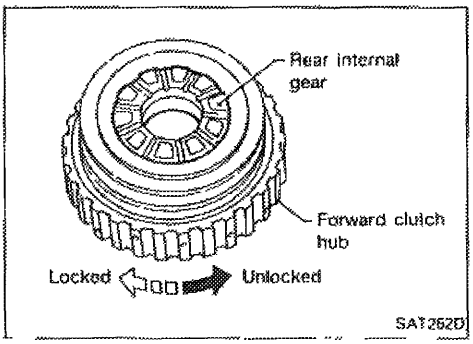


3. Install thrust washer on rear internal gear.
- **Apply petroleum jelly to thrust washer.**
- **Align pawls of thrust washer with holes of rear internal gear.**

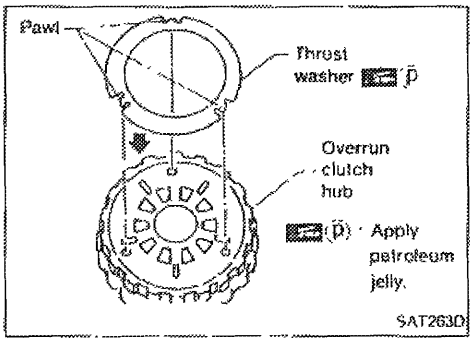
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub (Cont'd)



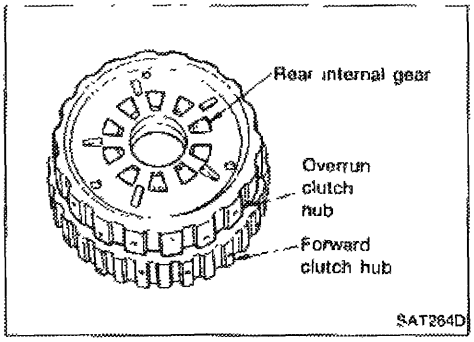
4. Install end bearing on rear internal gear.
   - **Apply petroleum jelly to end bearing.**



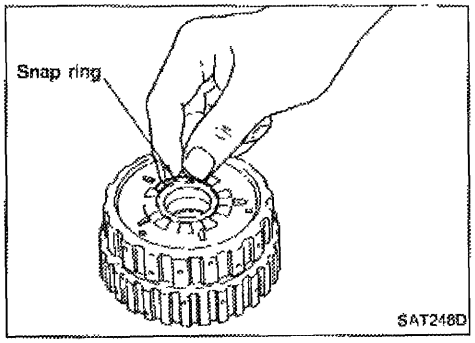
5. Install forward clutch hub on rear internal gear.
   - **Check operation of forward one-way clutch.**



6. Install thrust washer on overrun clutch hub.
   - **Apply petroleum jelly to thrust washer.**
   - **Align pawls of thrust washer with holes of overrun clutch hub.**

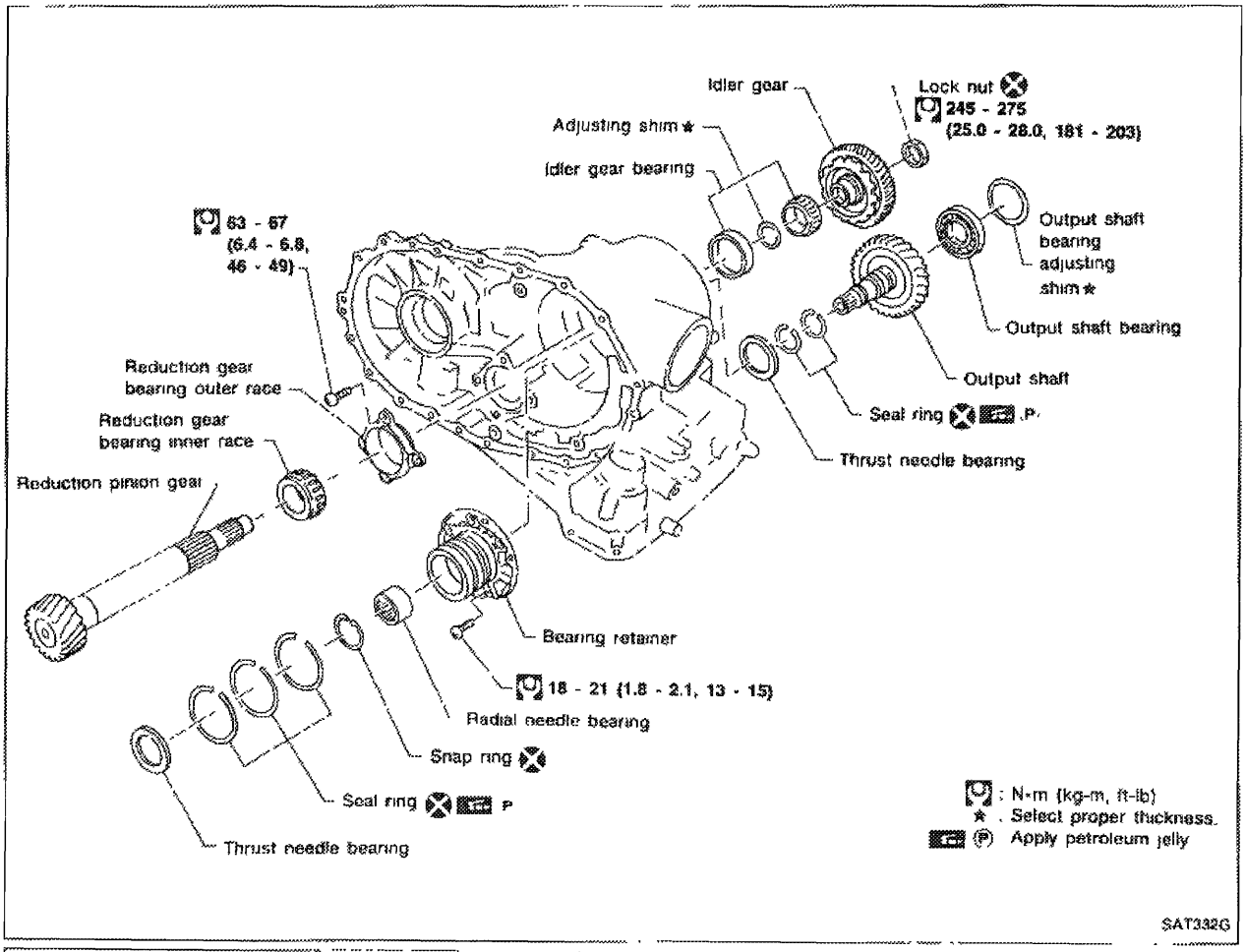


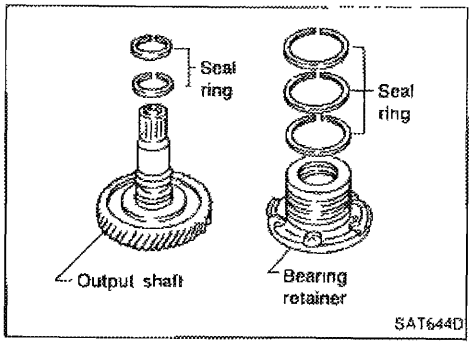
7. Install overrun clutch hub on rear internal gear.
   - **Align projections of rear internal gear with holes of overrun clutch hub.**



8. Install snap ring to groove of rear internal gear.

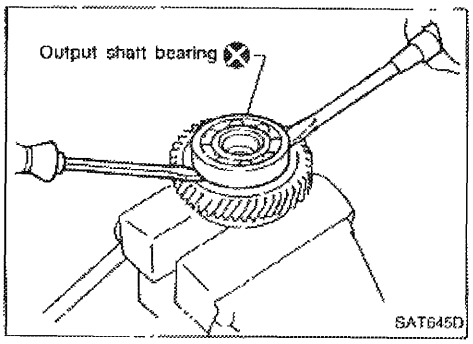
Output Shaft, Idler Gear, Reduction Gear and Bearing Retainer





DISASSEMBLY

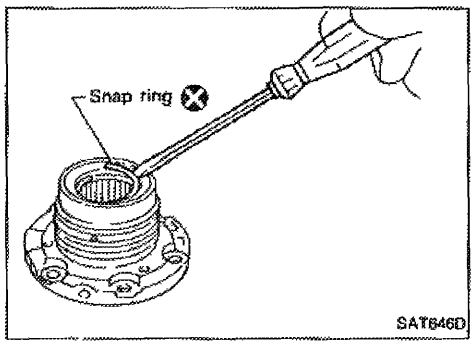
1. Remove seal rings from output shaft and bearing retainer.



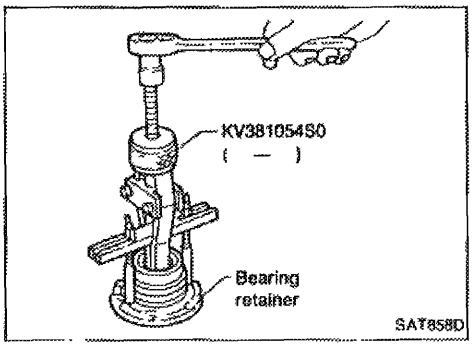
2. Remove output shaft bearing with screwdrivers.

- **Always replace bearing with a new one when removed.**
- **Do not damage output shaft.**

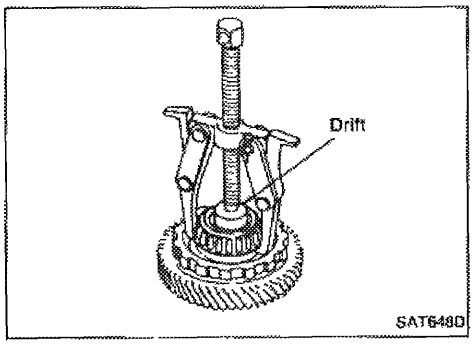
Output Shaft, Idler Gear, Reduction Gear and Bearing Retainer (Cont'd)



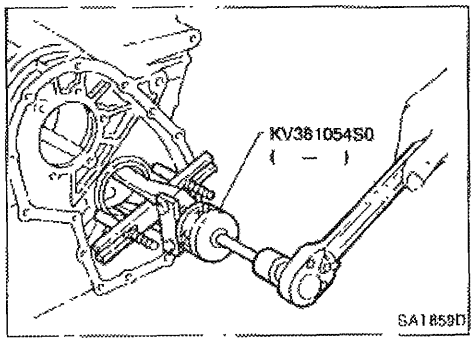
3. Remove snap ring from bearing retainer.



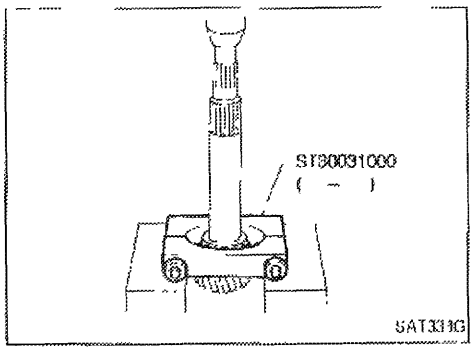
4. Remove needle bearing from bearing retainer.



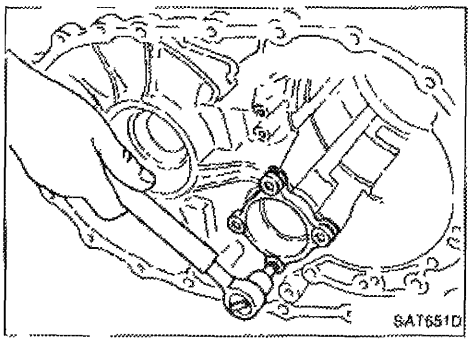
5. Remove idler gear bearing inner race from idler gear.



6. Remove idler gear bearing outer race from transmission case.



7. Press out reduction gear bearing inner race from reduction gear.



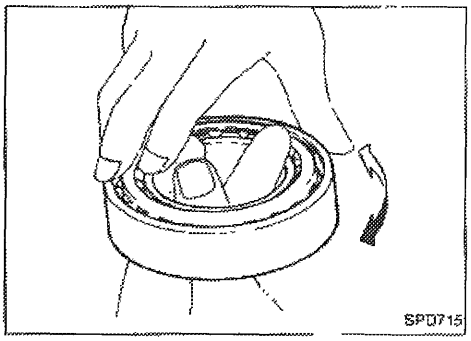
Output Shaft, Idler Gear, Reduction Gear and Bearing Retainer (Cont'd)

8. Remove reduction gear bearing outer race from transmission case.

INSPECTION

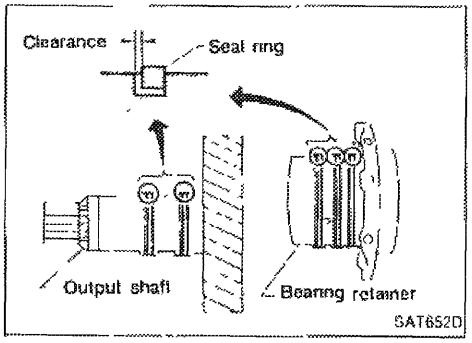
Output shaft, idler gear and reduction gear

- Check shafts for cracks, wear or bending.
- Check gears for wear, chips and cracks.



Bearing

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



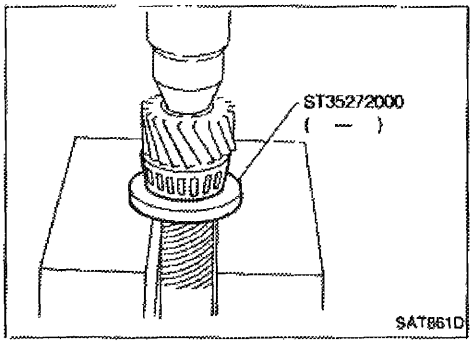
Seal ring clearance

- Install new seal rings to output shaft.
- Measure clearance between seal ring and ring groove of output shaft.
  Standard clearance:
  0.10 - 0.25 mm (0.0039 - 0.0098 in)
  Allowable limit:
  0.25 mm (0.0098 in)
- If not within allowable limit, replace output shaft.
- Install new seal rings to bearing retainer.
- Measure clearance between seal ring and ring groove of bearing retainer.
  Standard clearance:
  0.10 - 0.25 mm (0.0039 - 0.0098 in)
  Allowable limit:
  0.25 mm (0.0098 in)
- If not within allowable limit, replace bearing retainer.

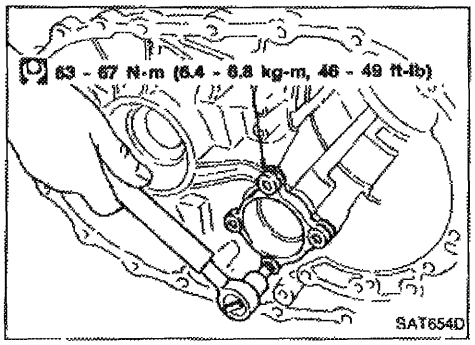
Output Shaft, Idler Gear, Reduction Gear and Bearing Retainer (Cont'd)

ASSEMBLY

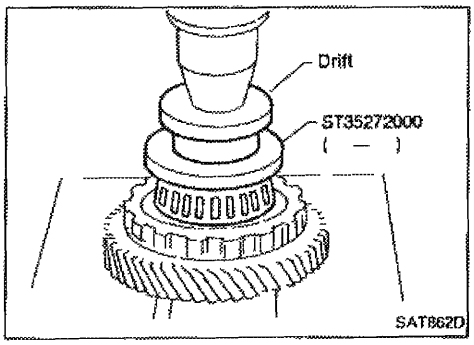
1. Press reduction gear bearing inner race on reduction gear.



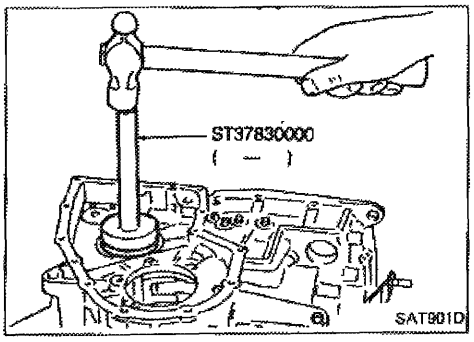
2. Install reduction gear bearing outer race on transmission case.



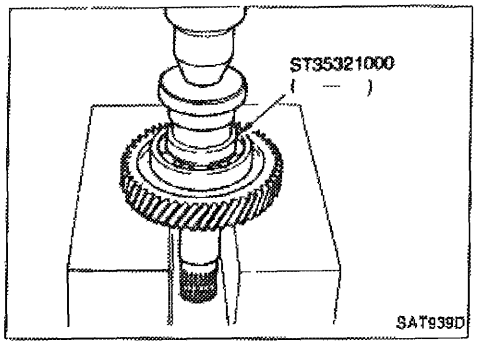
3. Press idler gear bearing inner race on idler gear.



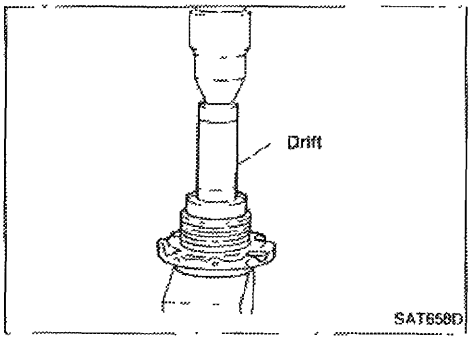
4. Install idler gear bearing outer race on transmission case.



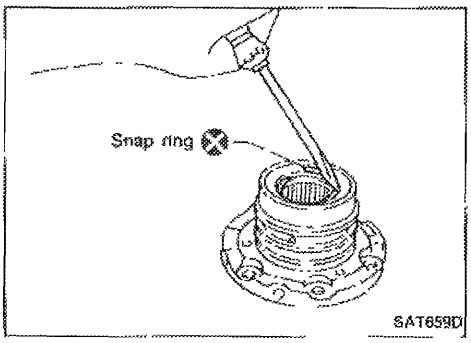
5. Press output shaft bearing on output shaft.



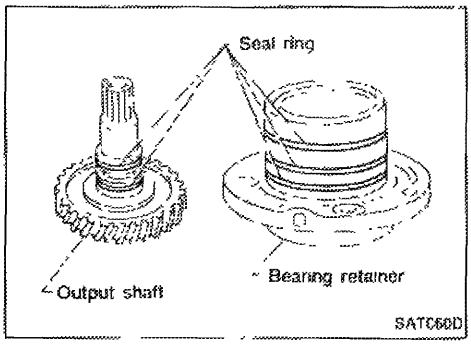
Output Shaft, Idler Gear, Reduction Gear and Bearing Retainer (Cont'd)



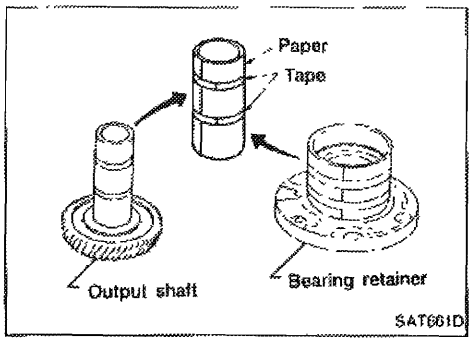
6. Press needle bearing on bearing retainer.



7. Install snap ring to bearing retainer.

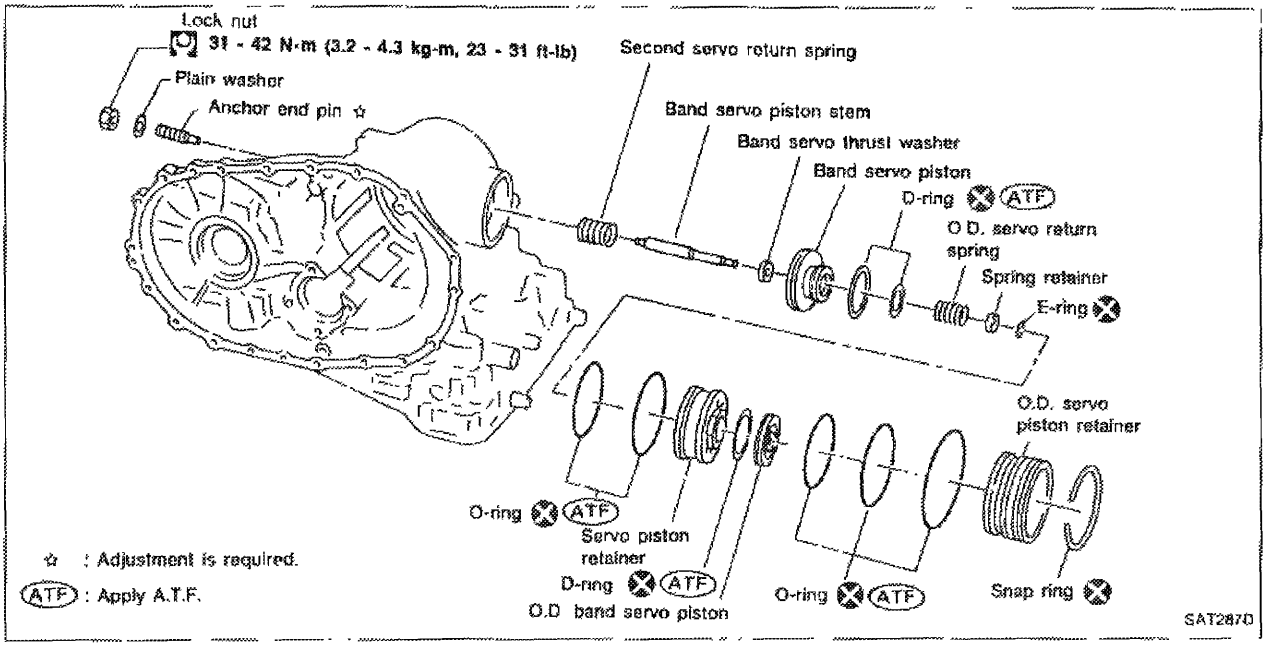


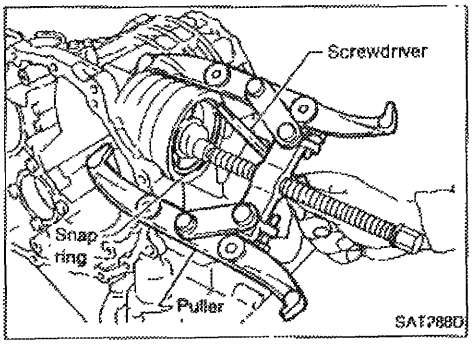
8. Install new seal rings to output shaft and bearing retainer carefully after packing ring grooves with petroleum jelly.



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

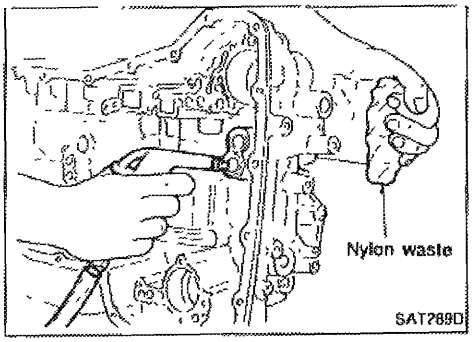
Band Servo Piston Assembly



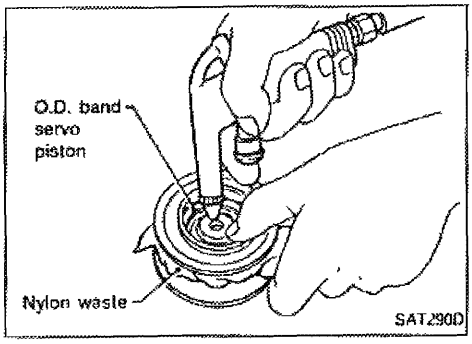


DISASSEMBLY

1. Remove band servo piston snap ring.

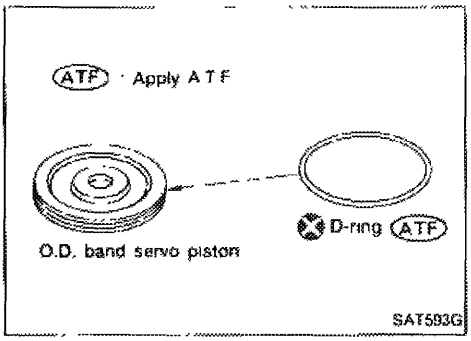


2. Apply compressed air to oil hole in transmission case to remove O.D. servo piston retainer and band servo piston assembly.
   - **Hold band servo piston assembly with a rag.**

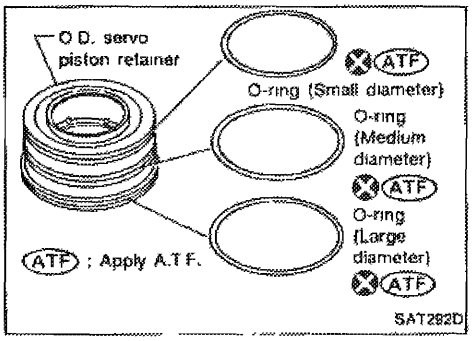


3. Apply compressed air to oil hole in O.D. servo piston retainer to remove O.D. band servo piston from retainer
   - **Hold O.D. band servo piston while applying compressed air.**

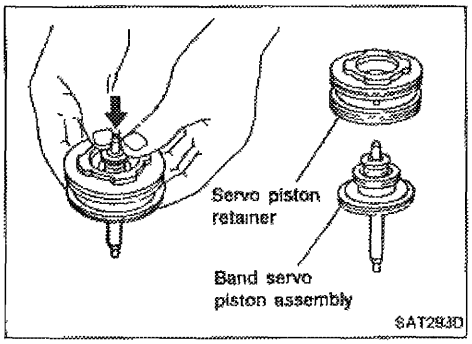
Band Servo Piston Assembly (Cont'd)



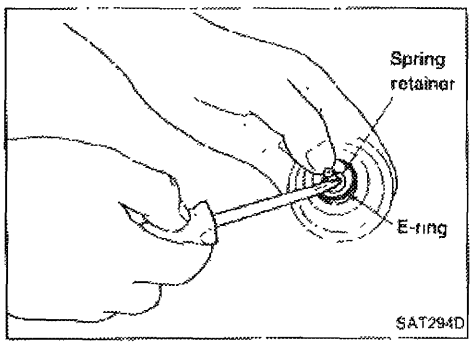
4. Remove D-ring from O D band servo piston.



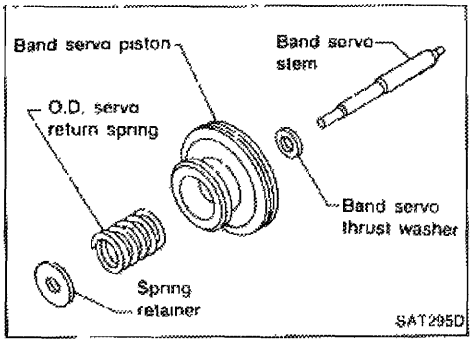
5. Remove O-rings from O.D. servo piston retainer.



6 Remove band servo piston assembly from servo piston retainer by pushing it forward.

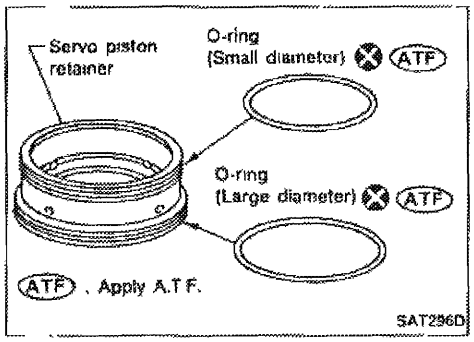


7. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, remove E-ring.

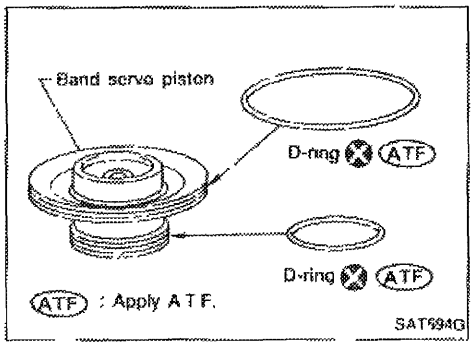


8. Remove O.D. servo return spring, band servo thrust washer and band servo piston stem from band servo piston.

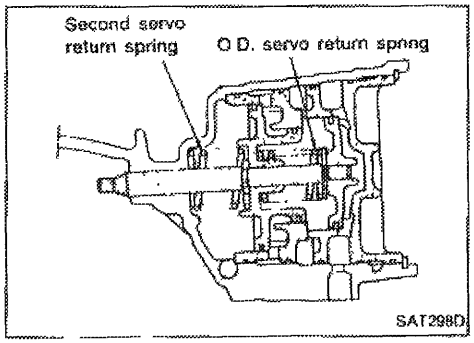
Band Servo Piston Assembly (Cont'd)



9. Remove O-rings from servo piston retainer.



10. Remove D-rings from band servo piston.



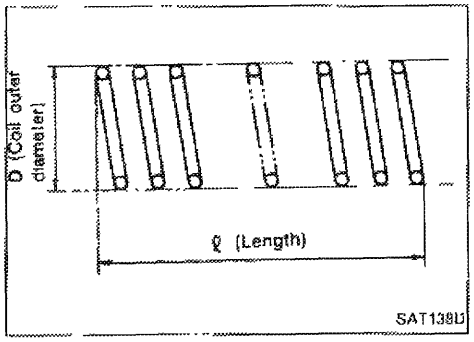
INSPECTION

Pistons, retainers and piston stem

- Check frictional surfaces for abnormal wear or damage.

Return springs

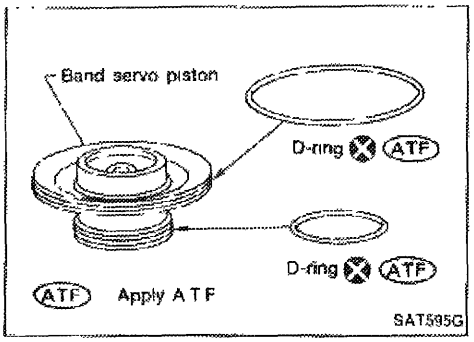
- Check for deformation or damage.
- Measure free length and outer diameter.



Inspection standard

Unit: mm (in)

Parts	Free length	Outer diameter
2nd servo return spring	32.5 (1.280)	25.9 (1.020)
O.D. servo return spring	31.0 (1.220)	21.7 (0.854)

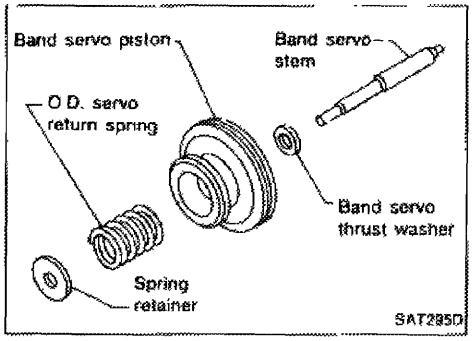


ASSEMBLY

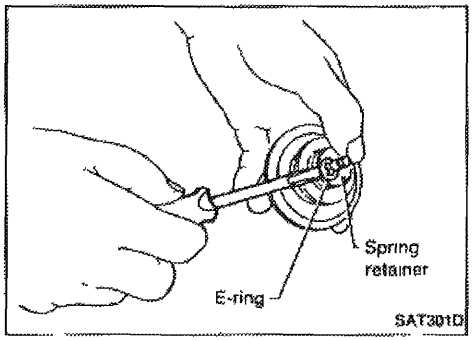
1. Install D-rings to servo piston retainer.

- **Apply A.T.F. to O-rings.**
- **Pay attention to position of each O-ring.**

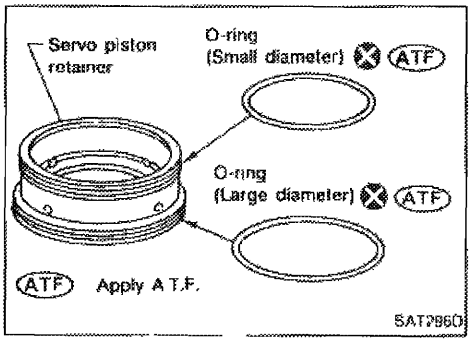
Band Servo Piston Assembly (Cont'd)



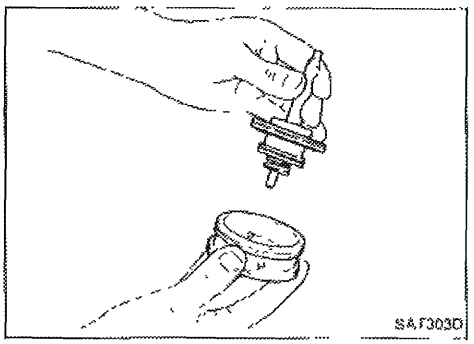
2. Install band servo piston stem, band servo thrust washer, O.D. servo return spring and spring retainer to band servo piston.



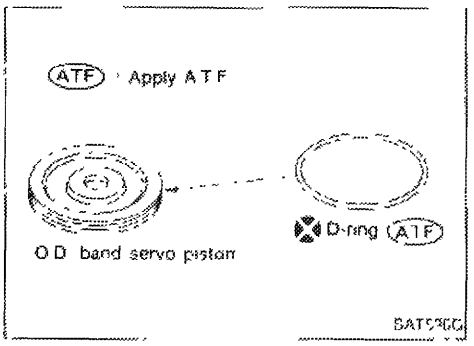
3. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, install E-ring.



4. Install O-rings to servo piston retainer.
   - **Apply A.T.F. to O-rings.**
   - **Pay attention to the positions of the O-rings.**

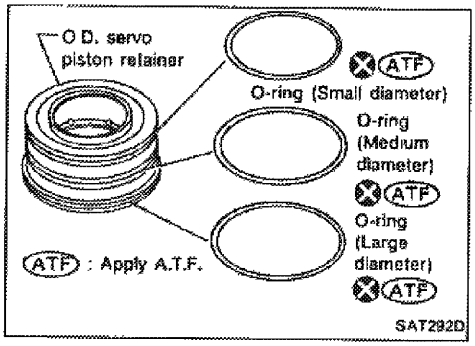


5. Install band servo piston assembly to servo piston retainer by pushing it inward.

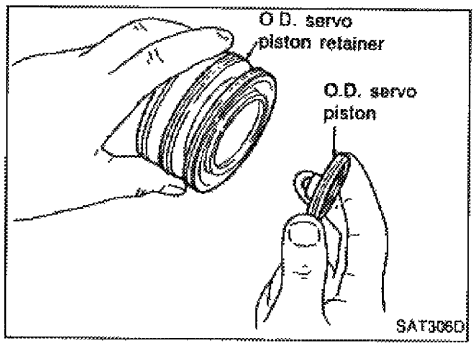


6. Install D-ring to O.D. band servo piston.
   - **Apply A.T.F. to D-ring.**

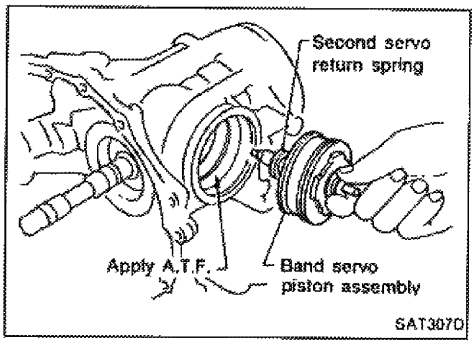
Band Servo Piston Assembly (Cont'd)



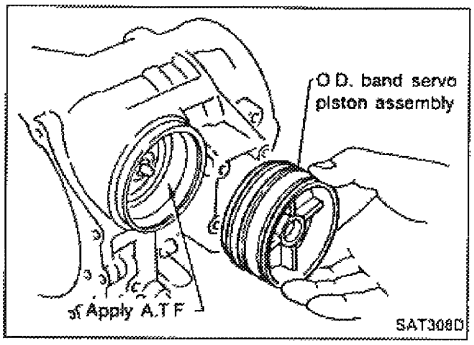
7. Install O-rings to O.D. servo piston retainer.
   - **Apply A.T.F. to O-rings.**
   - **Pay attention to the positions of the O-rings.**



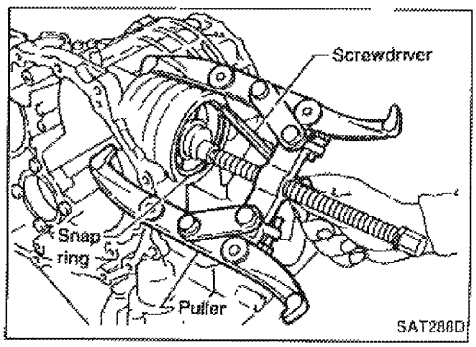
8. Install O.D. band servo piston to O.D. servo piston retainer.



9. Install band servo piston assembly and 2nd servo return spring to transmission case.
   - **Apply A.T.F. to O-ring of band servo piston and transmission case.**

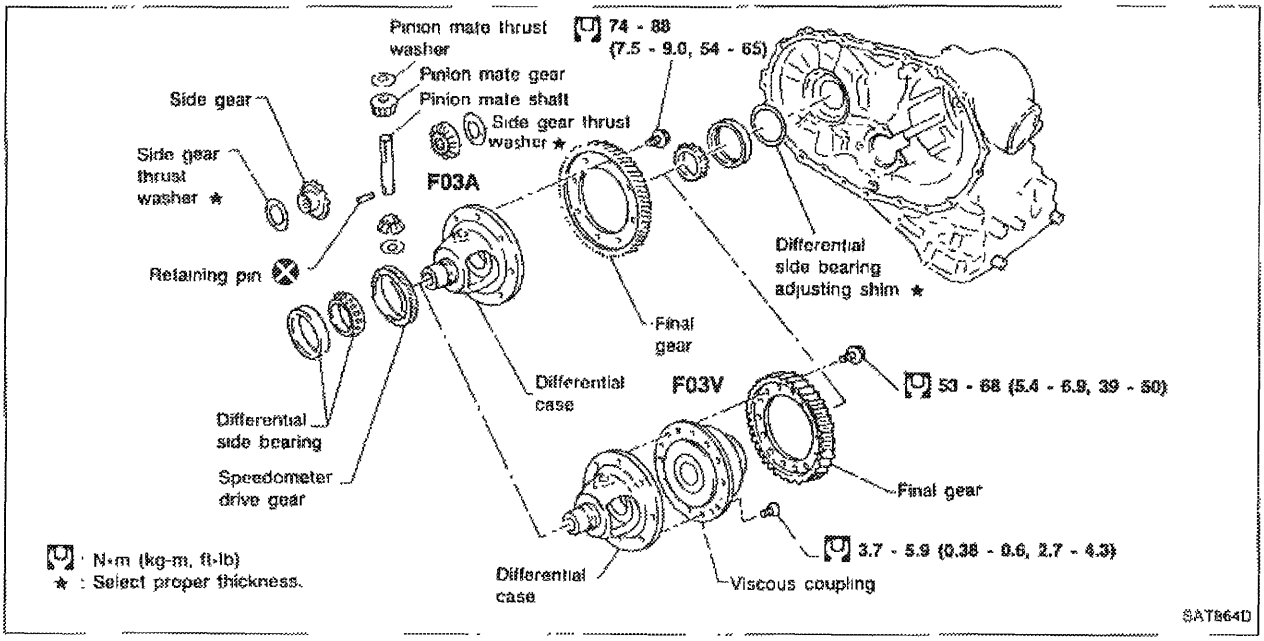


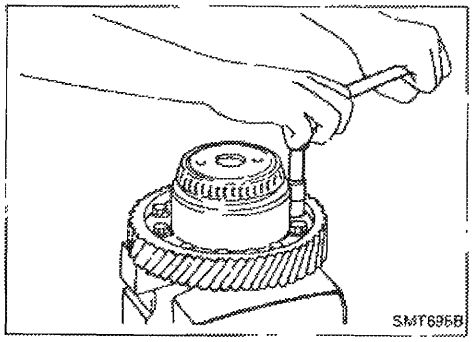
10. Install O.D. band servo piston assembly to transmission case.
    - **Apply A.T.F. to O-ring of band servo piston and transmission case.**



11. Install band servo piston snap ring to transmission case.

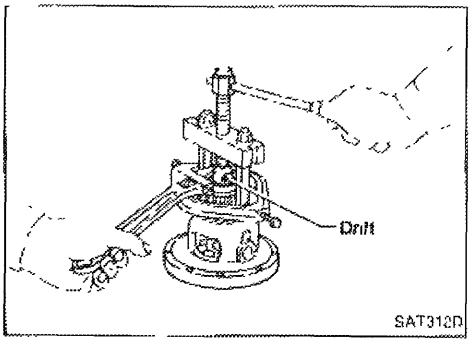
Final Drive



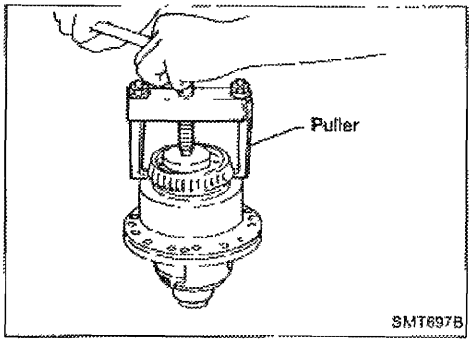


DISASSEMBLY

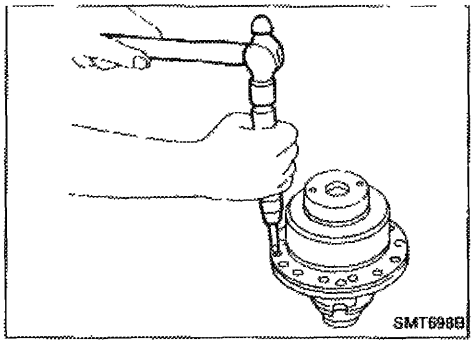
1. Remove final gear.



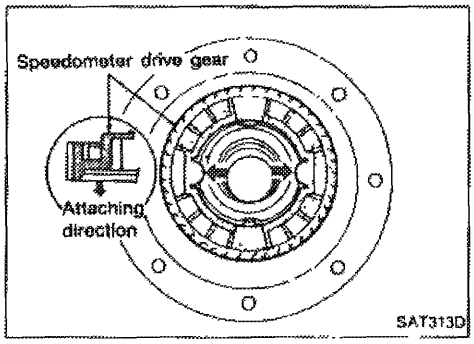
2. Press out differential side bearings.



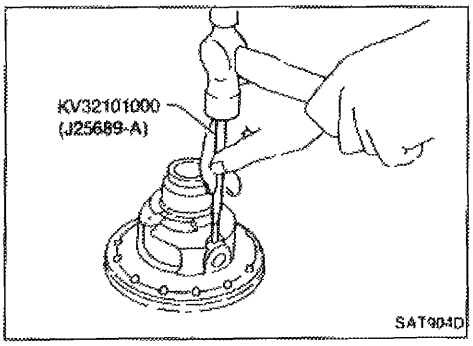
Final Drive (Cont'd)



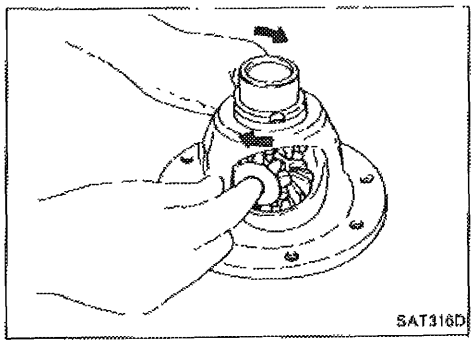
3. Remove viscous coupling — RE4F03V.



4. Remove speedometer drive gear.

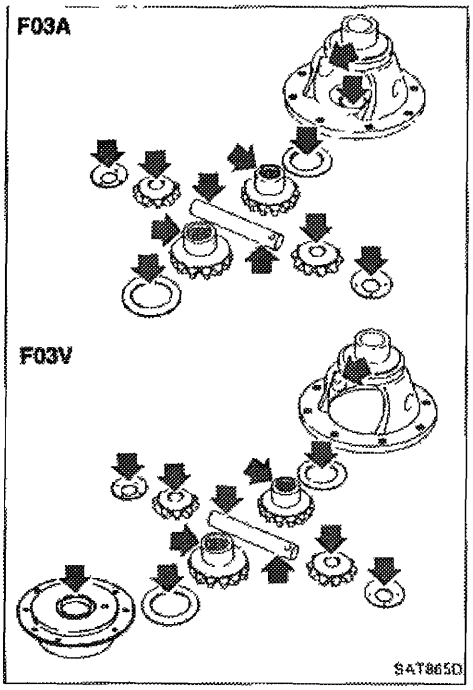


5. Drive out pinion mate shaft retaining pin



6. Draw out pinion mate shaft from differential case.
7. Remove pinion mate gears and side gears.

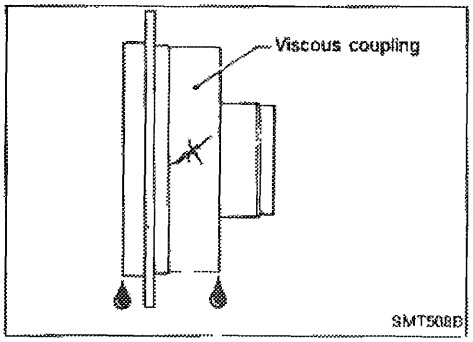
Final Drive (Cont'd)



INSPECTION

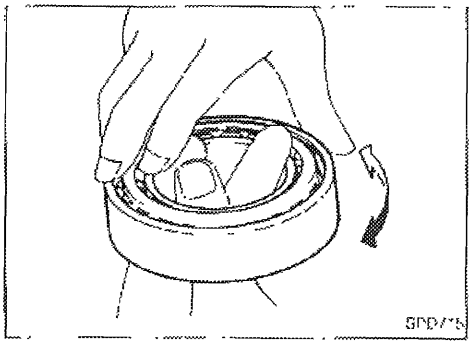
Gear, washer, shaft and case

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



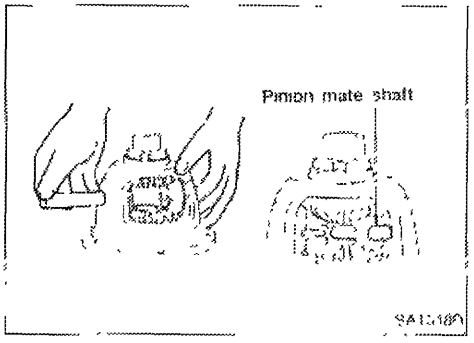
Viscous coupling — RE4F03V

- Check case for cracks.
- Check silicone oil for leakage.



Bearings

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

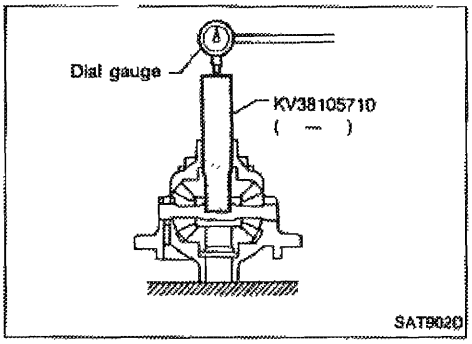


ASSEMBLY

1. Install side gear and thrust washers in differential case.
2. Install pinion mate gears and thrust washers in differential case while rotating them.

- **Apply A.T.F. to any parts.**

Final Drive (Cont'd)



— RE4F03A —

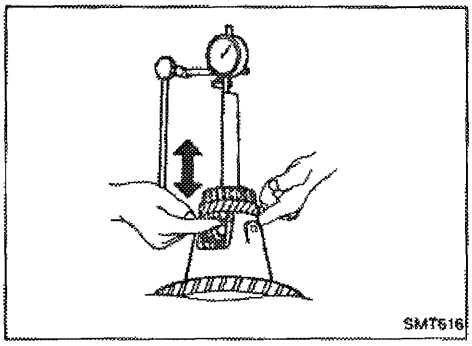
3. Measure clearance between side gear and differential case with washers using the following procedure.

a. Set Tool and dial indicator on side gear.

b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

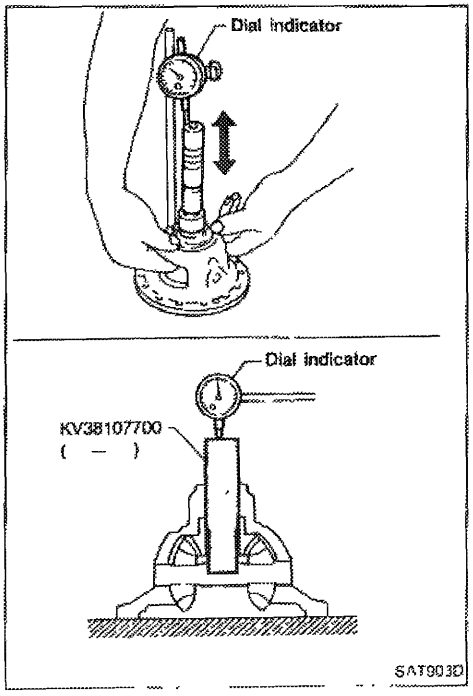
Clearance between side gear and differential case with washers:

0.1 - 0.2 mm (0.004 - 0.008 in)



c. If not within specifications, adjust clearance by changing thickness of side gear thrust washers.

Side gear thrust washer: Refer to S.D.S.



— RE4F03V —

3. Measure clearance between side gear and differential case & viscous coupling with washers using the following procedure:

Differential case side

a. Set Tool and dial indicator on side gear.

b. Move side gear up and down to measure dial indicator deflection.

Clearance between side gear and differential case with washers:

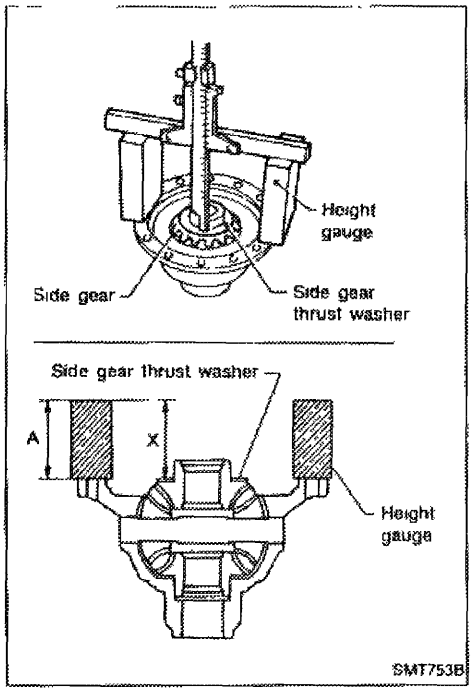
0.1 - 0.2 mm (0.004 - 0.008 in)

c. If not within specification adjust clearance by changing thickness of side gear thrust washer.

Side gear thrust washers for differential case side:

Refer to S.D.S.

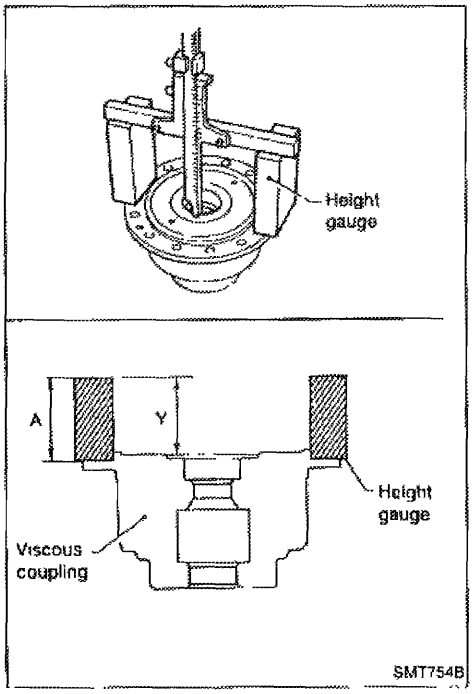
Final Drive (Cont'd)



Viscous coupling side

a. Place side gear and thrust washer on pinion mate gears installed on differential case.
b. Measure dimension X.

- **Measure dimension X in at least two places.**



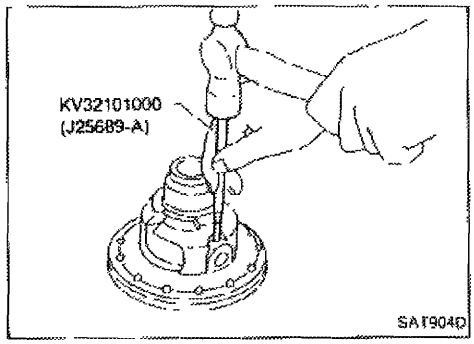
c. Measure dimension Y.

- **Measure dimension Y in at least two places.**

Clearance between side gear and viscous coupling
= X + Y − 2A: 0.1 - 0.2 mm (0.004 - 0.008 in)
A: Height of gauge

d. If not within specification, adjust clearance by changing thickness of side gear thrust washer.

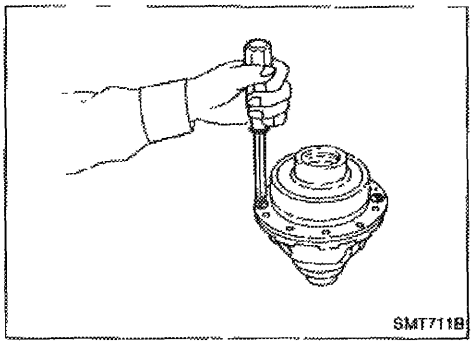
Side gear thrust washers for viscous coupling side:
Refer to S.D.S.



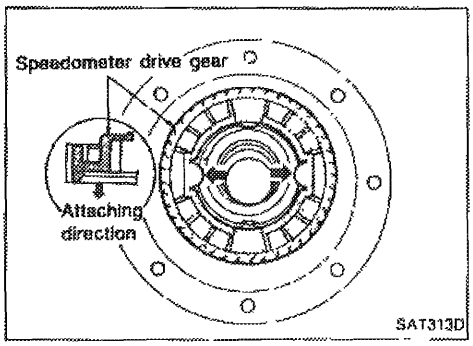
4. Install retaining pin.

- **Make sure that retaining pin is flush with case.**

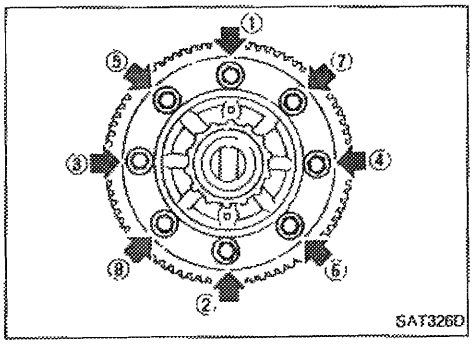
Final Drive (Cont'd)



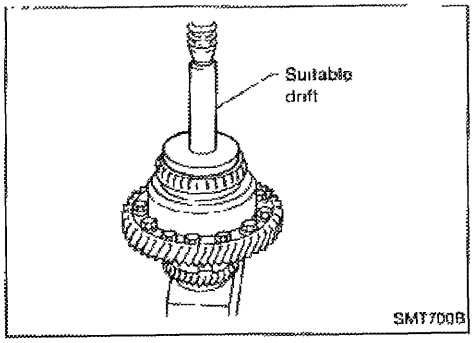
5. Install side gear (viscous coupling side) on differential case and then install viscous coupling — RE4F03V.



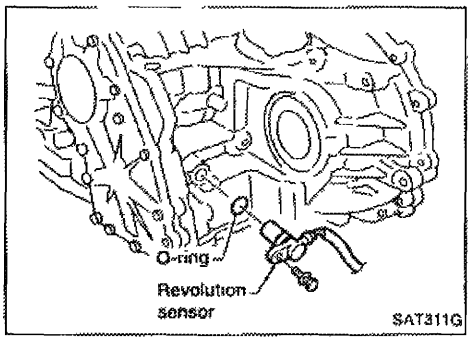
6. Install speedometer drive gear on differential case.
- **Align the projection of speedometer drive gear with the groove of differential case.**



7. Install final gear and tighten fixing bolts in numerical order.



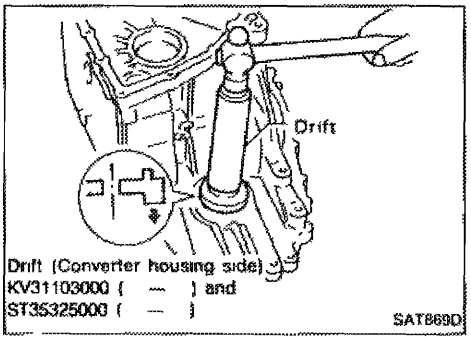
8. Press on differential side bearings.



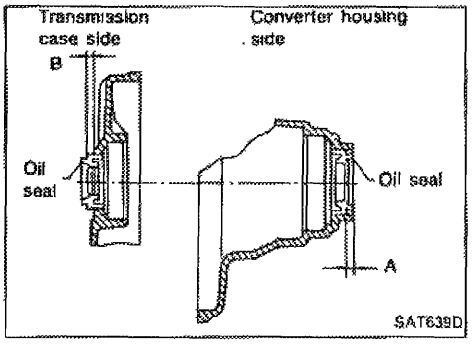
Assembly 1

1. Install revolution sensor onto transmission case.

Always use new sealing parts.

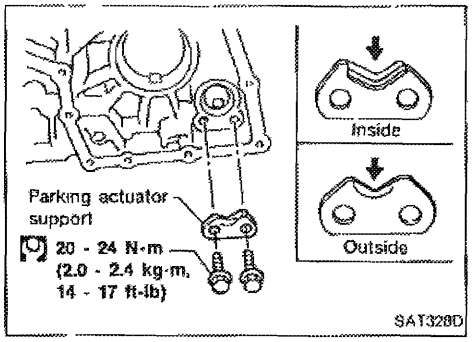


2. Install differential side oil seals on transmission case and converter housing, so that "A" and "B" are within specifications.



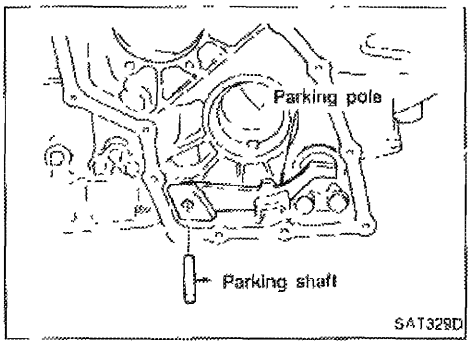
Unit: mm (in)

A	B
5.5 - 6.5 (0.217 - 0.256)	0.5 (0.020) or less



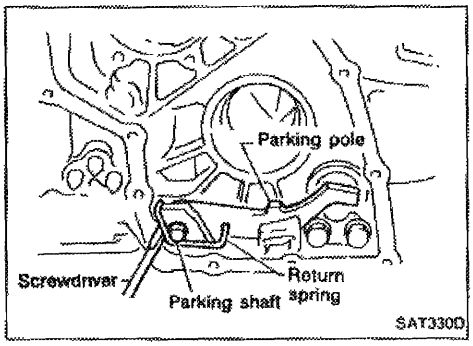
3. Install parking actuator support to transmission case.

- **Pay attention to direction of parking actuator support.**

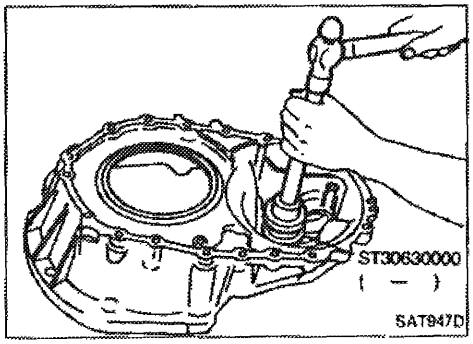


4. Install parking pawl on transmission case and fix it with parking shaft.

Assembly 1 (Cont'd)



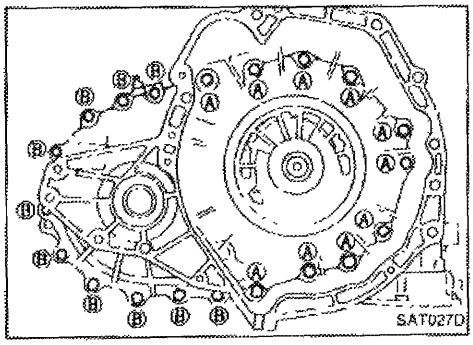
5. Install return spring.



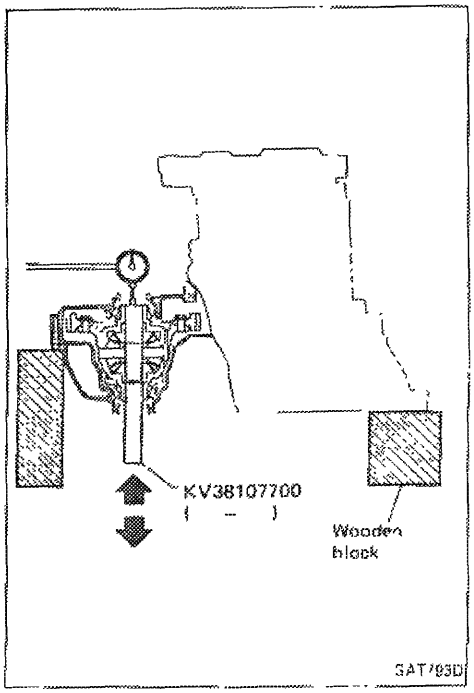
Adjustment 1

DIFFERENTIAL SIDE BEARING PRELOAD

1. Install differential side bearing outer race without adjusting shim on transmission case.
2. Install differential side bearing outer race on converter housing.



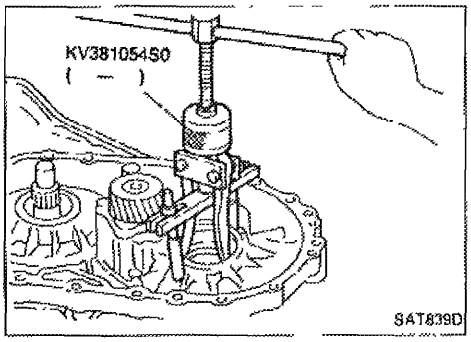
3. Place final drive assembly on transmission case.
4. Install transmission case on converter housing and tighten transmission case fixing bolts Ⓐ and Ⓑ to the specified torque.



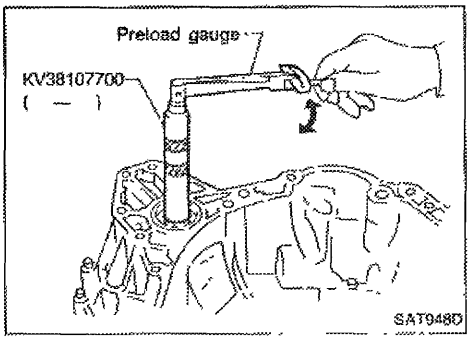
5. Attach dial indicator on differential case at transmission case side.
6. Insert Tool into differential side gear from converter housing.
7. Move Tool up and down and measure dial indicator deflection.
8. Select proper thickness of differential side bearing adjusting shim(s) using S.D.S. table as a guide.

Differential side bearing adjusting shim: Refer to S.D.S.

Adjustment 1 (Cont'd)



9. Remove converter housing from transmission case.
10. Remove final drive assembly from transmission case.
11. Remove differential side bearing outer race from transmission case.
12. Reinstall differential side bearing outer race and shim(s) selected from S.D.S. table on transmission case.
13. Reinstall converter housing on transmission case and tighten transmission case fixing bolts to the specified torque.



14. Insert Tool into differential case and measure turning torque of final drive assembly.

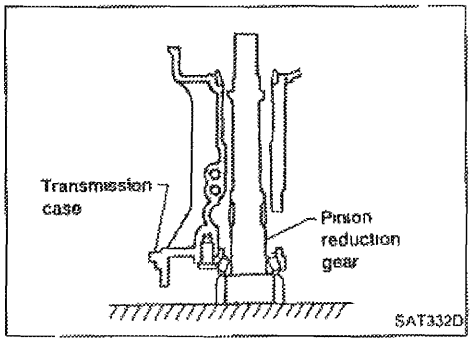
- **When measuring turning torque, turn final drive assembly in both directions several times to seat bearing rollers correctly.**

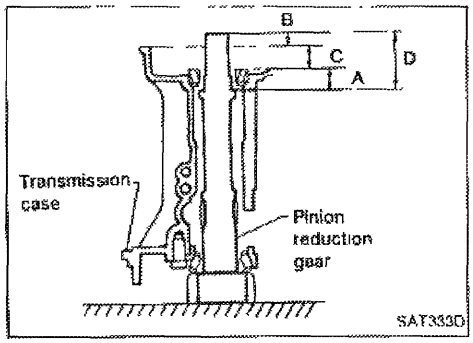
  Turning torque of final drive assembly (New bearing):
  0.49 - 1.08 N·m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb)
- **When old bearing is used again, turning torque will be slightly less than the above.**
- **Make sure torque is close to the specified range.**

REDUCTION GEAR BEARING PRELOAD

1. Remove transmission case and final drive assembly from converter housing.
2. Select proper thickness of reduction gear bearing adjusting shim using the following procedures.

a. Place reduction gear on transmission case as shown.

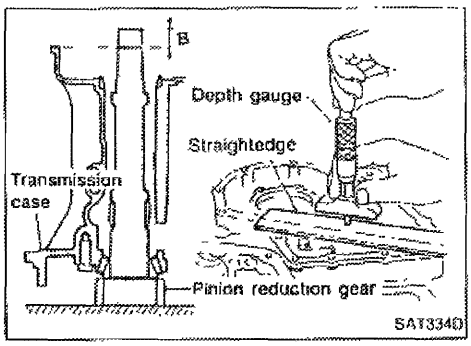




b. Place idler gear bearing on transmission case.
c. Measure dimensions "B" "C" and "D" and calculate dimension "A".

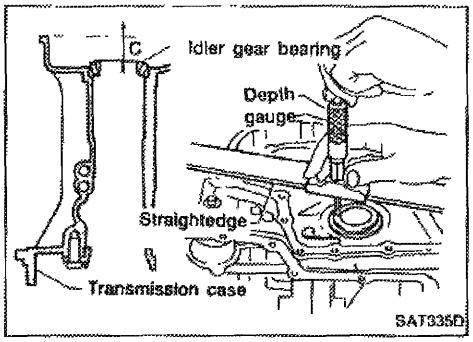
A = D – (B + C)

"A": Distance between the surface of idler gear bearing inner race and the adjusting shim mating surface of reduction gear.

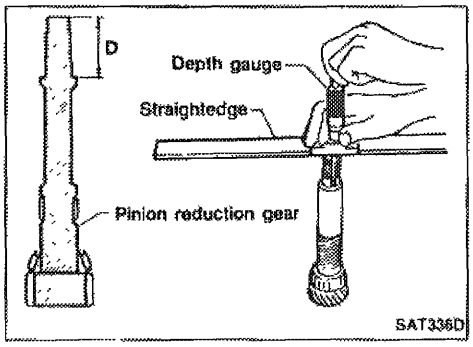


- Measure dimension "B" between the end of reduction gear and the surface of transmission case.
- **Measure dimension "B" in at least two places.**

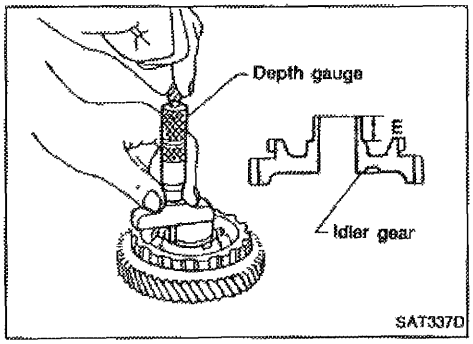
Adjustment 1 (Cont'd)



- Measure dimension "C" between the surface of idler gear bearing inner race and the surface of transmission case.
- **Measure dimension "C" in at least two places.**



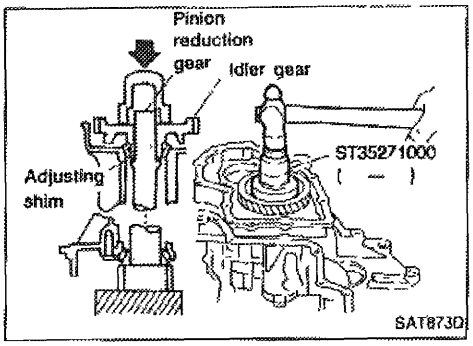
- Measure dimension "D" between the end of reduction gear and the adjusting shim mating surface of reduction gear.
- **Measure dimension "D" in at least two places.**
- Calculate dimension "A"
  A = D – (B + C)



d. Measure dimension "E" between the end of idler gear and the idler gear bearing inner race mating surface of idler gear.
- **Measure dimension "E" in at least two places.**

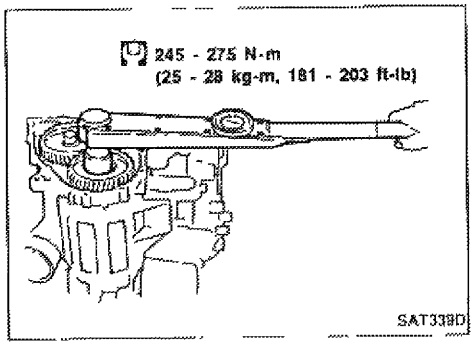
e. Calculate "T" and select proper thickness of reduction gear bearing adjusting shim using S.D.S. table as a guide.
  T = A – E

Reduction gear bearing adjusting shim: Refer to S.D.S.

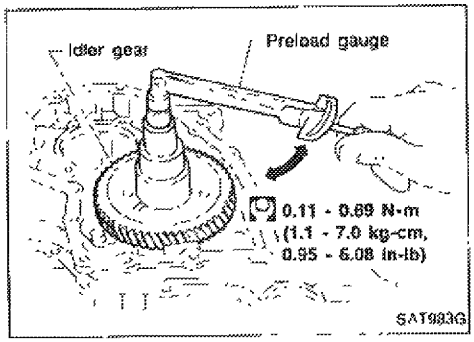


3. Install reduction gear and reduction gear bearing adjusting shim selected in step 2-e on transmission case.
4. Press idler gear bearing inner race on idler gear.
5. Press idler gear on reduction gear.
- **Press idler gear so that idler gear can be locked by parking pawl.**

Adjustment 1 (Cont'd)

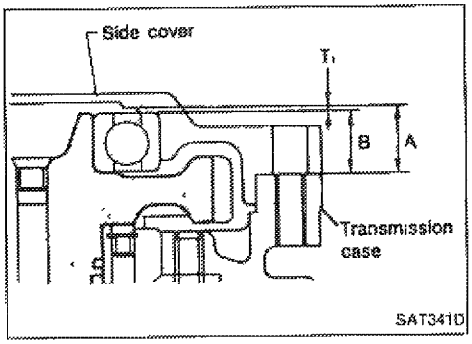


6. Tighten idler gear lock nut to the specified torque.
- **Lock idler gear with parking pawl when tightening lock nut.**



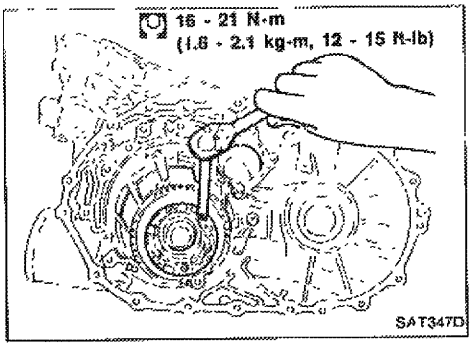
7. Measure turning torque of reduction gear.
- **When measuring turning torque, turn reduction gear in both directions several times to seat bearing rollers correctly.**

Turning torque of reduction gear:
0.11 - 0.69 N·m (1.1 - 7.0 kg-cm, 0.95 - 6.08 in-lb)

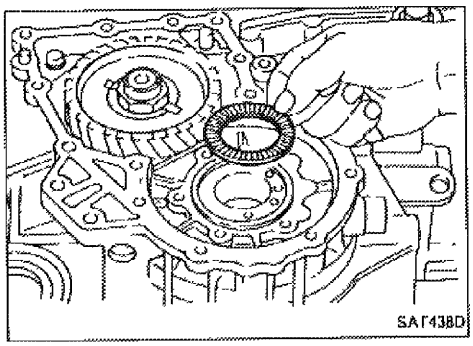


OUTPUT SHAFT END PLAY

- Measure clearance between side cover and the end of the output shaft bearing.
- Select proper thickness of adjusting shim so that clearance is within specifications.

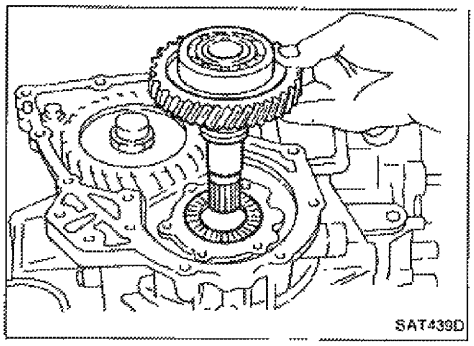


1. Install bearing retainer for output shaft.

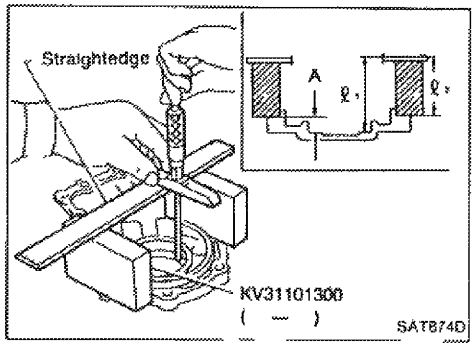


2. Install output shaft thrust needle bearing on bearing retainer.

Adjustment 1 (Cont'd)



3. Install output shaft on transmission case.

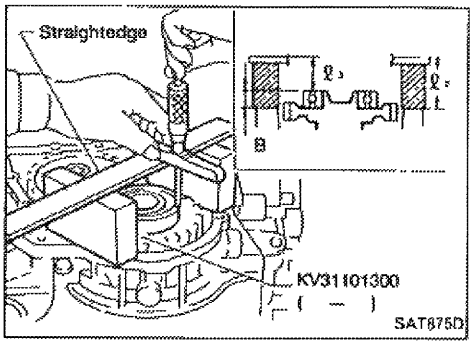


4. Measure dimensions "ℓ_1" and "ℓ_2" at side cover and then calculate dimension "A".

- **Measure dimension "ℓ_1" and "ℓ_2" in at least two places.**

"A": Distance between transmission case fitting surface and adjusting shim mating surface.

$A = \ell_1 - \ell_2$ ℓ_2: Height of gauge

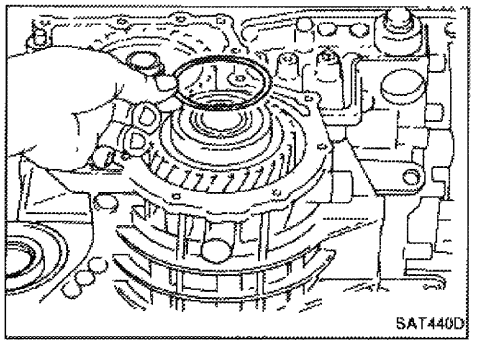


5. Measure dimensions "ℓ_2" and "ℓ_3" and then calculate dimension "B".

Measure "ℓ_2" and "ℓ_3" in at least two places.

"B": Distance between the end of output shaft bearing outer race and the side cover fitting surface of transmission case.

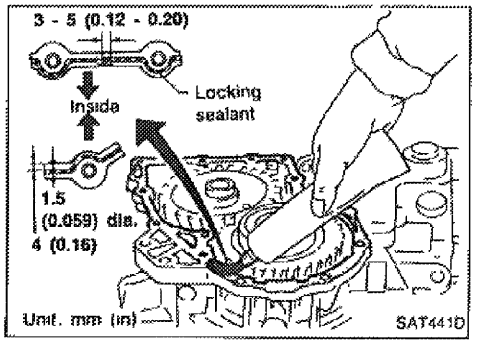
$B = \ell_2 - \ell_3$ ℓ_2: Height of gauge



6. Select proper thickness of adjusting shim so that output shaft end play (clearance between side cover and output shaft bearing) is within specifications.

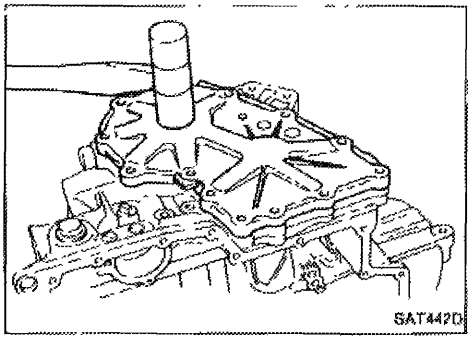
Output shaft end play (A – B):
0 - 0.5 mm (0 - 0.020 in)
Output shaft end play adjusting shim:
Refer to S.D.S.

7. Install adjusting shim on output shaft bearing.

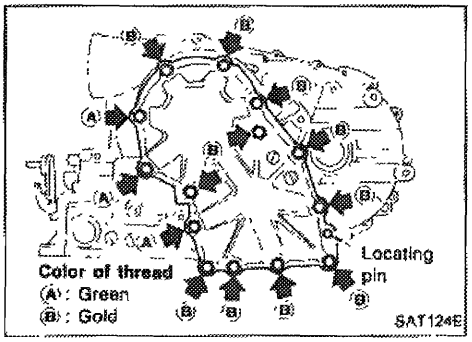


8. Apply locking sealant to transmission case as shown in illustration.

Adjustment 1 (Cont'd)



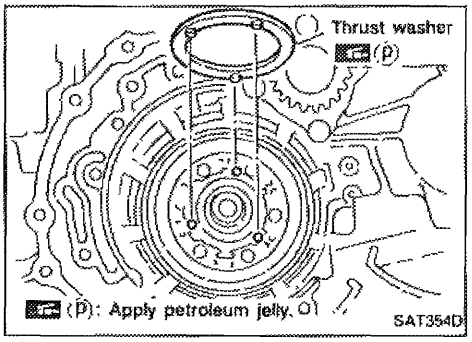
9. Install side cover on transmission case.
- **Apply locking sealant to the mating surface of transmission case.**

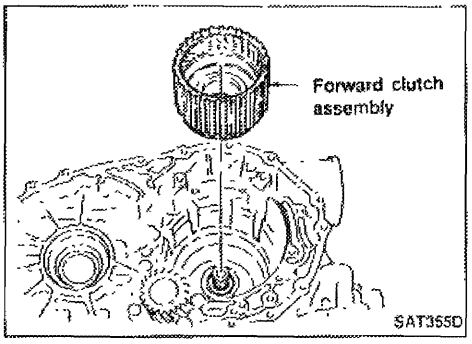


10. Tighten side cover fixing bolts to specified torque.
- **Do not mix bolts Ⓐ and Ⓑ.**
- **Always replace bolts Ⓐ as they are self-sealing bolts.**

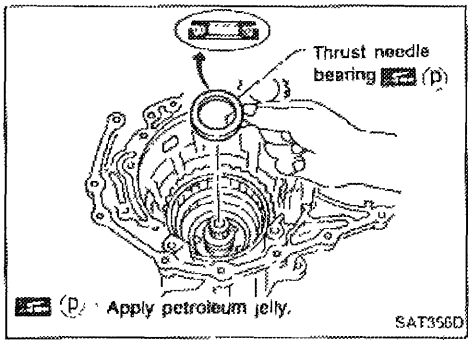
Assembly 2

1. Remove paper rolled around bearing retainer.
2. Install thrust washer on bearing retainer.
- **Apply petroleum jelly to thrust washer.**



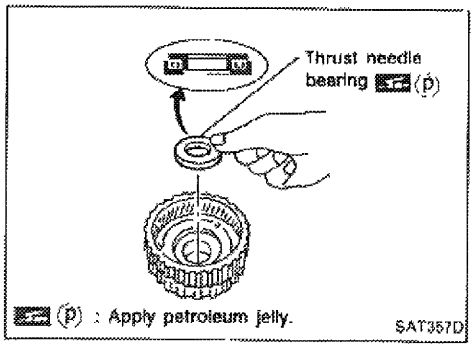


3. Install forward clutch assembly.
- **Align teeth of low & reverse brake drive plates before installing.**
- **Make sure that bearing retainer seal rings are not spread.**

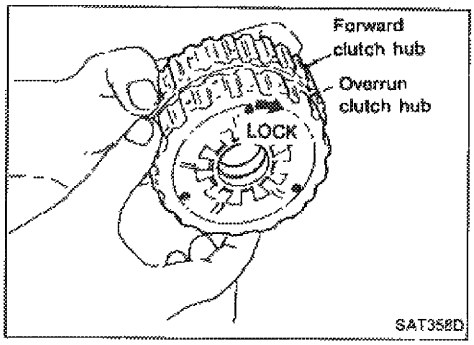


4. Install thrust needle bearing on bearing retainer.
- **Apply petroleum jelly to thrust bearing.**
- **Pay attention to direction of thrust needle bearing.**

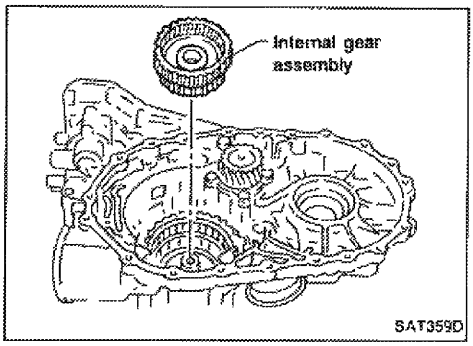
Assembly 2 (Cont'd)



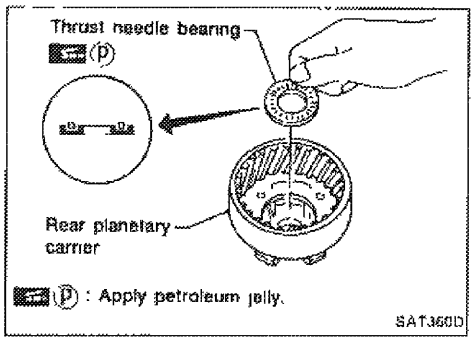
5. Install thrust needle bearing on rear internal gear.
   - **Apply petroleum jelly to thrust needle bearing.**
   - **Pay attention to direction of thrust needle bearing.**



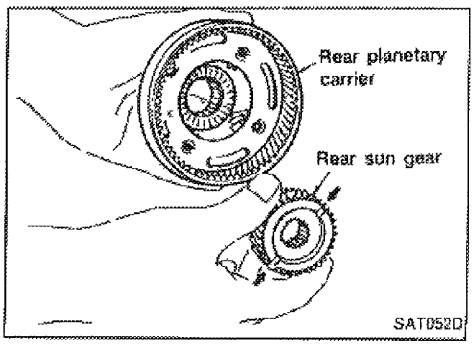
6. Hold forward clutch hub and turn overrun clutch hub. Check overrun clutch hub for directions of lock and unlock.
   - If not as shown in illustration, check installed direction of forward one-way clutch.



7. Install rear internal gear assembly.
   - **Align teeth of forward clutch and overrun clutch drive plate.**

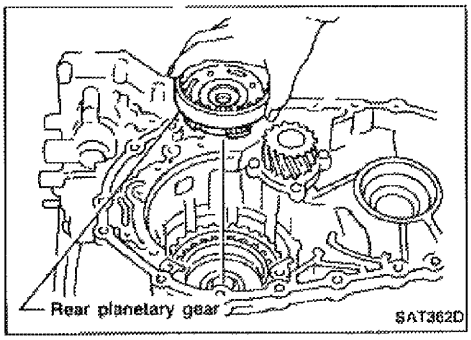


8. Install needle bearing on rear planetary carrier.
   - **Apply petroleum jelly to needle bearing.**
   - **Pay attention to direction of needle bearing.**

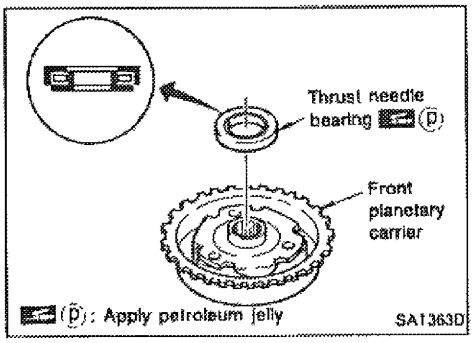


9. Install rear sun gear on rear planetary carrier.
   - **Pay attention to direction of rear sun gear.**

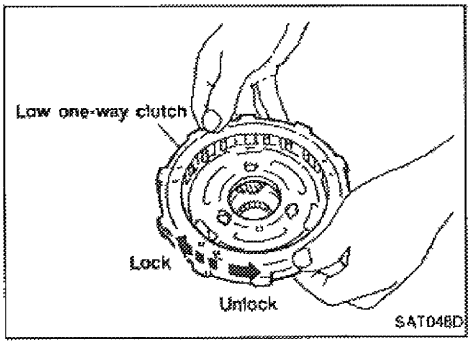
Assembly 2 (Cont'd)



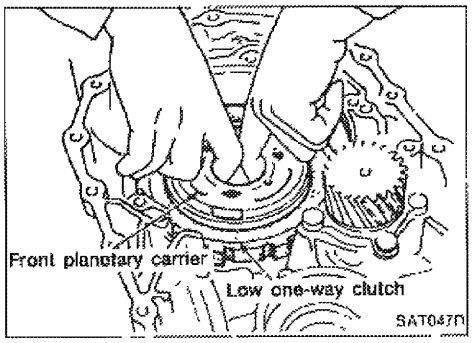
10. Install rear planetary carrier on transmission case



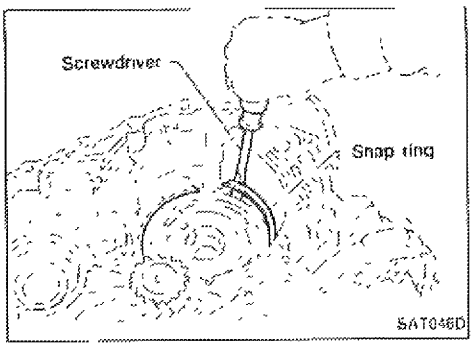
11. Install thrust needle bearing on front planetary carrier.
- **Apply petroleum jelly to thrust needle bearing.**
- **Pay attention to direction of thrust needle bearing.**



12. Install low one-way clutch to front planetary carrier by turning it in the direction of the arrow as shown.
13 While holding front planetary carrier, turn low one-way clutch.
Check low one-way clutch for correct directions of lock and unlock.

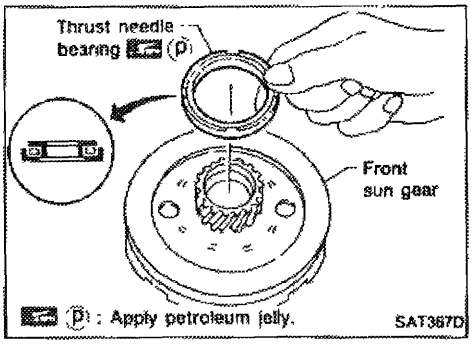


14. Install front planetary carrier assembly on transmission case.

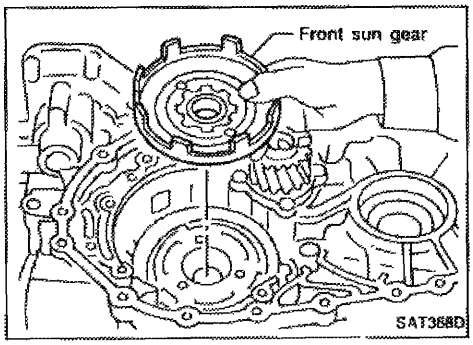


15 Install snap ring with screwdriver.
- **If forward clutch and bearings are not installed correctly, snap ring will not fit groove of transmission case.**

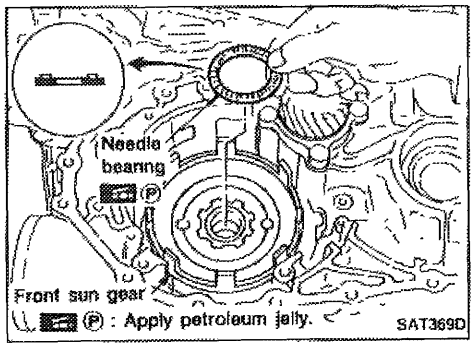
Assembly 2 (Cont'd)



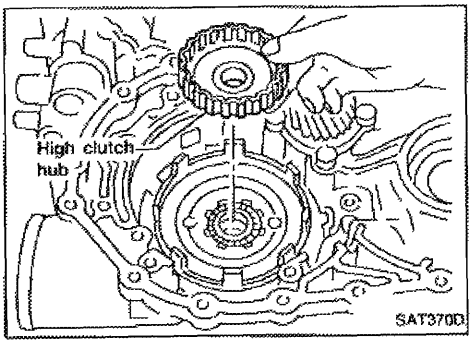
16. Install needle bearing on front sun gear.
- **Apply petroleum jelly to needle bearing.**
- **Pay attention to direction of needle bearing.**



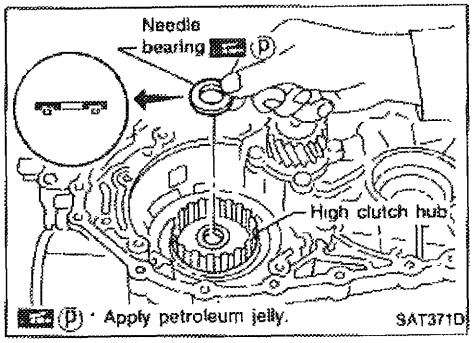
17. Install front sun gear on front planetary carrier.



18. Install needle bearing on front sun gear.
- **Apply petroleum jelly to needle bearing.**
- **Pay attention to direction of needle bearing.**

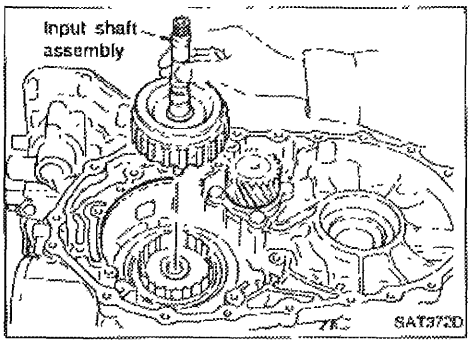


19. Install high clutch hub on front sun gear.



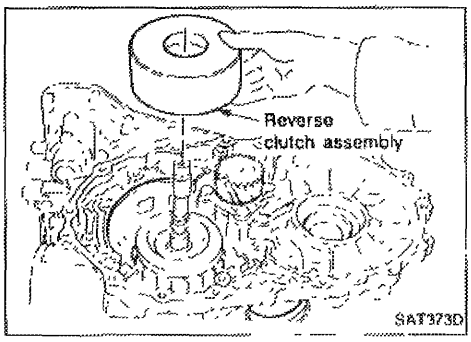
20. Install needle bearing on high clutch hub.
- **Apply petroleum jelly to needle bearing.**
- **Pay attention to direction of needle bearing.**

Assembly 2 (Cont'd)



21. Remove paper rolled around input shaft.
22. Install input shaft assembly.

- **Align teeth of high clutch drive plates before installing.**



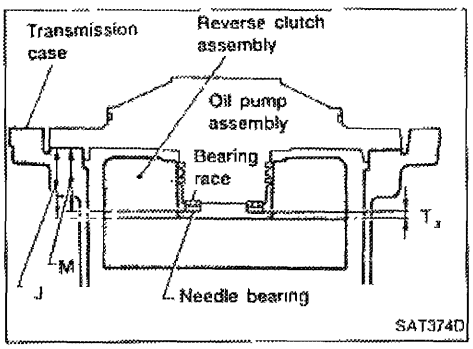
23. Install reverse clutch assembly.

- **Align teeth of reverse clutch drive plates before installing.**

Adjustment 2

When any parts listed in the following table are replaced, total end play or reverse clutch end play must be adjusted.

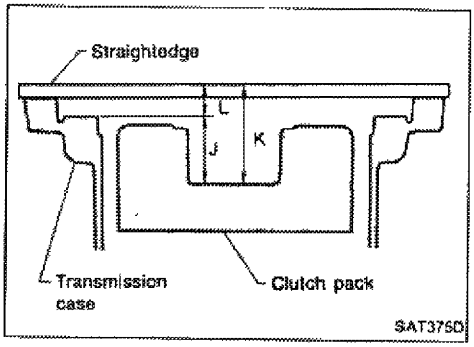
Part name	Total end play	Reverse clutch end play
Transmission case	*	*
Overrun clutch hub	*	*
Rear internal gear	*	*
Rear planetary carrier	*	*
Rear sun gear	*	*
Front planetary carrier	*	*
Front sun gear	*	*
High clutch hub	*	*
High clutch drum	*	*
Oil pump cover	*	*
Reverse clutch drum	*	*



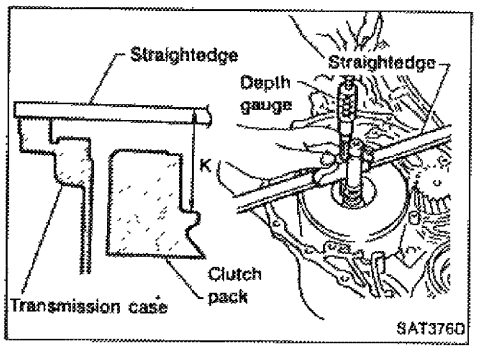
TOTAL END PLAY

- Measure clearance between reverse clutch drum and needle bearing for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.

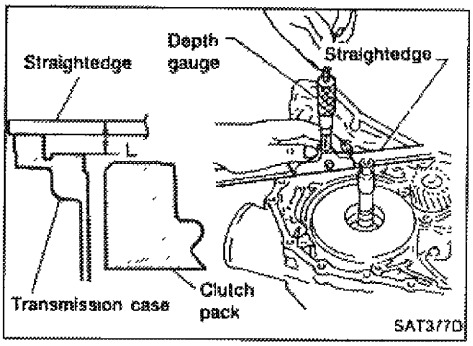
Adjustment 2 (Cont'd)



1. Measure dimensions "K" and "L" and then calculate dimension "J".



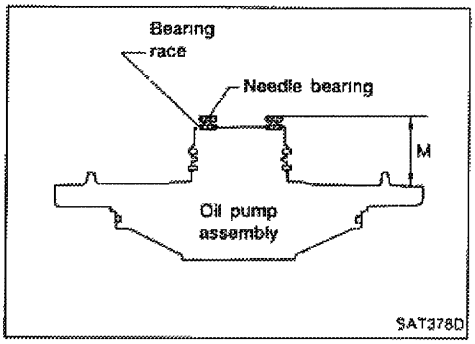
a. Measure dimension "K".



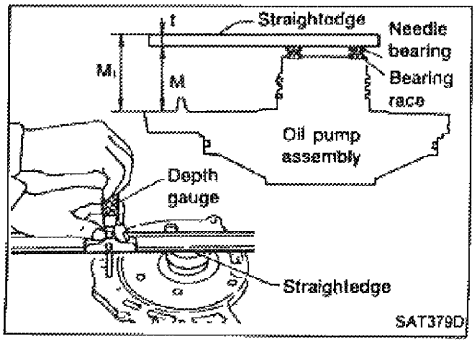
b. Measure dimension "L".
c. Calculate dimension "J".

"J": Distance between oil pump fitting surface of transmission case and needle bearing mating surface of high clutch drum.

$$J = K - L$$



2. Measure dimension "M".
a. Place bearing race and needle bearing on oil pump assembly.

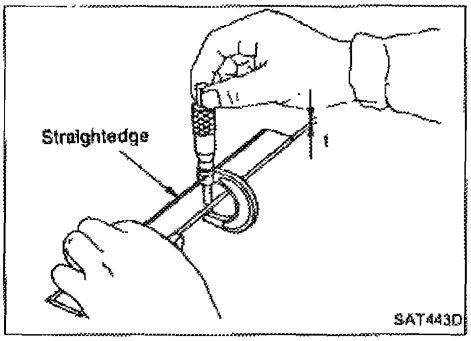


b Measure dimension "M".

"M": Distance between transmission case fitting surface and needle bearing on oil pump cover.

"M_1": Indication of gauge.

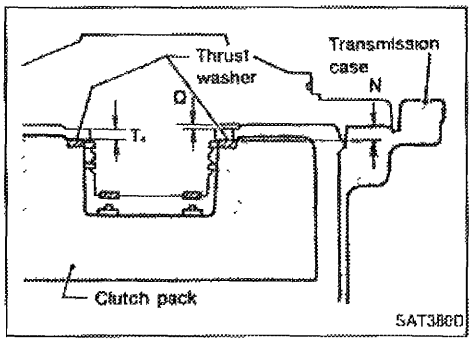
Adjustment 2 (Cont'd)



c. Measure thickness of straightedge "t".
   $M = M_t - t$

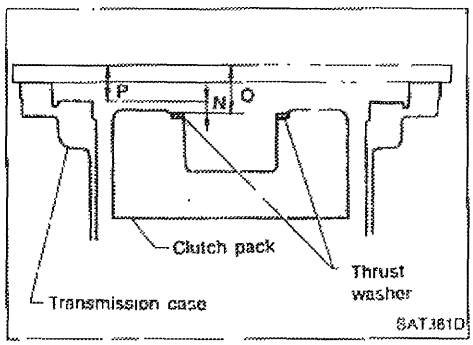
3. Adjust total end play "T_3".
   $T_3 = J - M$
   Total end play "T_3":
   0.25 - 0.55 mm (0.0098 - 0.0217 in)

- Select proper thickness of bearing race so that total end play is within specifications.
  Bearing races: Refer to S.D.S.

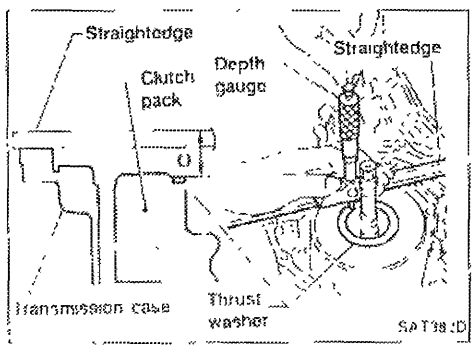


REVERSE CLUTCH END PLAY

- Measure clearance between oil pump cover and thrust washer for reverse clutch drum.
- Select proper thickness of thrust washer so that end play is within specifications.

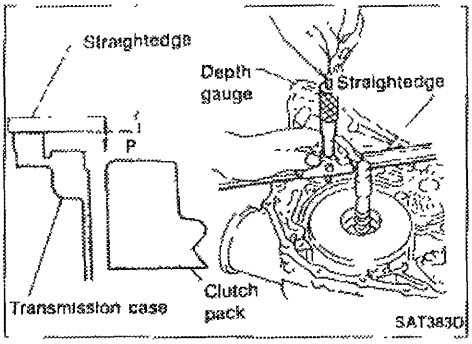


1. Measure dimensions "O" and "P" and then calculate dimension "N".



a. Place thrust washer on reverse clutch drum.
b. Measure dimension "O".

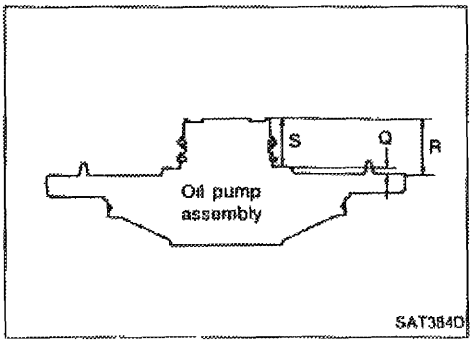
Adjustment 2 (Cont'd)



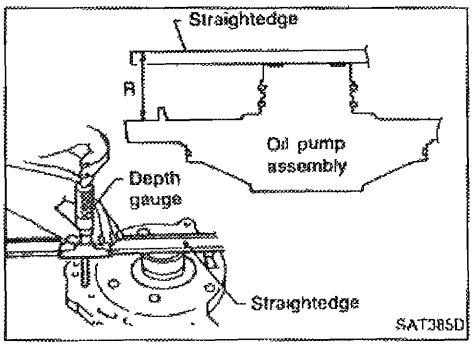
c. Measure dimension "P".
d Calculate dimension "N".

"N": Distance between oil pump fitting surface of transmission case and thrust washer on reverse clutch drum.

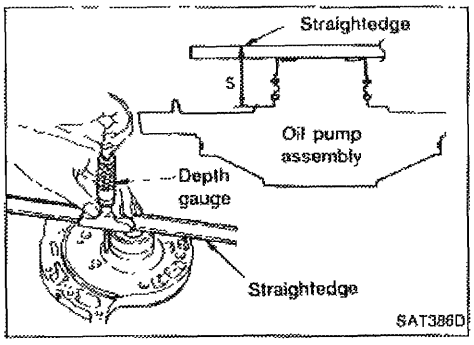
N = O – P



2. Measure dimensions "R" and "S" and then calculate dimension "Q".



a. Measure dimension "R".



b. Measure dimension "S".
c. Calculate dimension "Q".

"Q": Distance between transmission case fitting surface and thrust washer mating surface.

Q = R – S

3. Adjust reverse clutch end play "T_4"

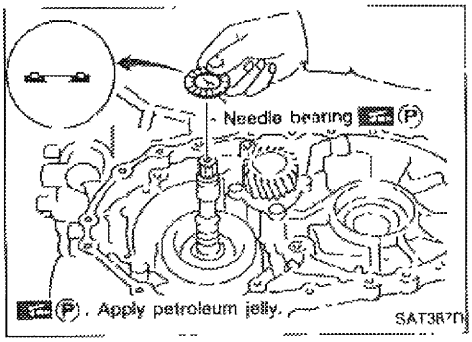
T_4 = N – Q

Reverse clutch end play:

0.65 - 1.00 mm (0.0256 - 0.0394 in)

* Select proper thickness of thrust washer so that reverse clutch end play is within specifications.

Thrust washer: Refer to S.D.S.

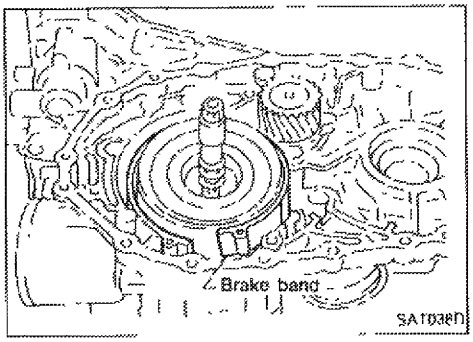


Assembly 3

1. Remove reverse clutch assembly and install needle bearing on high clutch assembly.

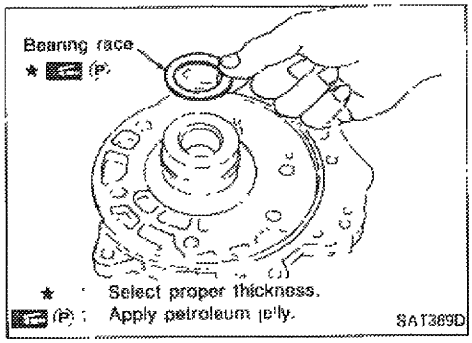
* **Pay attention to direction of needle bearing.**

2. Install reverse clutch assembly.



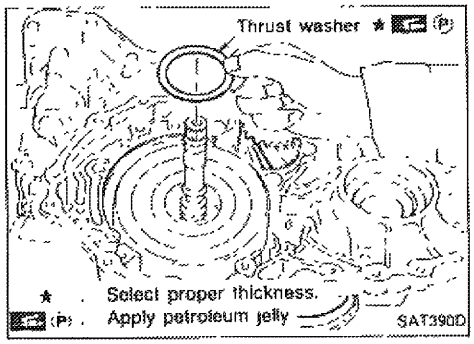
3 Install anchor end pin, washer and lock nut on transmission case.

4. Place brake band on periphery of reverse clutch drum Then, tighten anchor end pin just enough so that brake band is fitted on periphery of reverse clutch drum uniformly.



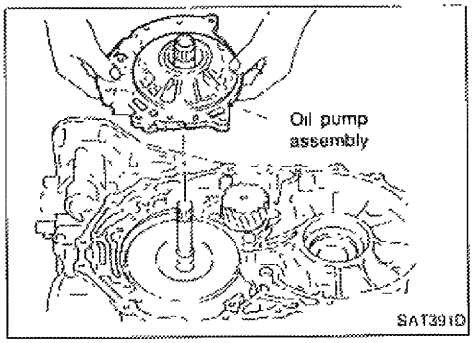
5. Place bearing race selected in total end play adjustment step on oil pump cover.

* **Apply petroleum jelly to bearing race.**



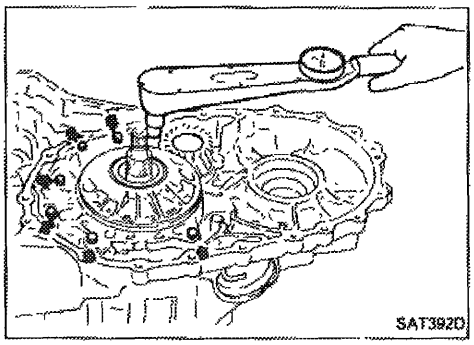
6. Place thrust washer selected in reverse clutch end play step on reverse clutch drum.

* **Apply petroleum jelly to thrust washer.**

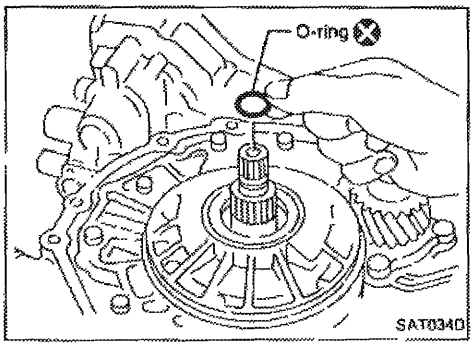


7. Install oil pump assembly on transmission case.

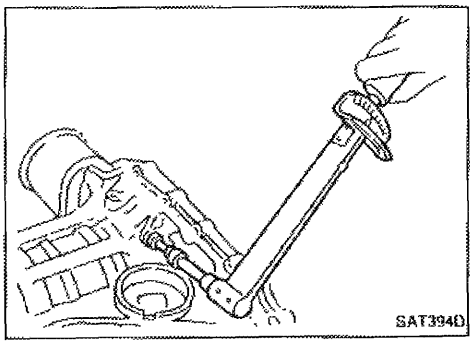
Assembly 3 (Cont'd)



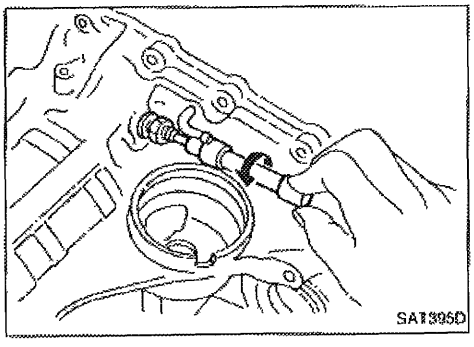
8. Tighten oil pump fixing bolts to specified torque.



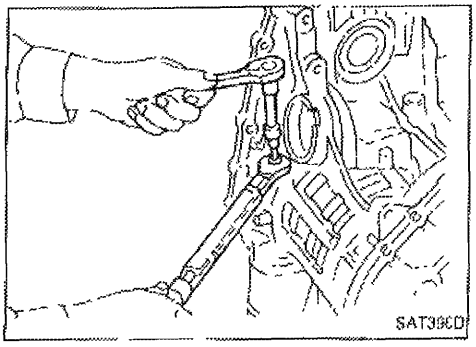
9. Install O-ring to input shaft.
   - **Apply A.T.F. to O-ring.**



10. Adjust brake band.
    a. Tighten anchor end pin to specified torque.
       Anchor end pin:
       4 - 6 N·m (0.4 - 0.6 kg-m, 2.9 - 4.3 ft-lb)

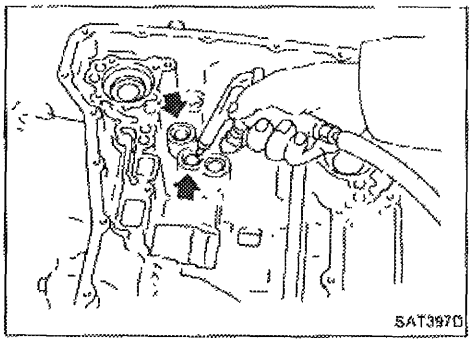


    b. Back off anchor end pin two and a half turns.

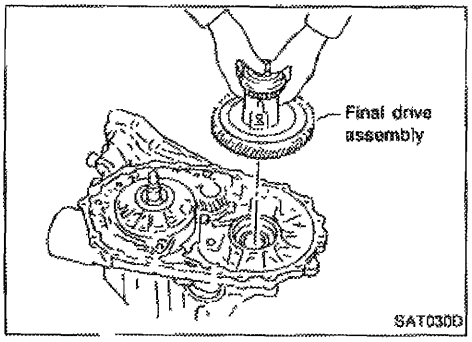


    c. While holding anchor end pin, tighten lock nut.

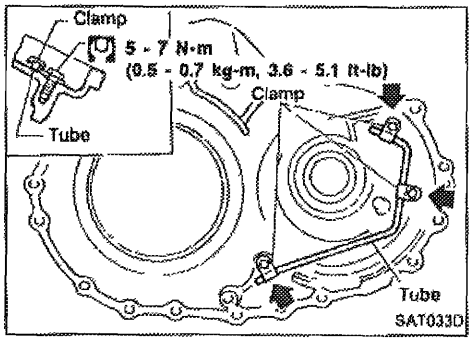
Assembly 3 (Cont'd)



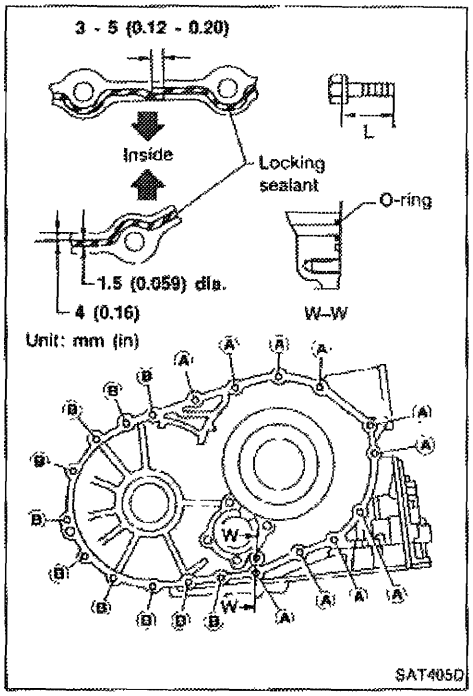
11. Apply compressed air to oil holes of transmission case and check operation of brake band.



12. Install final drive assembly on transmission case.



13. Install oil tube on converter housing.

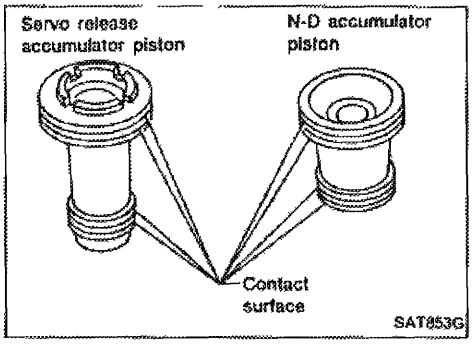


14. Install O-ring on differential oil port of transmission case.
15. Install converter housing on transmission case.

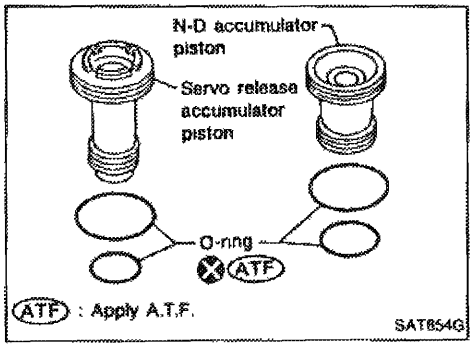
- **Apply locking sealant to mating surface of converter housing.**

Bolt	Length mm (in)
Ⓐ	30 (1.18)
Ⓑ	40 (1.57)

Assembly 3 (Cont'd)



16. Install accumulator piston.
a. Check contact surface of accumulator piston for damage

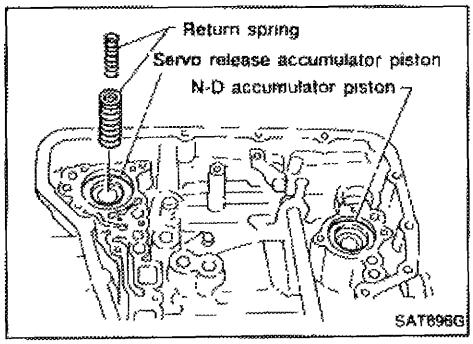


b. Install O-rings on accumulator piston.
- Apply A.T.F. to O-rings.

Accumulator piston O-rings:

Unit: mm (in)

Accumulator	Inner diameter (Small)	Inner diameter (Large)
Servo release accumulator	26.9 (1.059)	44.2 (1.740)
N-D accumulator	34.6 (1.362)	39.4 (1.551)

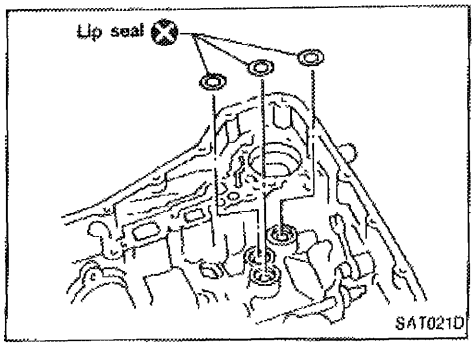


c. Install accumulator pistons and return springs on transmission case.
- **Apply A.T.F. to inner surface of transmission case.**

Return springs:

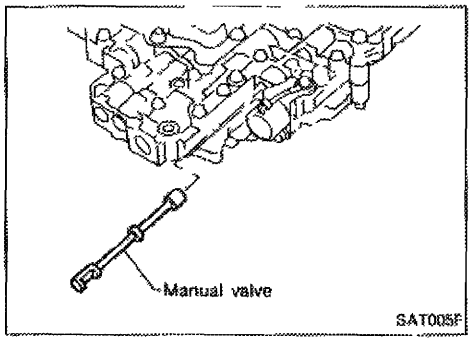
Unit: mm (in)

Spring		Free length	Outer diameter
Servo release accumulator spring	Outer	52.5 (2.067)	21.1 (0.831)
	Inner	52.0 (2.047)	13.1 (0.516)
N-D accumulator spring		43.5 (1.713)	28.0 (1.102)

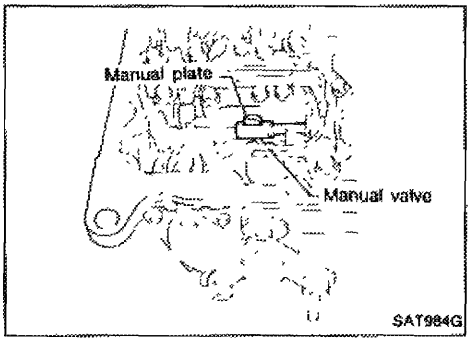


17. Install lip seals for band servo oil holes on transmission case.
- **Apply petroleum jelly to lip seals.**

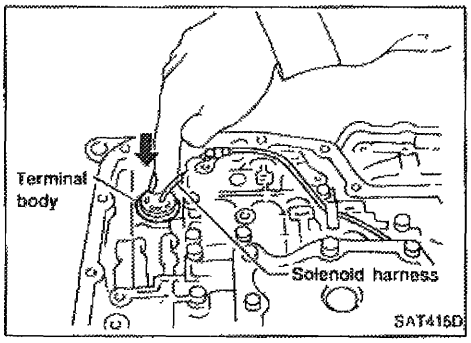
Assembly 3 (Cont'd)



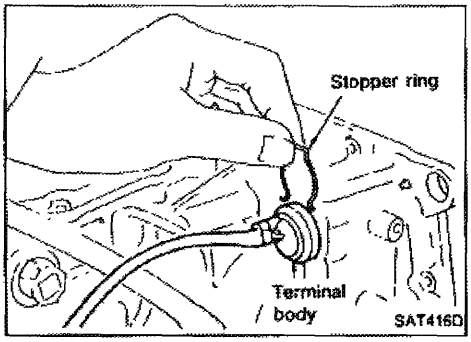
18. Install control valve assembly
a. Insert manual valve into control valve assembly.
- **Apply A.T.F. to manual valve.**



b. Set manual shaft in Neutral position.
c Install control valve assembly on transmission case while aligning manual valve with manual plate.

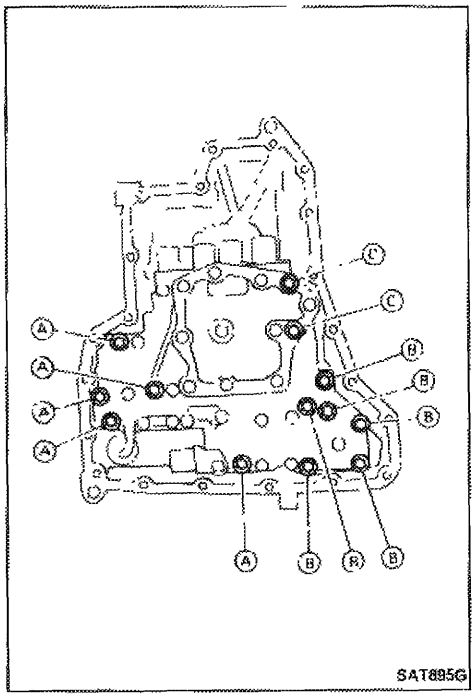


d. Pass solenoid harness through transmission case and install terminal body on transmission case by pushing it.



e. Install clip to terminal body.

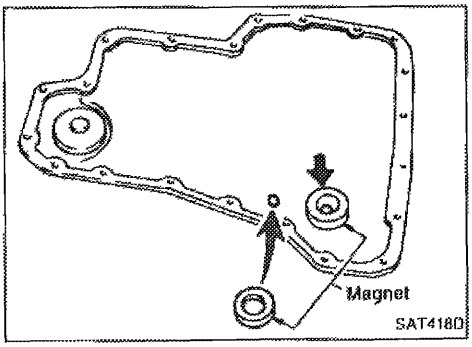
Assembly 3 (Cont'd)



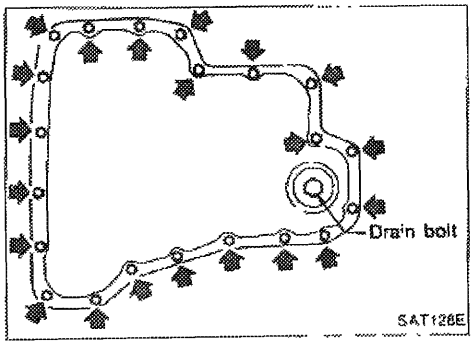
f. Tighten bolts Ⓐ, Ⓑ and Ⓒ.

Bolt length, number and location

Bolt symbol	Ⓐ	Ⓑ	Ⓒ
Bolt length "ℓ" mm (in)	40.0 (1.575)	33.0 (1.299)	43.5 (1.713)
Number of bolts	5	6	2

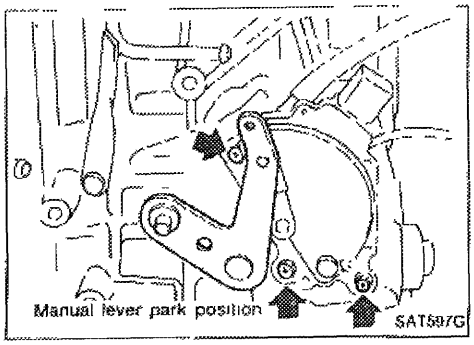


19. Install oil pan.
a. Attach magnet to oil pan



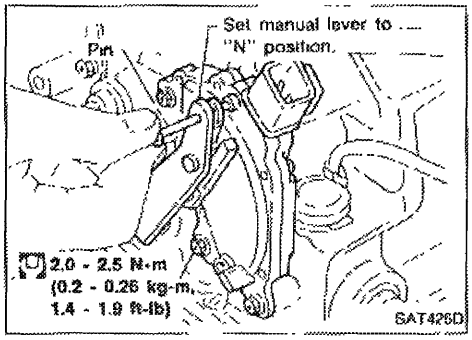
b. Install new oil pan gasket on transmission case.
c. Install oil pan on transmission case
- **Always replace oil pan bolts as they are self-sealing bolts.**
- **Tighten the four bolts in a criss-cross pattern to prevent dislocation of gasket.**

d. Tighten drain plug to specified torque.

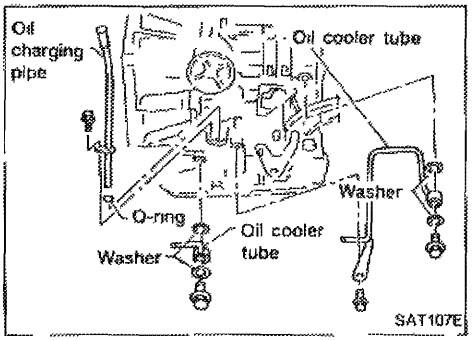


20. Install inhibitor switch.
a. Set manual lever in "P" position.
b. Temporarily install inhibitor switch on manual shaft.
c. Move selector lever to "N" position.

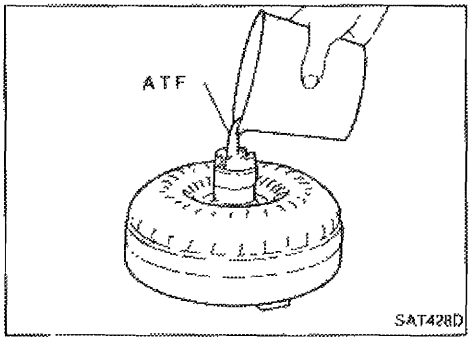
Assembly 3 (Cont'd)



d. Insert 4.0 mm (0.157 in) dia. pin into adjustment hole in both inhibitor switch and manual shaft as near vertically as possible.
e. Tighten inhibitor switch fixing bolts.
f. Remove pin from adjustment hole after adjusting inhibitor switch.

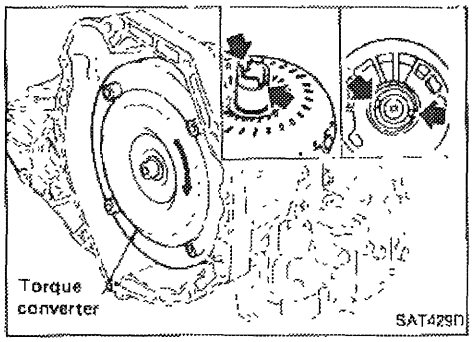


21. Install oil charging pipe and oil cooler tube to transmission case.

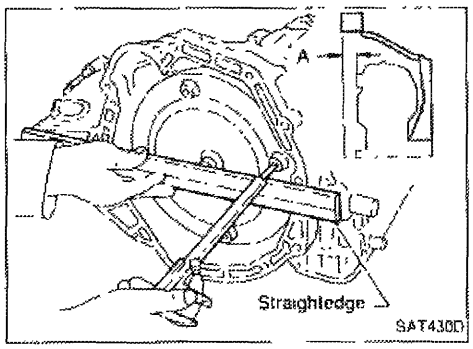


22. Install torque converter.
a. Pour A.T.F. into torque converter.

- **Approximately 1 liter (1 - 1/8 US qt, 7/8 Imp qt) of fluid is required for a new torque converter.**
- **When reusing old torque converter, add the same amount of fluid as was drained.**



b. Install torque converter while aligning notches of torque converter with notches of oil pump



c Measure distance "A" to check that torque converter is in proper position.

Distance "A":
15.9 mm (0.626 in) or more

General Specifications

Engine	SR20DE	
Automatic transaxle model	RE4F03V	RE4F03A
Automatic transaxle assembly Model code number	33X19	33X20
Transaxle gear ratio		
1st	2.861	
2nd	1.562	
3rd	1.000	
4th	0.697	
Reverse	2.310	
Final drive	4.072	
Recommended oil	Genuine Nissan ATF or equivalent type DEXRON™II-E	
Oil capacity ℓ (US qt, Imp qt)	7.0 (7-3/8, 6-1/8)	

Specifications and Adjustments

VEHICLE SPEED WHEN SHIFTING GEARS

Throttle position	Shift pattern	Vehicle speed km/h (MPH)					
		$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	Comfort	56 - 60 (35 - 37)	102 - 110 (63 - 68)	162 - 170 (101 - 106)	158 - 166 (98 - 103)	92 - 100 (57 - 62)	50 - 54 (31 - 34)
	Power	56 - 60 (35 - 37)	102 - 110 (63 - 68)	162 - 170 (101 - 106)	158 - 166 (98 - 103)	92 - 100 (57 - 62)	50 - 54 (31 - 34)
Half throttle	Comfort	35 - 39 (22 - 24)	62 - 70 (39 - 43)	98 - 106 (61 - 66)	62 - 70 (39 - 43)	40 - 48 (25 - 30)	11 - 15 (7 - 9)
	Power	41 - 45 (25 - 28)	74 - 82 (46 - 51)	118 - 126 (73 - 78)	84 - 92 (52 - 57)	42 - 50 (26 - 31)	11 - 15 (7 - 9)

VEHICLE SPEED WHEN PERFORMING LOCK-UP

Throttle position	O.D. switch (Shift range)	Shift pattern	Vehicle speed km/h (MPH)	
			Lock-up "ON"	Lock-up "OFF"
2/8	ON [D_4]	Comfort	81 - 89 (50 - 55)	61 - 69 (38 - 43)
		Power	96 - 104 (60 - 65)	66 - 74 (41 - 46)
	OFF [D_3]	Comfort	86 - 94 (53 - 58)	83 - 91 (52 - 57)
		Power	86 - 94 (53 - 58)	83 - 91 (52 - 57)

STALL REVOLUTION

Engine	Stall revolution rpm
SR20DE	1,900 - 2,200

LINE PRESSURE

Engine speed rpm	Line pressure kPa (kg/cm², psi)			
	R position	D position	2 position	1 position
Idle	853 (8.7, 124)	500 (5.1, 73)	500 (5.1, 73)	500 (5.1, 73)
Stall	1,863 (19.0, 270)	1,098 (11.2, 159)	1,098 (11.2, 159)	1,098 (11.2, 159)

CONTROL VALVES

Unit: mm (in)

Parts			Part No	Free length	Outer diameter
Upper body	(18)	Pilot valve spring	31742-80X14	36.0 (1.417)	8.1 (0.319)
	(19)	1-2 accumulator valve spring	31742-80X10	20.5 (0.807)	7.0 (0.276)
	(21)	1-2 accumulator piston spring	31742-33X02	48.8 (1.921)	19.6 (0.772)
	(23)	1st reducing valve spring	31742-80X05	27.0 (1.063)	7.0 (0.276)
	(24)	Overrun clutch reducing valve spring	31742-80X05	37.5 (1.476)	7.0 (0.276)
	(27)	Torque converter relief valve spring	31742-33X00	31.0 (1.220)	8.9 (0.350)
	(30)	Lock-up control valve	31742-80X17	39.5 (1.555)	11.0 (0.433)
		Oil cooler relief valve spring	31872-31X00	17.02 (0.6701)	8.0 (0.315)
Lower body	(55)	Line pressure solenoid valve spring	31742-80X11	17.0 (0.669)	10.7 (0.421)
	(59)	Pressure regulator valve spring	31742-80X13	45.0 (1.772)	15.0 (0.591)
	(64)	Overrun clutch control valve spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	(65)	Accumulator control valve spring	31742-80X02	22.0 (0.866)	6.5 (0.256)
	(66)	Shift valve A spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	(67)	Shift valve B spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	(71)	Pressure modifier valve spring	31742-41X15	30.5 (1.201)	9.8 (0.386)
	(72)		31742-80X16	32.0 (1.260)	6.9 (0.272)

Specifications and Adjustments (Cont'd)

CLUTCHES AND BRAKES

Model		RE4F03V, RE4F03A	
Reverse clutch			
Number of drive plates		2	
Number of driven plates		2	
Drive plate thickness	mm (in)		
Standard		2.0 (0.079)	
Allowable limit		1.8 (0.071)	
Clearance	mm (in)		
Standard		0.5 - 0.8 (0.020 - 0.031)	
Allowable limit		1.2 (0.047)	
Thickness of retaining plates		Thickness mm (in)	Part number
		4.4 (0.173)	31537-31X00
		4.6 (0.181)	31537-31X01
		4.8 (0.189)	31537-31X02
		5.0 (0.197)	31537-31X03
		5.2 (0.205)	31537-31X04
High clutch			
Number of drive plates		4	
Number of driven plates		7	
Drive plate thickness	mm (in)		
Standard		1.6 (0.063)	
Allowable limit		1.4 (0.055)	
Clearance	mm (in)		
Standard		1.4 - 1.8 (0.055 - 0.071)	
Allowable limit		2.6 (0.102)	
Thickness of retaining plates		Thickness mm (in)	Part number
		3.6 (0.142)	31537-31X10
		3.8 (0.150)	31537-31X11
		4.0 (0.157)	31537-31X12
		4.2 (0.165)	31537-31X13
		4.4 (0.173)	31537-31X14
		4.6 (0.181)	31537-31X15
		4.8 (0.189)	31537-31X16
		5.0 (0.197)	31537-31X17

Specifications and Adjustments (Cont'd)

Model	RE4F03V, RE4F03A	
Forward clutch		
Number of drive plates	5	
Number of driven plates	5	
Drive plate thickness mm (in)		
Standard	1.8 (0.071)	
Allowable limit	1.6 (0.063)	
Clearance mm (in)		
Standard	0.45 - 0.85 (0.0177 - 0.0335)	
Allowable limit	1.85 (0.0728)	
Thickness of retaining plate	Thickness mm (in)	Part number
	3.6 (0.142)	31537-31X60
	3.8 (0.150)	31537-31X61
	4.0 (0.157)	31537-31X62
	4.2 (0.165)	31537-31X63
	4.4 (0.173)	31537-31X64
	4.6 (0.181)	31537-31X65
Overrun clutch		
Number of drive plates	3	
Number of driven plates	5	
Drive plate thickness mm (in)		
Standard	1.6 (0.063)	
Allowable limit	1.4 (0.055)	
Clearance mm (in)		
Standard	1.0 - 1.4 (0.039 - 0.055)	
Allowable limit	2.0 (0.079)	
Thickness of retaining plate	Thickness mm (in)	Part number
	3.6 (0.142)	31537-31X70
	3.8 (0.150)	31537-31X71
	4.0 (0.157)	31537-31X72
	4.2 (0.165)	31537-31X73
	4.4 (0.173)	31537-31X74

Specifications and Adjustments (Cont'd)

Model	RE4F03V, RE4F03A	
Low & reverse brake		
Number of drive plates	5	
Number of driven plates	5	
Drive plate thickness mm (in)		
Standard	2.0 (0.079)	
Allowable limit	1.8 (0.071)	
Clearance mm (in)		
Standard	1.4 - 1.8 (0.055 - 0.071)	
Allowable limit	2.8 (0.110)	
Thickness of retaining plate	Thickness mm (in)	Part number
	3.6 (0.142)	31667-31X10
	3.8 (0.150)	31667-31X11
	4.0 (0.157)	31667-31X12
	4.2 (0.165)	31667-31X13
	4.4 (0.173)	31667-31X14
	4.6 (0.181)	31667-31X15
Brake band		
Anchor end bolt tightening torque N·m (kg-m, ft-lb)	4 - 6 (0.4 - 0.6, 2.9 - 4.3)	
Number of returning revolutions for anchor end bolt	2.5 ± 0.125	
Lock nut tightening torque N·m (kg-m, ft-lb)	31 - 42 (3.2 - 4.3, 23 - 31)	

Clutch and brake return springs

Unit: mm (in)

Parts		Free length	Outer diameter
Forward clutch (Overrun clutch) (16 pcs)	Outer	26.6 (1.047)	10.6 (0.417)
	Inner	26.3 (1.035)	7.7 (0.303)

Specifications and Adjustments (Cont'd)

OIL PUMP

Oil pump side clearance mm (in)	0.02 - 0.04 (0.0008 - 0.0016)	
Thickness of inner gears and outer gears	Inner gear	
	Thickness mm (in)	Part number
	9.99 - 10.00 (0.3933 - 0.3937)	31346-31X00
	9.98 - 9.99 (0.3929 - 0.3933)	31346-31X01
	9.97 - 9.98 (0.3925 - 0.3929)	31346-31X02
	Outer gear	
	Thickness mm (in)	Part number
	9.99 - 10.00 (0.3933 - 0.3937)	31347-31X00
	9.98 - 9.99 (0.3929 - 0.3933)	31347-31X01
	9.97 - 9.98 (0.3925 - 0.3929)	31347-31X02
Clearance between oil pump housing and outer gear mm (in)		
Standard	0.08 - 0.15 (0.0031 - 0.0059)	
Allowable limit	0.15 (0.0059)	
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)

PLANETARY CARRIER

Clearance between planetary carrier and pinion washer mm (in)	
Standard	0.15 - 0.70 (0.0059 - 0.0276)
Allowable limit	0.80 (0.0315)

FINAL DRIVE

Differential side gear clearance

Clearance between side gear and differential case with washer mm (in)	0.1 - 0.2 (0.004 - 0.008)

Differential side gear thrust washers for F03A

Thickness mm (in)	Part number
0.75 - 0.80 (0.0295 - 0.0315)	38424-D2111
0.80 - 0.85 (0.0315 - 0.0335)	38424-D2112
0.85 - 0.90 (0.0335 - 0.0354)	38424-D2113
0.90 - 0.95 (0.0354 - 0.0374)	38424-D2114
0.95 - 1.00 (0.0374 - 0.0394)	38424-D2115

Differential side gear thrust washers for F03V

	Thickness mm (in)	Part number
Viscous coupling side	0.70 - 0.75 (0.0276 - 0.0295)	38424-D2110
	0.75 - 0.80 (0.0295 - 0.0315)	38424-D2111
	0.80 - 0.85 (0.0315 - 0.0335)	38424-D2112
	0.85 - 0.90 (0.0335 - 0.0354)	38424-D2113
	0.90 - 0.95 (0.0354 - 0.0374)	38424-D2114
	0.95 - 1.00 (0.0374 - 0.0394)	38424-D2115
	1.00 - 1.05 (0.0394 - 0.0413)	38424-D2116
	1.05 - 1.10 (0.0413 - 0.0433)	38424-D2117
	1.10 - 1.15 (0.0433 - 0.0453)	38424-D2118
	1.15 - 1.20 (0.0453 - 0.0472)	38424-D2119
	1.20 - 1.25 (0.0472 - 0.0492)	38424-D2120
	1.25 - 1.30 (0.0492 - 0.0512)	38424-D2121
	1.30 - 1.35 (0.0512 - 0.0531)	38424-D2122
Differential case side	0.75 - 0.80 (0.0295 - 0.0315)	38424-D2111
	0.80 - 0.85 (0.0315 - 0.0335)	38424-D2112
	0.85 - 0.90 (0.0335 - 0.0354)	38424-D2113
	0.90 - 0.95 (0.0354 - 0.0374)	38424-D2114
	0.95 - 1.00 (0.0374 - 0.0394)	38424-D2115

Bearing preload

Differential side bearing preload "T" mm (in)	0.04 - 0.09 (0.0016 - 0.0035)

Turning torque

Turning torque of final drive assembly N·m (kg-cm, in-lb)	0.49 - 1.08 (5.0 - 11.0, 4.3 - 9.5)

Specifications and Adjustments (Cont'd)

Differential side bearing adjusting shims for F03A

Thickness mm (in)	Part number
0.40 (0.0157)	31499-21X07
0.44 (0.0173)	31499-21X08
0.48 (0.0189)	31499-21X09
0.52 (0.0205)	31499-21X10
0.56 (0.0220)	31499-21X11
0.60 (0.0236)	31499-21X12
0.64 (0.0252)	31499-21X13
0.68 (0.0268)	31499-21X14
0.72 (0.0283)	31499-21X15
0.76 (0.0299)	31499-21X16
0.80 (0.0315)	31499-21X17
0.84 (0.0331)	31499-21X18
0.88 (0.0346)	31499-21X19
0.92 (0.0362)	31499-21X20
1.44 (0.0567)	31499-21X21

Differential side bearing adjusting shims for F03V

Thickness mm (in)	Part number
0.28 (0.0110)	31439-31X00
0.32 (0.0126)	31439-31X01
0.36 (0.0142)	31439-31X02
0.40 (0.0157)	31439-31X03
0.44 (0.0173)	31439-31X04
0.48 (0.0189)	31439-31X05
0.52 (0.0205)	31439-31X06
0.56 (0.0220)	31439-31X07
0.60 (0.0236)	31439-31X08
0.64 (0.0252)	31439-31X09
0.68 (0.0268)	31439-31X10
0.72 (0.0283)	31439-31X11
0.76 (0.0299)	31439-31X12
0.80 (0.0315)	31439-31X13
0.84 (0.0331)	31439-31X14
0.88 (0.0346)	31439-31X15
0.92 (0.0362)	31439-31X16
0.96 (0.0378)	31439-31X17
1.44 (0.0567)	31439-31X18

Table for selecting differential side bearing adjusting shim(s) for F03A

Unit: mm (in)

Dial indicator deflection	Suitable shim(s)
0.31 - 0.35 (0.0122 - 0.0138)	0.40 (0.0157)
0.35 - 0.39 (0.0138 - 0.0154)	0.44 (0.0173)
0.39 - 0.43 (0.0154 - 0.0169)	0.48 (0.0189)
0.43 - 0.47 (0.0169 - 0.0185)	0.52 (0.0205)
0.47 - 0.51 (0.0185 - 0.0201)	0.56 (0.0220)
0.51 - 0.55 (0.0201 - 0.0217)	0.60 (0.0236)
0.55 - 0.59 (0.0217 - 0.0232)	0.64 (0.0252)
0.59 - 0.63 (0.0232 - 0.0248)	0.68 (0.0268)
0.63 - 0.67 (0.0248 - 0.0264)	0.72 (0.0283)
0.67 - 0.71 (0.0264 - 0.0280)	0.76 (0.0299)
0.71 - 0.75 (0.0280 - 0.0295)	0.80 (0.0315)
0.75 - 0.79 (0.0295 - 0.0311)	0.84 (0.0331)
0.79 - 0.83 (0.0311 - 0.0327)	0.88 (0.0346)
0.83 - 0.87 (0.0327 - 0.0343)	0.92 (0.0362)
0.87 - 0.91 (0.0343 - 0.0358)	0.48 (0.0189) + 0.48 (0.0189)
0.91 - 0.95 (0.0358 - 0.0374)	0.48 (0.0189) + 0.52 (0.0205)
0.95 - 0.99 (0.0374 - 0.0390)	0.52 (0.0205) + 0.52 (0.0205)
0.99 - 1.03 (0.0390 - 0.0406)	0.52 (0.0205) + 0.56 (0.0220)
1.03 - 1.07 (0.0406 - 0.0421)	0.56 (0.0220) + 0.56 (0.0220)
1.07 - 1.11 (0.0421 - 0.0437)	0.56 (0.0220) + 0.60 (0.0236)
1.11 - 1.15 (0.0437 - 0.0453)	0.60 (0.0236) + 0.60 (0.0236)
1.15 - 1.19 (0.0453 - 0.0469)	0.60 (0.0236) + 0.64 (0.0252)
1.19 - 1.23 (0.0469 - 0.0484)	0.64 (0.0252) + 0.64 (0.0252)
1.23 - 1.27 (0.0484 - 0.0500)	0.64 (0.0252) + 0.68 (0.0268)
1.27 - 1.31 (0.0500 - 0.0516)	0.68 (0.0268) + 0.68 (0.0268)
1.31 - 1.35 (0.0516 - 0.0531)	0.68 (0.0268) + 0.72 (0.0283)
1.35 - 1.39 (0.0531 - 0.0547)	1.44 (0.0567)
1.39 - 1.43 (0.0547 - 0.0563)	0.72 (0.0283) + 0.76 (0.0299)
1.43 - 1.47 (0.0563 - 0.0579)	0.76 (0.0299) + 0.76 (0.0299)
1.47 - 1.51 (0.0579 - 0.0594)	0.76 (0.0299) + 0.80 (0.0315)
1.51 - 1.55 (0.0594 - 0.0610)	0.80 (0.0315) + 0.80 (0.0315)
1.55 - 1.59 (0.0610 - 0.0626)	0.80 (0.0315) + 0.84 (0.0331)
1.59 - 1.63 (0.0626 - 0.0642)	0.84 (0.0331) + 0.84 (0.0331)
1.63 - 1.67 (0.0642 - 0.0657)	0.84 (0.0331) + 0.88 (0.0346)
1.67 - 1.71 (0.0657 - 0.0673)	0.88 (0.0346) + 0.88 (0.0346)
1.71 - 1.75 (0.0673 - 0.0689)	0.88 (0.0346) + 0.92 (0.0362)
1.75 - 1.79 (0.0689 - 0.0705)	0.92 (0.0362) + 0.92 (0.0362)
1.79 - 1.83 (0.0705 - 0.0720)	0.44 (0.0173) + 1.44 (0.0567)
1.83 - 1.87 (0.0720 - 0.0736)	0.48 (0.0189) + 1.44 (0.0567)
1.87 - 1.91 (0.0736 - 0.0752)	0.52 (0.0205) + 1.44 (0.0567)
1.91 - 1.95 (0.0752 - 0.0768)	0.56 (0.0220) + 1.44 (0.0567)

Specifications and Adjustments (Cont'd)

Table for selecting differential side bearing adjusting shim(s) for F03V

Unit: mm (in)

Dial indicator deflection	Suitable shim(s)
0.19 - 0.23 (0.0075 - 0.0091)	0.28 (0.0110)
0.23 - 0.27 (0.0091 - 0.0106)	0.32 (0.0126)
0.27 - 0.31 (0.0106 - 0.0122)	0.36 (0.0142)
0.31 - 0.35 (0.0122 - 0.0138)	0.40 (0.0157)
0.35 - 0.39 (0.0138 - 0.0154)	0.44 (0.0173)
0.39 - 0.43 (0.0154 - 0.0169)	0.48 (0.0189)
0.43 - 0.47 (0.0169 - 0.0185)	0.52 (0.0205)
0.47 - 0.51 (0.0185 - 0.0201)	0.56 (0.0220)
0.51 - 0.55 (0.0201 - 0.0217)	0.60 (0.0236)
0.55 - 0.59 (0.0217 - 0.0232)	0.64 (0.0252)
0.59 - 0.63 (0.0232 - 0.0248)	0.68 (0.0268)
0.63 - 0.67 (0.0248 - 0.0264)	0.72 (0.0283)
0.67 - 0.71 (0.0264 - 0.0280)	0.76 (0.0299)
0.71 - 0.75 (0.0280 - 0.0295)	0.80 (0.0315)
0.75 - 0.79 (0.0295 - 0.0311)	0.84 (0.0331)
0.79 - 0.83 (0.0311 - 0.0327)	0.88 (0.0346)
0.83 - 0.87 (0.0327 - 0.0343)	0.92 (0.0362)
0.87 - 0.91 (0.0343 - 0.0358)	0.48 (0.0189) + 0.48 (0.0189)
0.91 - 0.95 (0.0358 - 0.0374)	0.48 (0.0189) + 0.52 (0.0205)
0.95 - 0.99 (0.0374 - 0.0390)	0.52 (0.0205) + 0.52 (0.0205)
0.99 - 1.03 (0.0390 - 0.0406)	0.52 (0.0205) + 0.56 (0.0220)
1.03 - 1.07 (0.0406 - 0.0421)	0.56 (0.0220) + 0.56 (0.0220)
1.07 - 1.11 (0.0421 - 0.0437)	0.56 (0.0220) + 0.60 (0.0236)
1.11 - 1.15 (0.0437 - 0.0453)	0.60 (0.0236) + 0.60 (0.0236)
1.15 - 1.19 (0.0453 - 0.0469)	0.60 (0.0236) + 0.64 (0.0252)
1.19 - 1.23 (0.0469 - 0.0484)	0.64 (0.0252) + 0.64 (0.0252)
1.23 - 1.27 (0.0484 - 0.0500)	0.64 (0.0252) + 0.68 (0.0268)
1.27 - 1.31 (0.0500 - 0.0516)	0.68 (0.0268) + 0.68 (0.0268)
1.31 - 1.35 (0.0516 - 0.0531)	0.68 (0.0268) + 0.72 (0.0283)
1.35 - 1.39 (0.0531 - 0.0547)	1.44 (0.0567)
1.39 - 1.43 (0.0547 - 0.0563)	0.72 (0.0283) + 0.76 (0.0299)
1.43 - 1.47 (0.0563 - 0.0579)	0.76 (0.0299) + 0.76 (0.0299)
1.47 - 1.51 (0.0579 - 0.0594)	0.76 (0.0299) + 0.80 (0.0315)
1.51 - 1.55 (0.0594 - 0.0610)	0.80 (0.0315) + 0.80 (0.0315)
1.55 - 1.59 (0.0610 - 0.0626)	0.80 (0.0315) + 0.84 (0.0331)
1.59 - 1.63 (0.0626 - 0.0642)	0.84 (0.0331) + 0.84 (0.0331)
1.63 - 1.67 (0.0642 - 0.0657)	0.84 (0.0331) + 0.88 (0.0346)
1.67 - 1.71 (0.0657 - 0.0673)	0.88 (0.0346) + 0.88 (0.0346)
1.71 - 1.75 (0.0673 - 0.0689)	0.88 (0.0346) + 0.92 (0.0362)
1.75 - 1.79 (0.0689 - 0.0705)	0.92 (0.0362) + 0.92 (0.0362)
1.79 - 1.83 (0.0705 - 0.0720)	0.92 (0.0362) + 0.96 (0.0378)
1.83 - 1.87 (0.0720 - 0.0736)	0.96 (0.0378) + 0.96 (0.0378)
1.87 - 1.91 (0.0736 - 0.0752)	0.52 (0.0205) + 1.44 (0.0567)
1.91 - 1.95 (0.0752 - 0.0768)	0.56 (0.0220) + 1.44 (0.0567)

REDUCTION GEAR

Bearing preload

Reduction gear bearing preload mm (in)	0.05 (0.0020)

Turning torque

Turning torque of reduction gear N·m (kg-cm, in-lb)	0.11 - 0.69 (1.1 - 7.0, 0.95 - 6.08)

Specifications and Adjustments (Cont'd)

Reduction gear bearing adjusting shims

Thickness mm (in)	Part number
1.10 (0.0433)	31438-31X00
1.14 (0.0449)	31438-31X01
1.18 (0.0465)	31438-31X02
1.22 (0.0480)	31438-31X03
1.26 (0.0496)	31438-31X04
1.30 (0.0512)	31438-31X05
1.34 (0.0528)	31438-31X06
1.38 (0.0543)	31438-31X07
1.42 (0.0559)	31438-31X08
1.46 (0.0575)	31438-31X09
1.50 (0.0591)	31438-31X10
1.54 (0.0606)	31438-31X11
1.58 (0.0622)	31438-31X12
1.62 (0.0638)	31438-31X13
1.66 (0.0654)	31438-31X14
1.70 (0.0669)	31438-31X15
1.74 (0.0685)	31438-31X16
1.78 (0.0701)	31438-31X17
1.82 (0.0717)	31438-31X18
1.86 (0.0732)	31438-31X19
1.90 (0.0748)	31438-31X20
1.92 (0.0756)	31439-31X60
1.94 (0.0764)	31438-31X21
1.96 (0.0772)	31439-31X61
1.98 (0.0780)	31438-31X22
2.00 (0.0787)	31439-31X62
2.02 (0.0795)	31438-31X23
2.04 (0.0803)	31439-31X63
2.06 (0.0811)	31438-31X24
2.08 (0.0819)	31439-31X64
2.10 (0.0827)	31438-31X60
2.12 (0.0835)	31439-31X65
2.14 (0.0843)	31438-31X61
2.16 (0.0850)	31439-31X66
2.18 (0.0858)	31438-31X62
2.20 (0.0866)	31439-31X67
2.22 (0.0874)	31438-31X63
2.24 (0.0882)	31439-31X68
2.26 (0.0890)	31438-31X64
2.28 (0.0898)	31439-31X69
2.30 (0.0906)	31438-31X65
2.34 (0.0921)	31438-31X66
2.38 (0.0937)	31438-31X67
2.42 (0.0953)	31438-31X68
2.46 (0.0969)	31438-31X69
2.50 (0.0984)	31438-31X70
2.54 (0.1000)	31438-31X71
2.58 (0.1016)	31438-31X72
2.62 (0.1031)	31438-31X73
2.66 (0.1047)	31438-31X74
2.70 (0.1063)	31438-31X75
2.74 (0.1079)	31438-31X76
2.78 (0.1094)	31438-31X77
2.82 (0.1110)	31438-31X78

Table for selecting reduction gear bearing adjusting shim

Unit: mm (in)

Dimension "T"	Suitable shim(s)
1.13 - 1.17 (0.0445 - 0.0461)	1.10 (0.0433)
1.17 - 1.21 (0.0461 - 0.0476)	1.14 (0.0449)
1.21 - 1.25 (0.0476 - 0.0492)	1.18 (0.0465)
1.25 - 1.29 (0.0492 - 0.0508)	1.22 (0.0480)
1.29 - 1.33 (0.0508 - 0.0524)	1.26 (0.0496)
1.33 - 1.37 (0.0524 - 0.0539)	1.30 (0.0512)
1.37 - 1.41 (0.0539 - 0.0555)	1.34 (0.0528)
1.41 - 1.45 (0.0555 - 0.0571)	1.38 (0.0543)
1.45 - 1.49 (0.0571 - 0.0587)	1.42 (0.0559)
1.49 - 1.53 (0.0587 - 0.0602)	1.46 (0.0575)
1.53 - 1.57 (0.0602 - 0.0618)	1.50 (0.0591)
1.57 - 1.61 (0.0618 - 0.0634)	1.54 (0.0606)
1.61 - 1.65 (0.0634 - 0.0650)	1.58 (0.0622)
1.65 - 1.69 (0.0650 - 0.0665)	1.62 (0.0638)
1.69 - 1.73 (0.0665 - 0.0681)	1.66 (0.0654)
1.73 - 1.77 (0.0681 - 0.0697)	1.70 (0.0669)
1.77 - 1.81 (0.0697 - 0.0713)	1.74 (0.0685)
1.81 - 1.85 (0.0713 - 0.0728)	1.78 (0.0701)
1.85 - 1.89 (0.0728 - 0.0744)	1.82 (0.0717)
1.89 - 1.93 (0.0744 - 0.0760)	1.86 (0.0732)
1.93 - 1.96 (0.0760 - 0.0772)	1.90 (0.0748)
1.96 - 1.98 (0.0772 - 0.0780)	1.92 (0.0756)
1.98 - 2.00 (0.0780 - 0.0787)	1.94 (0.0764)
2.00 - 2.02 (0.0787 - 0.0795)	1.96 (0.0772)
2.02 - 2.04 (0.0795 - 0.0803)	1.98 (0.0780)
2.04 - 2.06 (0.0803 - 0.0811)	2.00 (0.0787)
2.06 - 2.08 (0.0811 - 0.0819)	2.02 (0.0795)
2.08 - 2.10 (0.0819 - 0.0827)	2.04 (0.0803)
2.10 - 2.12 (0.0827 - 0.0835)	2.06 (0.0811)
2.12 - 2.14 (0.0835 - 0.0843)	2.08 (0.0819)
2.14 - 2.16 (0.0843 - 0.0850)	2.10 (0.0827)
2.16 - 2.18 (0.0850 - 0.0858)	2.12 (0.0835)
2.18 - 2.20 (0.0858 - 0.0866)	2.14 (0.0843)
2.20 - 2.22 (0.0866 - 0.0874)	2.16 (0.0850)
2.22 - 2.24 (0.0874 - 0.0882)	2.18 (0.0858)
2.24 - 2.26 (0.0882 - 0.0890)	2.20 (0.0866)
2.26 - 2.28 (0.0890 - 0.0898)	2.22 (0.0874)
2.28 - 2.30 (0.0898 - 0.0906)	2.24 (0.0882)
2.30 - 2.32 (0.0906 - 0.0913)	2.26 (0.0890)
2.32 - 2.34 (0.0913 - 0.0921)	2.28 (0.0898)
2.34 - 2.37 (0.0921 - 0.0933)	2.30 (0.0906)
2.37 - 2.41 (0.0933 - 0.0949)	2.34 (0.0921)
2.41 - 2.45 (0.0949 - 0.0965)	2.38 (0.0937)
2.45 - 2.49 (0.0965 - 0.0980)	2.42 (0.0953)
2.49 - 2.53 (0.0980 - 0.0996)	2.46 (0.0969)
2.53 - 2.57 (0.0996 - 0.1012)	2.50 (0.0984)
2.57 - 2.61 (0.1012 - 0.1028)	2.54 (0.1000)
2.61 - 2.65 (0.1028 - 0.1043)	2.58 (0.1016)
2.65 - 2.69 (0.1043 - 0.1059)	2.62 (0.1031)
2.69 - 2.73 (0.1059 - 0.1075)	2.66 (0.1047)
2.73 - 2.77 (0.1075 - 0.1091)	2.70 (0.1063)
2.77 - 2.81 (0.1091 - 0.1106)	2.74 (0.1079)
2.81 - 2.85 (0.1106 - 0.1122)	2.78 (0.1094)
2.85 - 2.89 (0.1122 - 0.1138)	2.82 (0.1110)

Specifications and Adjustments (Cont'd)

OUTPUT SHAFT

Seal ring clearance

Output shaft seal ring clearance mm (in)	
Standard	0.10 - 0.25 (0.0039 - 0.0098)
Allowable limit	0.25 (0.0098)

End play

Output shaft end play mm (in)	0 - 0.5 (0 - 0.020)

Output shaft adjusting shims

Thickness mm (in)	Part number
0.56 (0.0220)	31438-31X46
0.96 (0.0378)	31438-31X47
1.36 (0.0535)	31438-31X48

BEARING RETAINER

Seal ring clearance

Bearing retainer seal ring clearance mm (in)	
Standard	0.10 - 0.25 (0.0039 - 0.0098)
Allowable limit	0.25 (0.0098)

TOTAL END PLAY

Total end play mm (in)	0.25 - 0.55 (0.0098 - 0.0217)

Bearing race for adjusting total end play

Thickness mm (in)	Part number
0.6 (0.024)	31435-31X01
0.8 (0.031)	31435-31X02
1.0 (0.039)	31435-31X03
1.2 (0.047)	31435-31X04
1.4 (0.055)	31435-31X05
1.6 (0.063)	31435-31X06
1.8 (0.071)	31435-31X07
2.0 (0.079)	31435-31X08
2.2 (0.087)	31435-31X09

REVERSE CLUTCH END PLAY

Reverse clutch end play mm (in)	0.65 - 1.00 (0.0256 - 0.0394)

Thrust washers for adjusting reverse clutch end play

Thickness mm (in)	Part number
0.65 (0.0256)	31508-31X00
0.80 (0.0315)	31508-31X01
0.95 (0.0374)	31508-31X02
1.10 (0.0433)	31508-31X03
1.25 (0.0492)	31508-31X04
1.40 (0.0551)	31508-31X05
1.55 (0.0610)	31508-31X06

ACCUMULATOR

O-ring

Unit: mm (in)

Accumulator	Diameter (Small)	Diameter (Large)
Servo release accumulator	26.9 (1.059)	44.2 (1.740)
N-D accumulator	34.6 (1.362)	39.4 (1.551)

Return spring

Unit: mm (in)

Accumulator		Free length	Outer diameter
Servo release accumulator spring	Outer	52.5 (2.067)	21.1 (0.831)
	Inner	52.0 (2.047)	13.1 (0.516)
N-D accumulator spring		43.5 (1.713)	28.0 (1.102)

BAND SERVO

Return spring

Unit: mm (in)

Return spring	Free length	Outer diameter
2nd servo return spring	32.5 (1.280)	25.9 (1.020)
O/D servo return spring	31.0 (1.220)	21.7 (0.854)

REMOVAL AND INSTALLATION

Unit: mm (in)

Distance between end of converter housing and torque converter	15.9 (0.626) or more
Drive plate runout limit	0.2 (0.008)

REAR AXLE & REAR SUSPENSION

SECTION RA

CONTENTS

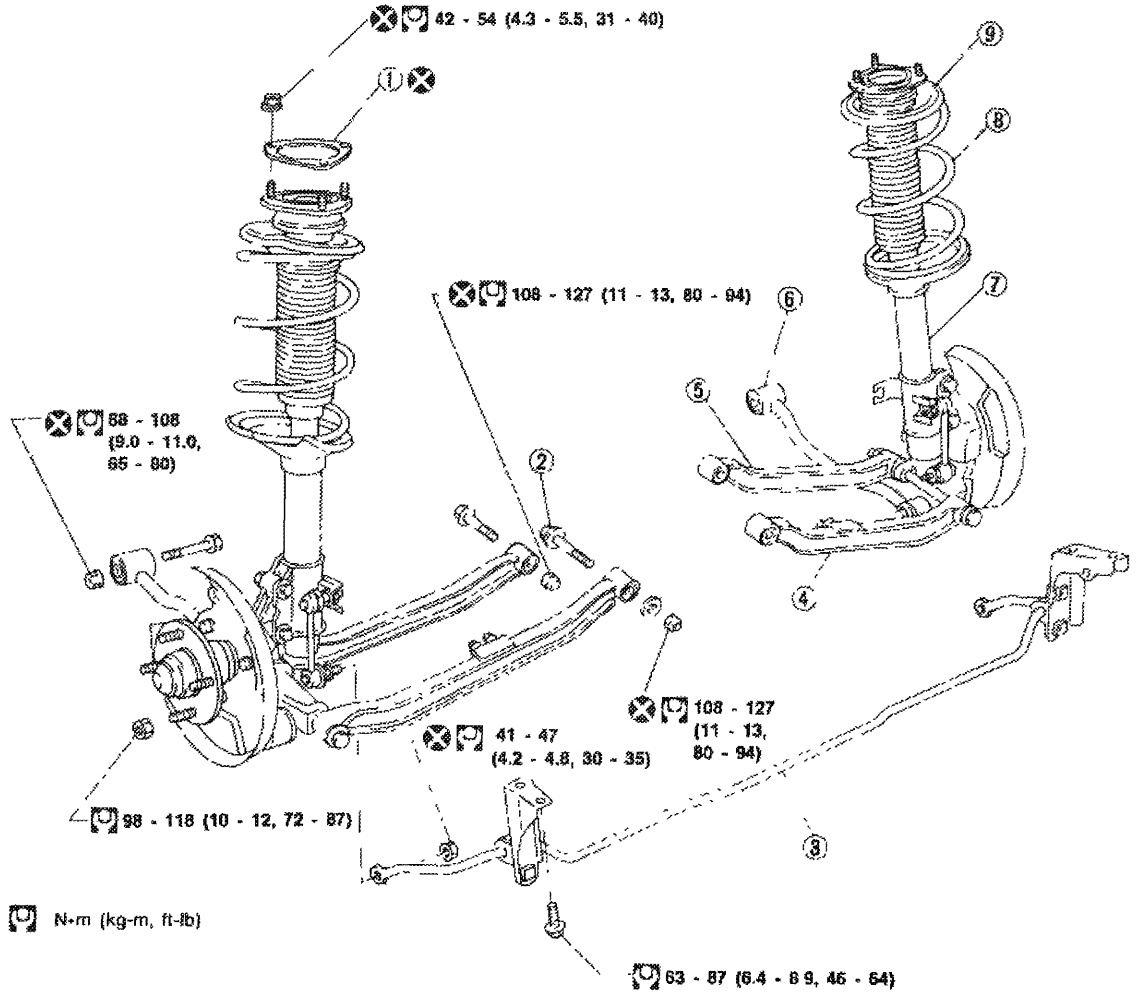
REAR AXLE AND REAR SUSPENSION 2

SERVICE DATA AND SPECIFICATIONS (S.D.S.) 3
- General Specifications 3
- Inspection and Adjustment 3

RA

When installing each rubber part final tightening must be carried out under unladen condition* with tires on ground.

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



SRA615A

① Gasket
② Adjusting bolt
③ Stabilizer bar
④ Rear parallel link
⑤ Front parallel link
⑥ Radius rod
⑦ Strut assembly
⑧ Coil spring
⑨ Strut mounting insulator assembly

General Specifications

REAR STABILIZER BAR

Applied model	All
Stabilizer bar diameter mm (in)	16.5 (0.650)
Identification color	Yellow

Inspection and Adjustment

WHEEL ALIGNMENT (Unladen*)

Applied model		All
Camber	degree	-1°56' to -0°40'
Toe-in		
A - B	mm (in)	-1 to 3
Total angle 2θ	degree	-5' to 15'

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

SECTION BR

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- Brake Hydraulic Line 2

BRAKE PEDAL AND BRACKET 3
- Removal and Installation 3
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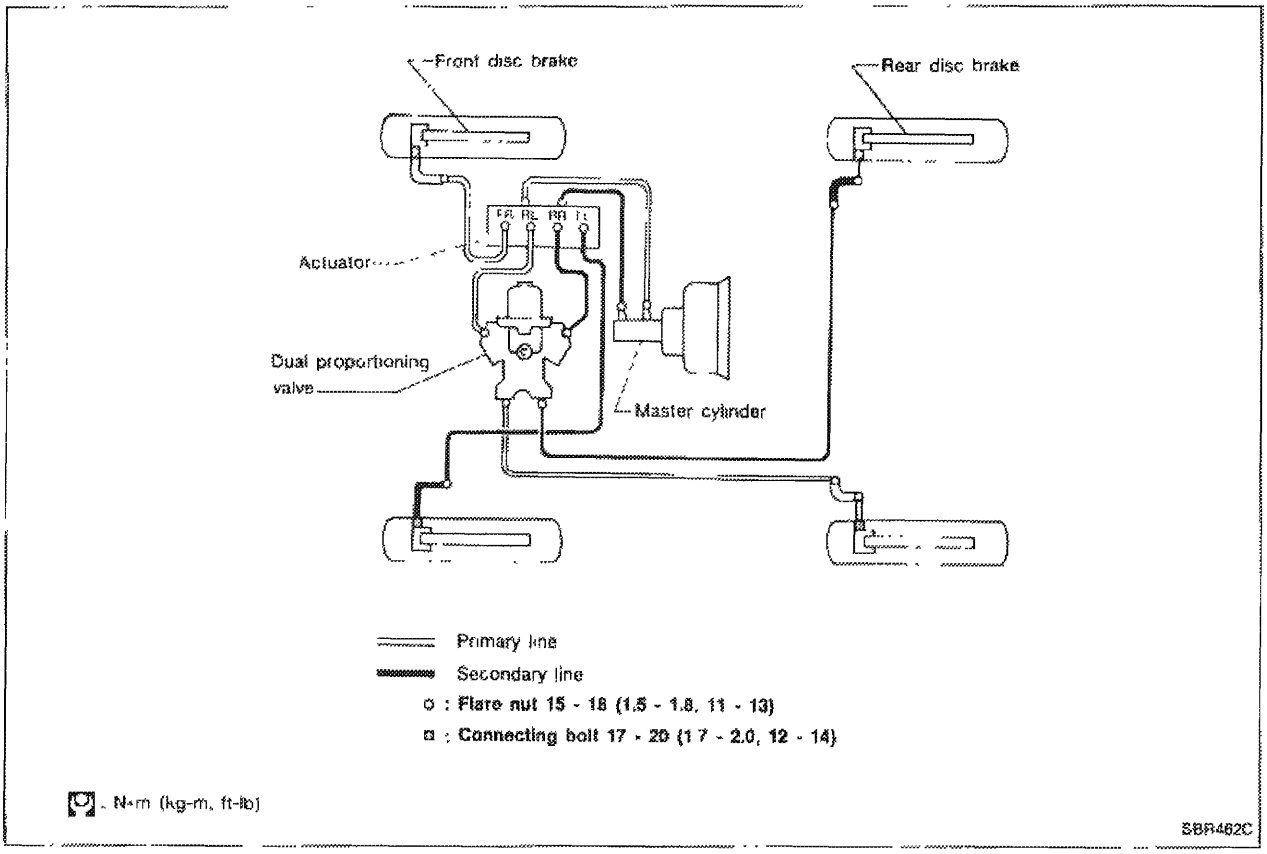
PARKING BRAKE CONTROL 4
- Removal and Installation 4
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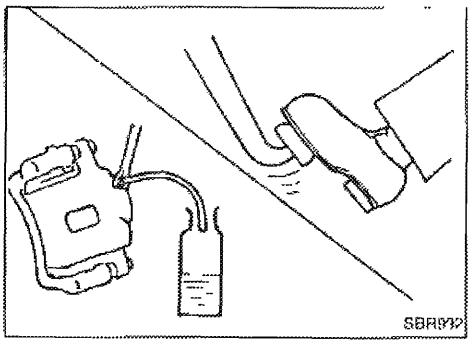
ANTI-LOCK BRAKE SYSTEM 6
- Wiring Diagram 6

TROUBLE DIAGNOSES 7
- Ground Circuit Check 7
- Circuit Diagram for Quick Pinpoint Check 7

SERVICE DATA AND SPECIFICATIONS (S.D.S.) 8
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- Inspection and Adjustment 8

Brake Hydraulic Line





REMOVAL

CAUTION:

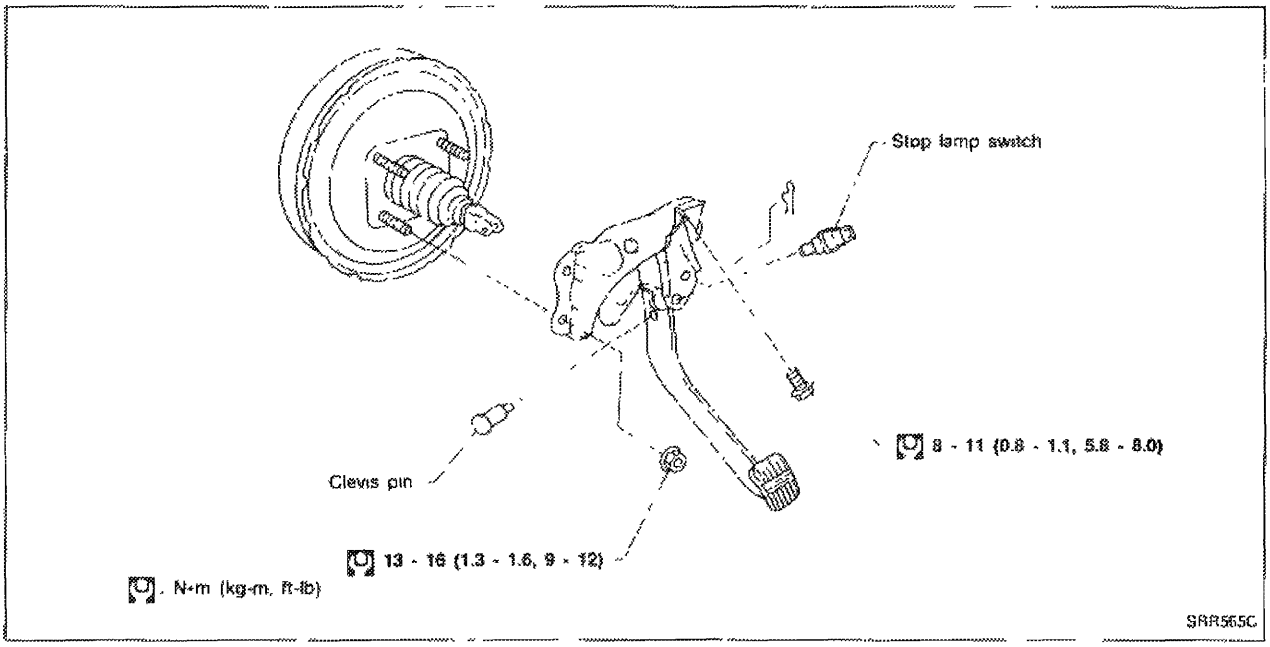
- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.**
- **All hoses must be free from excessive bending, twisting and pulling.**

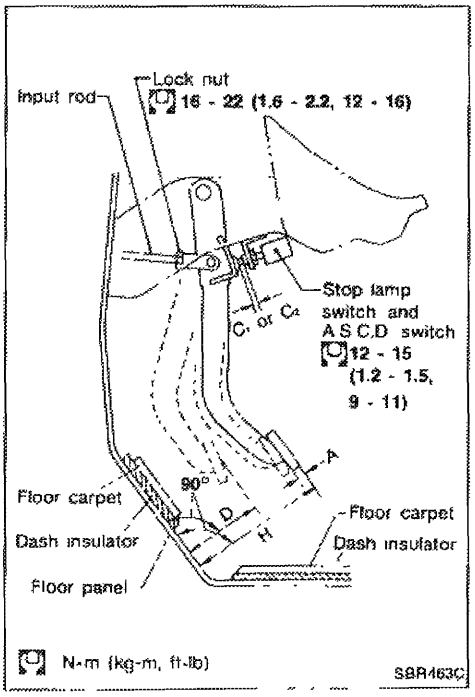
1. Connect vinyl tube to air bleeder valve.
2. Drain brake fluid from each air bleeder valve by depressing brake pedal.
3. Remove flare nut connecting brake tube and hose, then withdraw lock spring.
4. Cover openings to prevent entrance of dirt whenever disconnecting brake line.

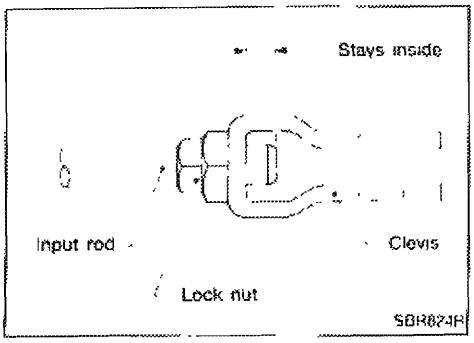
INSPECTION

Check brake lines (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.

Removal and Installation







Inspection

Check brake pedal for following items.

- Brake pedal bend
- Clevis pin deformation
- Crack of any welded portion

Adjustment

Check brake pedal free height from dash reinforcement panel. Adjust if necessary.

H: Free height
Refer to S.D.S.

D: Depressed height
Refer to S.D.S.
Under force of 490 N (50 kg, 110 lb) with engine running

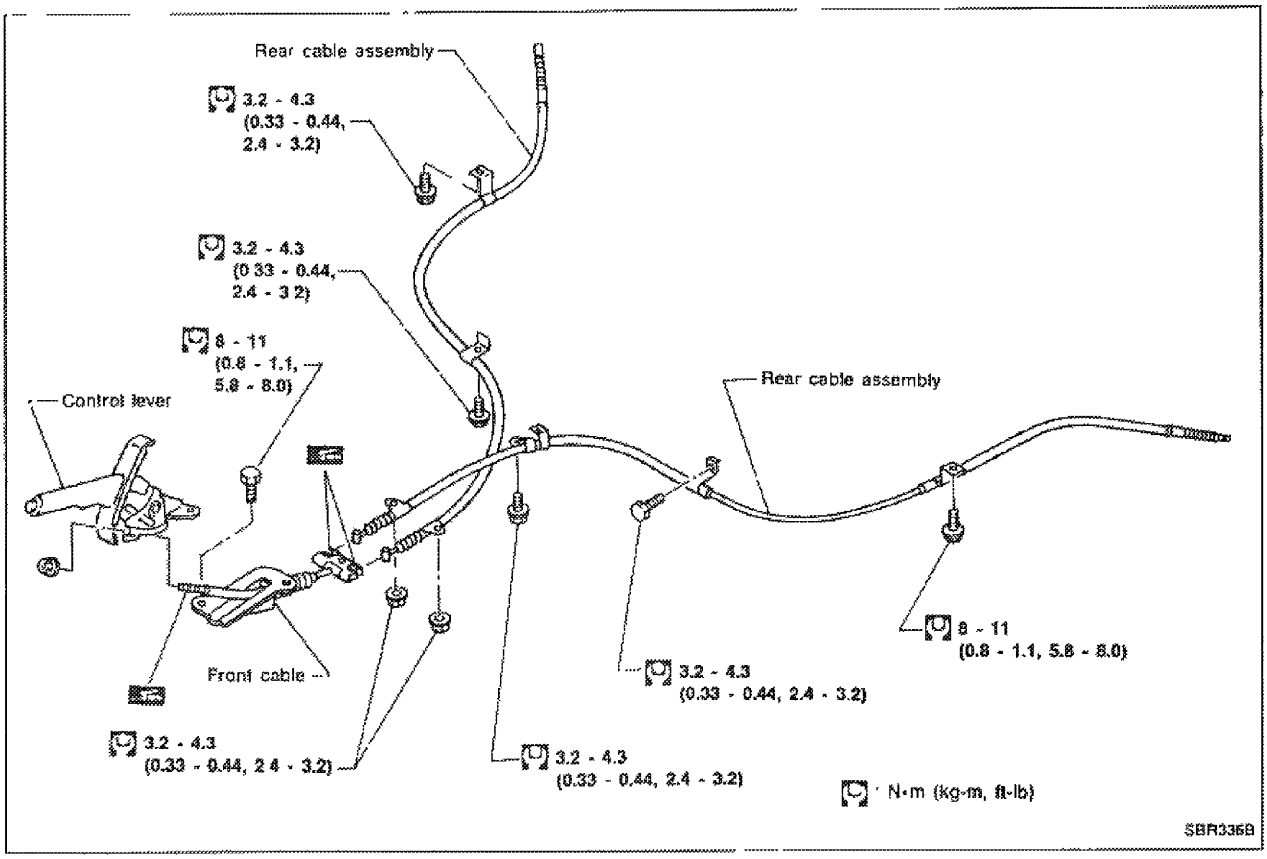
C_1, C_2: Clearance between pedal stopper and threaded end of stop lamp switch and A.S.C.D. switch
0.3 - 1.0 mm (0.012 - 0.039 in)

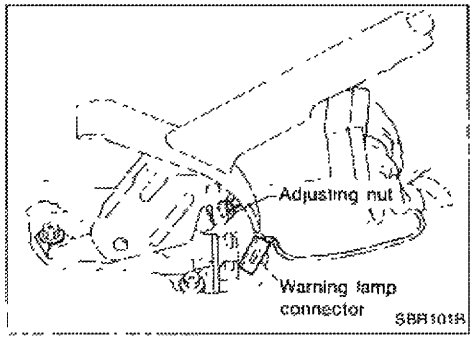
A: Pedal free play
1 - 3 mm (0.04 - 0.12 in)

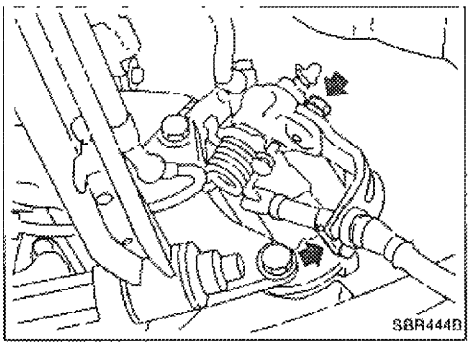
1. Loosen lock nut and adjust pedal free height by turning brake booster input rod. Then tighten lock nut.
2. Check pedal free play.

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

3. Check brake pedal's depressed height while engine is running.
   If depressed height is below specified value, check brake system for leaks, accumulation of air or any damage to components (master cylinder, wheel cylinder, etc.), then make necessary repairs.





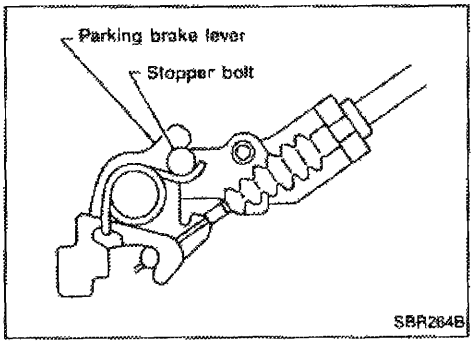


Removal and Installation

1. To remove parking brake cable, first remove center console.
2. Disconnect warning lamp connector.
3. Remove bolts, slacken off and remove adjusting nut.
4. Remove cable mounting bracket and lock plate.

Inspection

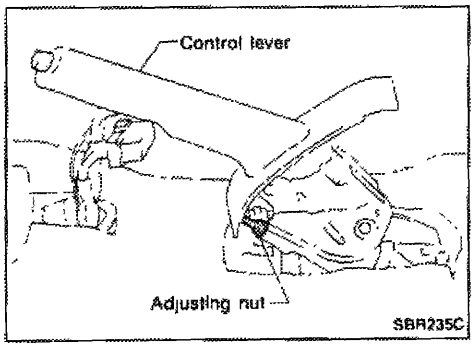
1. Check control lever for wear or other damage. Replace if necessary.
2. Check wires for discontinuity or deterioration. Replace if necessary.
3. Check warning lamp and switch. Replace if necessary.
4. Check parts at each connecting portion and, if found deformed or damaged, replace.



Adjustment

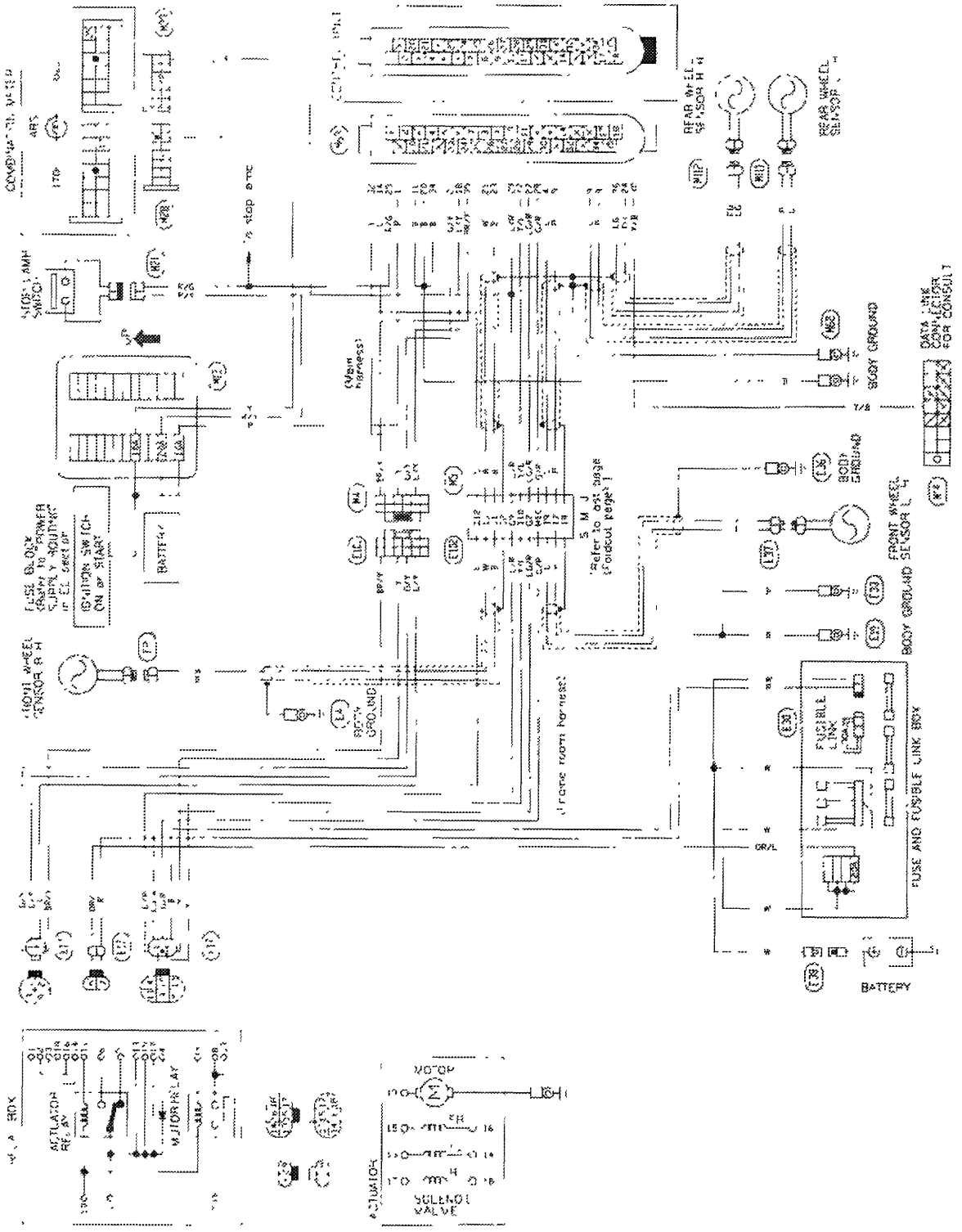
Pay attention to the following points after adjustment.

a. There is no drag when control lever is being released.
b. Parking brake lever returns to stopper bolt when control lever for rear disc brake models is released.

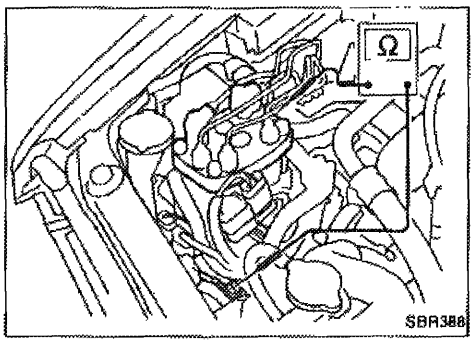


1. Loosen parking brake cable.
2. Depress brake pedal fully more than 5 times.
3. Adjust control lever by turning adjusting nut.
4. Pull control lever with specified amount of force. Check lever stroke and ensure smooth operation.
   Number of notches : 6 - 8 [196 N (20 kg, 44 lb)]
5. Bend parking brake warning lamp switchplate so that brake warning lamp comes on when ratchet at parking brake lever is pulled "A" notches and goes out when fully released.
   Number of "A" notches : 1

Wiring Diagram



MBR067A



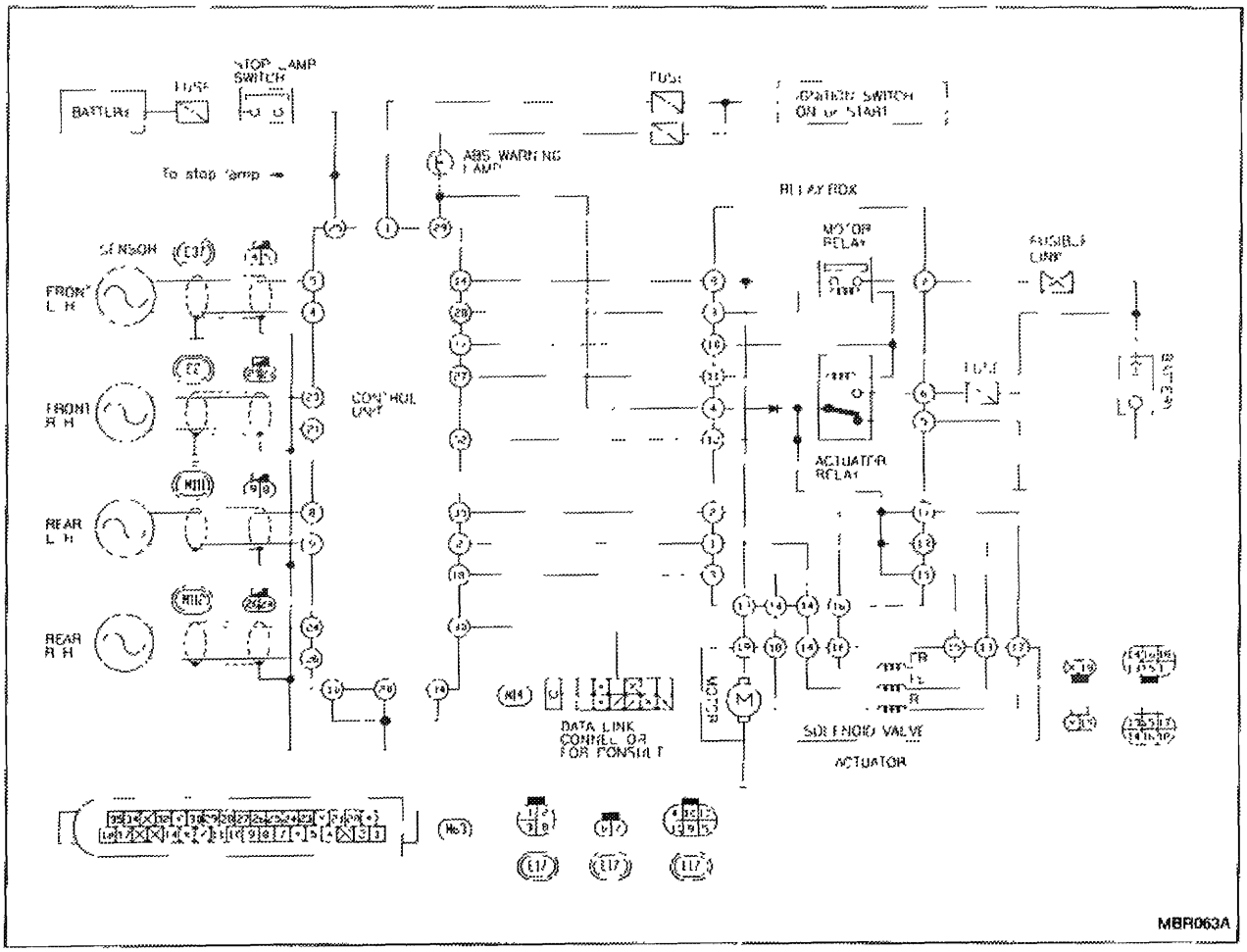
Ground Circuit Check

ACTUATOR MOTOR GROUND

- Check resistance between both terminals.
  Resistance: 0Ω

Circuit Diagram for Quick Pinpoint Check

- The unit side connectors with a double circle "⬭" are connected to the harness side connectors shown in the "Component Parts and Harness Connector Location". (See page BR-46 in 1993 G20 Service Manual.)
- The terminal numbers in the connector coincide with the circuit numbers surrounded by a single circle "○".



General Specifications

Front brake	
Brake model	CL25VA disc brake
Cylinder bore diameter mm (in)	57.2 (2.252)
Pad mm (in) Length x width x thickness	125.6 x 45.3 x 11 (4.94 x 1.783 x 0.43)
Rotor outer diameter x thickness mm (in)	257 x 22 (10.12 x 0.87)
Rear brake	
Brake model	CL9HA disc brake
Cylinder bore diameter mm (in)	33.96 (1.3370)
Pad mm (in) Length x width x thickness	89.1 x 39.5 x 10 (3.508 x 1.555 x 0.39)
Rotor outer diameter x thickness mm (in)	258 x 9 (10.16 x 0.35)

Master cylinder	
Cylinder bore diameter mm (in)	23.81 (15/16)
Control valve	
Valve model	Dual proportioning valve
Split point kPa (kg/cm^2, psi) x reducing ratio	2,452 (25, 356) x 0.4
Brake booster	
Booster model	M195T
Diaphragm diameter mm (in)	Primary: 205 (8.07) Secondary: 180 (7.09)
Recommended brake fluid	DOT 3

Inspection and Adjustment

DISC BRAKE

Brake model	CL25VA	CL9HA
Pad wear limit mm (in)		
Minimum thickness	2.0 (0.079)	
Rotor repair limit mm (in)		
Minimum thickness	20.0 (0.787)	8 (0.31)

PARKING BRAKE

Type	Center lever
Number of notches	
[under force of 196 N (20 kg, 44 lb)]	6 - 8
Number of notches	
when warning lamp switch comes on	1

BRAKE PEDAL

Free height "H" mm (in)	
M/T	151 - 161 (5.94 - 6.34)
A/T	159 - 169 (6.26 - 6.65)
Depressed height "D" mm (in)	
[under force of 490 N (50 kg, 110 lb) with engine running]	M/T: 80 (3.15) A/T: 85 (3.35)
Pedal free play "A" mm (in)	1 - 3 (0.04 - 0.12)
Clearance "C" between pedal stopper and threaded end of stop lamp switch or A/T/C/D switch mm (in)	0.3 - 1.0 (0.012 - 0.039)

STEERING SYSTEM

SECTION ST

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PRECAUTIONS AND PREPARATION 2
Precautions 2
STEERING WHEEL AND STEERING COLUMN 3
Removal and Installation 3

Supplemental Restraint System "AIR BAG" and "SEAT BELT PRE-TENSIONER"

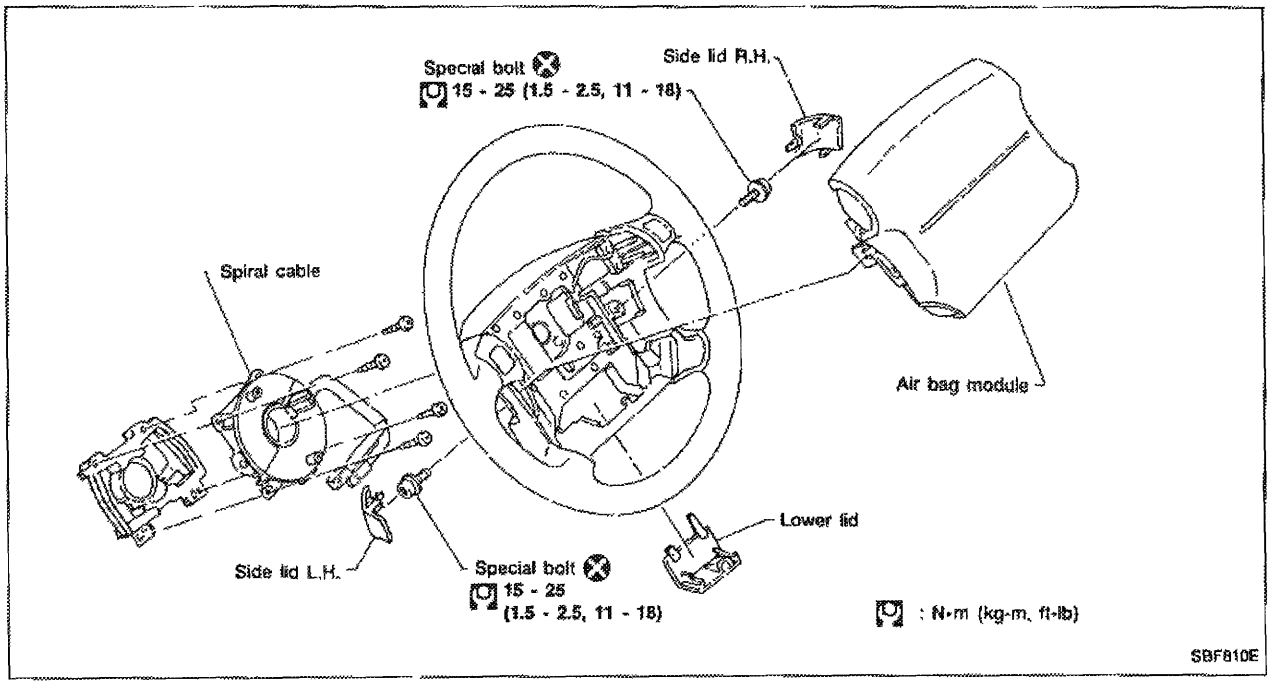
The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner" help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, sensors, a control unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **BF section** of this Service Manual.

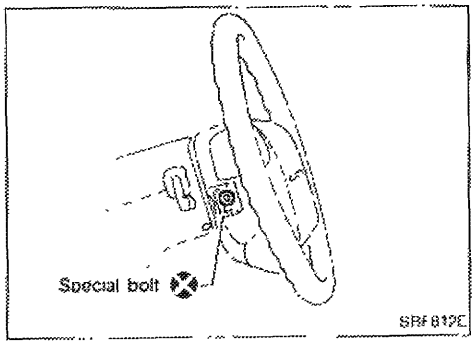
WARNING:

- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **All SRS air bag electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS SYSTEM.**

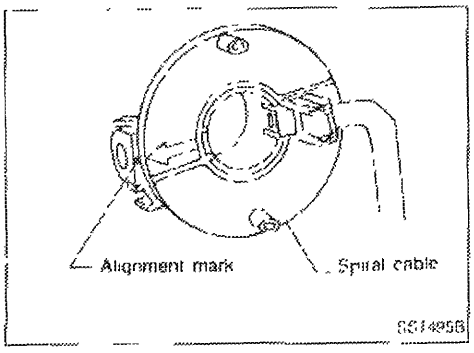
Removal and Installation

— With air bag type —





- Remove special bolts from both sides of steering wheel and pull out air bag module. Refer to section BF for Air Bag Module and Spiral Cable Removal.



- Align spiral cable correctly when installing steering wheel Refer to section BF for Air Bag Module and Spiral Cable Installation.

BODY

SECTION BF

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BF

Supplemental Restraint System "AIR BAG" and "SEAT BELT PRE-TENSIONER"

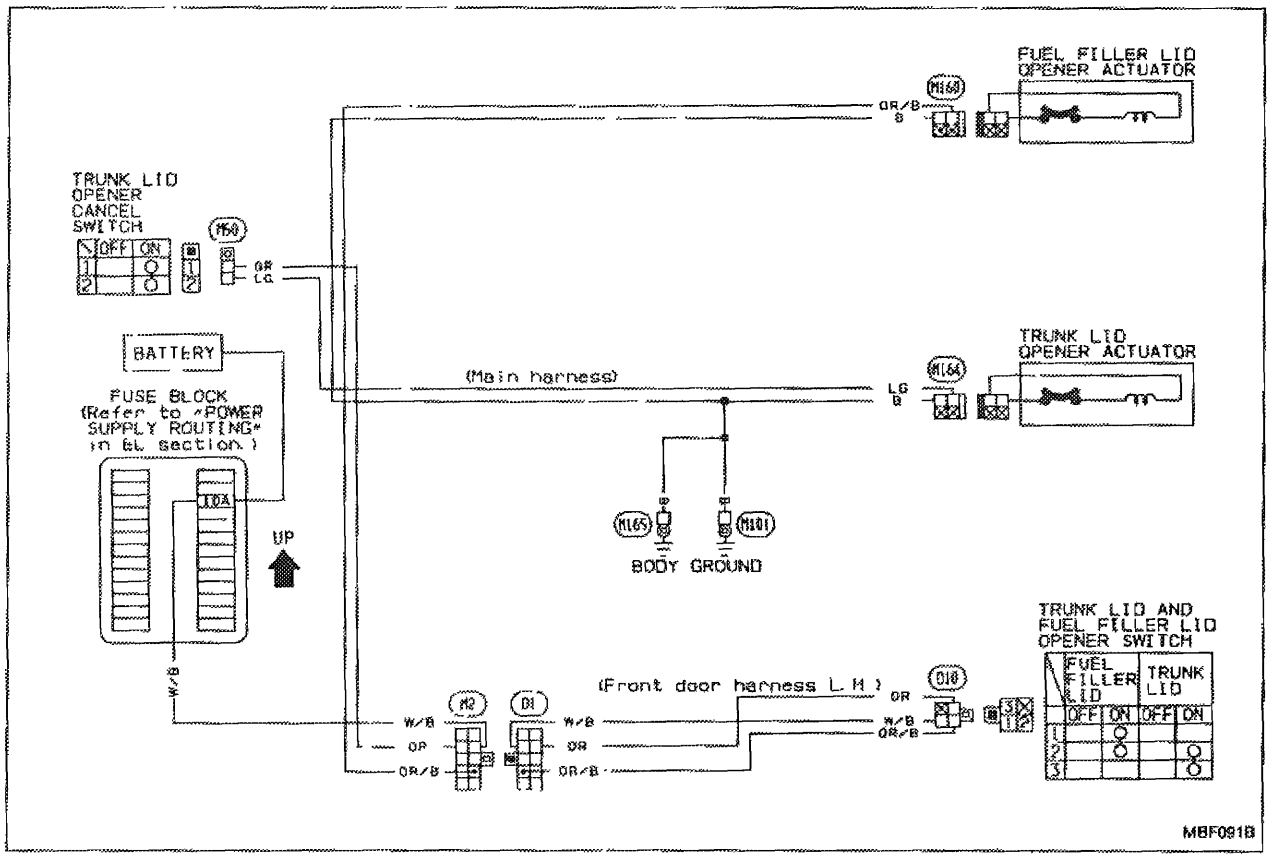
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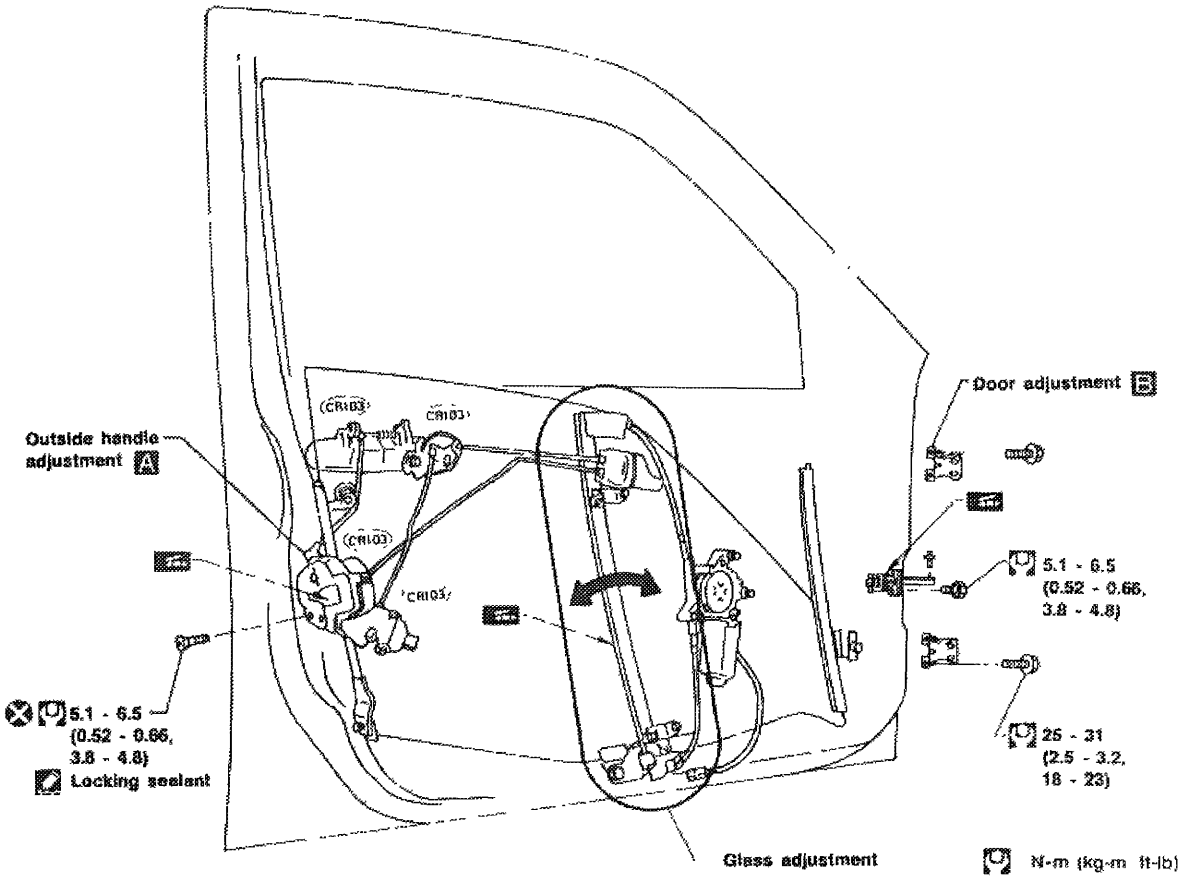
Body Rear End and Opener

TRUNK LID AND FUEL FILLER LID OPENER/WIRING DIAGRAM

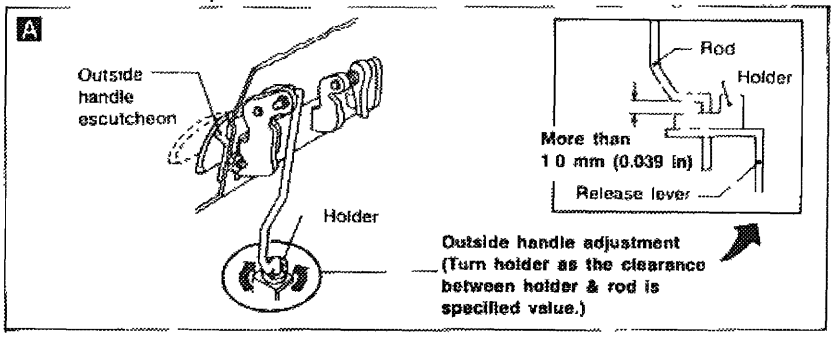


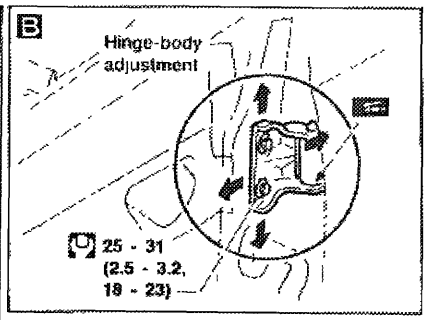
Front Door

- After adjusting door or door lock, check door lock operation.

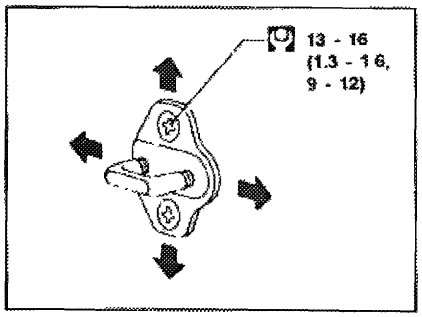


Outside handle adjustment



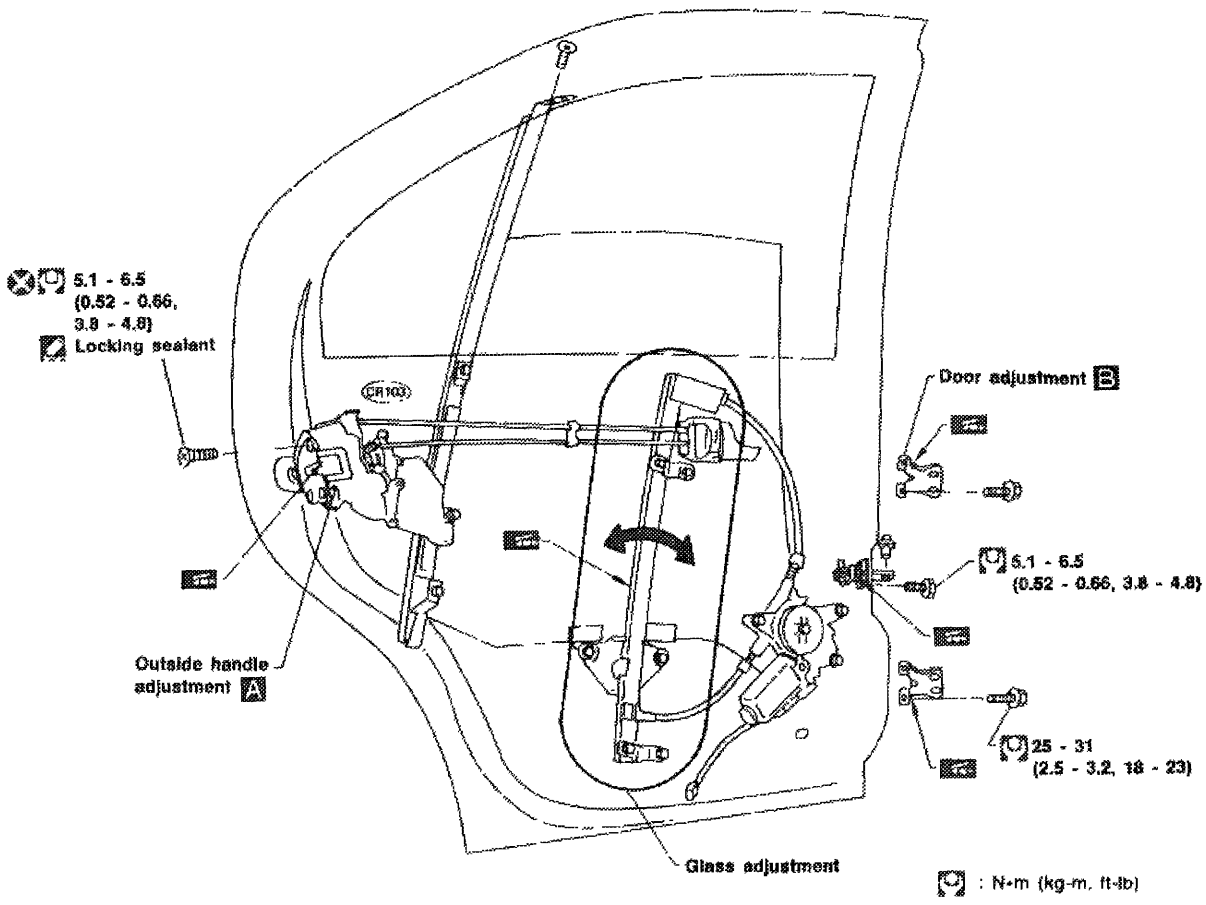


Striker adjustment

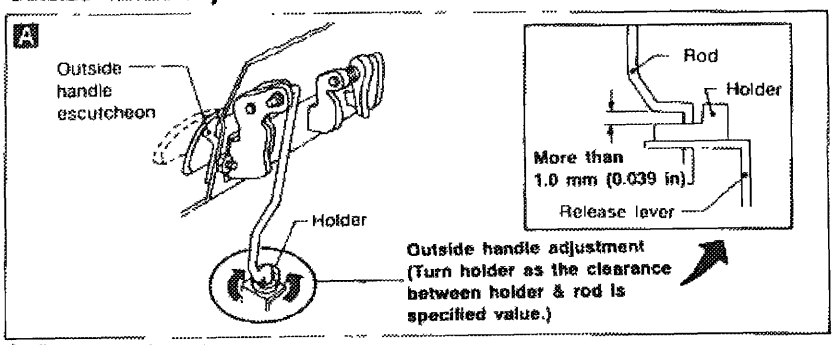


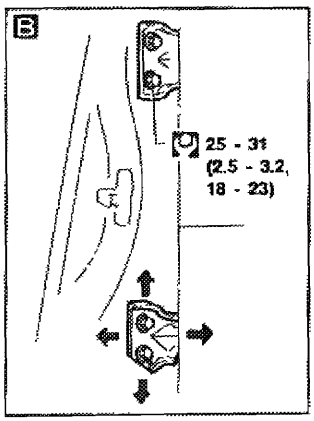
MBF064B

Rear Door

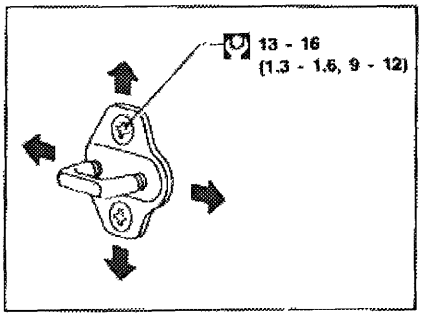


Outside handle adjustment





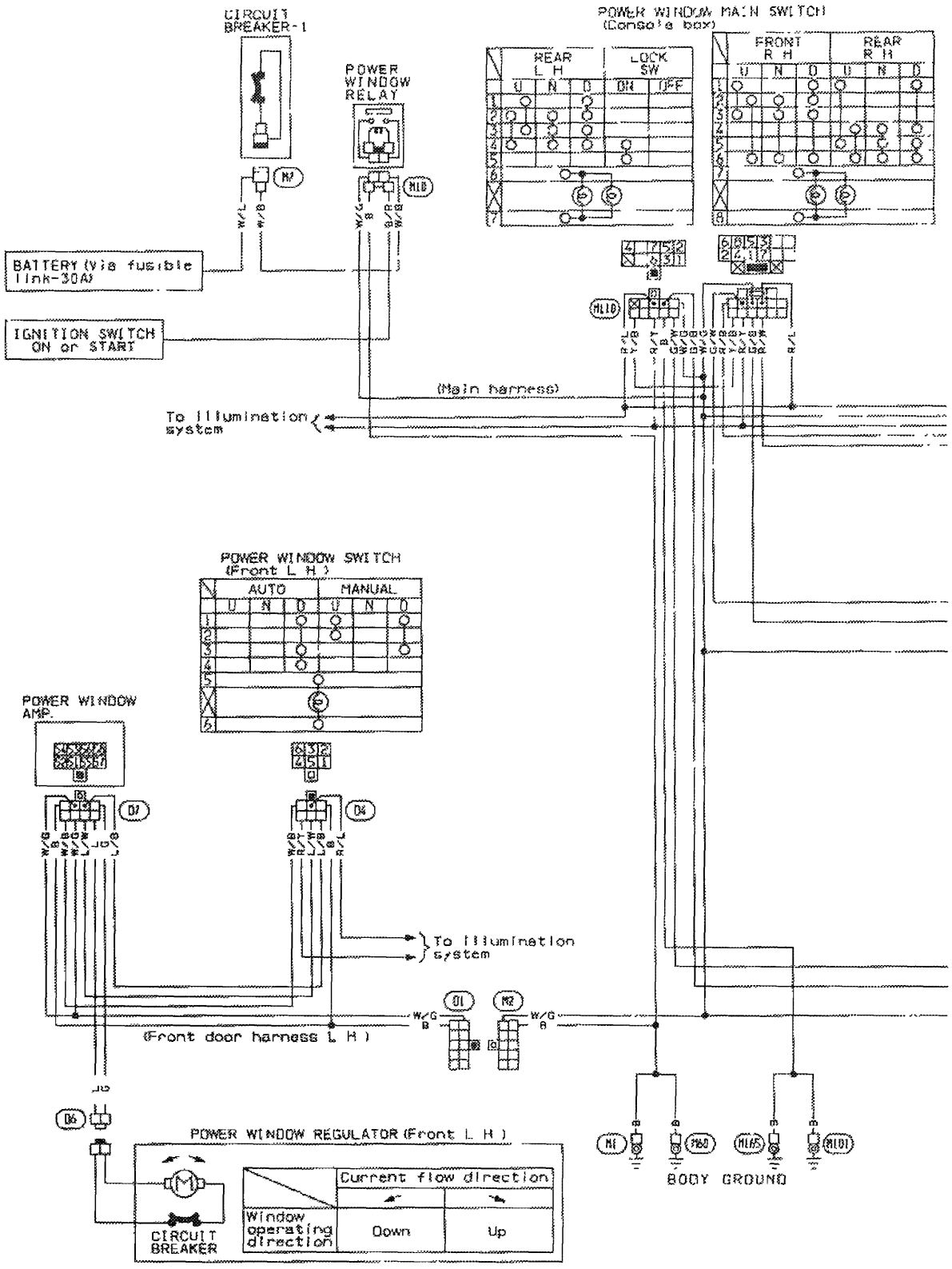
Striker adjustment



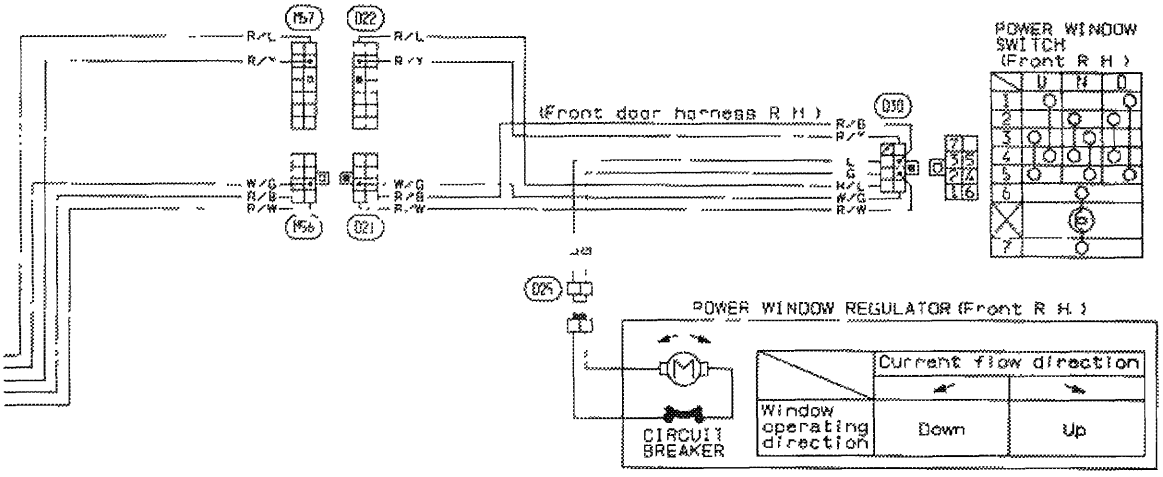
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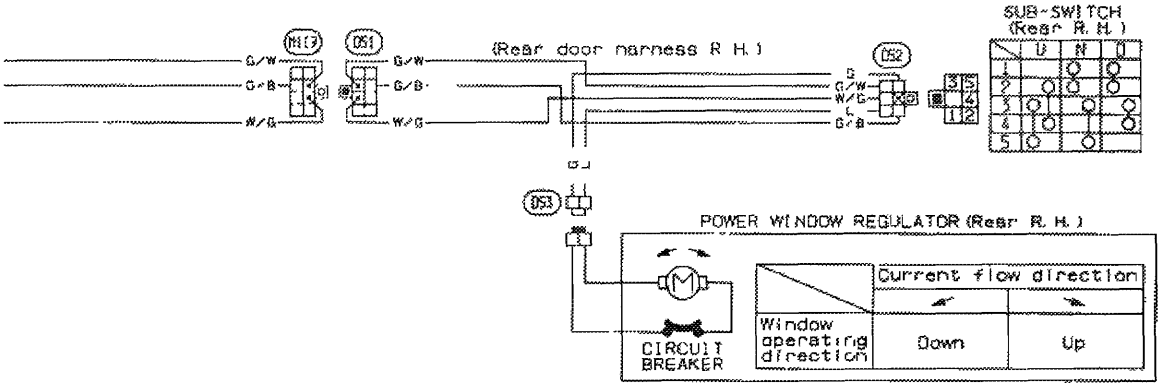
Power Window

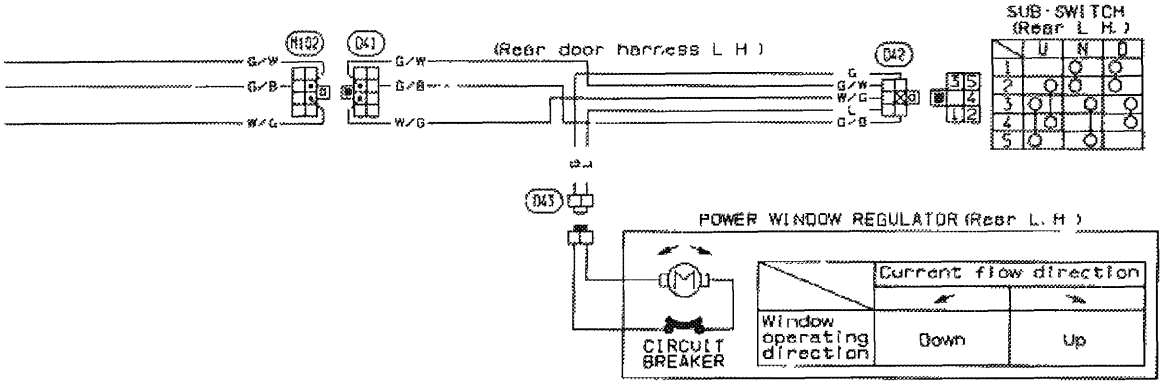
WIRING DIAGRAM



Power Window (Cont'd)



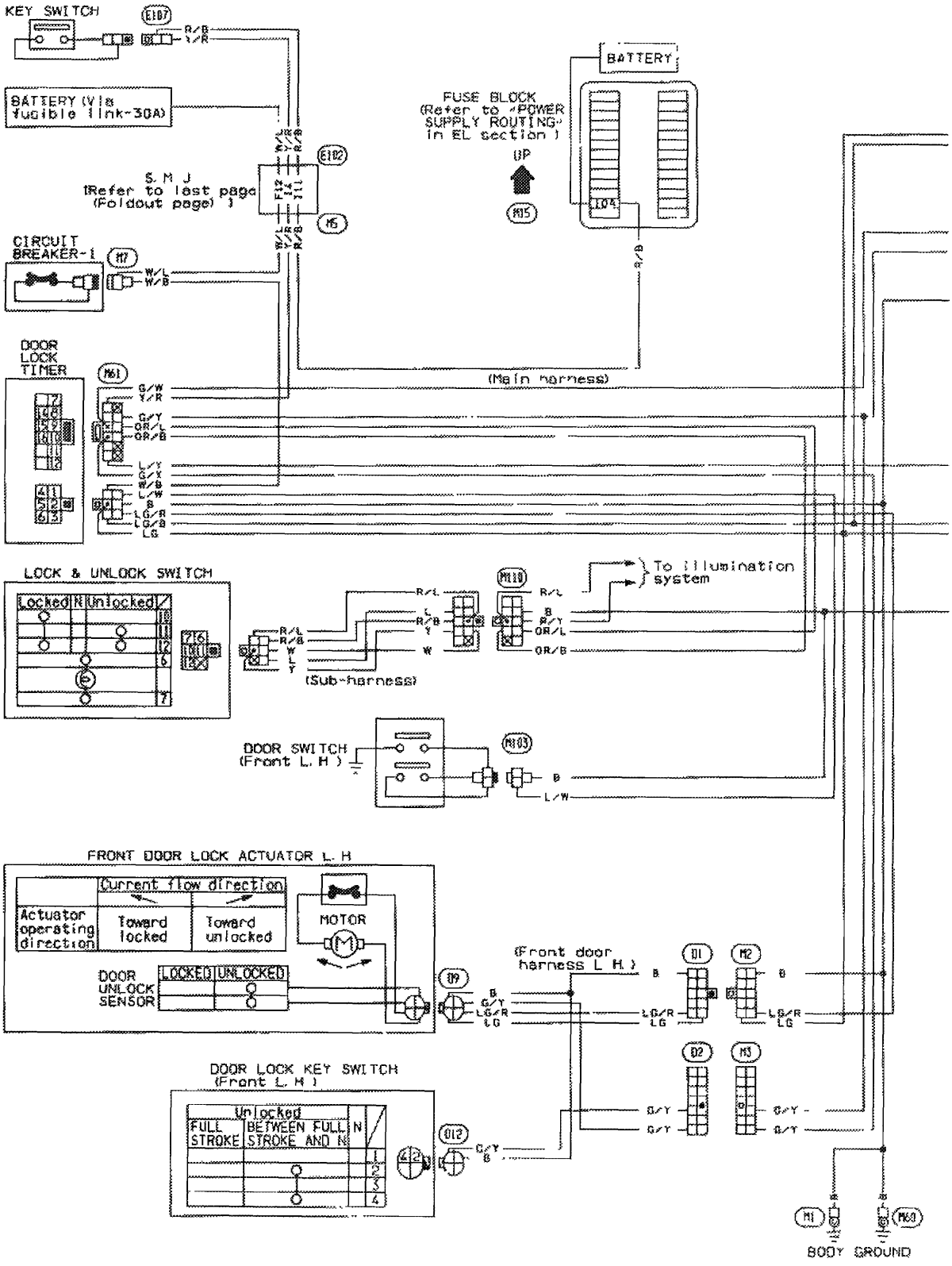




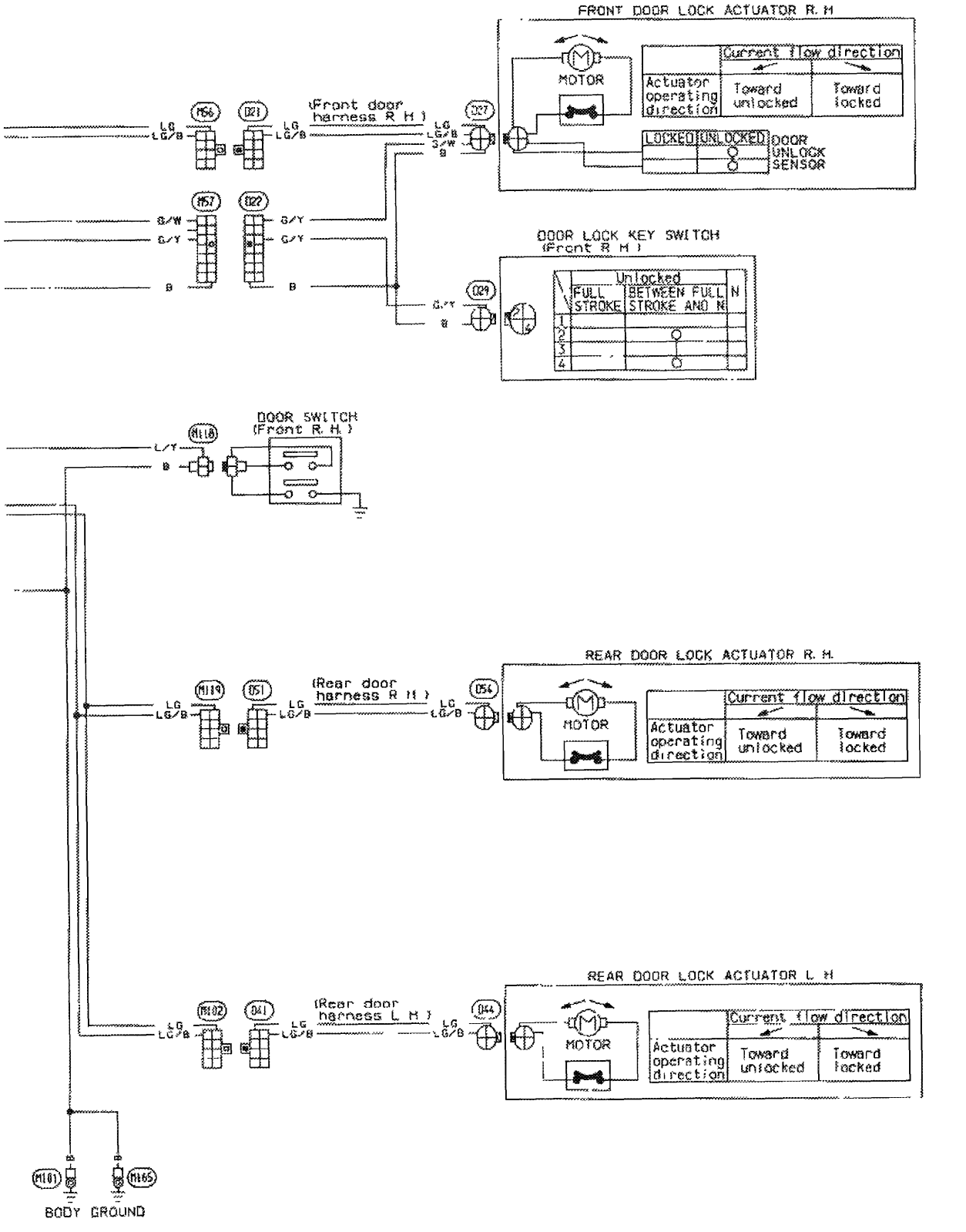
MBF095B

Power Door Lock

WIRING DIAGRAM



Power Door Lock (Cont'd)



MBF0929

Power Door Lock (Cont'd)

DOOR LOCK TIMER INSPECTION

- Carry out the following inspections:

(1) Check power source and ground.
(2) Check input signals.
If the input signal is N.G., check corresponding components.
(3) Check output signals.
If the output signal is O.K., check the door lock actuator.

Lock & unlock operation by lock knob or lock & unlock switch

	Connections		Operations			
			Lock knob L.H.	Lock knob R.H	Lock & unlock switch	
			Unlock → Lock	Unlock → Lock	N → Unlock	N → Lock
1	Power source		12V	12V	12V	12V
5	Ground		Ground	Ground	Ground	Ground
7	Input signals	Key switch	Either key switch or door switches are off. (Key is not in the ignition or all doors are closed.)			
4		Door switch (Front L.H.)				
12		Door switch (Front R.H.)				
10		Door unlock sensor (Front L.H.)	ON (Ground) → OFF (Open)	—	—	—
9		Door unlock sensor (Front R.H.)	—	ON (Ground) → OFF (Open)	—	—
14		Door lock key switch (Front L.H.)	—	—	—	—
16		Lock & unlock switch (Lock)	—	—	—	OFF (Open) → ON (Ground)
15		Lock & unlock switch (Unlock)	—	—	OFF (Open) → ON (Ground)	—
2	Output signals	Door lock actuator (Lock power source)	0V → 12V → 0V (Approx. 1.0 sec.)	0V → 12V → 0V (Approx. 1.0 sec.)	0V	0V → 12V → 0V (Approx. 1.0 sec.)
6		Door lock actuator (Front L.H.) (Unlock power source)	0V	0V	0V → 12V → 0V (Approx. 1.0 sec.)	0V
3		Door lock actuator (Except Front L.H.) (Unlock power source)	0V	0V	0V → 12V → 0V (Approx. 1.0 sec.)	0V

- The voltage values are approximate.

Power Door Lock (Cont'd)

Unlock operation by door lock key switch

	Connections		Operations		
			Door lock key switch L.H		
			N → Unlock → N → Unlock		Unlock → Lock
1	Power source		12V	12V	12V
5	Ground		Ground	Ground	Ground
7	Input signal	Key switch	Either key switch or door switches are off. (Key is not in the ignition or all doors are closed.)		
4		Door switch (Front L.H.)			
12		Door switch (Front R.H.)			
10		Door unlock sensor (Front L.H.)	—	—	ON (Ground) → OFF (Open)
9		Door unlock sensor (Front R.H.)	—	—	—
14		Door lock key switch (Front L.H.)	OFF → ON → OFF → ON → OFF (Open) (Ground) (Open) (Ground) (Open)		OFF (Open)
16		Lock & unlock switch	—	—	—
15		Lock & unlock switch	—	—	—
2	Output signal	Door lock actuator (Lock power source)	0V	0V	0V → 12V → 0V (Approx. 1.0 sec.)
6		Door lock actuator (Front L.H.) (Unlock power source)	0V	0V → 12V → 0V (Approx. 1.0 sec.)	0V
3		Door lock actuator (Except Front L.H.) (Unlock power source)	0V	0V → 12V → 0V (Approx. 1.0 sec.)	0V

- The second unlock signal of door lock key switch is counted when it is within approximately 4 seconds of the first signal
- Lock operation by key is mechanically transmitted to the lock knob switch.
- Operation of door lock key switch R.H. is the same as L.H

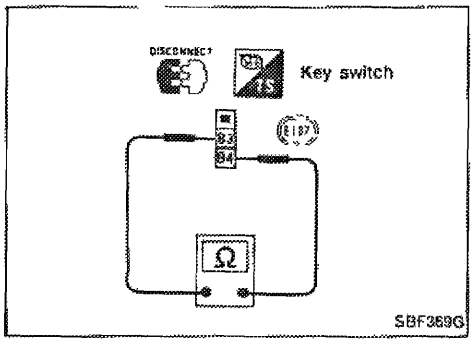
Key reminder operation

	Connections		Operations	
			Lock knob L.H.	Lock & unlock switch
			Unlock → Lock → Automatically Unlocked	N → Lock → Automatically Unlocked
1	Power source		12V	12V
5	Ground		0V	0V
7	Input signal	Key switch	ON (12V) — Key is in the ignition.	
4		Door switch (Front L.H.)	ON (Ground) — Door is open.	
12		Door switch (Front R.H.)	ON (Ground) — Door is open.	
10		Door unlock sensor (Front L.H.)	ON → OFF → ON (Ground) (Open) (Ground)	—
9		Door unlock sensor (Front R.H.)	—	—
14		Door lock key switch (Front L.H.)	—	—
16		Lock & unlock switch (Lock)	—	OFF → ON → OFF (Open) (Ground) (Open)
15		Lock & unlock switch	—	—
2	Output signal	Door lock actuator (Lock power source)	0V → 12V → 0V (Approx. 0.3 sec.)	0V → 12V → 0V (Approx. 0.3 sec.)
6		Door lock actuator (Except Front L.H.) (Unlock power source)	0V → 12V → 0V (Approx. 1.4 sec.)	0V → 12V → 0V (Approx. 1.4 sec.)
3		Door lock actuator (Except Front L.H.) (Unlock power source)	0V → 12V → 0V (Approx. 1.4 sec.)	0V → 12V → 0V (Approx. 1.4 sec.)

- Operation of lock knob switch R.H. is the same as L.H.

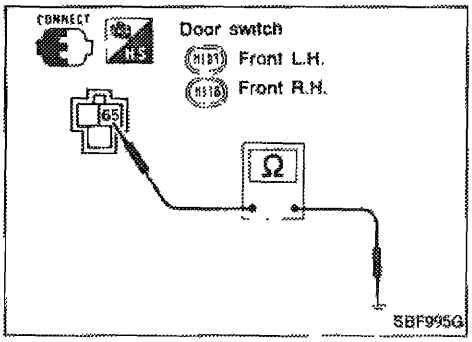
Power Door Lock (Cont'd)

ELECTRICAL COMPONENTS INSPECTION



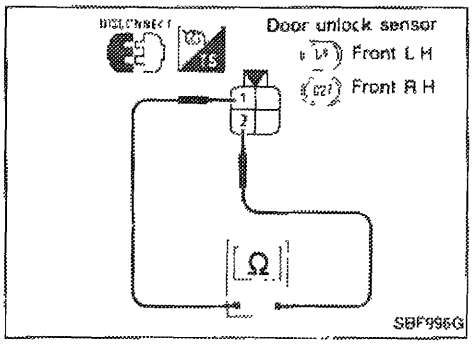
Key switch

Terminals	Condition	Continuity
㉝ - ㉞	Key is in the ignition.	Yes
	Key is not in the ignition.	No



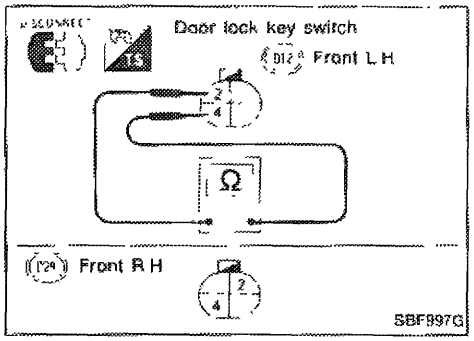
Door switch

Terminals	Condition	Continuity
㊺ - Ground	Door is closed.	No
	Door is open.	Yes



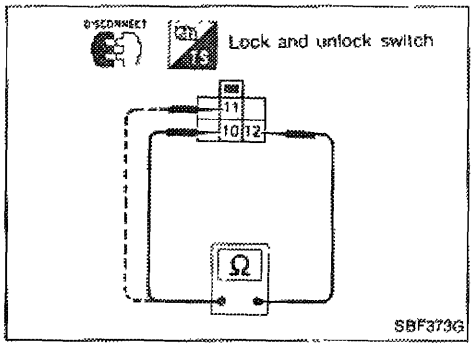
Door unlock sensor

Terminals	Lock knob condition	Continuity
① - ②	Lock	No
	Unlock	Yes



Door lock key switch

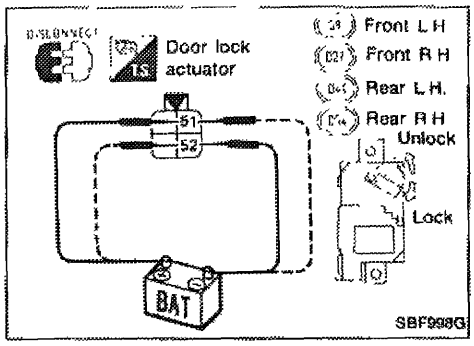
Terminals	Operation	Continuity
② - ④	Key is turned toward unlock	Yes
	Except above	No



Lock and unlock switch

Terminals	Operation	Continuity
⑩ - ⑫	Lock	Yes
	Neutral and unlock	No
⑪ - ⑫	Unlock	Yes
	Neutral and unlock	No

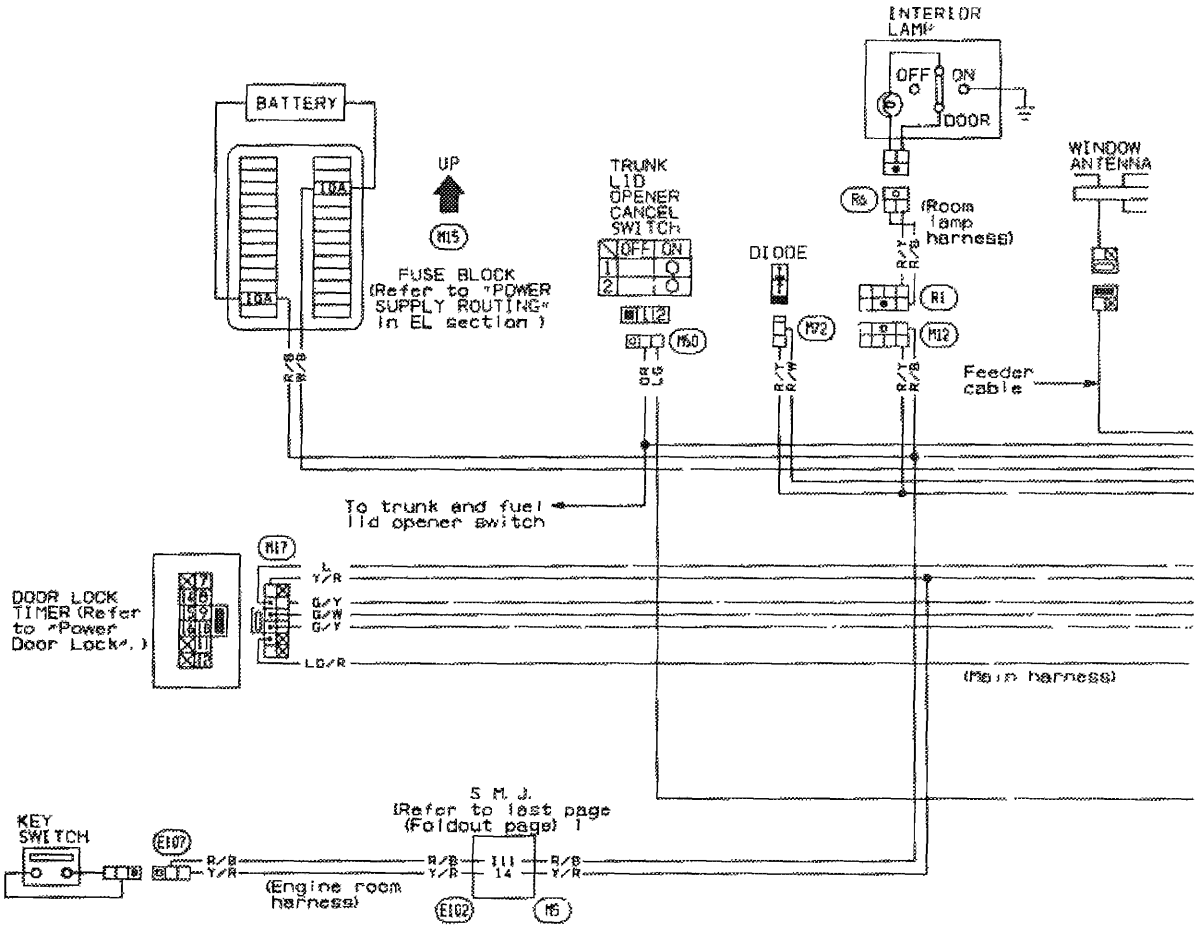
Power Door Lock (Cont'd)

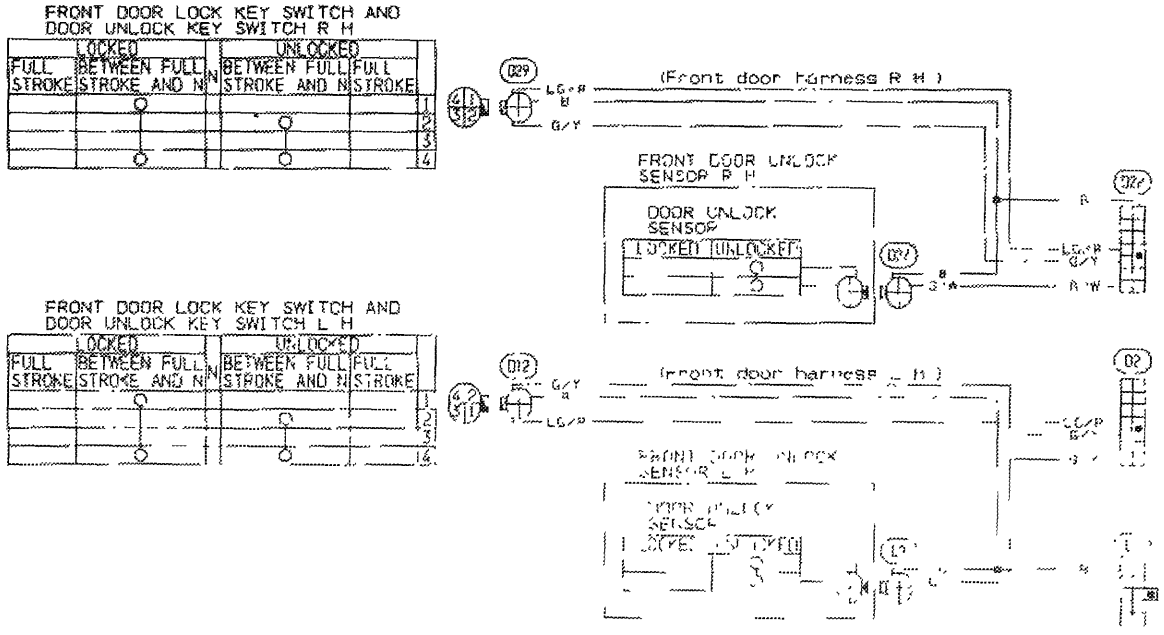


Door lock actuator

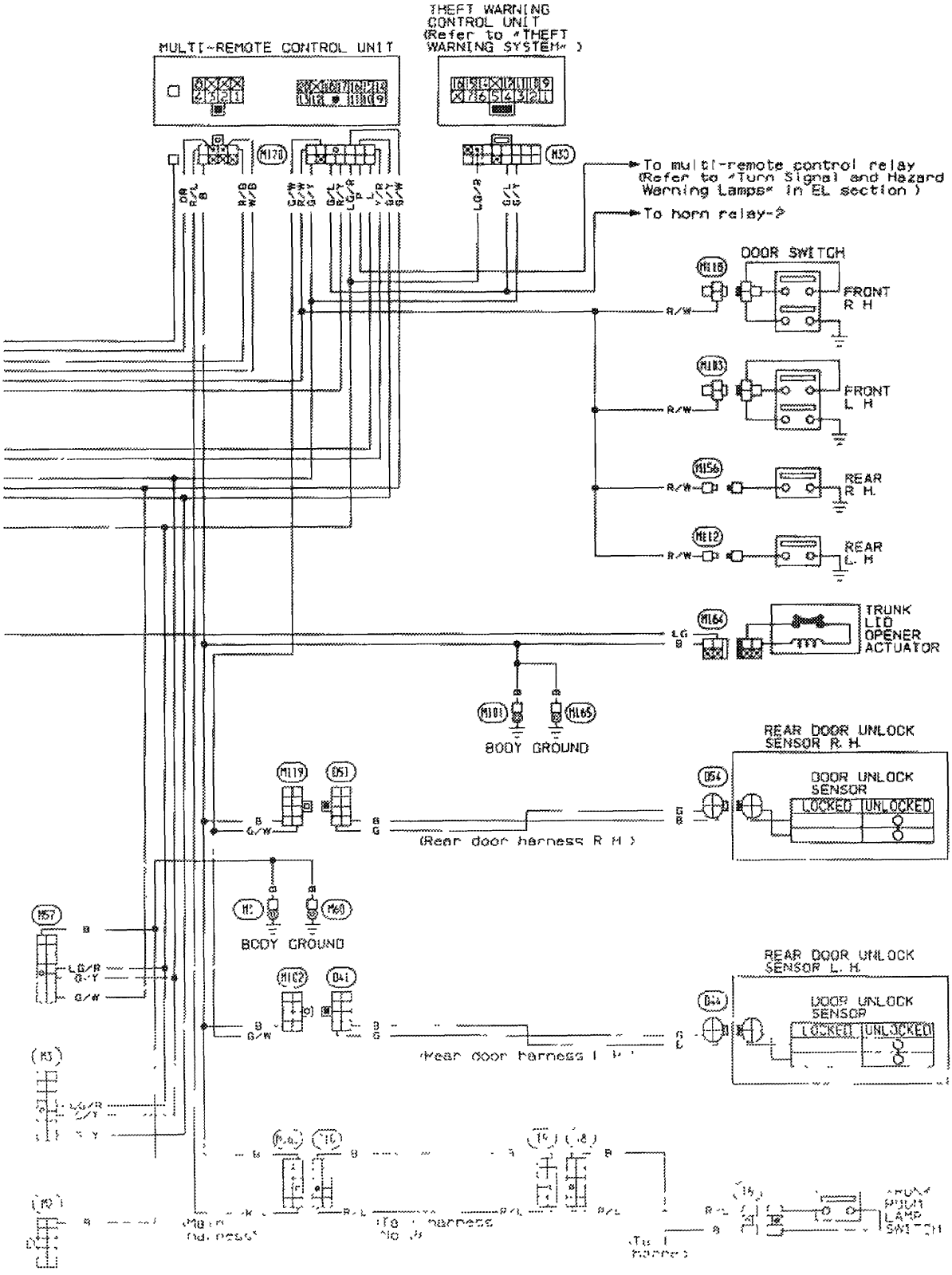
Terminals		Operation
⊕	⊖	
⑤①	⑤②	Lock
⑤②	⑤①	Unlock

Wiring Diagram

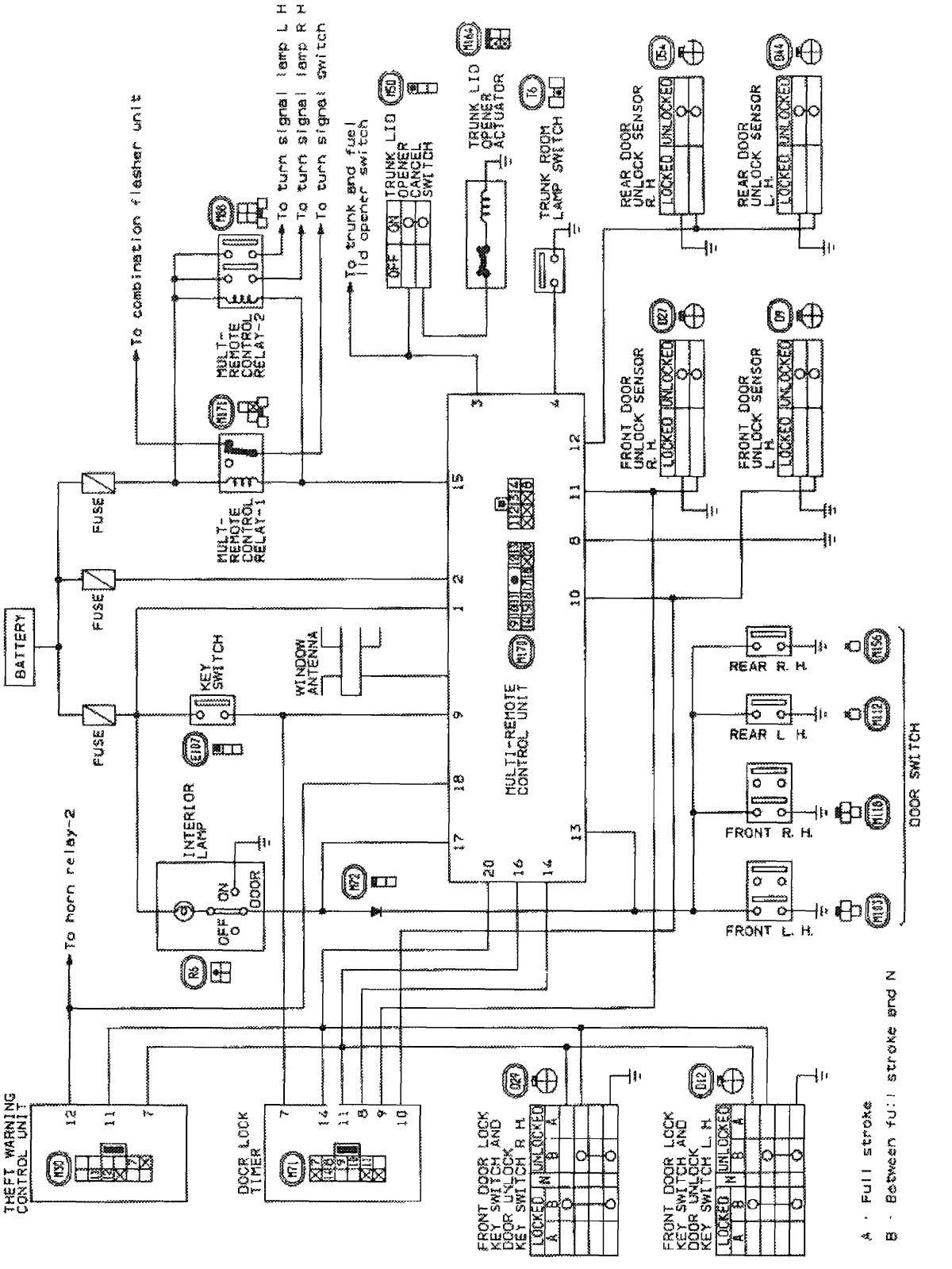




Wiring Diagram (Cont'd)



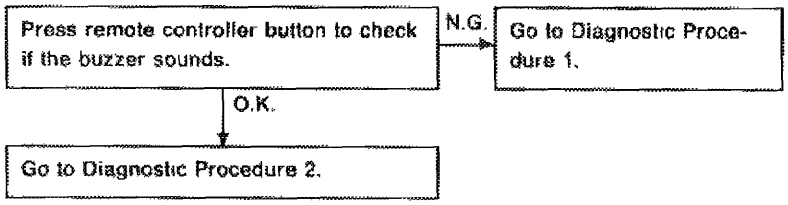
Circuit Diagram for Quick Pinpoint Check



Trouble Diagnoses Preliminary Inspection

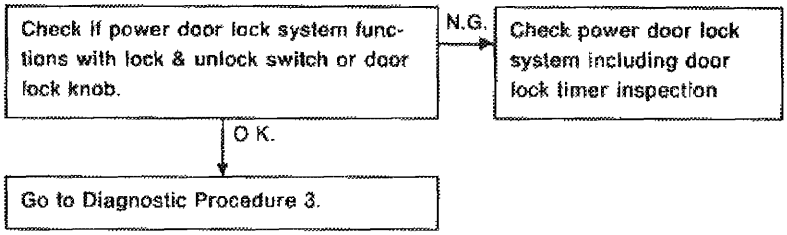
PRELIMINARY INSPECTION PROCEDURE 1

All functions of multi remote control system do not function.



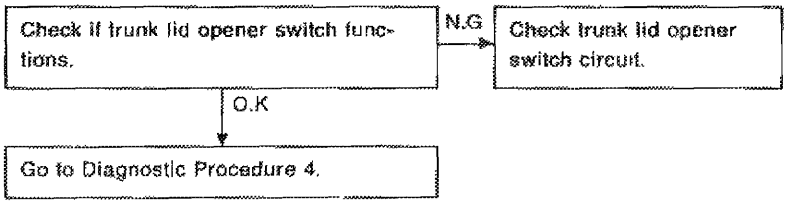
PRELIMINARY INSPECTION PROCEDURE 2

Door lock and unlock do not function.



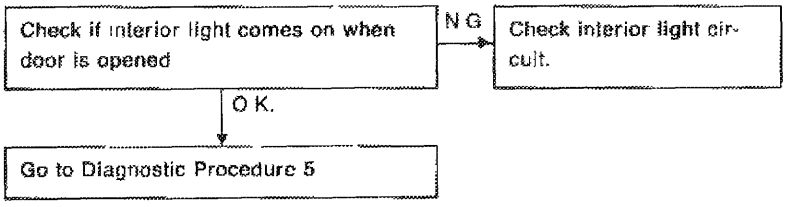
PRELIMINARY INSPECTION PROCEDURE 3

Trunk lid open function does not function.



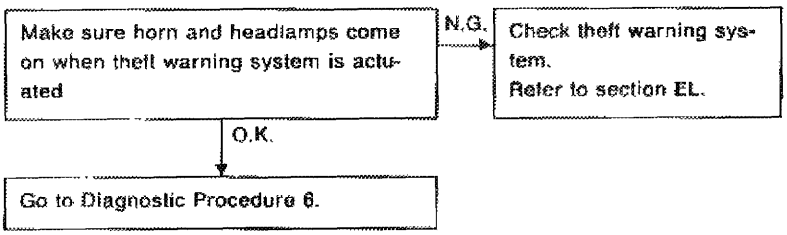
PRELIMINARY INSPECTION PROCEDURE 4

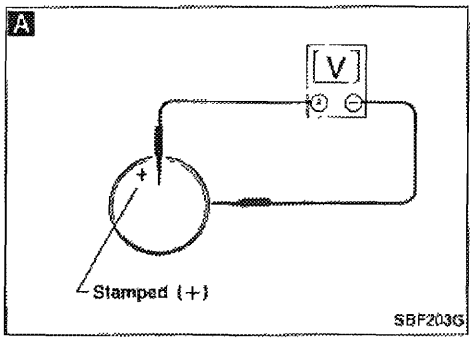
Interior light does not function.



PRELIMINARY INSPECTION PROCEDURE 5

Panic alarm does not function.





Trouble Diagnoses

DIAGNOSTIC PROCEDURE 1

Remote controller buzzer does not sound when the button is pressed.

A

CHECK REMOTE CONTROLLER BATTERY.
Remove battery and measure voltage across battery positive and ground terminals ⊕ and ⊖

Measuring terminal		Standard value
⊕	⊖	
Battery positive terminal ①	Battery positive terminal ○	3V or more

N.G. → Replace battery.

O.K.

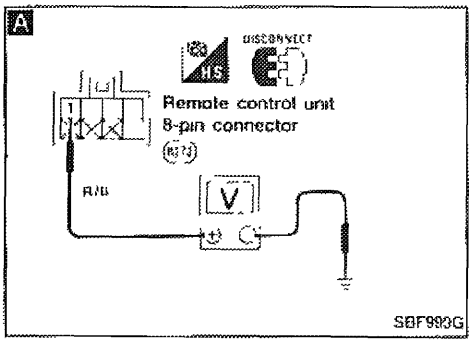
1) Push door lock button of remote controller before installing battery.
2) Reset battery in remote controller to make sure the buzzer sound.

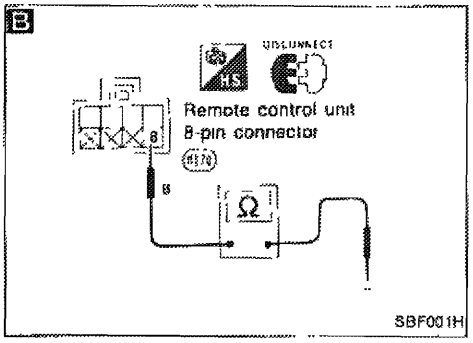
O.K → Check system operation.

N.G.

Replace controller.

Note:
Remote controller does not function if battery is not set correctly.





DIAGNOSTIC PROCEDURE 2

All remote controls do not function even if remote controller buzzer does sound.

A

CHECK MAIN POWER SUPPLY AND GROUND CIRCUIT.
1) Remove key from ignition.
2) Disconnect 8-pin connector from control unit. Check voltage across remote control unit terminal ① and GND.
Battery voltage should exist.

N G. → Check power supply harness.

O.K.

B

Check continuity between terminal ⑧ and GND.
Continuity should exist.

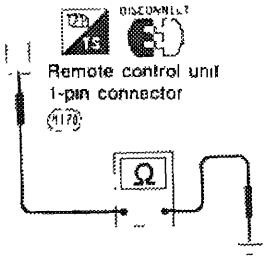
N G. → Check GND harness.

O K.

Ⓐ

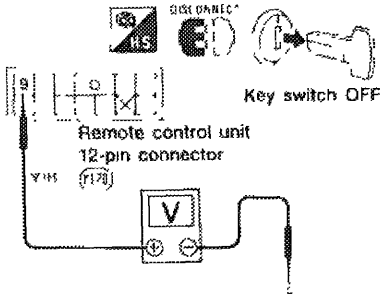
Trouble Diagnoses (Cont'd)

C



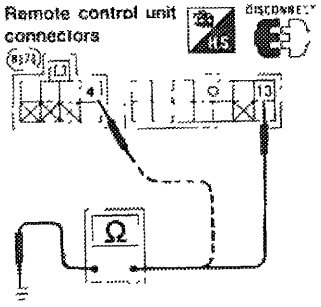
SBF002H

D



SBF003H

E



SBF004H

Ⓐ

C

CHECK ANTENNA CIRCUIT.
Disconnect 1-pin connector from control unit.
Check continuity between a terminal and GND.
Continuity should exist.

N.G. → Check antenna circuit.

O.K.

D

CHECK IGNITION KEY SWITCH CIRCUIT.
Disconnect 12-pin connector from control unit.
Check voltage across remote control unit terminal ⑨ and GND.
Does battery voltage exist?

Yes → Check ignition key switch.

No

E

CHECK DOOR SWITCH CIRCUIT.
Close all doors and trunk lid.
Check continuity between terminals ⑬ and GND, ④ and GND.
Does continuity exist?

Yes → Check door switch circuit.

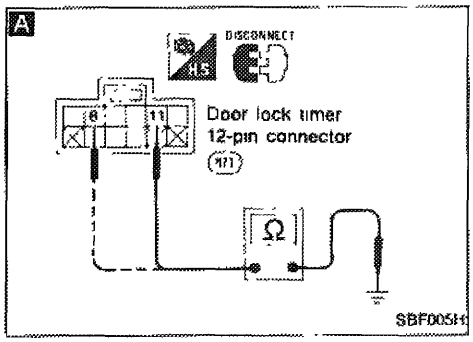
No

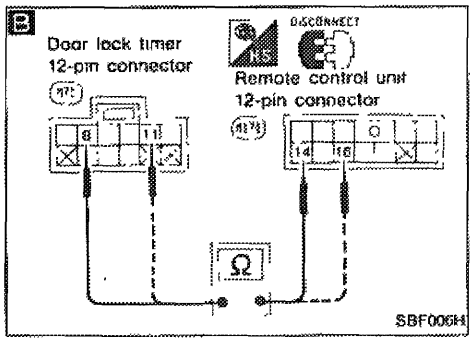
Replace control unit.

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 3

Door lock and unlock remote control do not function. Everything else does function.





A

CHECK DOOR LOCK AND UNLOCK SIGNAL FOR DOOR LOCK TIMER.

1) Remove key from ignition.
2) Close all doors and trunk lid
3) Remove door lock timer 12-pin connector
   Push remote controller buttons and check continuity between terminals ⑪ and GND, ⑧ and GND.

Terminals	Operation	Continuity
⑪ - GND	Lock	Yes
	Unlock	No
⑧ - GND	Unlock	Yes
	Lock	No

O.K. → Check power door lock system.

N G

Does continuity exist continually?

Yes → Repair harness. (There might be incorrect grounding.)

No

B

Remove remote control unit 12-pin connector.
Check continuity between remote control unit terminals and door lock timer

Terminals	
Remote control	Door lock timer
⑭	⑧
⑯	⑪

Continuity should exist.

N.G → Repair harness.

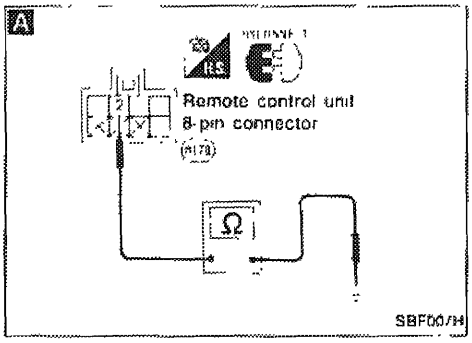
O.K.

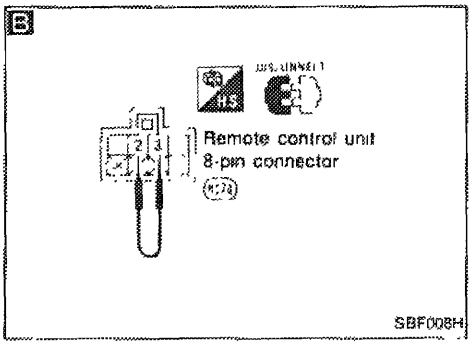
Replace multi remote control unit.

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 4

Trunk lid open remote control does not function. Everything else does function.





A

CHECK GROUND CIRCUIT FOR TRUNK OPEN FUNCTION.
Disconnect 8-pin connector from remote control unit
Check voltage between terminal ② and ground.
Battery voltage should exist.

N.G. → Repair harness.

O.K. ↓

B

Connect remote control unit connector terminal ② to ③.
Does trunk lid opener function?

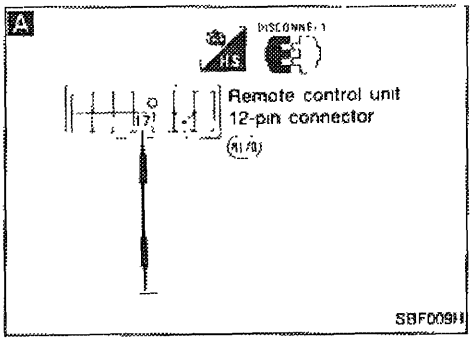
No → Check trunk lid opener circuit

Yes ↓

Replace control unit

DIAGNOSTIC PROCEDURE 5

Interior light does not function. Everything else does function.



A

CHECK INTERIOR LIGHT CIRCUIT.
Disconnect remote control unit 12-pin connector.
Ground remote control unit connector terminal ⑰.
Does interior light function?

No → Check interior light circuit.

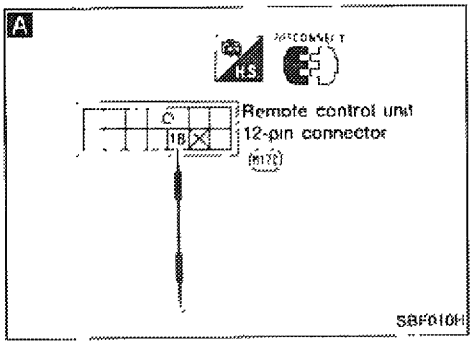
Yes ↓

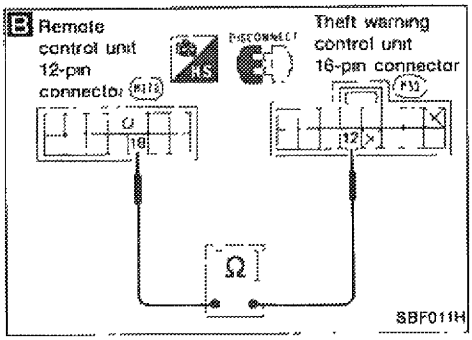
Replace control unit

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

Panic alarm function does not function. Everything else does function.





A

CHECK PANIC ALARM CIRCUIT.
Disconnect 12-pin connector from remote control unit
Ground remote control unit connector terminal ⑯.
Does panic alarm function function?

Yes → Replace control unit

No ↓

B

Disconnect 16-pin connector from theft warning control unit.
Check continuity between terminals ⑯ of remote control unit connector and ⑫ of theft warning control unit.
Does continuity exist?

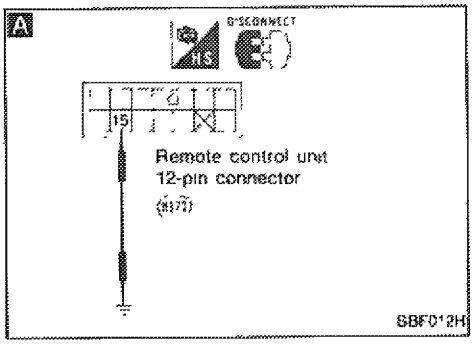
Yes → Check theft warning system. Refer to section EL.

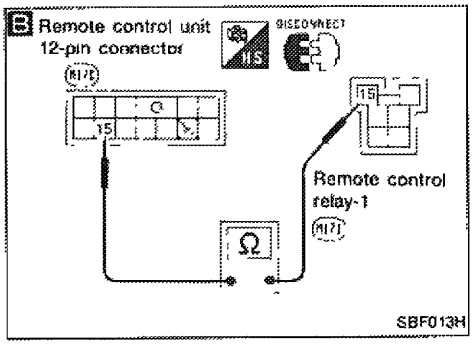
No ↓

Repair harness.

DIAGNOSTIC PROCEDURE 7

Hazard indicator flashing does not function. Everything else does function.





A

CHECK HAZARD INDICATOR FLASHING CIRCUIT.
Disconnect 12-pin connector from remote control unit
Ground remote control unit connector terminal ⑮
Does hazard indicator flashing function function?

Yes → Replace control unit.

No ↓

B

Disconnect remote control relay-1 connector.
Check continuity between terminals ⑮ of remote control unit connector and remote control relay-1.
Does continuity exist?

Yes → Check remote control relay-1 and harness.

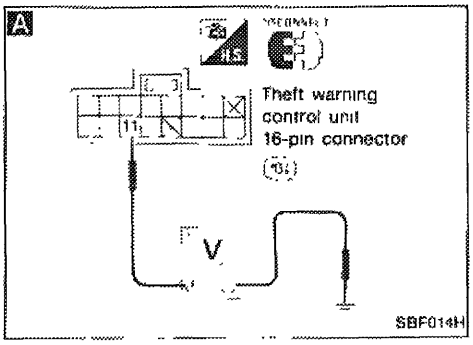
No ↓

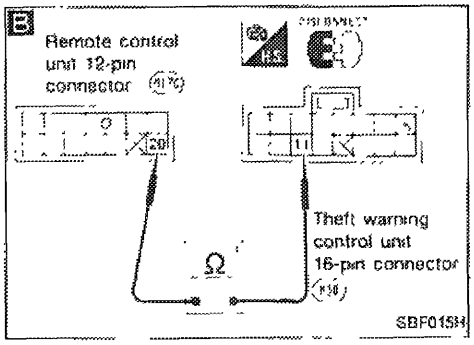
Repair harness.

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 8

Theft warning is actuated when door is unlocked or trunk lid is opened with remote control.





A

CHECK THEFT WARNING CANCEL SIGNAL CIRCUIT.

1) Disconnect theft warning control unit 16-pin connector.
2) Remove key from ignition
3) Close all doors and trunk lid.
   Check voltage between terminal ⑪ and GND when door unlock remote control function is operated

Terminal	Operation	Voltage
⑪ - GND	Door is unlocked	12V → 0V → 12V

Does voltmeter gauge move when door is unlocked?

Yes → Check theft warning system
Refer to section EL.

No

B

Disconnect 12-pin connector from remote control unit
Check continuity between terminals ⑳ of remote control unit and ⑪ of theft warning control unit
Does continuity exist?

Yes → Replace remote control unit

No

Repair harness.

Replacing Remote Controller or Control Unit

If the remote controller or the control unit needs to be replaced or if an additional remote controller needs to be set, enter the identity (ID) code manually.

ID Code Entry Procedure

To enter the ID code, follow this procedure.

"Setting mode".

Three steps must be followed to establish the "setting mode".

(1) Open the trunk.
(2) Close and lock all doors.
(3) Insert and remove the key from the ignition more than six times within 10 seconds.

ID code entry:

(4) Unlock and lock the driver's door inside lock lever once.
(5) Push lock button on the new remote controller once (for example, if door is locked using the remote controller during this ID code entry enable state, a new ID code can be entered).

Note

At this time, the original ID codes are eliminated and the new ID code is entered.

(6) If you need to enter additional remote controllers (including the original) repeat the step (4) and (5) for each additional controller.
(7) This ID code entry enable state and setting mode remain until any one of the doors is opened.

Note

- **If the same ID code that existing in the memory is input, the entry is canceled, and no ID code will be entered.**
- **Entry of maximum four ID codes is allowed and any attempt to enter more will be ignored.**
- **Any ID codes entered after termination of the "setting" mode will not be accepted. Additionally remote control signals will be inhibited when an ID code has not been entered during the "setting" mode.**

CAUTION:
a. Disconnect ground terminal from battery in advance.
b. Disconnect air bag system line in advance.
c. Be careful not to scratch pad and other parts.

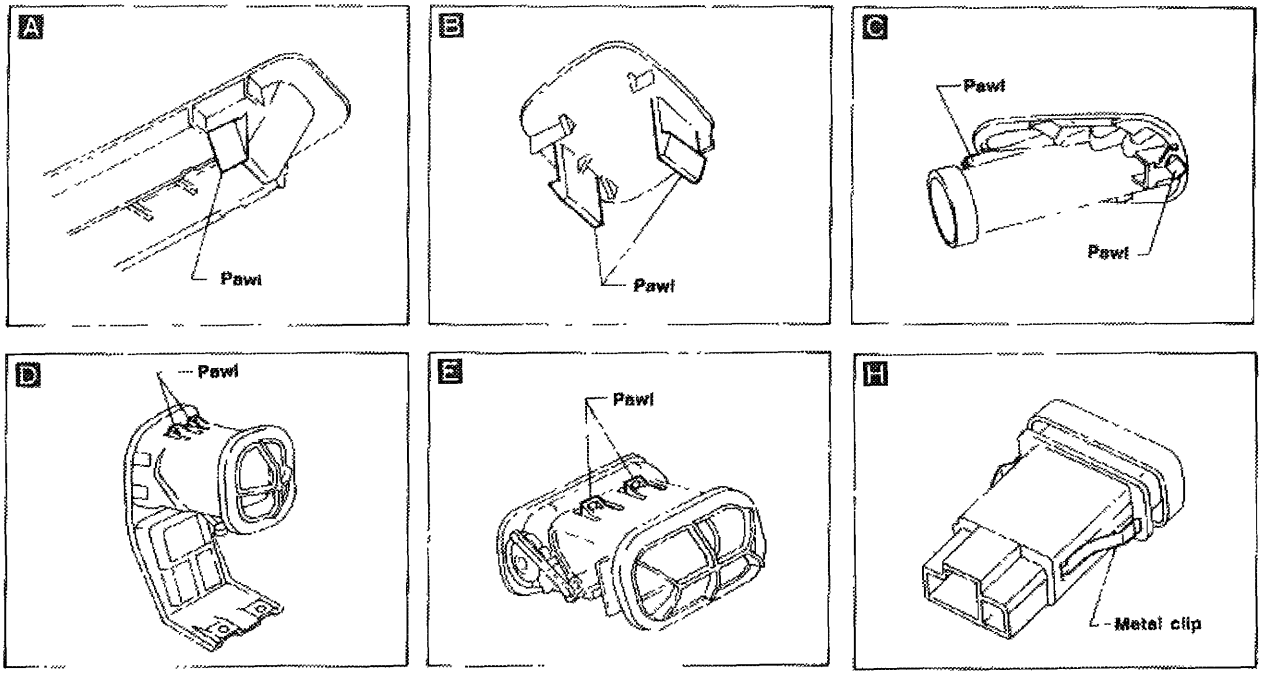
REMOVAL — Instrument panel assembly

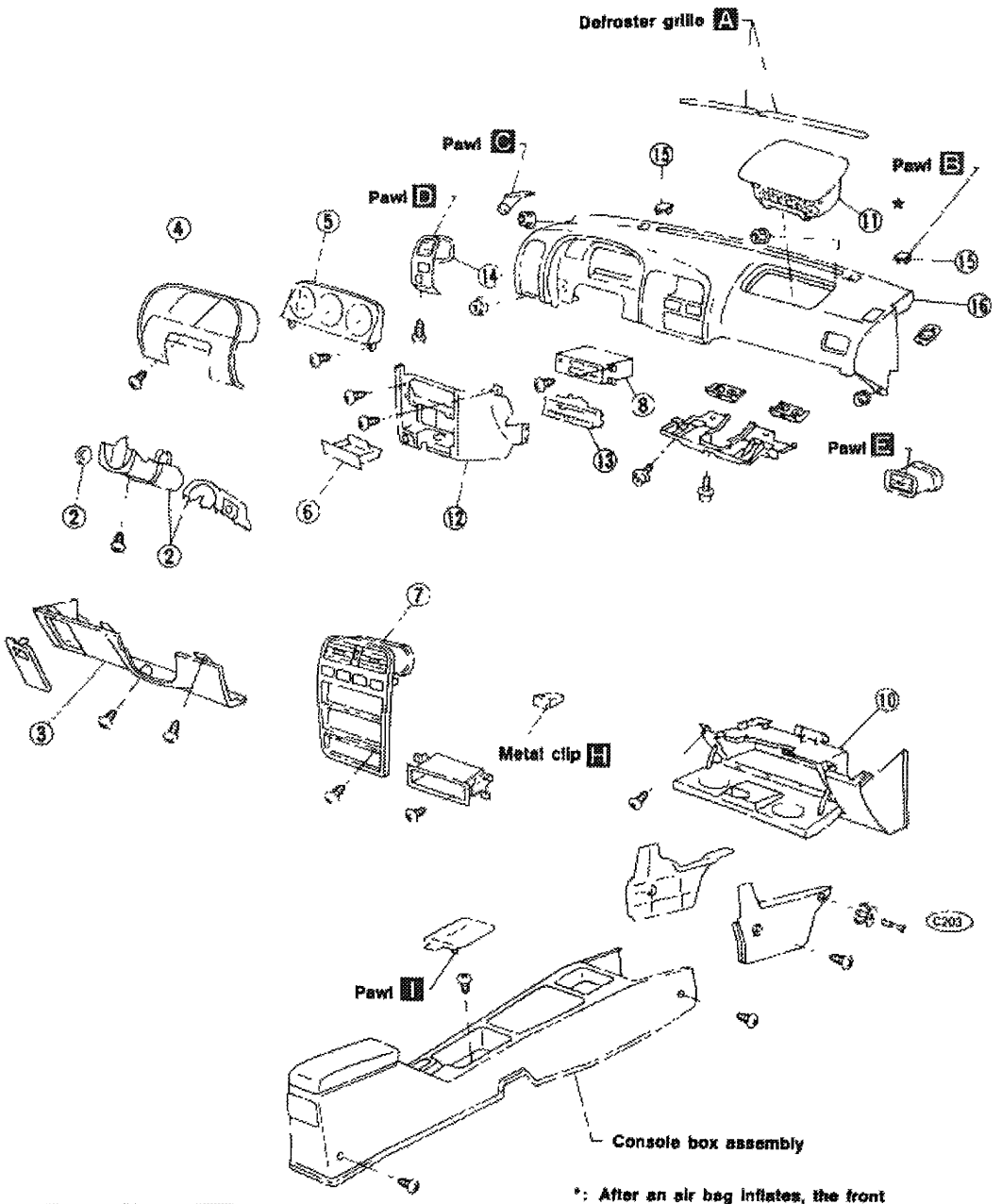
Pay attention so as not to scratch the parts (plastic). During installation, fit the ducting parts precisely.

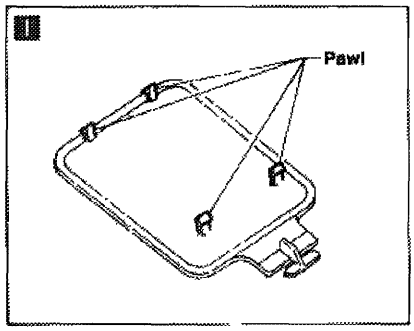
① Remove steering wheel. Disengage air bag system in advance.
② Remove lower and upper column cover.
③ Remove lower instrument panel on driver side.
④ Remove cluster lid A.
⑤ Remove meters.
⑥ Remove ashtray inner case.
⑦ Remove cluster lid C.
⑧ Remove audio system parts.
⑨ Remove front passenger air bag module harness connector.
⑩ Remove glove box.
⑪ Remove front passenger air bag module.
⑫ Remove center lower instrument panel.
⑬ Remove heater control unit.
⑭ Remove ventilator on the driver's side.
⑮ Remove mask instrument R.H./L.H.
⑯ Remove instrument panel.

INSTALLATION

Reverse the procedures described above.




Defroster grille A
Pawl C
Pawl D
Pawl B
Pawl E
Pawl F
Metal clip H
Pawl I
C203
Console box assembly
*: After an air bag inflates, the front instrument panel assembly should be replaced.


I
Pawl

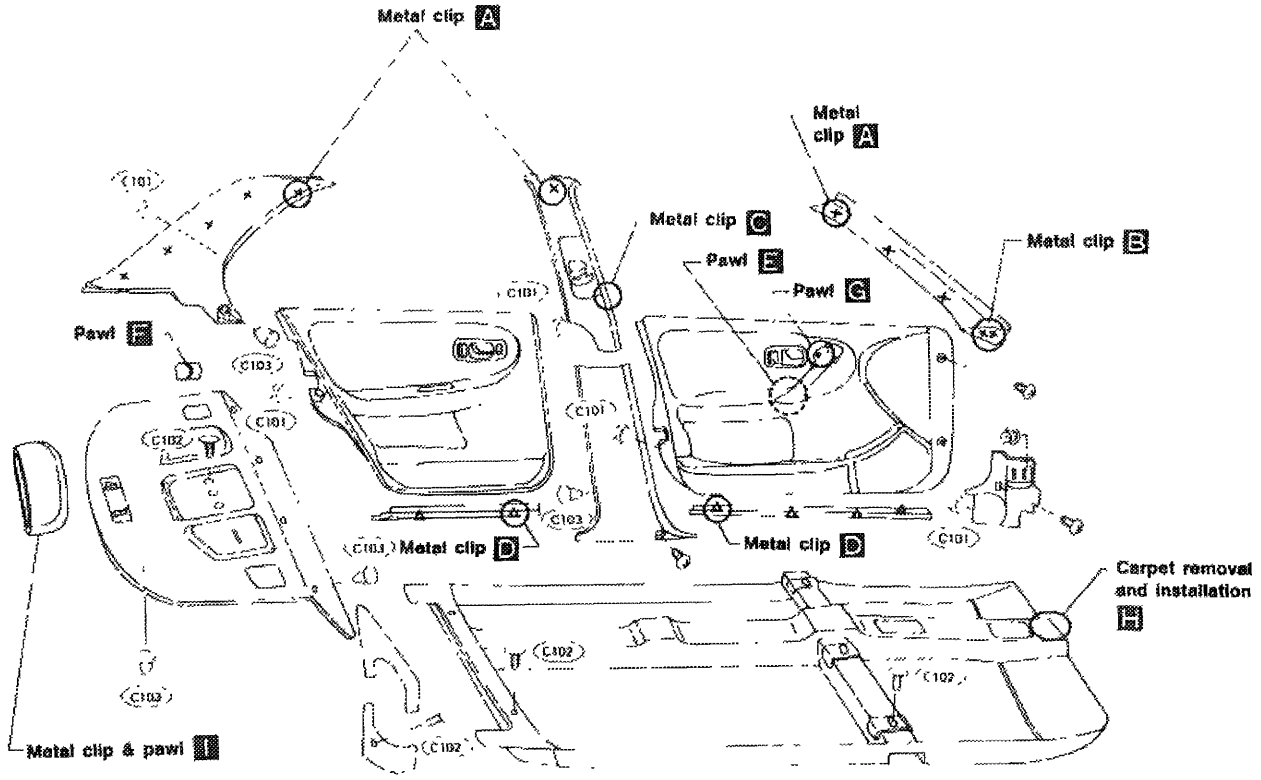
MBF060B

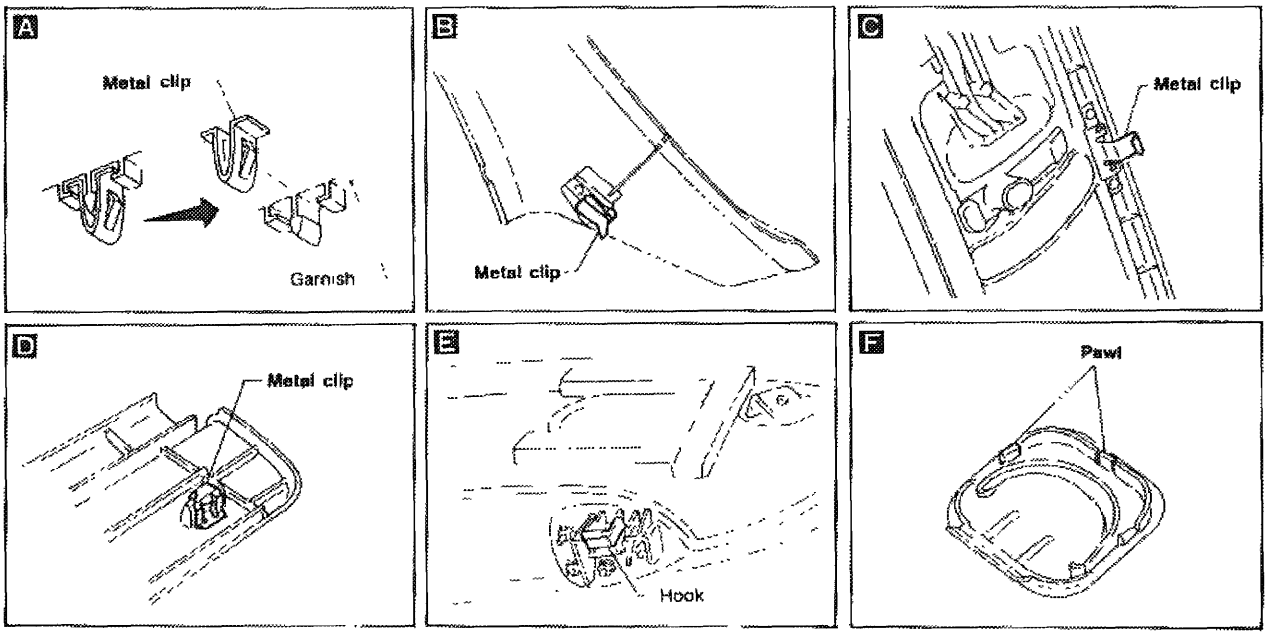
Interior

SIDE AND FLOOR TRIM — Passenger room

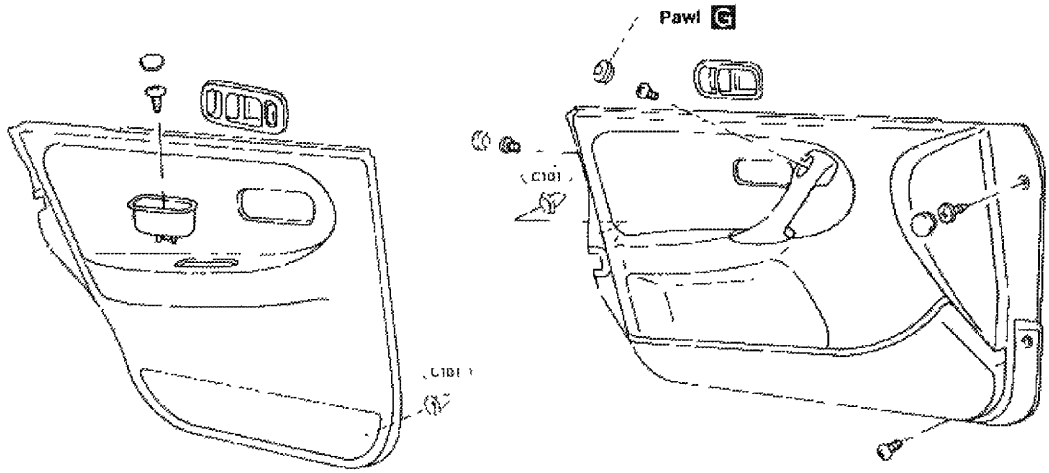
CAUTION:

a. Be sure to remove front, center and rear pillar garnishes by pulling them straight out. Use a long flat-bladed screwdriver when removing metal clips from rear pillar garnish Ⓐ.
b. Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.

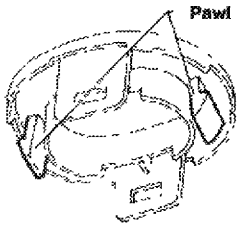




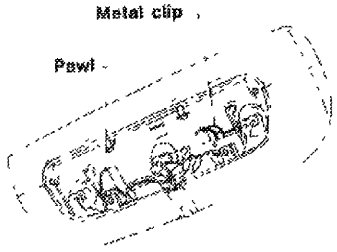
Interior (Cont'd)



G Power window switch

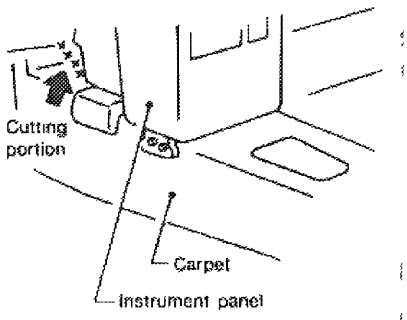


I



H

When removing or installing carpet instrument panel has to be removed or carpet has to be cut at the portion shown by arrow as carpet is a one-piece design



MBF066B

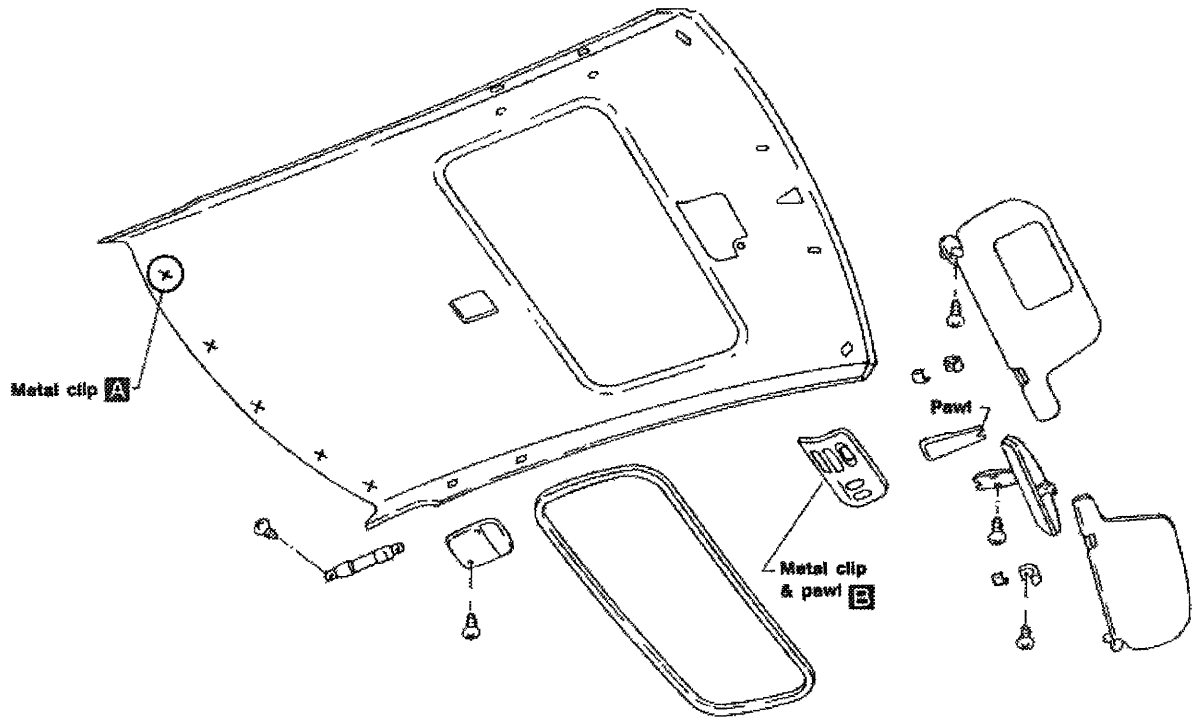
Interior (Cont'd)

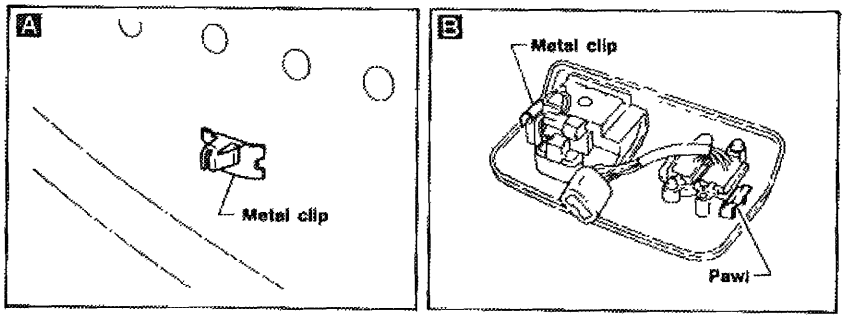
ROOF TRIM

Removal — headlining cloth

- Fully recline both front seats for easy access. Remove headlining through front passenger door.

1. Remove sunvisor, assist straps, room lamps and inside mirror.
2. Remove body side welts.
3. Remove front pillar garnishes, center pillar garnishes, rear quarter garnishes and roof finishers.
4. Remove clips and headlining cloth.

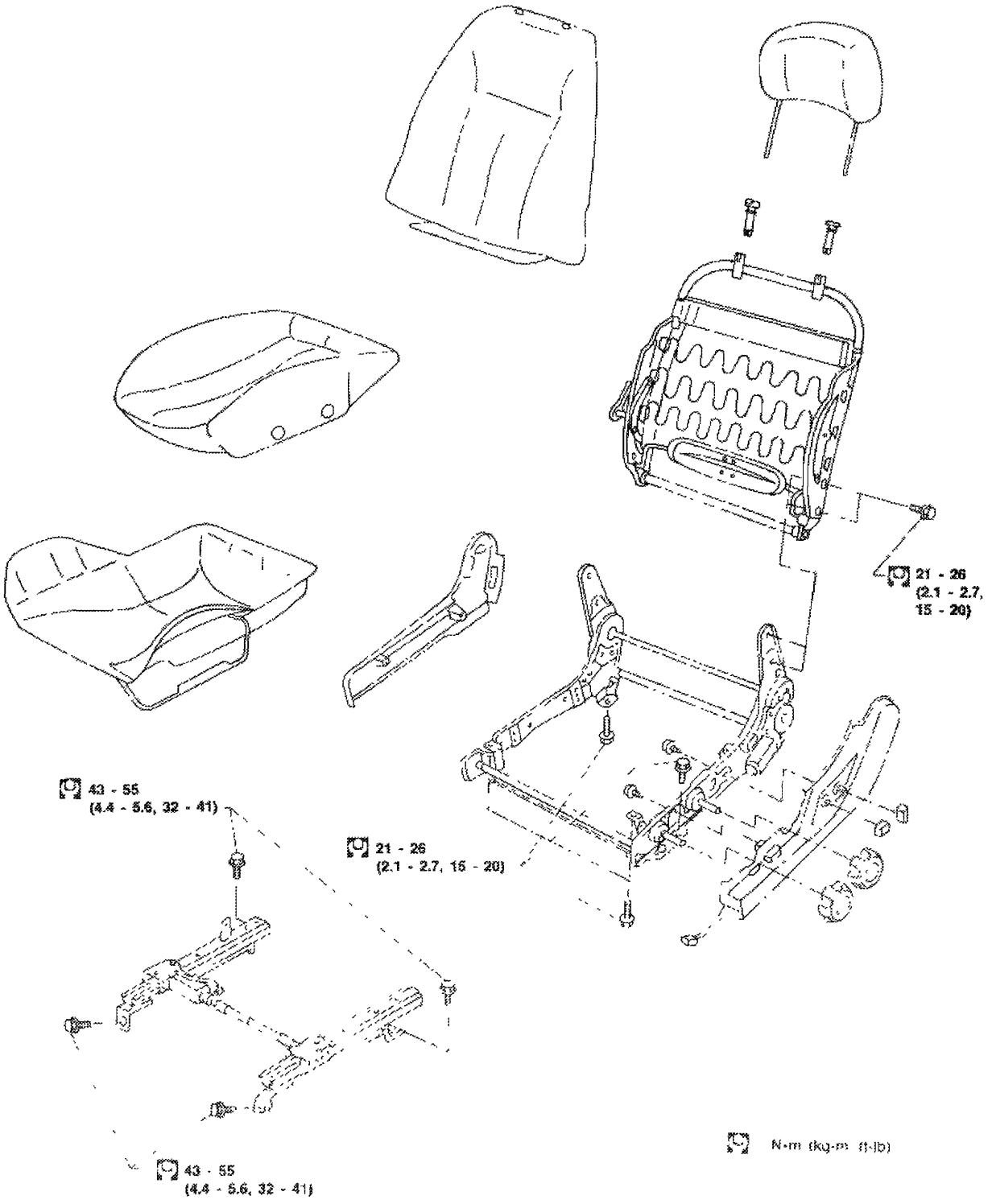




MBF067B

- When removing or installing the seat trim, carefully handle it to keep dirt out and avoid damage.

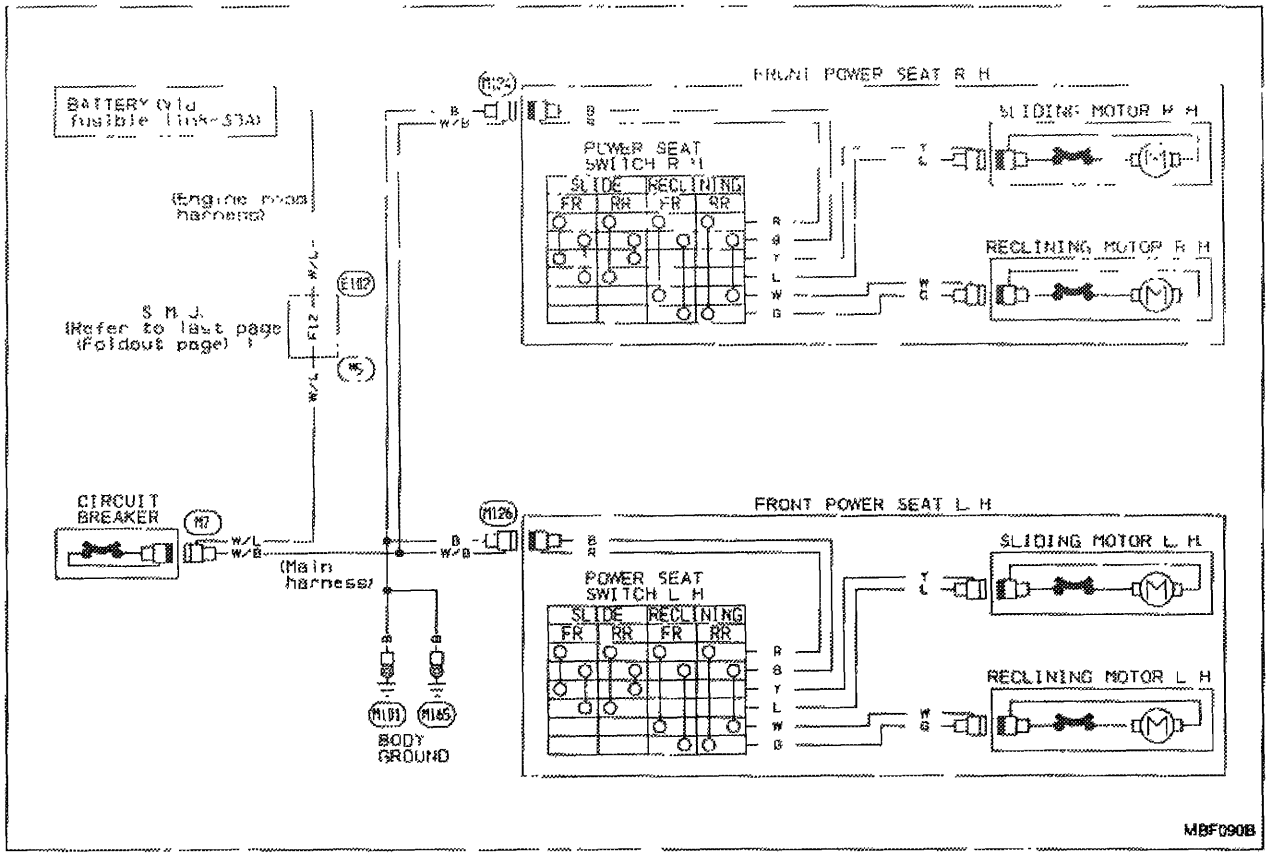
Front Seat



MBF0038

Front Seat (Cont'd)

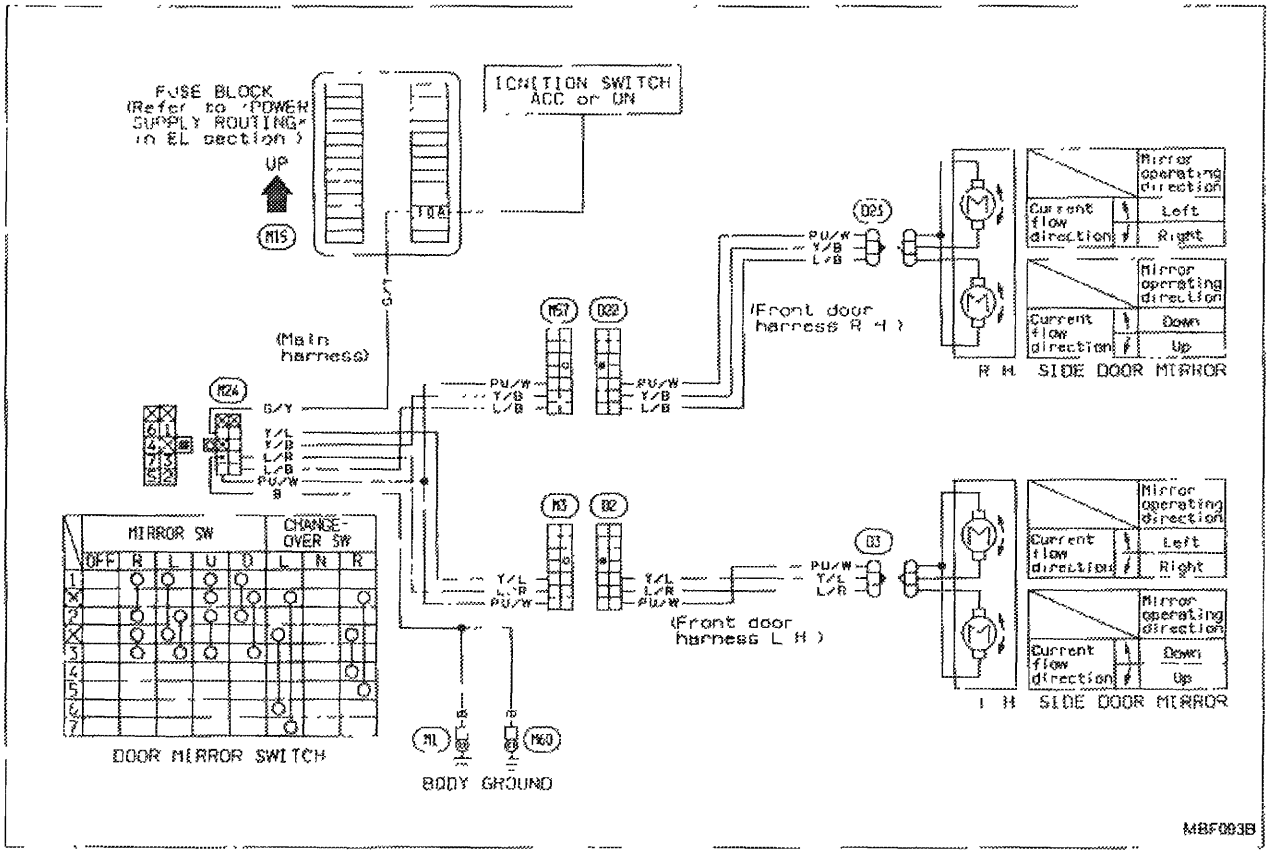
POWER SEAT/WIRING DIAGRAM



Door Mirror

WIRING DIAGRAM

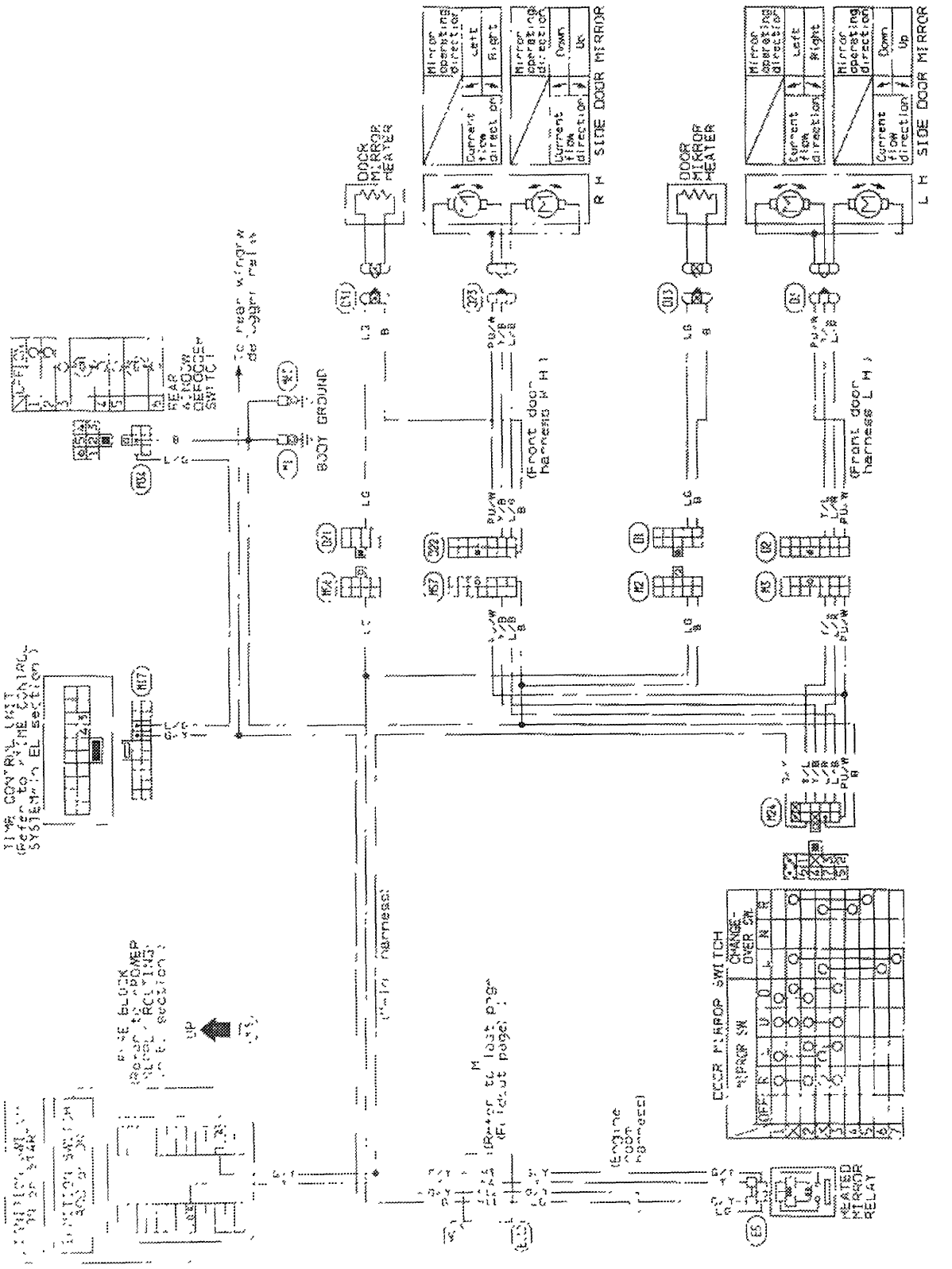
Without heated mirror



Door Mirror (Cont'd)

WIRING DIAGRAM

With heated mirror

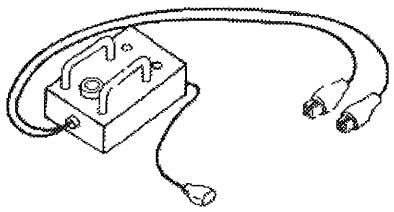


MBF094B

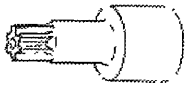
Precautions for SRS "Air Bag" and "Seat Belt Pre-tensioner" Service

- Do not use a circuit tester to check SRS circuits
- Before servicing the SRS, turn ignition switch "OFF", disconnect battery ground cable and wait for at least 10 minutes
  For approximately ten minutes after the cables are removed, it is still possible for the air bag to inflate. Therefore, do not work on any air bag system connectors or wires until at least ten minutes have passed.
- SRS sensors must always be installed with their arrow marks " ⇦" facing the front of the vehicle for proper operation. Also check sensors for cracks, deformities or rust before installation and replace as required.
- The spiral cable must be aligned with the neutral position since its rotations are limited. Do not attempt to turn steering wheel or column after removal of steering gear.
- Handle air bag module carefully. Always place it with the pad side facing upward.
- After removing any SRS parts, discard old bolts and replace with new ones. Conduct self-diagnosis to check entire SRS for proper function.
- If front of vehicle is damaged in a collision, always check the crash zone sensor and the wiring harness.
- After air bag inflates, the front instrument panel assembly should be replaced.

Special Service Tool

Tool number (Kent-Moore No.) Tool name	Description	
KV999R0011 (J38381) Deployment tool		Disposing of air bag module

Commercial Service Tools

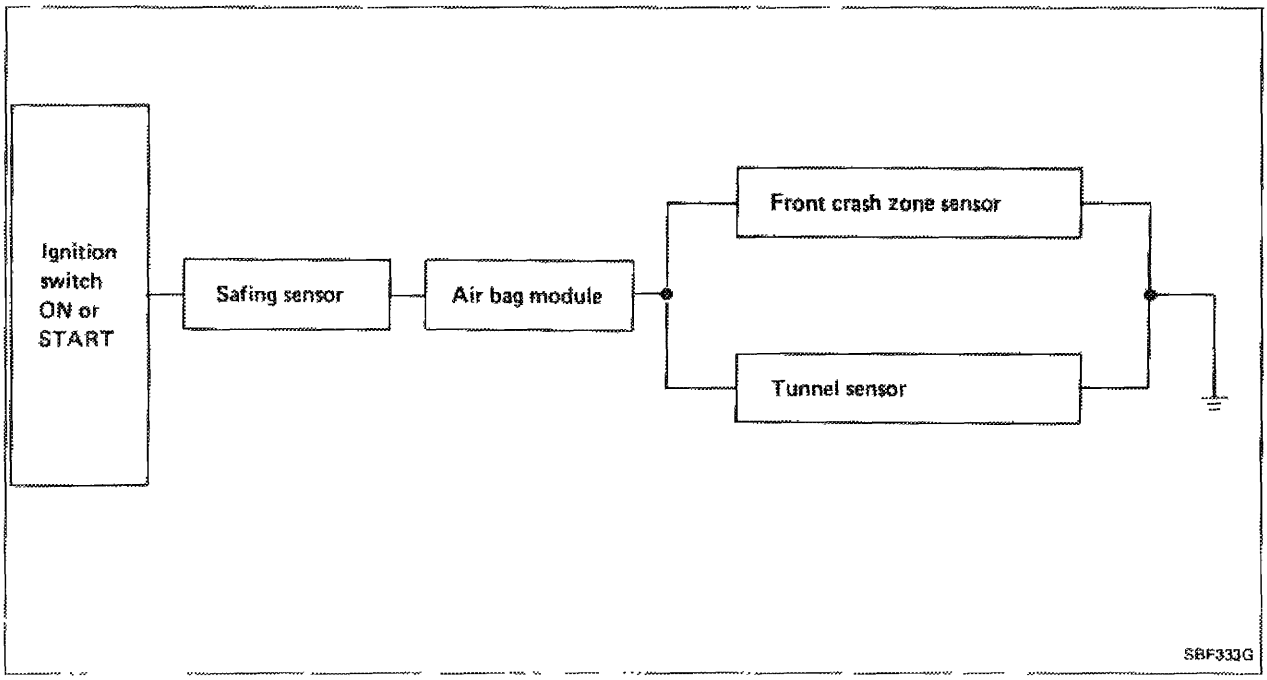
Tool name	Description	
Special torx bit		Use for special bolts (tamper resistant screw)
Spiral cable stopper		Avoiding unexpected spiral cable rotation

- When laying aside a single pre-tensioner (belt assembly), make sure cylinder tip does not point towards a person. Always place pre-tensioner in a box if possible. (If pre-tensioner should go off accidentally, rubber cap will jump out of cylinder tip, blowing out hightemperature gas.)

Description

The air bag deploys when any of the two sensors (front crash zone sensor or tunnel sensor) and the safing sensor simultaneously activate while the ignition switch is "ON".

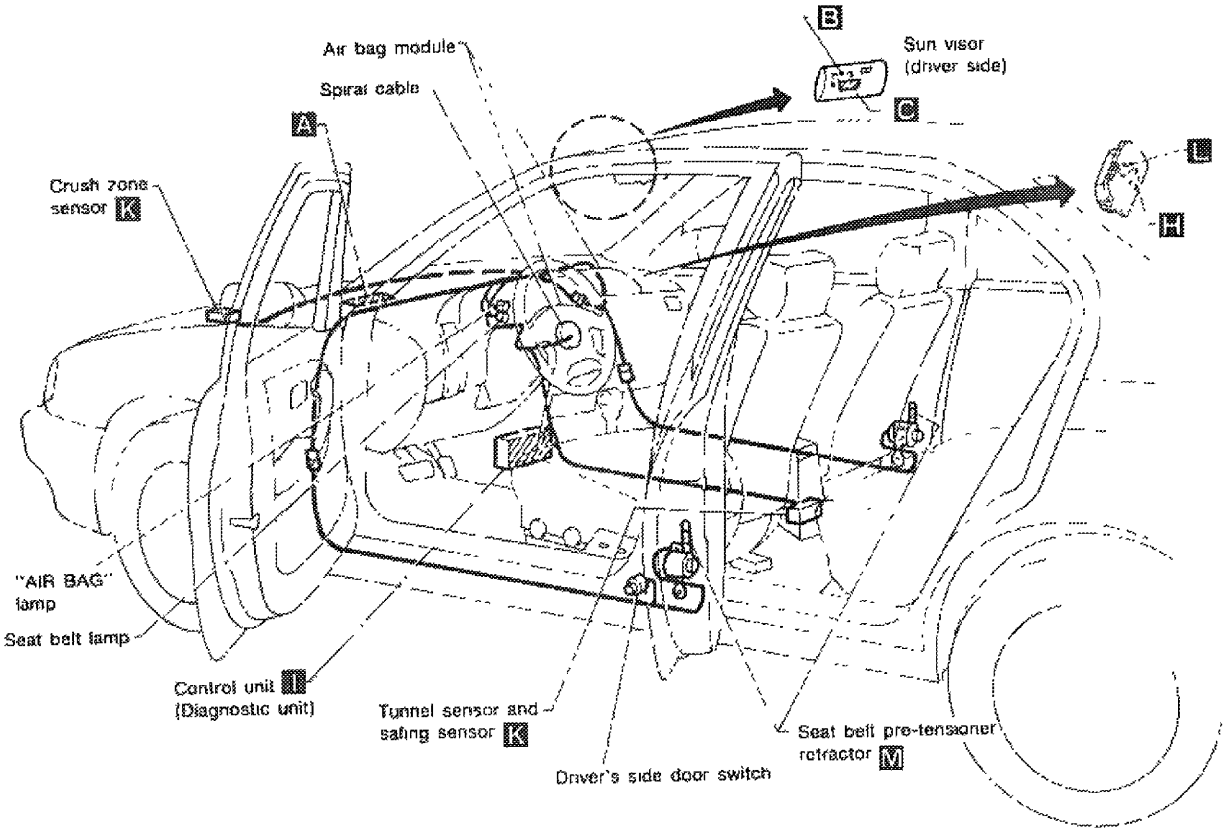
Ignition	Front crash zone sensor	Tunnel sensor	Safing sensor	Air bag signal
ON	ON		ON	ON
ON		ON	ON	ON

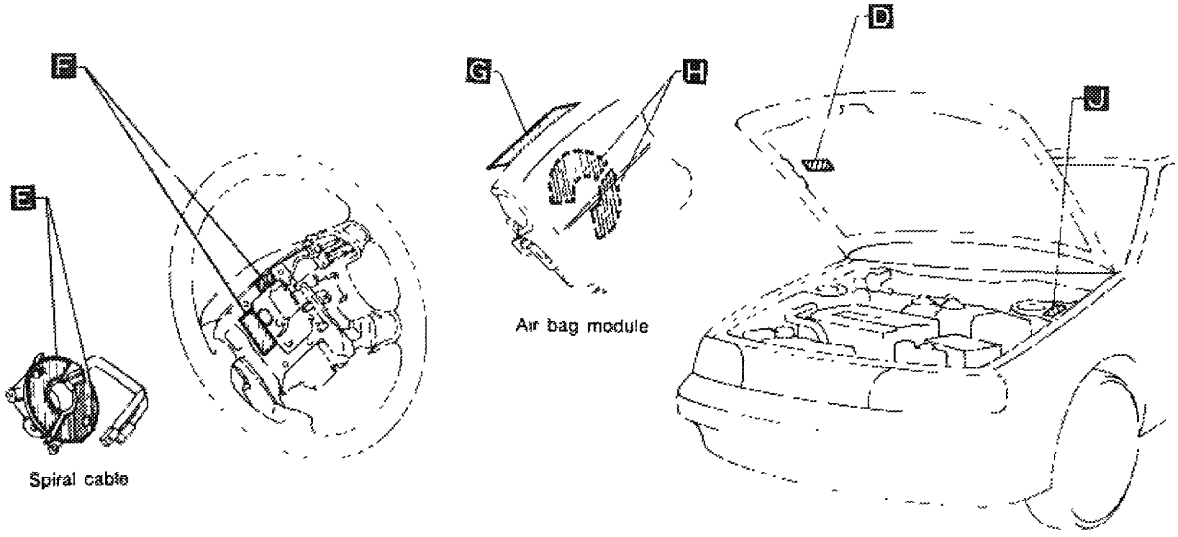


Self-diagnosis

The control unit (diagnostic unit) diagnoses the SRS circuit. When the ignition key is in the "ON" or "START" position, the "AIR BAG" warning lamp will illuminate for about 7 seconds and then turn off. This means that the system is operational.

SRS Component Parts Location





MBF069B

Caution Labels

The CAUTION LABELS are important when servicing air bags in the field. If they are dirty or damaged, replace them with new ones.

A

SRS AIRBAG

B

INFORMATION SRS AIRBAG

- THIS CAR IS EQUIPPED WITH AIR BAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (S.R.S.) TO HELP PROTECT FRONT OCCUPANTS IN A FRONTAL COLLISION.
- ALWAYS USE SEAT BELTS OR CHILD SEAT.
- THE SYSTEM MUST BE INSPECTED 10 YEARS AFTER DATE OF MANUFACTURE, AS NOTED ON THE CERTIFICATION LABEL LOCATED ON THE LEFT FRONT DOOR.
- IF ANY OF THE FOLLOWING CONDITIONS OCCUR, THE SYSTEM MUST BE SERVICED: THE "AIR BAG" LAMP DOES NOT GO ON, FLASHES INTERMITTENTLY OR REMAINS ON.
- SEE YOUR OWNER'S MANUAL FOR DETAILS ABOUT THE FUNCTIONING, SERVICE AND DISPOSAL PROCEDURES FOR THE SYSTEM.

C

NOTICE SRS AIRBAG

- THIS CAR IS EQUIPPED WITH AIR BAGS TO SUPPLEMENT THE SEAT BELTS
- ALWAYS USE SEAT BELTS OR CHILD SEAT.
- CHILD SEATS, USE IN REAR SEAT IF USED IN PASSENGER SEAT, SET CHILD SEATS FORWARD FACING AND MOVE AS FAR FROM DASH AS POSSIBLE.
- READ THE INFORMATION ON THE REVERSE SIDE.

D

WARNING SRS AIRBAG

- THIS CAR IS EQUIPPED WITH AIR BAGS AS A SUPPLEMENTAL RESTRAINT SYSTEM (S.R.S.)
- ALL S.R.S. ELECTRICAL WIRING AND CONNECTORS ARE COLORED YELLOW.
- DO NOT USE ELECTRICAL TEST EQUIPMENT ON THESE CIRCUITS.
- TAMPERING WITH OR DISCONNECTING THE S.R.S. WIRING AND CONNECTORS COULD RESULT IN ACCIDENTAL DEPLOYMENT OF THE AIR BAGS OR MAKE THE SYSTEM INOPERATIVE, WHICH MAY RESULT IN SERIOUS INJURY.

E

CAUTION SRS AIRBAG

- BEFORE ASSEMBLY;
  - LINE UP THE FRONT WHEELS STRAIGHT AHEAD.
  - ALIGN THE ARROW WITH THE YELLOW MARK ON THE SIDE GEAR.
  - READ SERVICE MANUAL.
- NO SERVICEABLE PARTS INSIDE
- DO NOT DISASSEMBLE OR TAMPER

F

WARNING SRS AIRBAG

BEFORE MOUNTING STEERING WHEEL,

- MAKE SURE THAT THE FRONT WHEELS ARE IN STRAIGHT-AHEAD POSITION.
- ALIGN THE ARROW WITH THE YELLOW MARK ON THE SIDE GEAR. (SPIRAL CABLE)
- READ SERVICE MANUAL.

Caution Labels (Cont'd)

G

WARNING SRS AIRBAG

- THIS AIRBAG MODULE CANNOT BE REPAIRED.
- USE DIAGNOSTIC INSTRUCTIONS TO DETERMINE IF THE UNIT IS OPERATIONAL.
- IF NOT OPERATIONAL, REPLACE AND DISPOSE OF THE ENTIRE UNIT AS DIRECTED IN THE INSTRUCTIONS.
- UNDER NO CIRCUMSTANCES SHOULD A DIAGNOSIS BE PERFORMED USING ELECTRICALLY POWERED TEST EQUIPMENT OR PROBING DEVICES.
- TAMPERING OR MISHANDLING CAN RESULT IN PERSONAL INJURY.
- STORE THE REMOVED AIRBAG MODULE WITH THE PAD SURFACE UP.
- FOR SPECIAL HANDLING OR STORAGE REFER TO SERVICE MANUAL.

H

DANGER POISON

- KEEP OUT OF THE REACH OF CHILDREN.
- CONTAINS SODIUM AZIDE AND POTASSIUM NITRATE.
- CONTENTS ARE POISONOUS AND EXTREMELY FLAMMABLE.
- CONTACT WITH ACID, WATER OR HEAVY METALS MAY PRODUCE HARMFUL AND IRRITATING GASES OR EXPLOSIVE COMPOUNDS.
- DO NOT DISMANTLE, INCINERATE, OR BRING INTO CONTACT WITH ELECTRICITY OR STORE AT TEMPERATURES EXCEEDING 200°F.
- FIRST AID: IF CONTENTS ARE SWALLOWED, INDUCE VOMITING;
  - — FOR EYE CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES
  - — IF GASES FROM ACID OR WATER CONTACT ARE INHALED, SEEK FRESH AIR
  - — IN EVERY CASE, GET PROMPT MEDICAL ATTENTION
- FOR ADDITIONAL INFORMATION, SEE MATERIAL SAFETY DATA SHEET (MSDS) FOR THIS PRODUCT.

I

CAUTION SRS AIRBAG

- NO SERVICEABLE PARTS INSIDE.
- DO NOT DISASSEMBLE OR TAMPER.
- DO NOT DROP, KEEP DRY.
- WHILE REMOVED, STORE IN A CLEAN AND DRY AREA
- IF WET CONDITION OCCURS, THIS UNIT MUST BE SERVICED.

J

CAUTION SRS AIRBAG

- TO AVOID DAMAGING THE S.R.S. SPIRAL CABLE, REMOVE THE STEERING WHEEL BEFORE REMOVING THE STEERING LOWER JOINT.

K

WARNING SRS AIRBAG

- DO NOT DISASSEMBLE OR TAMPER.
- DISMANTLING AND INSTALLATION SHOULD ONLY BE PERFORMED BY TRAINED PERSONNEL.

L

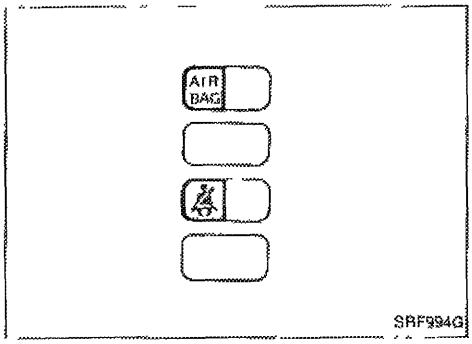
WARNING SRS AIRBAG

- THIS AIRBAG MODULE CANNOT BE REPAIRED. SEE SERVICE MANUAL FOR INSTRUCTIONS (ON DIAGNOSIS AND REPLACEMENT).
- DO NOT DIAGNOSE ELECTRICALLY POWERED TEST EQUIPMENT OR PROBING DEVICES.
- TAMPERING OR MISHANDLING CAN RESULT IN PERSONAL INJURY.
- STORE THE REMOVED AIRBAG MODULE WITH THE PAD OR COVER SURFACE UP. (REFER TO SERVICE MANUAL FOR SPECIAL HANDLING OR STORAGE)

M

DANGER

- DO NOT REMOVE, IMPACT OR DISASSEMBLE



Maintenance Items

1. Check "AIR BAG" and "Seat belt" warning lamps
   When the ignition key is in the "ON" or "START" position, the "AIR BAG" and "Seat belt" (when fastening the seat belt) warning lamps will illuminate for about 7 seconds and then turn off. This means that the systems are operational. When a warning lamp flashes, check and correct cause of the problem.
2. Visually check SRS components

(1) Sensors
- Check sensors to ensure the arrow marks face the front of the vehicle.
- Check body and sensor brackets for deformities or rust.
- Check sensor case for dents, cracks, deformities or rust.
- Check sensor harness for binds, connector for damage, and terminals for deformities.

(2) Control unit — Airbag
- Check case and bracket for dents, cracks or deformities.
- Check connectors for damage, and terminals for deformities.

(3) Main harness
- Check connectors for poor connections
- Check harnesses for binds, connectors for damage, and terminals deformities.

(4) Spiral cable
- Visually check lock (engagement) pins and combination switch for damage
- Check connectors, flat cable and protective tape for damage.
- Check steering wheel for noise, binds or difficult operation.

(5) Steering wheel
- Check harness (built into steering wheel) and connectors for damage, and terminals for deformities.
- Install air bag module to check fit or alignment with steering wheel.
- Check steering wheel for excessive free play.

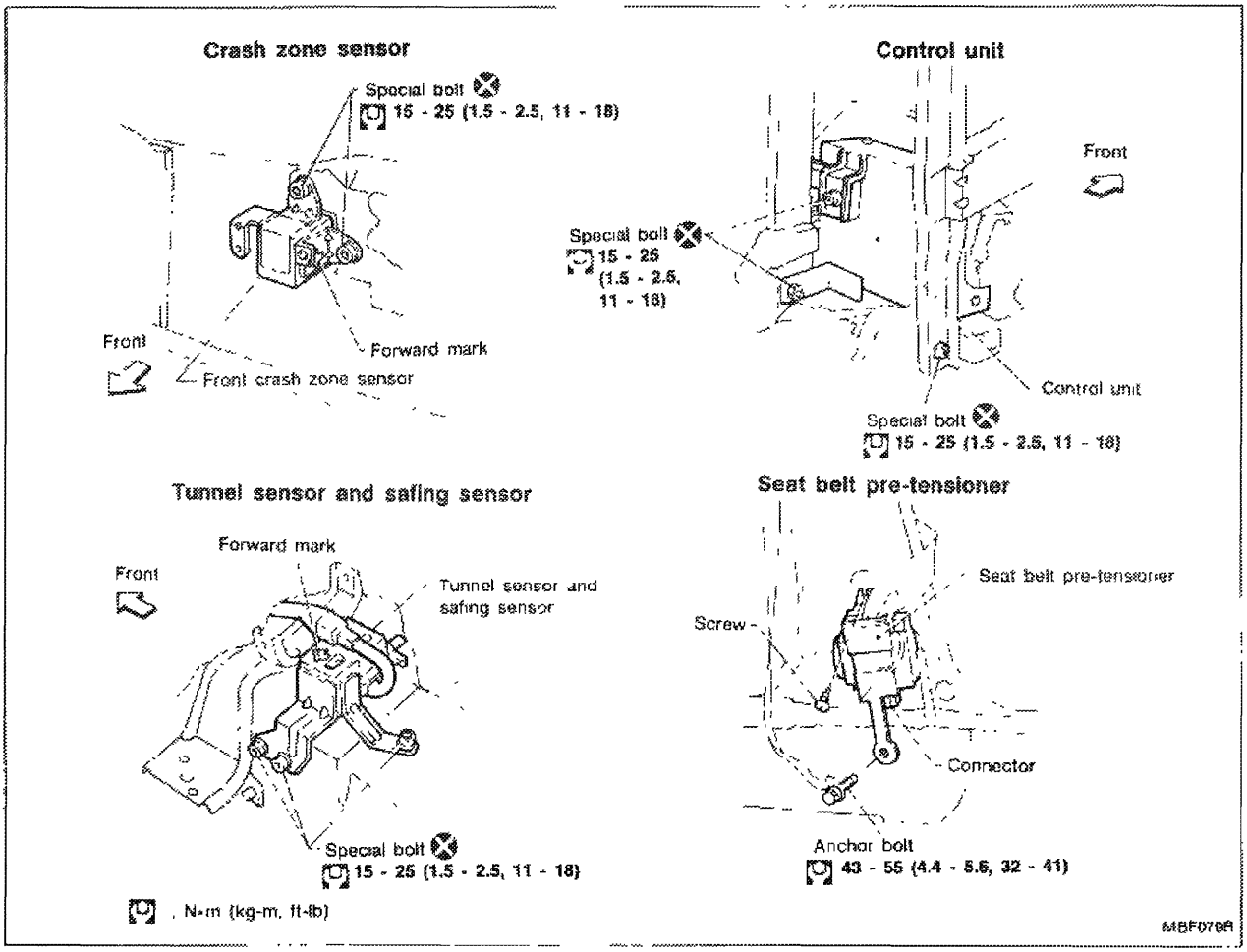
(6) Air bag module — Driver and passenger side
- Check harness cover and connectors for damage, terminals for deformities, and harness for binds.
- Install air bag module to steering wheel to check fit or alignment with the wheel.

CAUTION:
Replace previously used screws with new ones.

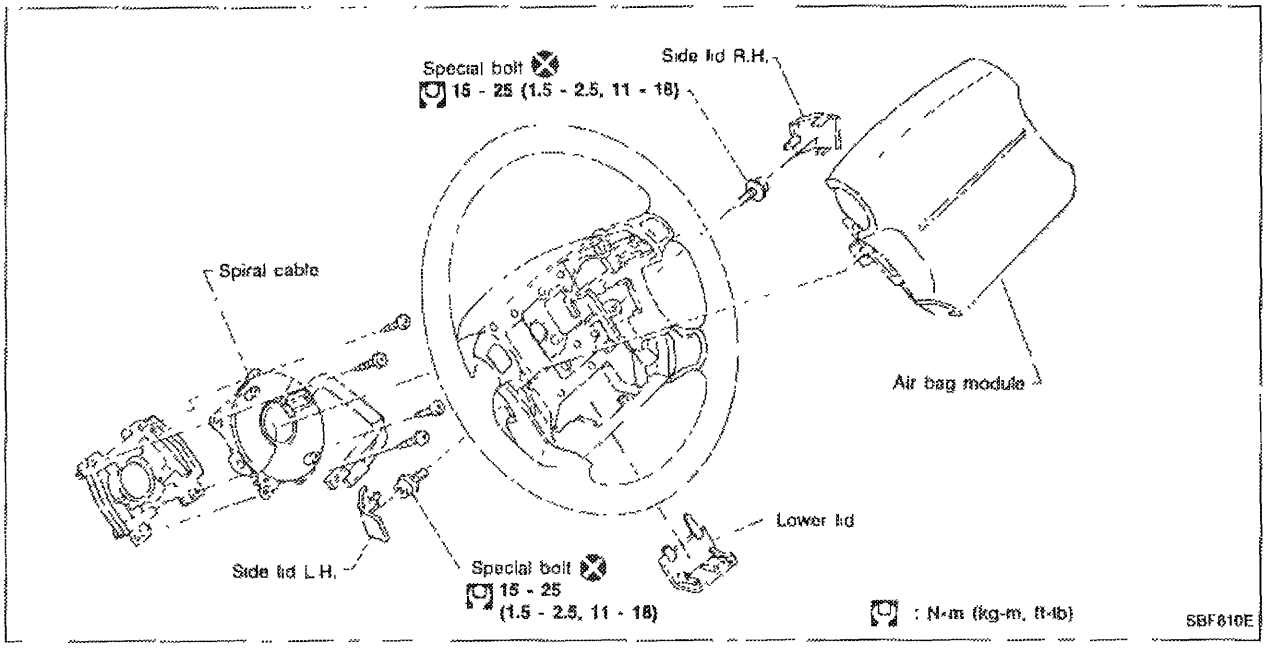
Removal and Installation — Control Unit, Sensors and Seat Belt Pre-tensioner

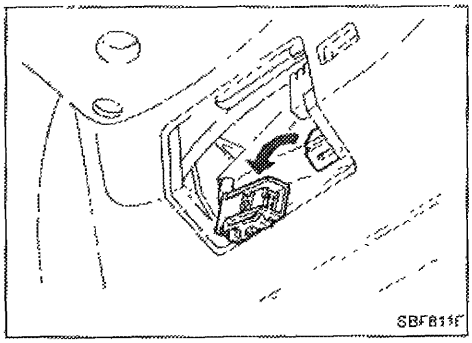
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect battery ground cable and wait for at least 10 minutes.**
- **Do not attempt to disassemble seat belt pre-tensioner.**
- **Do not drop or impact seat belt pre-tensioner. If any portion is damaged, replace the seat belt pre-tensioner.**
- **Do not expose seat belt pre-tensioner to temperatures exceeding 80°C (176°F).**
- **Whenever seat belts (equipped with pre-tensioner) are moved, ensure that cylinder faces down. Do not hold cylinder.**
- **The special bolts are coated with bonding agent. Discard old ones after removal; replace with new ones.**
- **Check all sensors for proper installation.**
- **Check all sensors to ensure they are free of deformities, dents, cracks or rust. If they show any visible signs of damage, replace them with new ones.**
- **Check sensor brackets to ensure they are free of deformities or rust.**



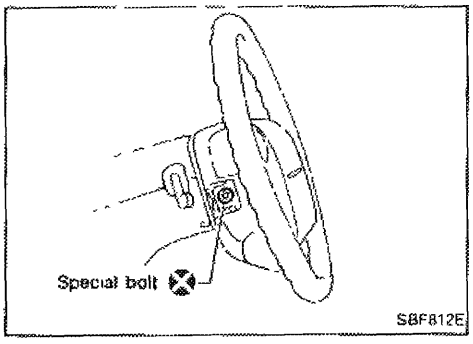
Removal — Air Bag Module and Spiral Cable



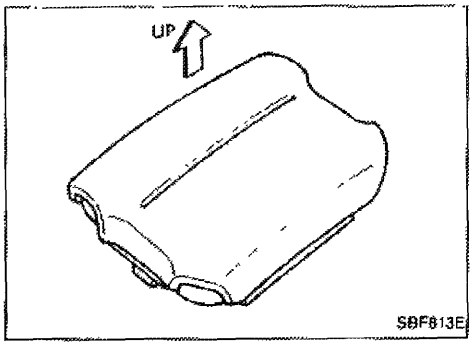


CAUTION:
Before servicing SRS, turn the ignition switch off, disconnect battery ground cable and wait for at least 10 minutes.

1. Remove lower lid from steering wheel, and disconnect air bag module connector.

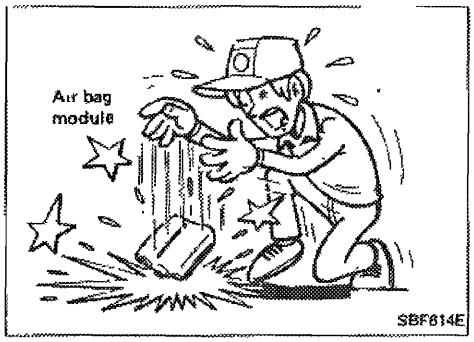


2. Remove side lid. Using the T50H torx bit, remove left and right special bolts. Air bag module can then be removed.

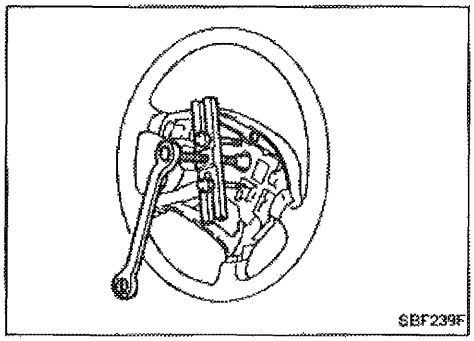


CAUTION:
- **Always place air bag module with pad side facing upward.**
- **Do not attempt to disassemble air bag module.**
- **The special bolts are coated with bonding agent. Discard old ones after removal; replace with new ones.**

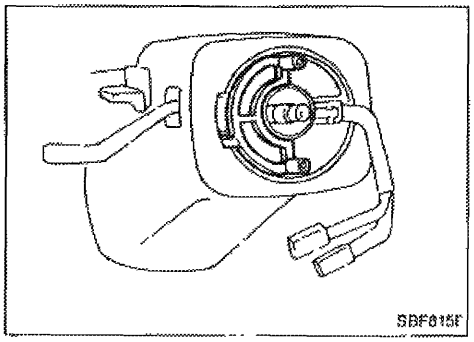
Removal — Air Bag Module and Spiral Cable (Cont'd)



- **Do not drop or impact air bag module. If any portion is deformed or cracked, replace the module.**
- **Do not expose the air bag module to temperatures exceeding 100°C (212°F).**
- **Do not allow oil, grease or water to come in contact with the air bag module.**



3. Set steering wheel in the neutral position.
4. Disconnect horn connector and remove nuts.
5. Using steering wheel puller, remove steering wheel. Be careful not to over-tighten puller bolt on steering wheel.



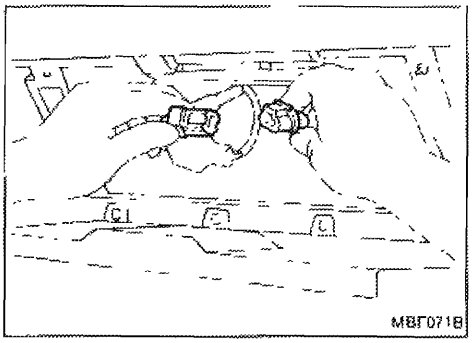
6. Attach spiral cable to stopper.
7. Remove steering column cover
8. Disconnect connector and remove the four screws. The spiral cable can then be removed.

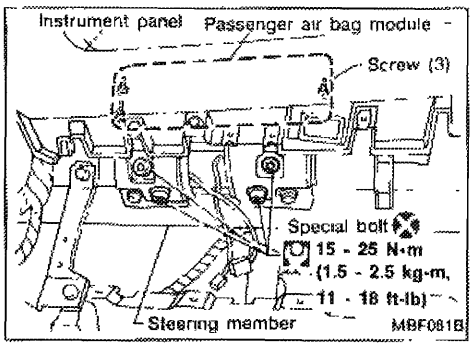
Removal — Front Passenger Air Bag Module

CAUTION:

Before servicing SRS, turn the ignition switch off, disconnect battery ground cable and wait for at least 10 minutes.

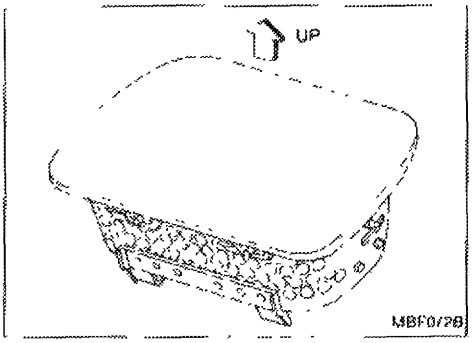
1. Remove lid glove box (connector lid).
2. Remove connector bracket from lid glove box (connector lid) and inflator connector from air bag harness on body side.





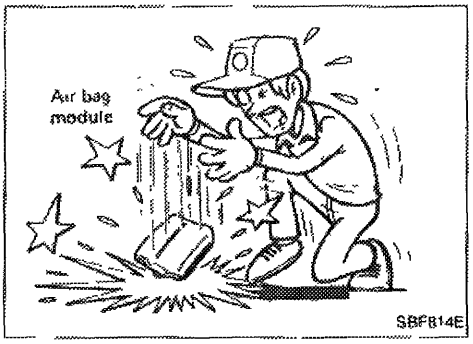
3. Remove cluster lid C.
4. Remove audio system parts
5. Remove lower side of instrument panel (including glove box and lid)
6. Remove two special bolts (one on each side of front passenger air bag module) and four screws securing air bag module to instrument panel, then remove air bag module.

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



CAUTION:

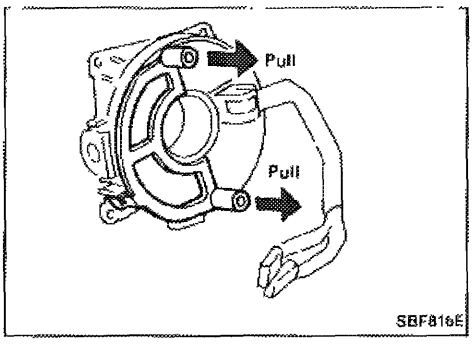
- **Always place air bag module with pad side facing upward.**
- **Do not attempt to disassemble air bag module.**
- **The special bolts are coated with bonding agent. Discard old ones after removal; replace with new ones.**



- **Do not drop or impact air bag module. If any portion is deformed or cracked, replace the module.**
- **Do not expose the air bag module to temperatures exceeding 100°C (212°F).**
- **Do not allow oil, grease or water to come in contact with the air bag module.**

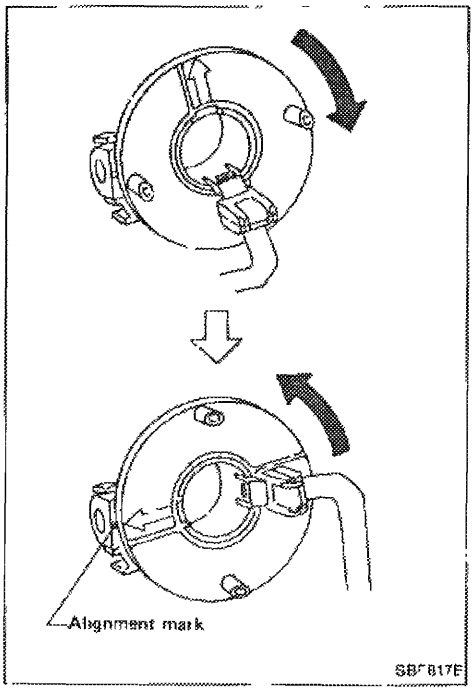
Installation — Air Bag Module and Spiral Cable

1. Connect spiral cable connector and tighten with screws. Install steering column cover.

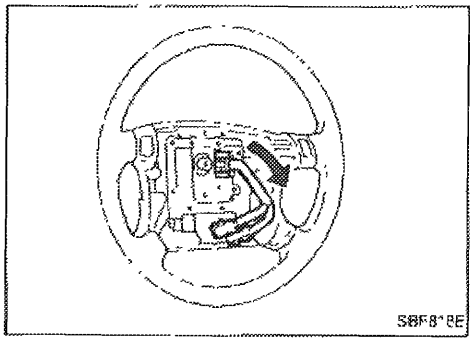


2. Remove stopper by pulling two pin guides.

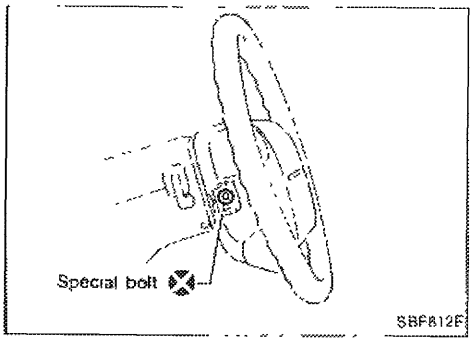
Installation — Air Bag Module and Spiral Cable (Cont'd)



- Alignment of spiral cable with neutral position
  If stopper is not used, align spiral cable with neutral position as follows:
  Turn spiral cable clockwise until it catches stopper. Then, back spiral cable off approximately two turns until yellow alignment mark appears on left gear. Align arrow mark "⇦" of spiral cable with this yellow mark.

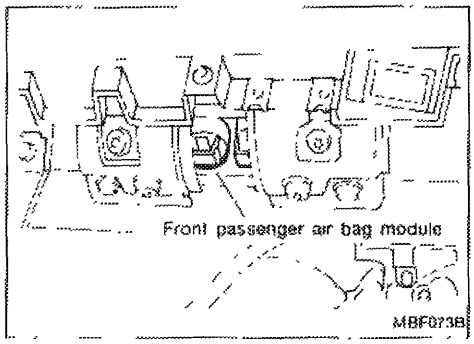


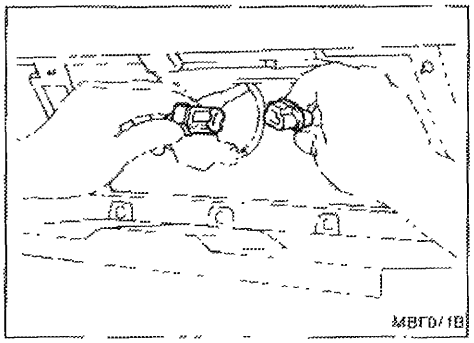
3. Install steering wheel setting spiral cable pin guides, and pull spiral cable through
4. Connect horn connector and engage spiral cable with pawls in steering wheel.
5. Tighten nuts.

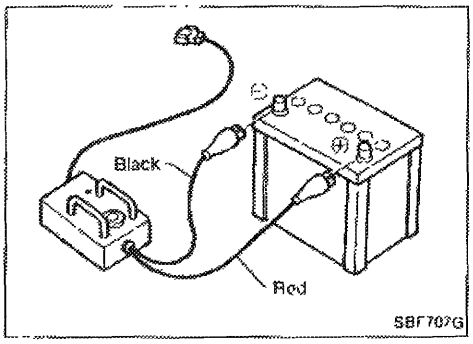


6. Position air bag module and tighten with new special bolts.
7. Connect air bag module connector.
8. Install all lids.

9. Conduct self-diagnosis to ensure entire SRS operates properly. (Use CONSULT or warning lamp check.)







Installation — Front Passenger Air Bag Module

1. Install air bag module to steering member and instrument panel.

CAUTION:

Make sure harness is not caught between rear of air bag module and steering member.

2. Install lower side of instrument panel (including glove box and lid).
3. Install connector to connector bracket.
4. Secure connector bracket to lid glove box (connector lid), then glove box lid to glove box.

Scrapping Air Bag and Seat Belt Pre-tensioners

Before scrapping air bag modules, seat belt pre-tensioners or a vehicle equipped with an SRS system, be sure to deactivate the units or the system.

CONNECTING TO BATTERY

- Place the vehicle outdoors in such a way that it is surrounded on all sides by at least 6 m (20 ft) of open space.
- Use a voltmeter to make sure the vehicle battery is fully charged.

CAUTION:

The battery must show voltage of 9.6V or more.

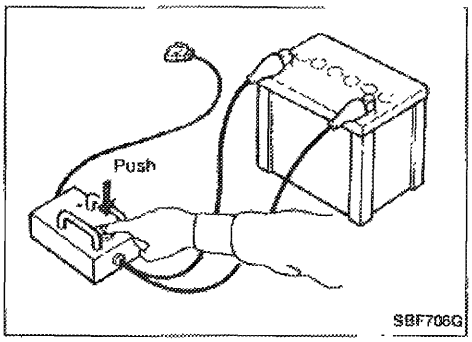
Remove the battery from the vehicle and place it on dry wood blocks approximately 5 m (16 ft) away from the vehicle

- Wait 10 to 12 minutes after the vehicle battery is disconnected before proceeding.
- Connect deployment tool to the battery.

CAUTION:

Make sure the polarity is correct. The right side lamp in the tool, marked "deployment tool power", should glow with a green light. If the right side lamp glows red, reverse the connections to the battery.

Scrapping Air Bag and Seat Belt Pre-tensioners (Cont'd)



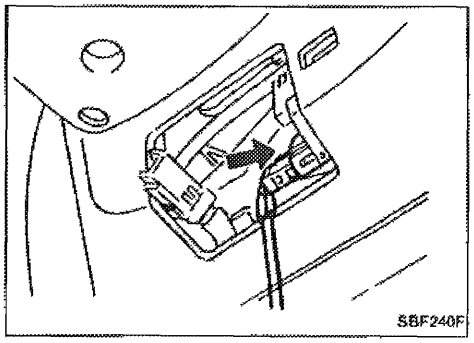
DEPLOYMENT TOOL CHECK

Press the deployment tool switch to the "ON" position. The left side lamp in the tool, marked "air bag connector voltage" should illuminate. If it does not illuminate, replace the tool.

AIR BAG DEPLOYMENT TOOL LAMP ILLUMINATION CHART (Battery connected)

Switch operation	Left side lamp, green* "AIR BAG CONNECTOR VOLTAGE"	Right side lamp, green* "DEPLOYMENT TOOL POWER"
OFF	OFF	ON
ON	ON	ON

*: If this lamp glows red, the tool is connected to the battery incorrectly. Reverse the connections and make sure the lamp glows green.

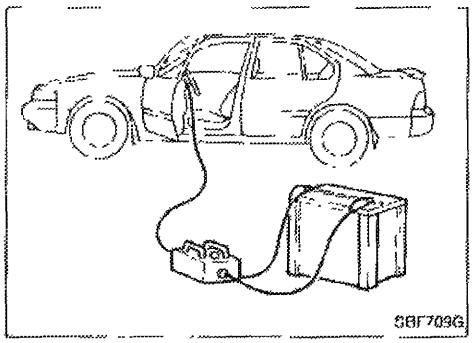


CONNECTING TO AIR BAG AND SEAT BELT PRE-TENSIONER

- Disconnect the prepared battery cable.
- Also disconnect the vehicle battery ground cable and wait 10 minutes.
- Disconnect air bag module and seat belt pre-tensioner connector.
- Connect deployment tool connector to air bag module or seat belt pre-tensioner.
  For front passenger air bag and seat belt pre-tensioners, attach the adapters to the tool connector.

CAUTION:
Make sure the deployment tool is disconnected from the battery before you make this connection.

- Reconnect the battery cable to the prepared battery.
- The lamp on the right side of the tool, marked "deployment tool power", should glow green, not red.



Scrapping Air Bag and Seat Belt Pre-tensioners (Cont'd)

DEPLOYMENT

Press the button on the deployment tool. The left side lamp on the tool, marked "air bag connector voltage", will illuminate and the air bag will deploy.

DISPOSAL

- Remove steering wheel side lids. Use the special "torx" bit to remove the air bag module from the steering wheel. Place it into a sealed vinyl bag for disposal.

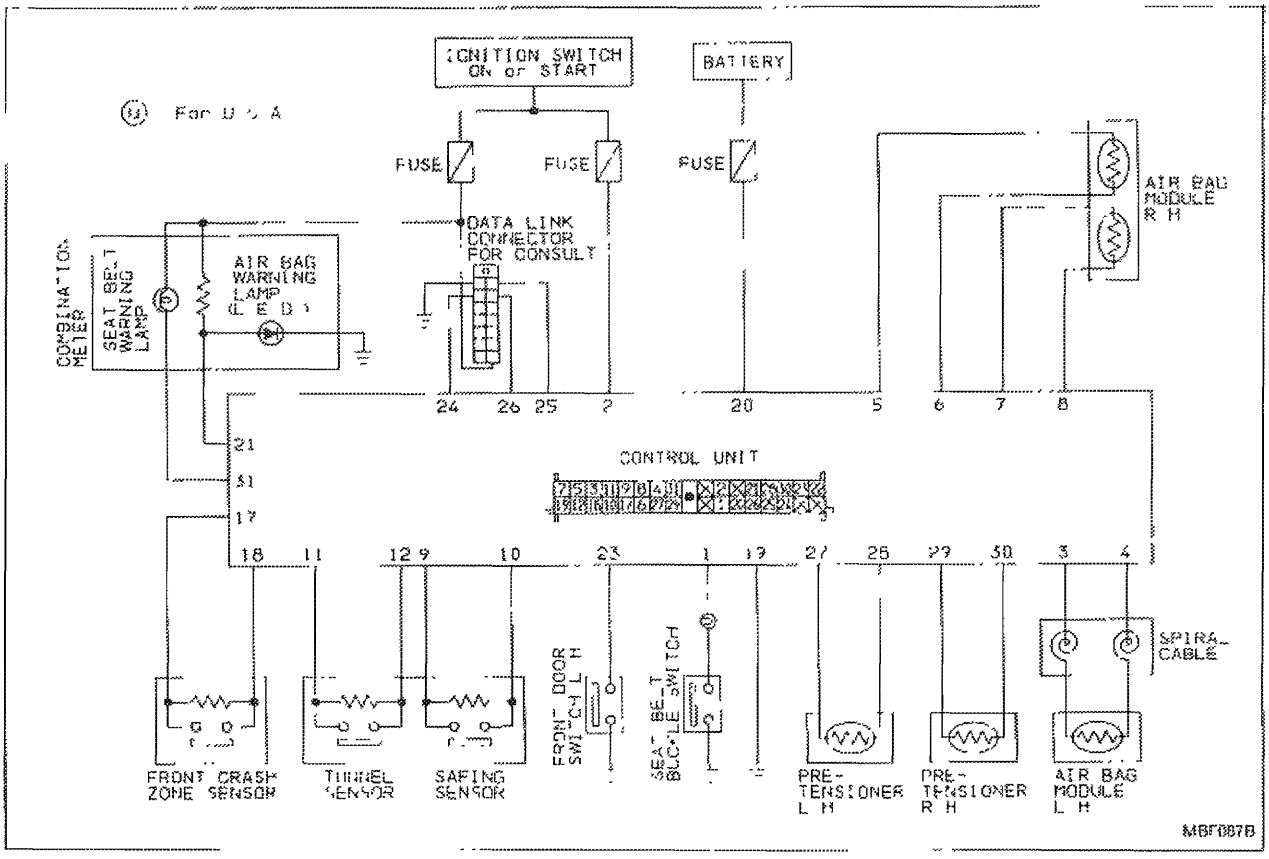
CAUTION:

- **When deploying air bag, ensure vehicle is empty.**
- **No poisonous gas is produced upon air bag deployment. However, be careful not to inhale gas since it irritates throat and can cause choking.**
- **Due to heat, leave air bag module unattended for more than 30 minutes and leave seat belt pre-tensioner unattended for more than 10 minutes after deployment.**
- **Do not attempt to disassemble air bag module and seat belt pre-tensioner.**
- **Air bag module and seat belt pre-tensioner can not be re-used.**
- **Never apply water to a deployed air bag module.**
- **Be sure to wear gloves when handling a deployed air bag module.**

Contents

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Diagnostic Procedure 2 ..... BF-56
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Diagnostic Procedure 3 ..... BF-57
SYMPTOM: Warning lamp does not go off
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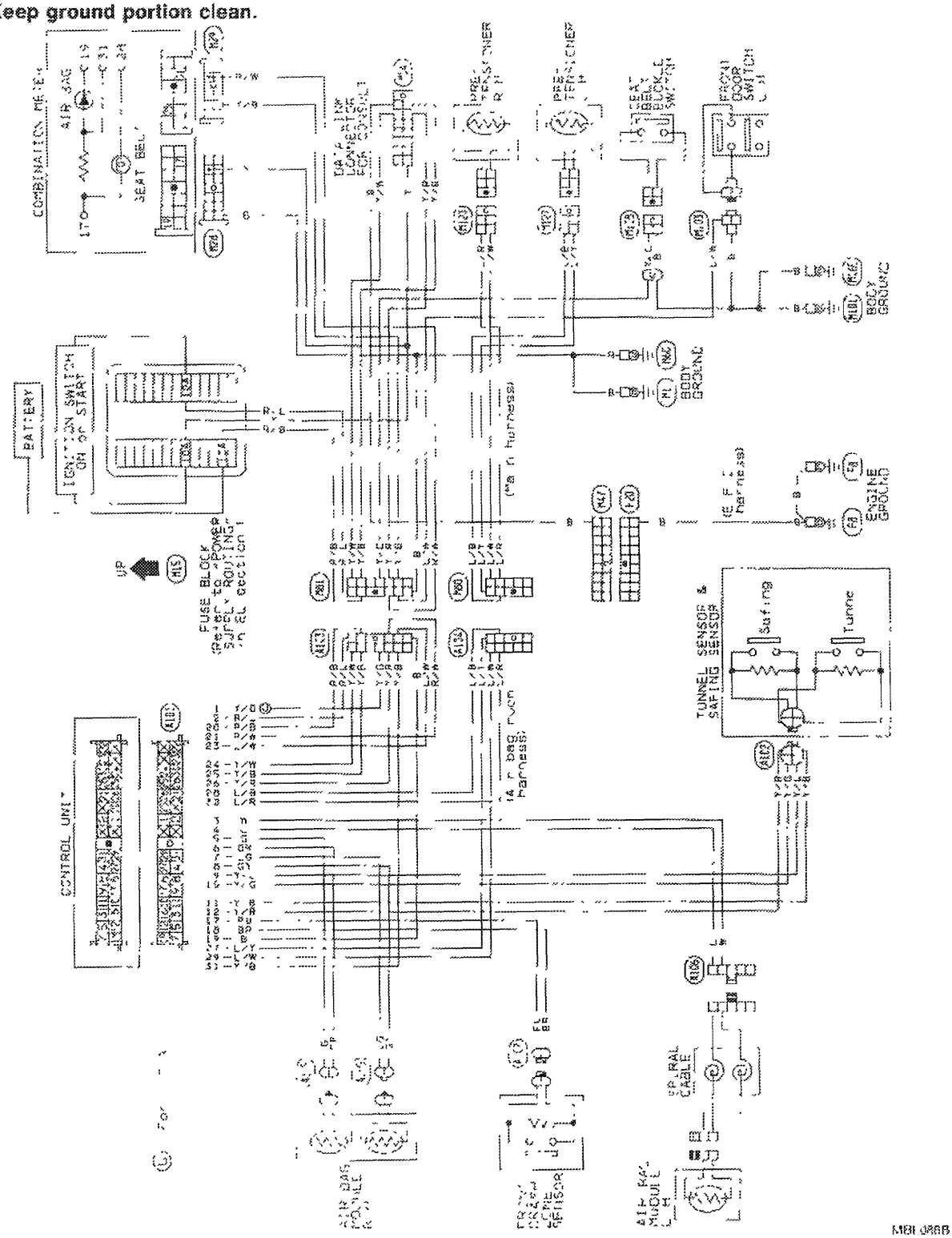
Schematic

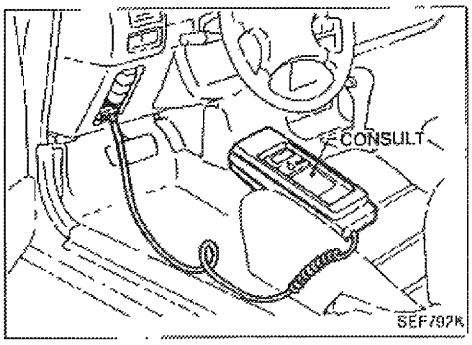


Wiring Diagram

CAUTION:

- **Do not use a circuit tester to check SRS "Air Bag" harness connectors. The wiring harness and connectors have yellow outer insulation for easy identification.**
- **Do not attempt to repair, splice or modify the SRS "Air Bag" wiring harness. If the harness is damaged, replace it with a new one.**
- **Keep ground portion clean.**



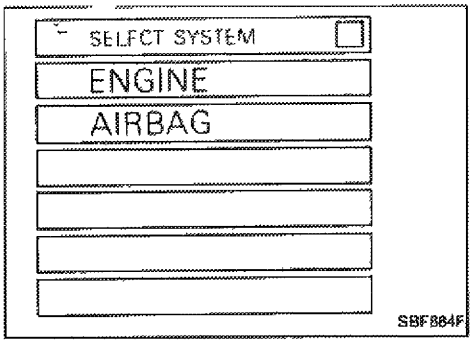


Self-diagnosis

USING CONSULT

The self-diagnosis results can be read by CONSULT, as follows:

1. Connect "CONSULT" to data link connector for CONSULT. (Data link connector for CONSULT is located in the fuse box.)
2. Turn ignition switch to "ON". (When CONSULT is connected, the "AIR BAG" warning lamp will be turned to present diagnosis mode)
3. Touch "START" to operate "CONSULT".
4. Touch "AIR BAG" to choose air bag system.
5. Touch "SELF DIAG RESULTS" to read self-diagnosis results.
6. Problem codes are displayed on "SELF DIAG RESULT 1" (first page — present mode). The problem code last indicated is displayed on "SELF DIAG RESULT 2" (second page — initial mode).
7. When "PRINT" is pressed, information displayed on "SELF DIAG RESULTS 1 and 2" is printed out.
8. After repairing malfunctioning parts, press "ERASE" to clear self-diagnosis results.
   - **After repairing malfunctioning parts, attempt to clear self-diagnosis results from memory.**
   - **If malfunctioning parts are not completely repaired, self-diagnosis results remain stored in memory.**
9. Push Back Key of CONSULT until SELECT SYSTEM mode appears to make "SELF-DIAGNOSIS" user mode.
10. Push the power off switch
11. Turn off ignition switch.



Self-diagnosis (Cont'd)

Self-diagnosis results

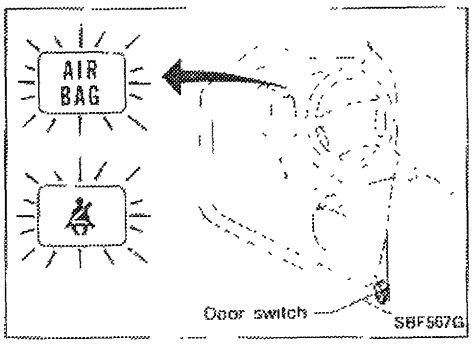
Failure parts group	Explanation	Repair order * Recheck SRS at each replacement.
NO SELF DIAGNOSTIC FAILURE INDICATED.	Normal. The SRS system is in good order.	—
SAFING SENSOR [OPEN/UPR-VB-SHORT]	The circuit for the safing sensor is open or the wire from the control unit (terminal No. 9) to the safing sensor is shorted to some power supply circuit.	1. Visually check the wiring harness connections. 2. Replace the safing sensor. (safing sensor and tunnel sensor unit) 3. Replace the control unit 4. Replace the main harness.
SAFING SENSOR [SHORT/UPR-GND-SHORT]	Both the wires for the safing sensor are shorted or the wire from the control unit (terminal No. 9) to the safing sensor is shorted to ground.	
AIRBAG MODULE [OPEN]	The circuit for driver's air bag module is open. (including the spiral cable)	1. Visually check the wiring harness connections. 2. Replace the spiral cable. 3. Replace driver's air bag module. (Before disposing of it, it must be deployed.) 4. Replace the control unit. 5. Replace the main harness.
AIRBAG MODULE [VB-SHORT]	The circuit for driver's air bag module is shorted to some power supply circuit (including the spiral cable)	
AIRBAG MODULE [GND-SHORT]	The circuit for driver's air bag module is shorted to ground. (including the spiral cable)	
AIRBAG MODULE [SHORT]	The circuits for driver's air bag module are shorted to each other.	
ASSIST A/B MODULE 1 [OPEN]	The circuit for front passenger air bag module 1 is open.	1. Visually check the wiring harness connections. 2. Replace front passenger air bag module. (Before disposing of it, it must be deployed.) 3. Replace the control unit 4. Replace the main harness
ASSIST A/B MODULE 1 [VB-SHORT]	The circuit for front passenger air bag module 1 is shorted to some power supply circuit.	
ASSIST A/B MODULE 1 [GND-SHORT]	The circuit for front passenger air bag module 1 is shorted to ground.	
ASSIST A/B MODULE 1 [SHORT]	The circuits for front passenger air bag module 1 are shorted to each other	
ASSIST A/B MODULE 2 [OPEN]	The circuit for front passenger air bag module 2 is open.	1. Visually check the wiring harness connections. 2. Replace front passenger air bag module. (Before disposing of it, it must be deployed.) 3. Replace the control unit 4. Replace the main harness
ASSIST A/B MODULE 2 [VB-SHORT]	The circuit for front passenger air bag module 2 is shorted to some power supply circuit.	
ASSIST A/B MODULE 2 [GND-SHORT]	The circuit for front passenger air bag module 2 is shorted to ground.	
ASSIST A/B MODULE 2 [SHORT]	The circuits for front passenger air bag module 2 are shorted to each other	

Self-diagnosis (Cont'd)

Failure parts group	Explanation	Repair order * Recheck SRS at each replacement.
TUNNEL SENSOR [OPEN/UPR-VB-SHORT]	The circuit for the tunnel sensor is open or the wire from the control unit (terminal No 11) to the tunnel sensor is shorted to some power supply circuit.	1. Visually check the wiring harness connections. 2. Replace the tunnel sensor. (safing sensor and tunnel sensor unit) 3 Replace the control unit 4 Replace the main harness.
TUNNEL SENSOR [SHORT/UPR-GND-SHORT]	Both the wires for the tunnel sensor are shorted or the wire from the control unit (terminal No. 11) to the tunnel sensor is shorted to ground.	
CRASH ZONE SEN-CTR [OPEN/UPR-VB-SHORT]	The circuit for the crash zone sensor is open or the wire from the control unit (terminal No 17) to the crash zone sensor is shorted to some power supply circuit	1 Visually check the wiring harness connections 2. Replace the crash zone sensor. 3. Replace the control unit. 4. Replace the main harness.
CRASH ZONE SEN-CTR [SHORT/UPR-GND-SHORT]	Both the wires for the crash zone sensor are shorted or the wire from the control unit (terminal No. 17) to the crash zone sensor is shorted to ground	
DRIVE PRE-TENSION [OPEN/VB-SHORT]	The circuit for the driver's pre-tensioner is open or shorted to some power supply circuit.	1. Visually check the wiring harness connections 2. Replace the driver's seat belt. (Before disposing, it must be deactivated.) 3. Replace the control unit. 4. Replace the main harness.
DRIVE PRE-TENSION [GND-SHORT]	The circuit for the driver's pre-tensioner is shorted to ground.	
ASSIST PRE-TENSION [OPEN/VB-SHORT]	The circuit for the front passenger pre-tensioner is open or shorted to some power supply circuit.	1 Visually check the wiring harness connections 2 Replace the front passenger seat belt. (Before disposing, it must be deactivated.) 3 Replace the control unit 4. Replace the main harness.
ASSIST PRE-TENSION [GND-SHORT]	The circuit for the front passenger pre-tensioner is shorted to ground.	
CONTROL UNIT	The control unit (diagnostic unit) is out of order.	1. Visually check the wiring harness connections. 2. Replace the control unit. 3. Replace the main harness.
INDEFINITE FAILURES [AIR BAG]	A problem which cannot be specified occurs because more than two parts except seat belt pre-tensioners are out of order.	1. See the SELF-DIAGNOSIS RESULT 2 failure parts group [Initial], then repair as necessary. 2. Visually check the wiring harness connections. 3. Replace the control unit. 4. Replace all sensors, spiral cable and air bag modules and seat belts. 5. Replace the main harness.
INDEFINITE FAILURES [PRE-TENSIONER]	Driver's and front passenger seat belt pre-tensioners are out of order.	1 Visually check the wiring harness connections. 2 Replace the driver's and front passenger seat belts. (Before disposing, they must be deactivated.) 3. Replace the control unit. 4. Replace the main harness.

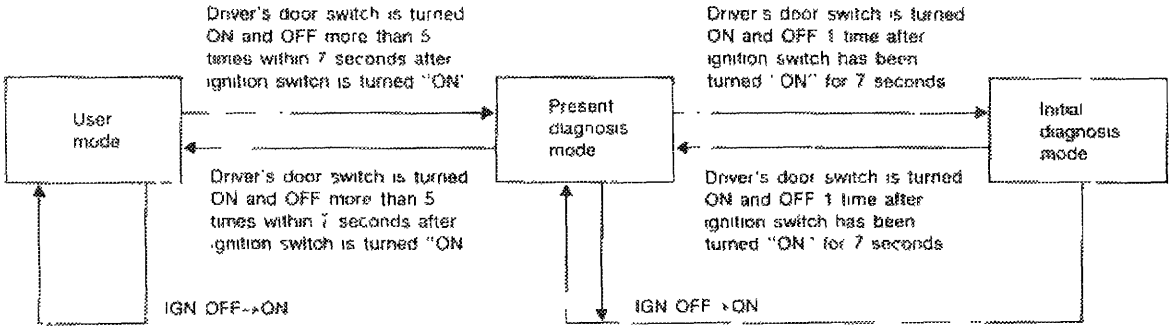
Self-diagnosis (Cont'd)

USING THE WARNING LAMP



Self-diagnosis results can be also read by using the "AIR BAG" warning lamp for SRS system except seat belt pre-tensioner. When "seat belt" warning lamp flashes, check seat belt pre-tensioner system.
The "Air bag" warning lamp operates as shown below:

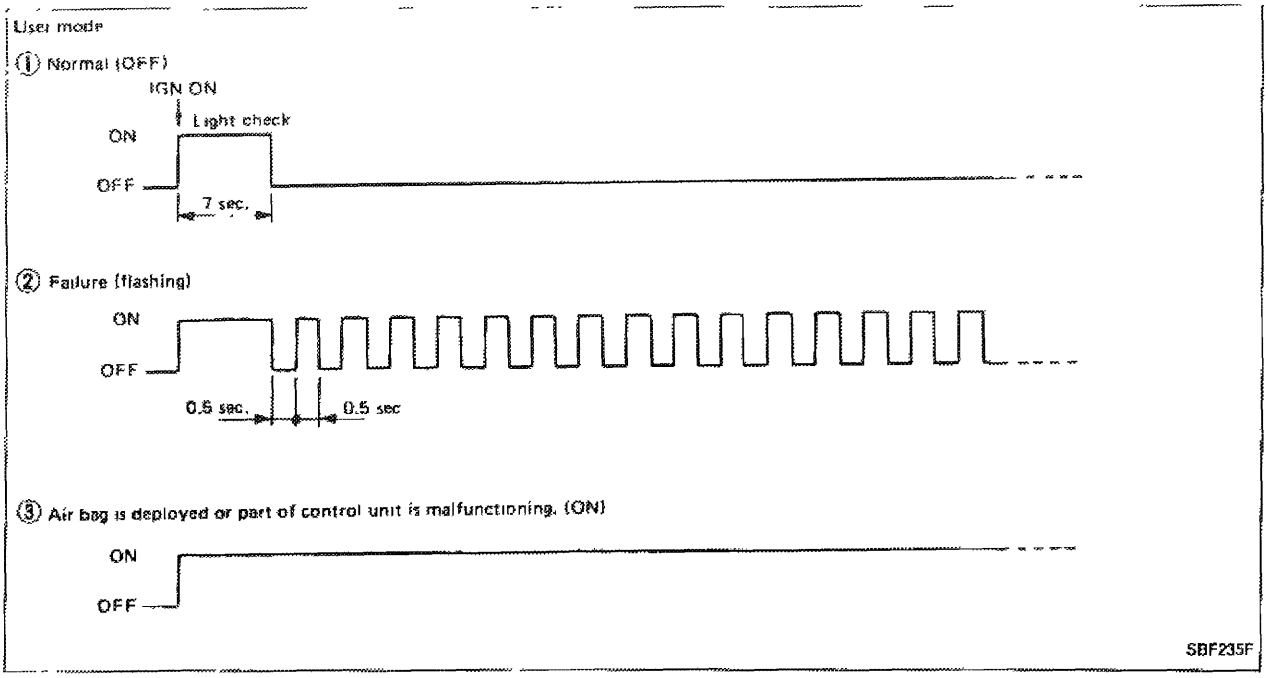
How to alternate self-diagnosis



Problem codes are displayed in present diagnosis mode (self-diagnosis result 1). The problem code last indicated is displayed in initial diagnosis mode (self-diagnosis result 2).

After the malfunctioning parts have been repaired and the system is returned to the user mode, the present diagnosis mode information, displayed as self-diagnosis results, is automatically cleared from memory.

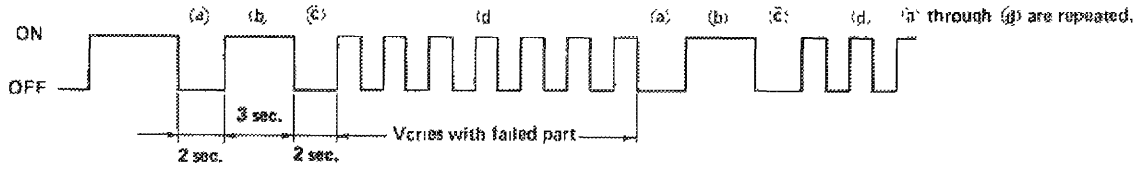
- **After repairing malfunctioning part, attempt to clear self-diagnosis results from memory.**
- **If a malfunctioning part is not completely repaired, information stored in memory will not be cleared.**



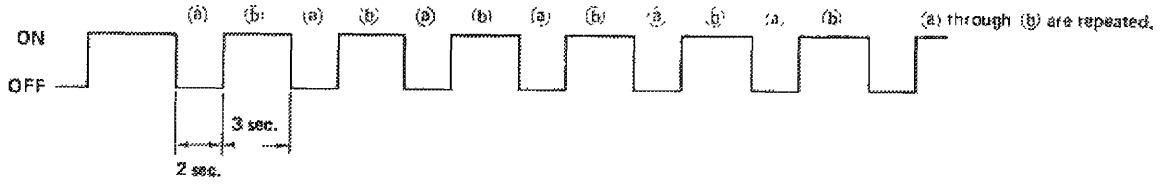
Self-diagnosis (Cont'd)

Present diagnosis mode (self diagnosis result 1)

ⓑ Start signal. Start signal identifies display modes.



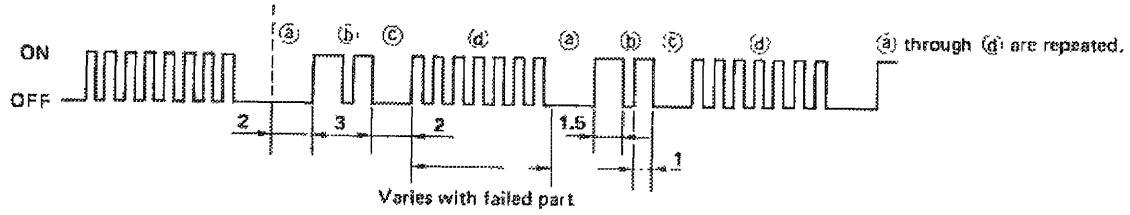
* No failure (or intermittent failure/repair completion)



SBF236F

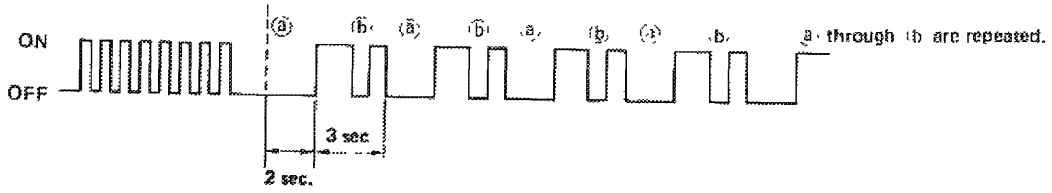
Initial diagnosis mode (self-diagnosis result 2)

ⓑ Start signal; Start signal identifies display modes.



* No failure

Unit: sec.



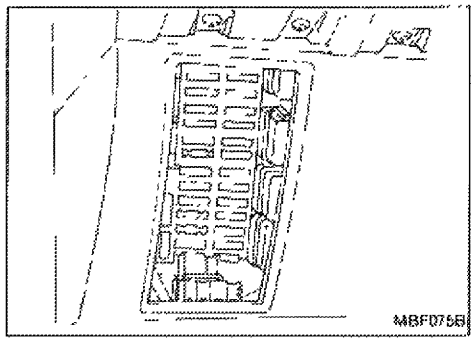
SBF237F

Self-diagnosis results in present- and initial-diagnosis modes can be identified by number of flashes ⓓ. Refer to Table on next page for failed parts.

Self-diagnosis (Cont'd)

Warning lamp flashing times and repair

Flash code (#) (# of flashes)	Explanation	Repair order * Recheck SRS at each replacement.
0	Normal. The SRS "Air Bag" is in good order	—
1	The circuit for the safing sensor is out of order	1. Visually check the wiring harness connections. 2. Replace the safing sensor. (safing sensor and tunnel sensor unit) 3 Replace the control unit. 4 Replace the main harness.
2	The circuit for the air bag module is out of order	1. Visually check the wiring harness connections. 2 Replace the spiral cable. 3 Replace the air bag module. (Before disposing of it, it must be deployed.) 4 Replace the control unit. 5. Replace the main harness
3	The circuit for the tunnel sensor is out of order.	1. Visually check the wiring harness connections 2. Replace the tunnel sensor (safing sensor and tunnel sensor unit) 3. Replace the control unit 4. Replace the main harness.
6	The circuit for the center crash zone sensor is out of order,	1. Visually check the wiring harness connections. 2. Replace the center crash zone sensor 3. Replace the control unit. 4 Replace the main harness.
7	The control unit (diagnostic unit) is out of order.	1. Visually check the wiring harness connections. 2. Replace the control unit. 3. Replace the main harness
8	More than two parts groups are out of order	1 See the SELF-DIAGNOSIS RESULT 2 failure parts group [Initial], then repair it 2 Visually check the wiring harness connections. 3. Replace the control unit. 4. Replace all sensors, spiral cable and air bag module. 5 Replace the main harness.



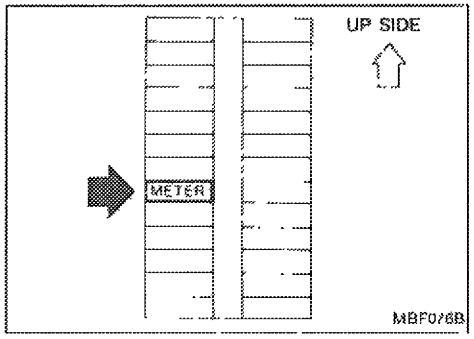
Diagnostic Procedure 1

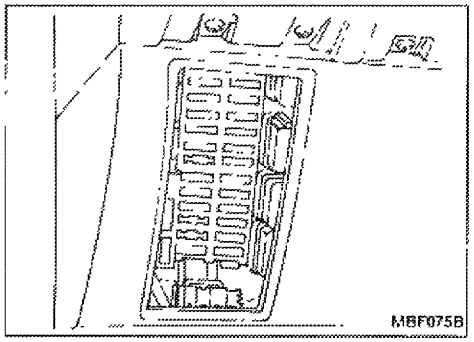
SYMPTOM: Warning lamp flashes.

Connect the CONSULT and operate it. Read the SELF-DIAGNOSIS RESULTS 1 and 2 → Refer to SELF-DIAGNOSIS RESULTS and repair

OR

Refer to warning lamp self-diagnosis. → Refer to the number of warning lamp flashes. Repair as necessary.

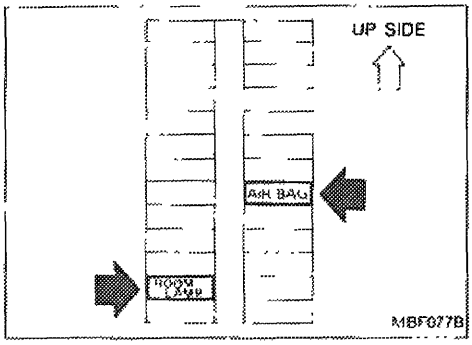


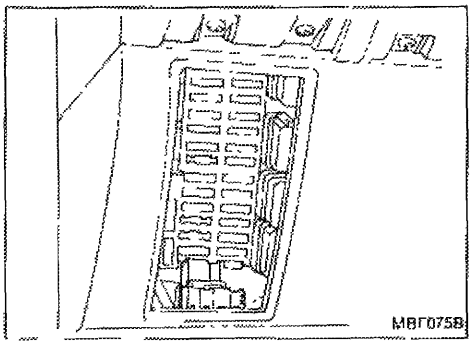


Diagnostic Procedure 2

SYMPTOM: Warning lamp does not come on.

1. Check the warning lamp fuse. — N.G → Replace the fuse
   - O.K ↓
2. Connect the CONSULT unit and begin diagnosis
   - Is "AIR BAG" displayed on the CONSULT screen? — N.G → Replace the control unit.
   - O.K ↓
3. Read the SELF-DIAGNOSIS RESULTS 1 and 2 — N.G → Refer to SELF-DIAGNOSIS RESULTS and repair
   - O.K. ↓
4. Check the warning lamp bulb. — N.G → Replace the warning lamp bulb
   - O.K ↓
5. Check the warning lamp harness connection. — N.G. → Replace the harness.
   - O.K. ↓
6. Replace the control unit.





Diagnostic Procedure 3

SYMPTOM: Warning lamp does not go off.

1. Is the air bag module deployed? — Yes → Replace the air bag module
   - No ↓
2. Check the fuses used for the SRS "Air Bag" and "ROOM LAMP". — N.G. → Replace the fuse.
   - O.K. ↓
3. Connect the CONSULT unit and operate it.
   - Is "AIR BAG" displayed on the CONSULT? — N.G → Replace the control unit.
   - O.K. ↓
4. Read the SELF-DIAGNOSIS RESULTS 1 and 2.* — N.G → Refer to SELF-DIAGNOSIS RESULTS and repair.

   OR

   Refer to the warning lamp self-diagnosis.* — N.G → Refer to the warning lamp flashing times and repair as necessary
   - O.K. ↓
5. Check the harness connection between the warning lamp and the control unit. — N.G → Replace the harness.
   - O.K. ↓
6. Replace the control unit

* Recheck SRS after each replacement.

Collision Diagnosis

To repair the SRS "AIR BAG", perform the following steps.

When air bag deploys in a collision:

① Replace the control unit.
② Remove the air bag module.
③ Check the SRS components using the table shown below:
- If the SRS components are showing any visible damage such as dents, cracks, or deformation, replace them with new ones.

④ Conduct self-diagnosis using CONSULT or "AIR BAG" warning lamp to ensure entire SRS operates properly except open circuits of air bag module and seat belt pre-tensioners.
⑤ Install new air bag module and seat belt pre-tensioners.
⑥ Conduct self-diagnosis again.

When air bag does not deploy in a collision:

① Check the SRS components using the table shown below:
- If the SRS components are showing any visible damage such as dents, cracks, or deformation, replace them with new ones.

② Conduct self-diagnosis using CONSULT or "AIR BAG" warning lamp to ensure entire SRS operates properly.

SRS inspection

Part	Air bag deployed	Air bag did NOT deploy
Air bag module (driver and passenger side)	REPLACE Install with new bolts.	1 Remove air bag module. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 2 Install air bag module into the steering wheel to check fit and alignment with the wheel. 3 No damage found, reinstall with new bolts. 4 If damaged—REPLACE. Air bag must be deployed before discarding.
Instrument panel	REPLACE Install with new bolts.	1. Check instrument panel for bending, deformities, or cracks 2 If no damage is found, reinstall with new bolts. 3 If damaged—REPLACE.
Seat belt pre-tensioner assembly	REPLACE Install with new bolts.	1 Remove seat belt pre-tensioners Check harness cover and connectors for damage, terminals for deformities, and harness for binding 2. Check belts for damage and anchors for loose mounting 3. Check retractor for smooth operation 4. If no damage is found, reinstall with new bolts. 5 If damaged—REPLACE
Control unit	REPLACE Install with new bolts.	1 Check case and bracket for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall with new bolts. 4. If damaged—REPLACE
Sensors	1. Check body and sensor brackets for deformities or rust. 2 Check sensor case for dents, cracks, scratches, deformities or rust. 3. Check sensor harness, connector, and terminals for binding, damage, or deformities. 4. If no damage is found, reinstall with new bolts 5. If damaged—REPLACE	
Steering wheel	1. Check harness (built into steering wheel) and connectors for damage, and terminals for deformities. 2 Install air bag module to check fit or alignment with steering wheel. 3 Check steering wheel for excessive free play. 4 If no damage is found reinstall with new bolts 5 If damaged—REPLACE	

Collision Diagnosis (Cont'd)

Part	Air bag deployed	Air bag did NOT deploy
Spiral cable	1 Visually check lock (engagement) pins and combination switch for damage 2 Check connectors, flat cable and protective tape for damage 3 Check steering wheel for noise, binding or heavy operation. 4 If no damage is found, reinstall with new bolts 5. If damaged—REPLACE	
Harness and Connectors	1 Check connectors for poor connection, damage, and terminals for deformities 2. Check harness for binding, chafing, cuts, or deformities. 3 If no damage is found, reinstall. 4 Damaged—REPLACE damaged section of harness Do not attempt to repair, splice or modify any SRS harness.	

HEATER & AIR CONDITIONER

SECTION HA

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MODIFICATION NOTICE:

- Refrigerant has been changed to HFC-134a (R-134a).
- Compressor has been changed to DKV-14C.
- For U.S.A., dual-pressure switch has been replaced by triple-pressure switch.

HA

When you read wiring diagrams:
- **Read GI section, "HOW TO READ WIRING DIAGRAMS".**
- **See EL section, "POWER SUPPLY ROUTING" for power distribution circuit.**

When you perform trouble diagnoses, read GI section, "HOW TO FOLLOW FLOW CHART IN TROUBLE DIAGNOSES".

Supplemental Restraint System "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner" help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, sensors, a control unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **BF section** of this Service Manual.

WARNING:

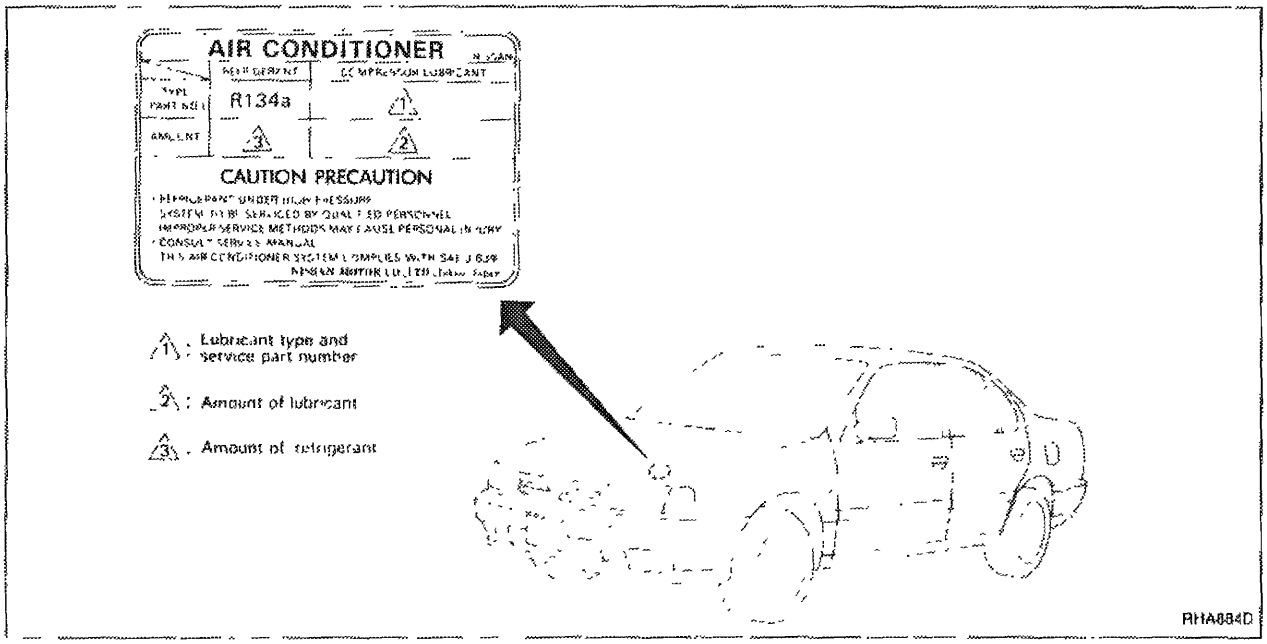
- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **All SRS air bag electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS SYSTEM.**

Introduction

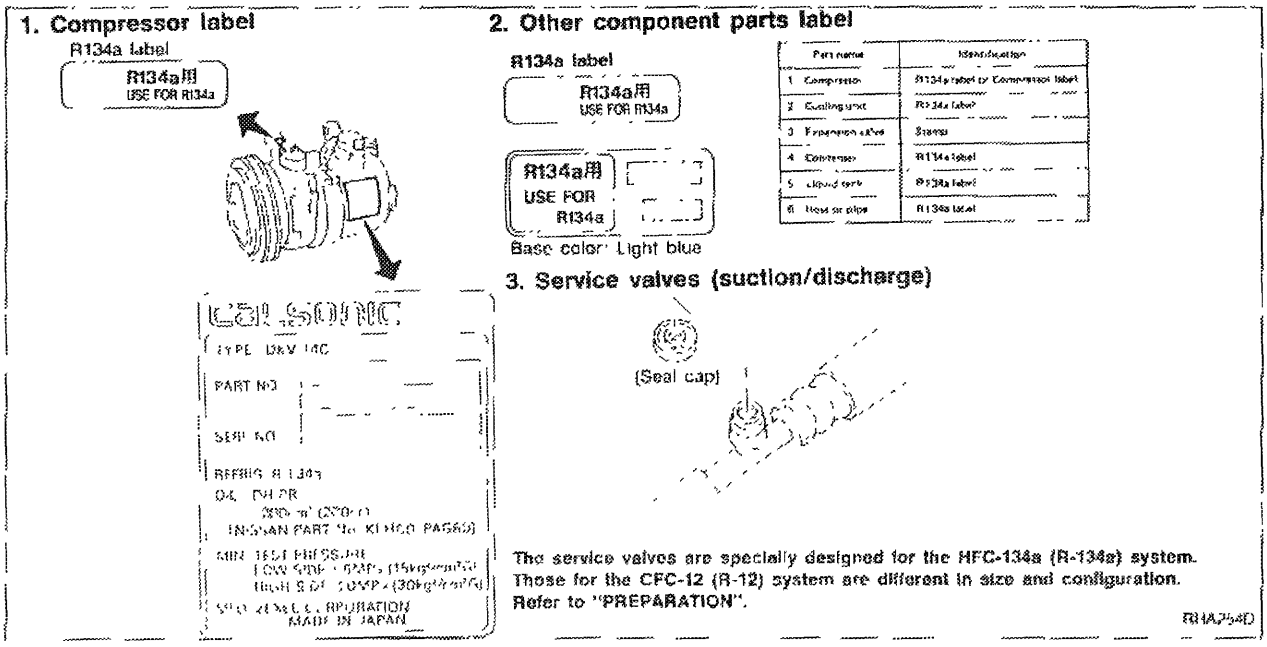
To prevent the ozone layer from being destroyed, the HFC-134a (R-134a) refrigerant has replaced the previously used CFC-12 (R-12).
The new and previous service tools, refrigerant, lubricant, etc. are not interchangeable due to differences in their physical properties and characteristics.
Always service the HFC-134a (R-134a) air conditioning system using the specified tools, lubricant and refrigerant, observing the following precautions:

Identification

IDENTIFICATION LABEL FOR VEHICLE



PARTS IDENTIFICATION



Precautions for Working with HFC-134a (R-134a)

WARNING:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant must never be mixed, even in the smallest amounts, as they are incompatible with each other. If the refrigerants are mixed, compressor failure is likely to occur.**
- **Use only specified lubrication oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubrication oil other than that specified is used, compressor failure is likely to occur.**
- **The specified HFC-134a (R-134a) lubrication oil absorbs moisture from the atmosphere at a rapid rate, therefore the following handling precautions must be observed:**
  - **a: When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
  - **b: When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Also, complete the connection of all refrigerant loop components as quickly as possible to minimize the entry of moisture into the system.**
  - **c: Use the specified lubrication oil from a sealed container only. Containers must be re-sealed immediately after dispensing the lubrication oil. Lubrication oil in containers which are not properly sealed will become moisture saturated, and such lubrication oil is no longer suitable for use and should be properly disposed of.**
  - **d: Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. To remove R-134a from the A/C system, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**
  - **e: Do not allow lubrication oil (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.**

General Refrigerant Precautions

WARNING:

- **Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Do not store or heat refrigerant containers above 52°C (125°F).**
- **Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Do not intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Do not introduce compressed air to any refrigerant container or refrigerant component.**

Precautions for Refrigerant Connection

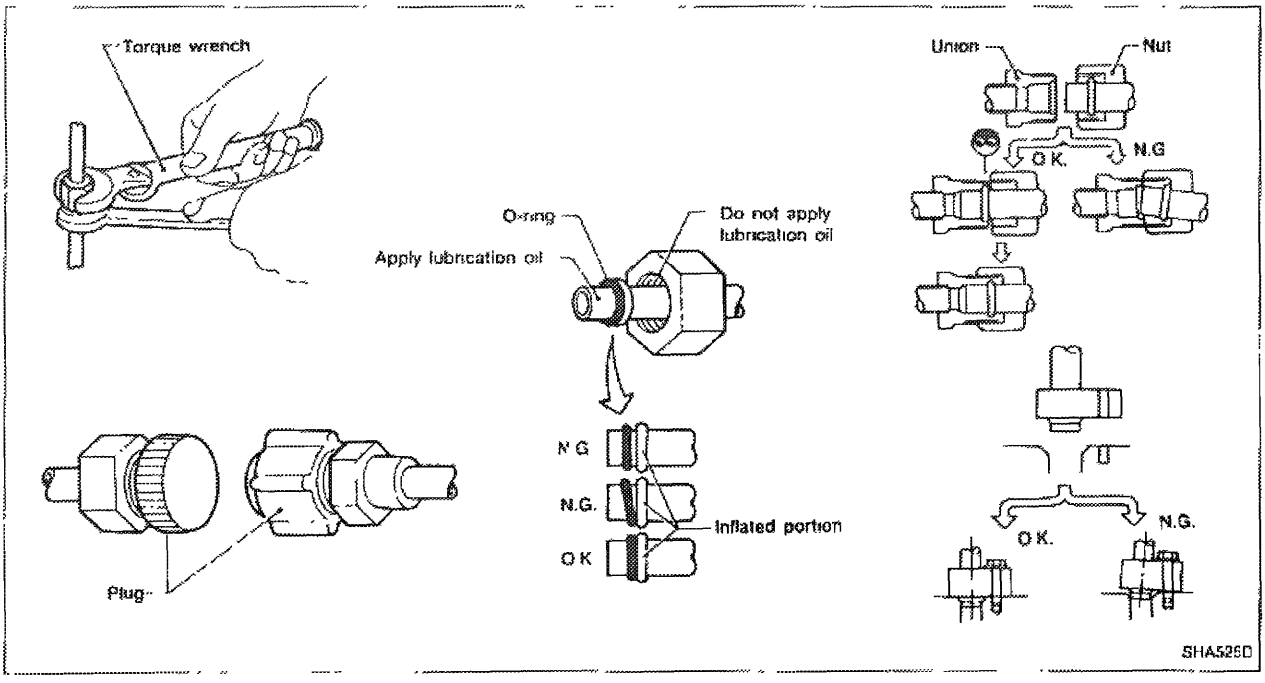
WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric. Then gradually loosen the discharge side hose fitting and remove it.

CAUTION:

When replacing or cleaning refrigerant cycle components, observe the following.

- **Do not leave compressor on its side or upside down for more than 10 minutes, as compressor oil will enter low pressure chamber.**
- **When connecting tubes, always use a torque wrench and a back-up wrench.**
- **After disconnecting tubes, plug all openings immediately to prevent entrance of dirt and moisture.**
- **When installing an air conditioner in the vehicle, the pipes must be connected as the final stage of the operation. The seal caps of the pipes and other components must not be removed until their removal is required for connection.**
- **To prevent the condensation of moisture inside A/C components, components stored in cool areas should be allowed to warm to the working area temperature before removing the seal caps.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Always replace used O-rings.**
- **When connecting tube, apply lubrication oil to portions shown in illustration. Be careful not to apply oil to threaded portion.**
  Lubrication oil name: Nissan A/C System Oil Type R
  Part number: KLH00-PAGR0
- **O-ring must be closely attached to inflated portion of tube.**
- **After inserting tube into union until O-ring is no longer visible, tighten nut to specified torque.**
- **After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.**



Precautions for Servicing Compressor

- Attach a blind plug to the suction port (low pressure) and discharge port (high pressure) of the compressor to prevent oil from leaking out and dust from getting inside.
- When the compressor is removed, store it in the same position as it is when mounted on the car.
- When replacing or repairing compressor, be sure to remove oil from the compressor and check the oil quantity extracted.
- When replacing with a new compressor, be sure to remove oil from the new compressor so that the quantity of oil remaining in the new compressor is equal to the quantity collected from the removed compressor. See the section "LUBRICATION OIL".
- Pay attention so as not to allow dirt and oil to attach on the friction surfaces between clutch and pulley. If the surface is contaminated, with oil, wipe it off by using a clean waste cloth moistened with thinner.
- After completing the compressor service operation, be sure to rotate the compressor shaft more than five turns in both directions by hand to equalize oil distribution inside the compressor, then run the compressor for about one hour by idling the engine.
- When the compressor magnet clutch has been replaced, be sure to check the magnet clutch for normal operation by applying voltage to the clutch.

Refrigeration Cycle

REFRIGERANT FLOW

The refrigerant flows in the standard pattern, that is, through the compressor, the condenser, the liquid tank, through the 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.

FREEZE PROTECTION

The compressor cycles on and off to maintain the evaporator temperature within a specified range. When the evaporator coil temperature falls below a specified point, the thermo control amplifier interrupts the compressor operation. When the evaporator coil temperature rises above the specification, the thermo control amplifier allows compressor operation.

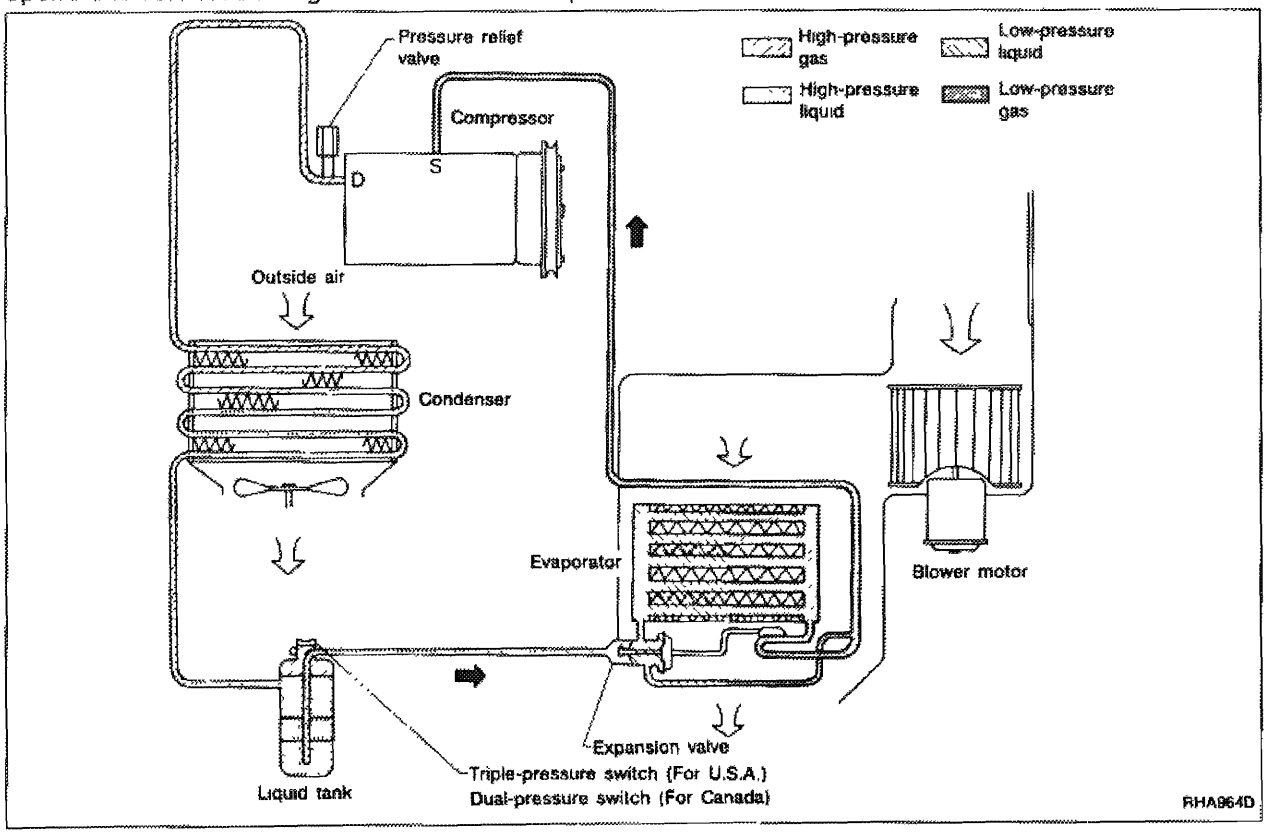
REFRIGERANT SYSTEM PROTECTION

Triple-pressure switch (For U.S.A.) or Dual-pressure switch (For Canada)

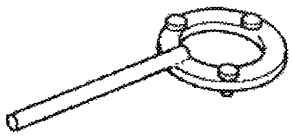
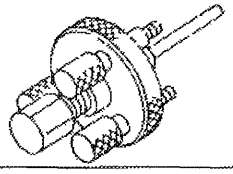
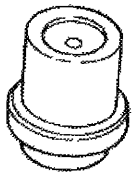
The refrigerant system is protected against excessively high or low pressures by the triple or dual-pressure switch, located on the liquid tank. If the system pressure rises above, or falls below the specifications, the triple or dual-pressure switch opens to interrupt the compressor operation. Operate the radiator fan motor. (U.S.A. model only)

Pressure relief valve

The refrigerant system is also protected by a pressure relief valve, located on the end of high flexible hose near compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 3,727 kPa (38 kg/cm^2, 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

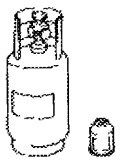
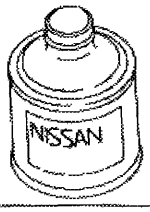
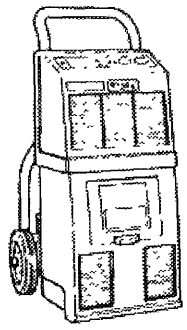
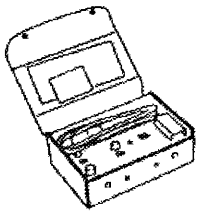


Special Service Tools

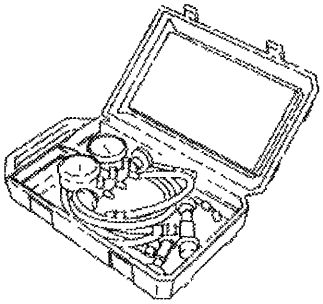
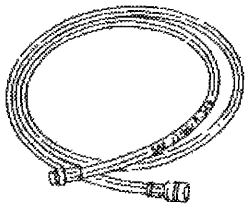
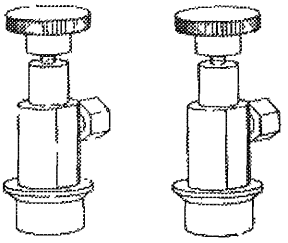
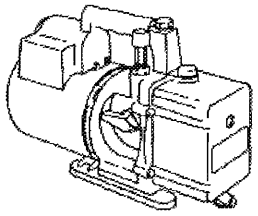
Tool number (Kent-Moore No.) Tool name	Description	
KV99231260 (J-38874) Clutch disc wrench		Removing shaft nut and clutch disc
KV99232340 (J-38874) Clutch disc puller		Removing clutch disc
KV99234330 (J-39024) Pulley installer		Installing pulley
KV99233130 (J-39023) Center pulley puller		Removing pulley

HFC-134a (R-134a) Service Tools and Equipment

It is important to understand that HFC-134a (R-134a) refrigerant, and the specified lubrication oil which must be used with HFC-134a (R-134a), must never be mixed with CFC-12 (R-12) refrigerant and/or the CFC-12 (R-12) lubrication oil.
This means that separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubrication oil.
To prevent the mixing of refrigerants/lubrication oils, refrigerant container fittings, service hose fittings, and service equipment fittings (equipment which handles refrigerant and/or lubrication oil) are different between CFC-12 (R-12) and HFC-134a (R-134a).
Adapters to convert from one size fitting to the other must never be used: refrigerant/lubrication oil contamination will occur and compressor failure will result.

Tool number (Kent-Moore No.) Tool name	Description	Note
HFC-134a (R-134a) refrigerant	 RHA259D	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2"-16 ACME
KLH00-PAGR0 (—) Nissan A/C System Oil Type R	 RHA260D	Type: Poly alkyline glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotor plate (piston) compressors (Nissan only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-NI) Recovery/Recycling equipment (ACR4)	 RHA261D	Function: Refrigerant Recovery and Recycling and Recharging
(J-39400) Electrical leak detector	 RHA267D	Power supply: • DC 12 V (Cigarette lighter)

HFC-134a (R-134a) Service Tools and Equipment (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	Note
(J-39183) Manifold gauge set (with hoses and couplers)	 RHA262D	Identification: • The gauge face indicates R-134a Fitting size: Thread size • 1/2"-16 ACME
Service hoses • High side hose (J-39501-72) • Low side hose (J-39502-72) • Utility hose (J-39476-72)	 RHA263D	Hose color: • Low hose: Blue with black stripe • High hose: Red with black stripe • Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: • 1/2"-16 ACME
Service couplers • High side coupler (J-39500-20) • Low side coupler (J-39500-24)	 RHA264D	Hose fitting to service hose • M14 x 1.5 fitting is optional or permanently attached
(J-39650) Refrigerant weight scale	 RHA265D	For measuring of refrigerant Fitting size: Thread size • 1/2"-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)	 RHA266D	Capacity: • Air displacement: 4 CFM • Micron rating: 20 microns • Oil capacity: 482 g (17 oz) Fitting size: Thread size • 1/2"-16 ACME

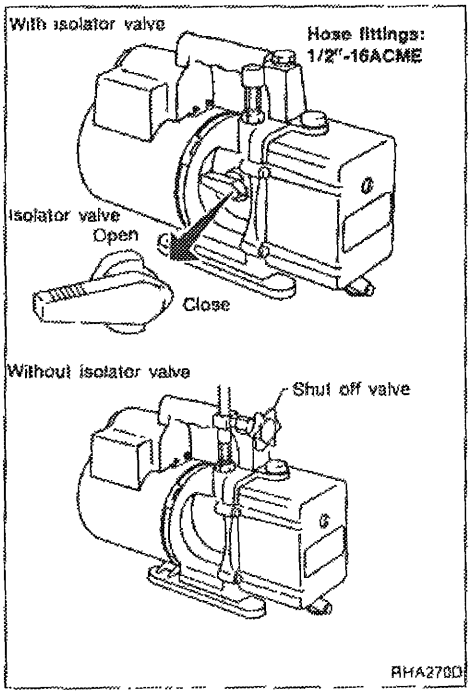
Precautions for Service Equipment

RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturers instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRONIC LEAK DETECTOR

Be certain to follow the manufactures instructions for tester operation and tester maintenance.



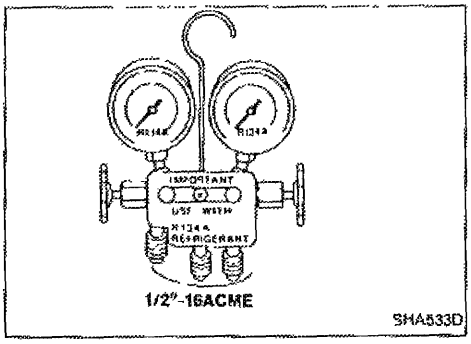
VACUUM PUMP

The lubrication oil contained inside the vacuum pump is not compatible with the specified lubrication oil for HFC-134a (R-134a) A/C systems. Since the vent side of the vacuum pump is exposed to atmospheric pressure, it is possible for the vacuum pump lubrication oil to migrate out of the pump into the service hose if the pump is switched off after evacuation (vacuuming) and the service hose is not isolated from the vacuum pump.

To prevent the migration of vacuum pump lubrication oil into service hoses, it is necessary to use a valve (which can be manually opened or closed) near the connection of the service hose to the pump.

- On a vacuum pump which is equipped with an isolator valve (usually part of the vacuum pump), closing this valve will isolate the service hose from the pump.
- For pumps without an isolator valve, be certain that the service hose is equipped with a manual shut off valve near the pump end of the hose.
- Hoses which contain an automatic shut off valve at the end of the service hose must be disconnected from the vacuum pump to prevent the migration of lubrication oil: as long as the hose is connected, the valve is open and lubrication oil may migrate.

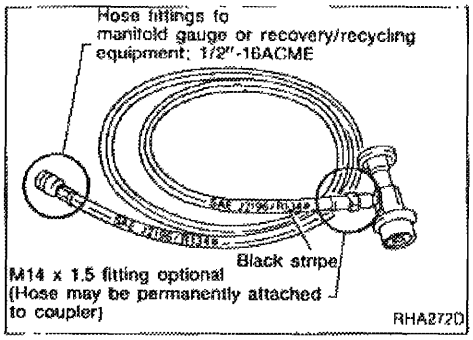
One-way valves which open when vacuum is applied and close under a no vacuum condition are not recommended, because this valve may restrict the pump's ability to pull a deep vacuum.



MANIFOLD GAUGE SET

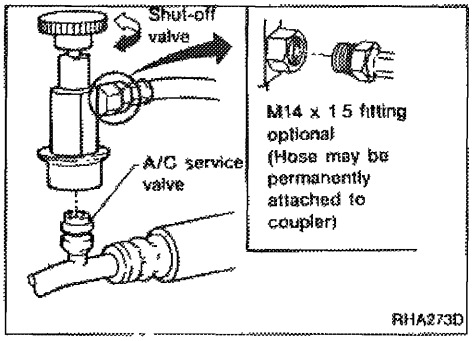
Be certain that the gauge face indicates R-134a or 134a. Be certain that the manifold gauge set has the 1/2"-16 ACME threaded connections for service hoses, and that no refrigerants other than HFC-134a (R-134a) (along with only specified lubrication oils) have been used with the manifold gauge set.

Precautions for Service Equipment (Cont'd)



SERVICE HOSES

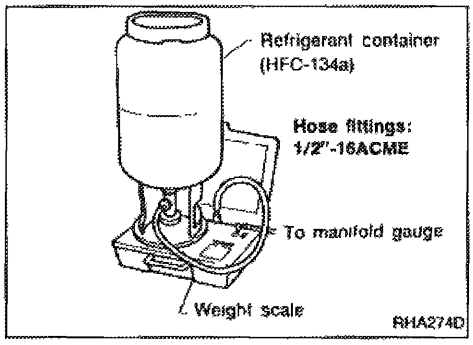
Be certain that the service hoses display the markings described (colored hose with black stripe). Be certain that all hoses include positive shut off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. Although the HFC-134a (R-134a) couplers will not secure on to the CFC-12 (R-12) system, CFC-12 (R-12) refrigerant and lubrication oil will be discharged into the HFC-134a (R-134a) coupler, causing contamination.

Shut off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close



REFRIGERANT WEIGHT SCALE

If the scale allows electronic control of the flow of refrigerant through the scale, be certain that the hose fitting size is 1/2"-16 ACME, and that no refrigerant other than HFC-134a (R-134a) (along with only specified lubrication oil) have been used with the scale.

CHARGING CYLINDER

The charging cylinder is not recommended because refrigerant may be vented into the air from the top valve of the cylinder when filling the cylinder with refrigerant. Additionally, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

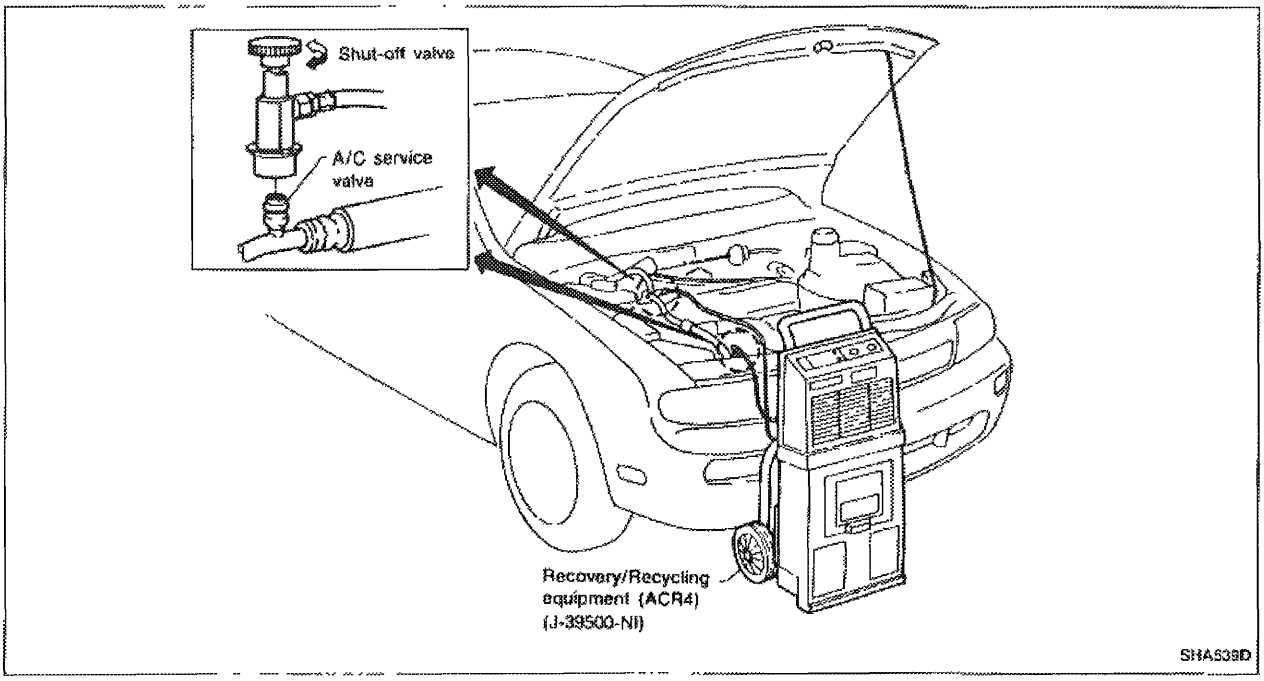
HFC-134a (R-134a) Service Procedure

SETTING OF SERVICE TOOLS AND EQUIPMENT

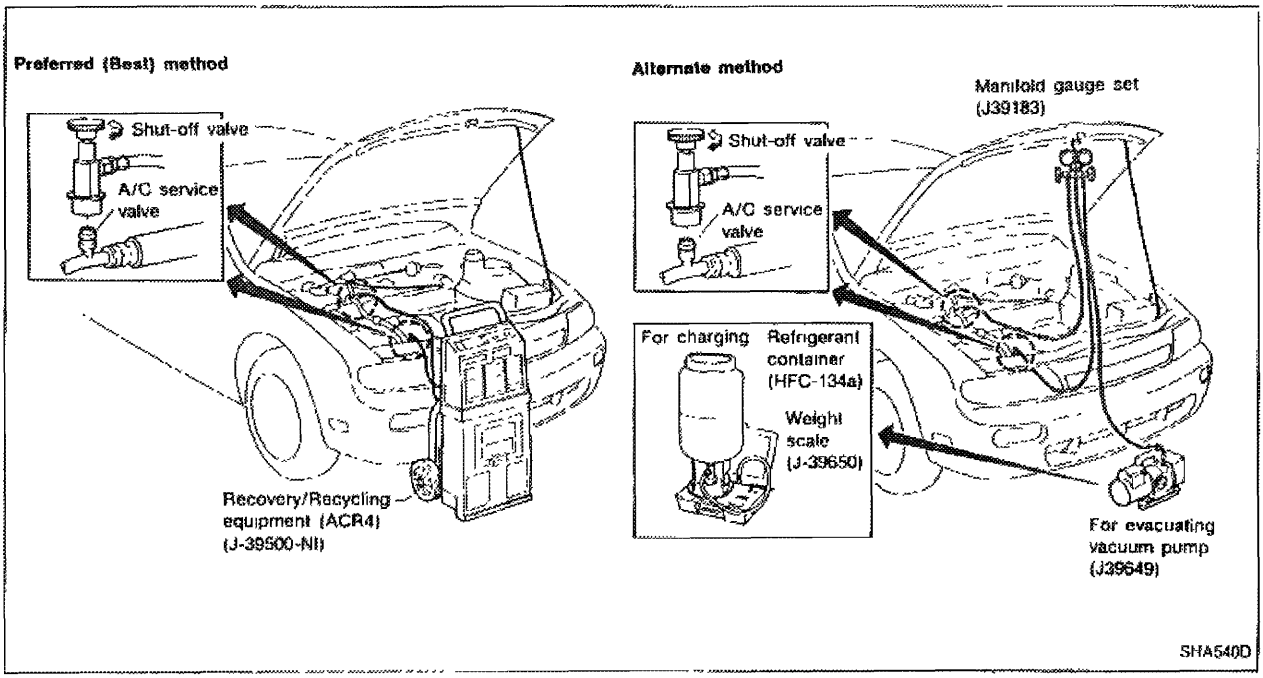
DISCHARGING REFRIGERANT

WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. To remove HFC-134a (R-134a) from the A/C system, use service equipment certified to meet the requirements of SAE J2210 [HFC-134a (R-134a) recycling equipment] or J2209 [HFC-134a (R-134a) recovery equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

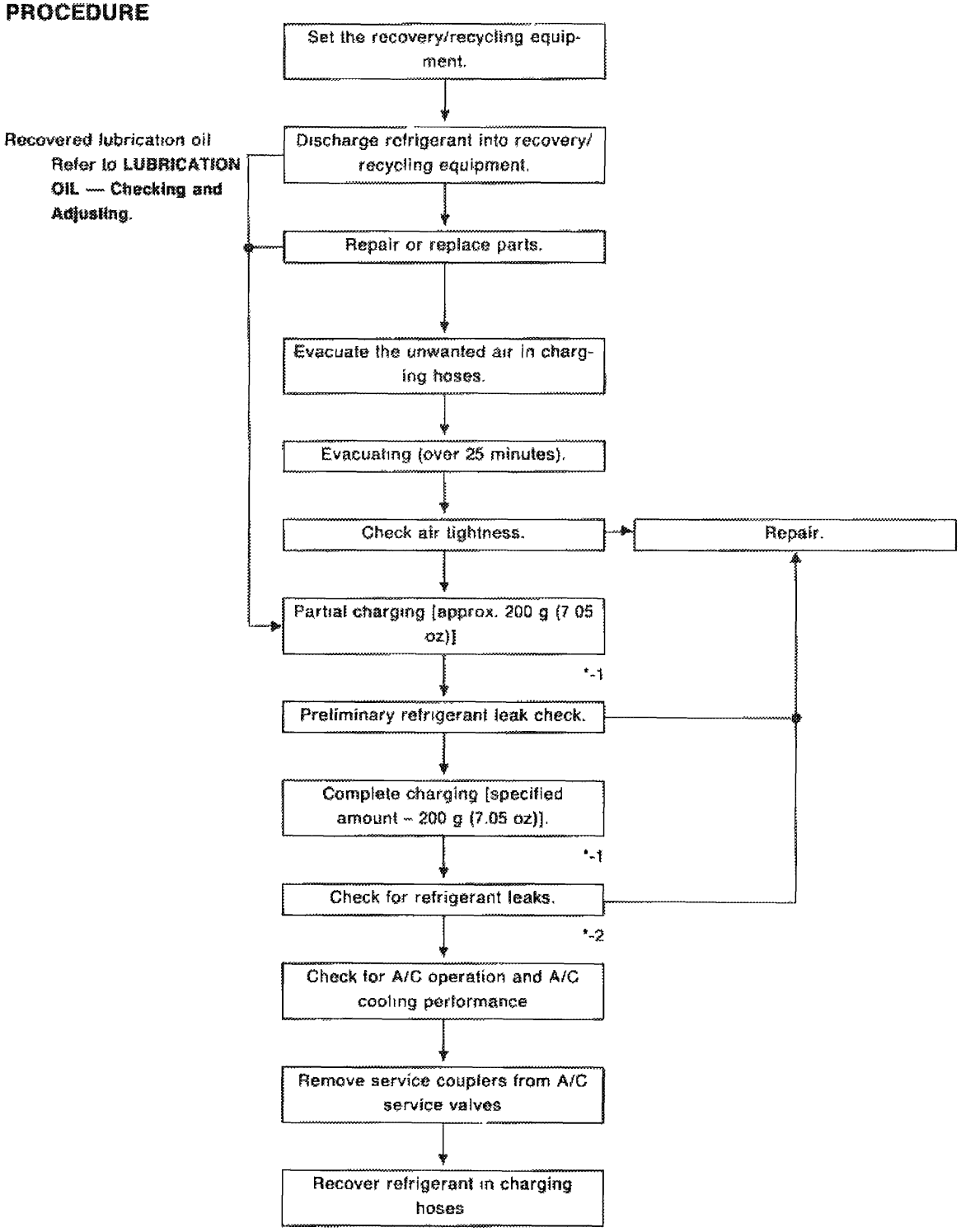


EVACUATING SYSTEM AND CHARGING REFRIGERANT



HFC-134a (R-134a) Service Procedure (Cont'd)

WORK PROCEDURE



Note: *-1 Before charging refrigerant, ensure engine is off.
*-2 Before checking for leaks, start engine to activate air conditioning system then turn in off. Service valve caps must be attached to valves (to prevent leakage).

Lubrication Oil

Name: Nissan A/C System Oil Type R
Part number: KLH00-PAGR0

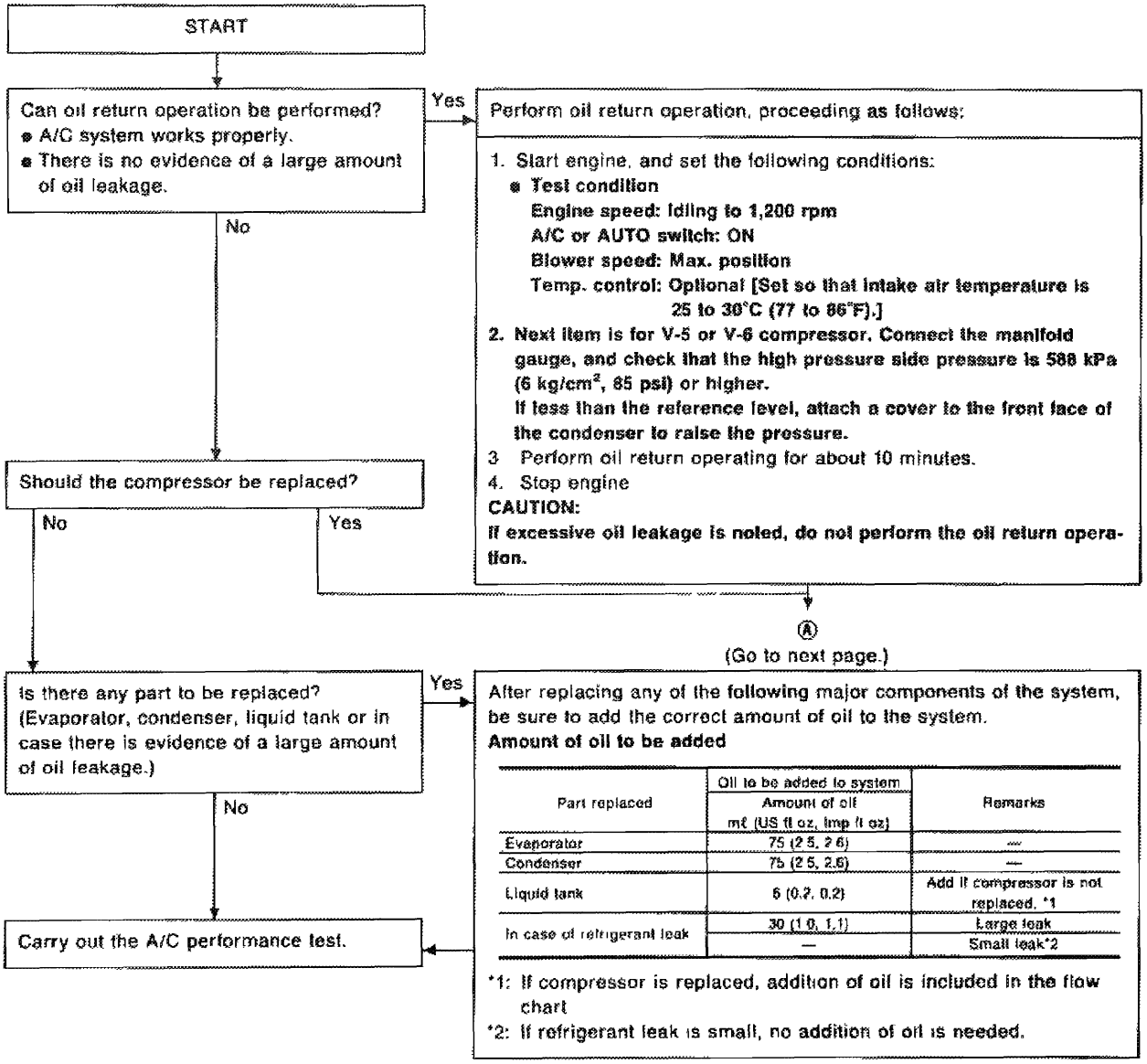
Maintenance of Oil Quantity in Compressor

The oil used to lubricate the compressor circulates through the system with the refrigerant. Whenever any component of the system is replaced or a large amount of gas leakage occurs, add oil to the compressor to maintain the specified amount.
If oil quantity is not maintained properly, the following malfunctions may result:

- Lack of oil: May lead to a seized compressor
- Excessive oil: Inadequate cooling (thermal exchange impeded)

Checking and Adjusting

Adjust the oil quantity according to the flowchart shown below.

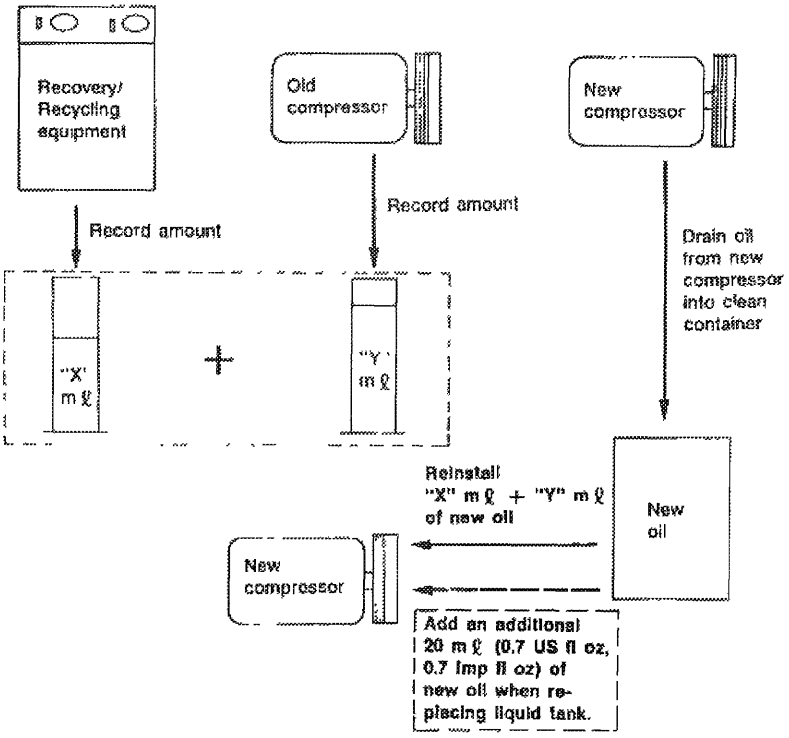


Checking and Adjusting (Cont'd)

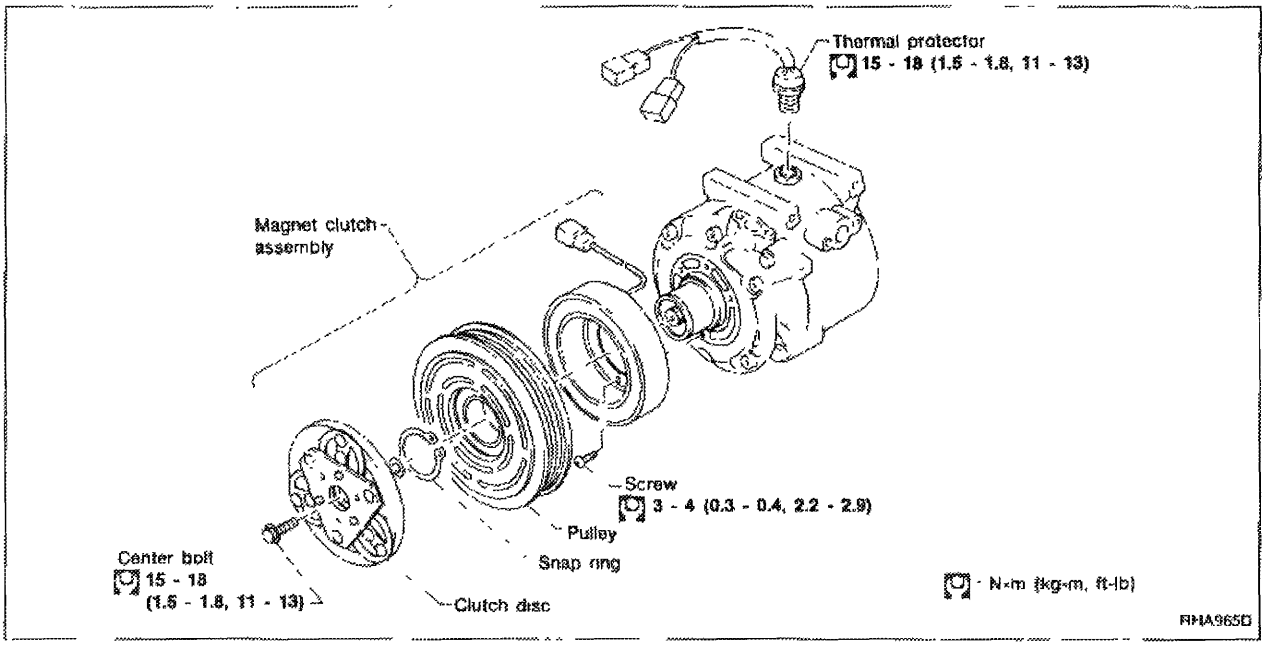
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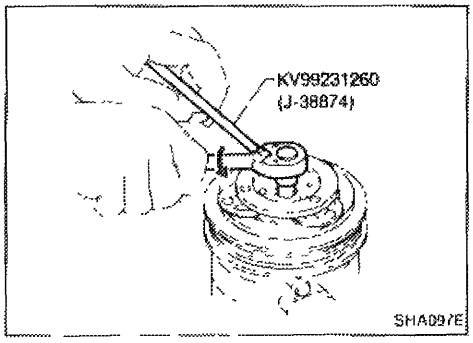
1. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure oil discharged into the recovery/recycling equipment.
2. Remove the drain plug (for V-5 or V-6, and DKS-16H compressor) and drain the oil from the "old" (removed) compressor into a graduated container, and record the amount of oil drained.
3. Remove the drain plug and drain the oil from the "new" compressor into a separate, clean container.
4. Measure an amount of the new oil equivalent to that drained from the "old" compressor, and add this oil to the "new" compressor through the drain plug or suction port opening.
5. Measure an amount of the "new" oil equivalent to that recovered during discharging, and add this oil to the "new" compressor through the drain plug or suction port opening.
6. Torque the drain plug
   V-5 or V-6 compressor: 18 - 19 N·m (1.8 - 1.9 kg-m, 13 - 14 ft-lb)
   DKS-16H compressor: 14 - 16 N·m (1.4 - 1.6 kg-m, 10 - 12 ft-lb)
7. If the liquid tank also needs to be replaced, add an additional 5 ml (0.2 US fl oz, 0.2 Imp fl oz) of oil at this time.
   Do not add this 5 ml (0.2 US fl oz, 0.2 Imp fl oz) of oil if only replacing the compressor.

Oil adjusting procedure for compressor replacement



RHA065D

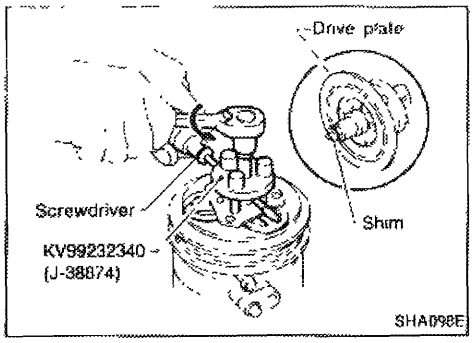




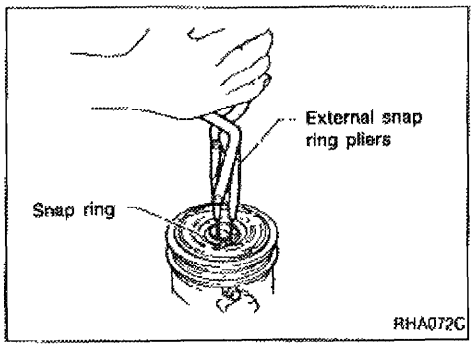
Compressor Clutch

REMOVAL

- When removing center bolt, hold clutch disc with clutch disc wrench.

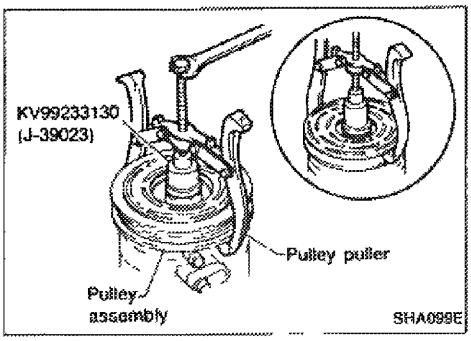


- Remove the drive plate using the drive plate puller.
  Insert the holder's three pins into the holes in the drive plate, and rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the drive plate.
  When tightening the center bolt, insert a round bar (screwdriver, etc.) between two of the pins (as shown in the left-hand figure) to prevent drive plate rotation. After removing the drive plate, remove the shims from either the drive shaft or the drive plate.

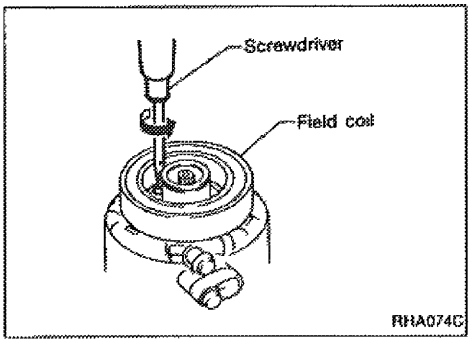


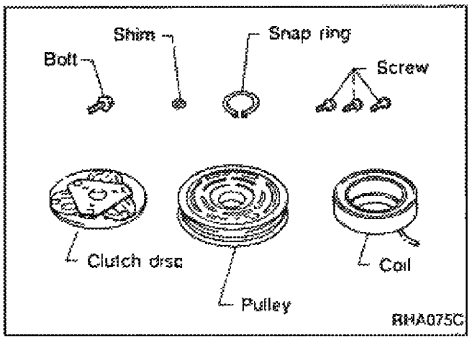
- Remove the snap ring using external snap ring pliers.

Compressor Clutch (Cont'd)



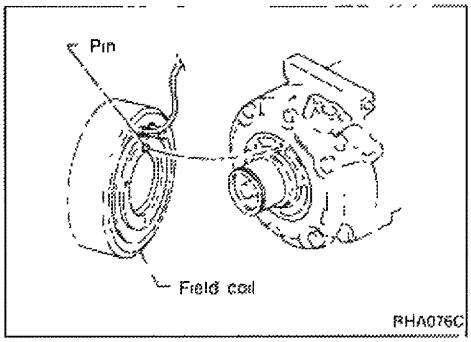
- Pulley removal
  Position the center pulley puller on the end of the drive shaft, and remove the pulley assembly using any commercially available pulley puller.
  For pressed pulleys
  To prevent deformation of the pulley groove, the puller claws should be hooked into (not under) the pulley groove.
  For machine latched pulleys
  Align the pulley puller groove with the pulley groove, and then remove the pulley assembly.
- Remove the field coil harness clip using a screwdriver.
- Remove the three field coil fixing screws and remove the field coil.





INSPECTION

Clutch disc : If the contact surface shows signs of damage due to excessive heat, the clutch disc and pulley should be replaced.
Pulley : Check the appearance of the pulley assembly. If the contact surface of the pulley shows signs of excessive grooving due to slippage, both the pulley and clutch disc should be replaced. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.
Coil : Check coil for loose connection or cracked insulation.

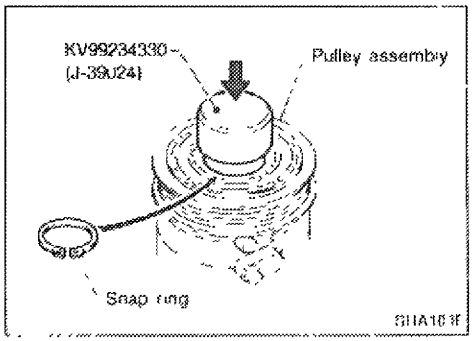


INSTALLATION

- Install the field coil.

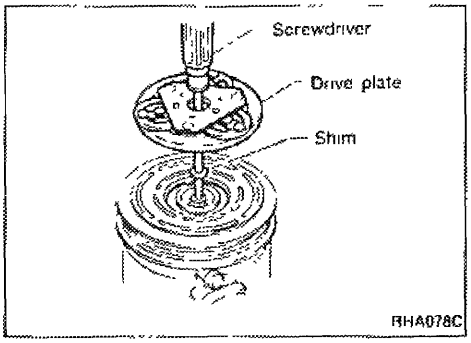
Be sure to align the coil's pin with the hole in the compressor's front head.

- Install the field coil harness clip using a screwdriver.

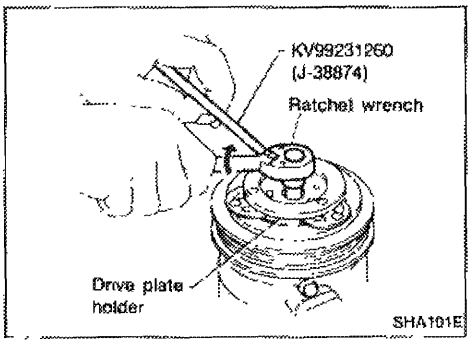


- Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.

Compressor Clutch (Cont'd)

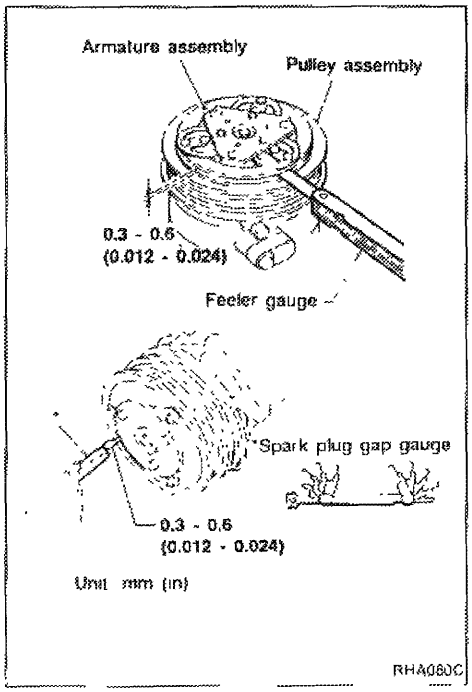


- Install the drive plate on the drive shaft, together with the original shim(s) Press the drive plate down by hand.



- Using the holder to prevent drive plate rotation, tighten the bolt to 12 to 15 N·m (1.2 to 1.5 kg-m, 9 to 11 ft-lb) torque.

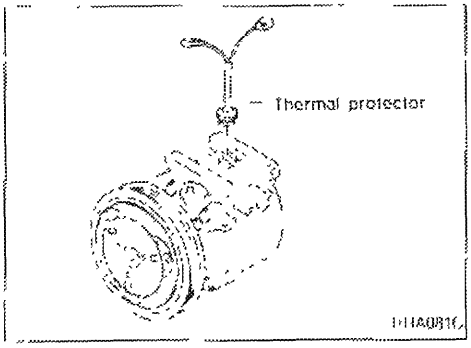
After tightening the bolt, check that the pulley rotates smoothly.



- Check clearance around the entire periphery of clutch disc.
  Disc-to-pulley clearance:
  0.3 - 0.6 mm (0.012 - 0.024 in)
  If the specified clearance is not obtained, replace adjusting spacer and readjust.

BREAK-IN OPERATION

When replacing compressor clutch assembly, do not forget break-in operation, accomplished by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque.



Thermal Protector

INSPECTION

- When servicing, do not allow foreign matter to get into compressor.
- Check continuity between two terminals.

Performance Chart

TEST CONDITION

Testing must be performed as follows:

Vehicle location: Indoors or in the shade (in a well-ventilated place)
Doors: Closed
Door window: Open
Hood: Open
TEMP.: Max. COLD
Discharge Air: Face Vent
REC switch: (Recirculation) set
FAN speed: 4-speed
Engine speed: 1,500 rpm
Time required before starting testing after air conditioner starts operating: More than 10 minutes

TEST READING

Recirculating-to-discharge air temperature table

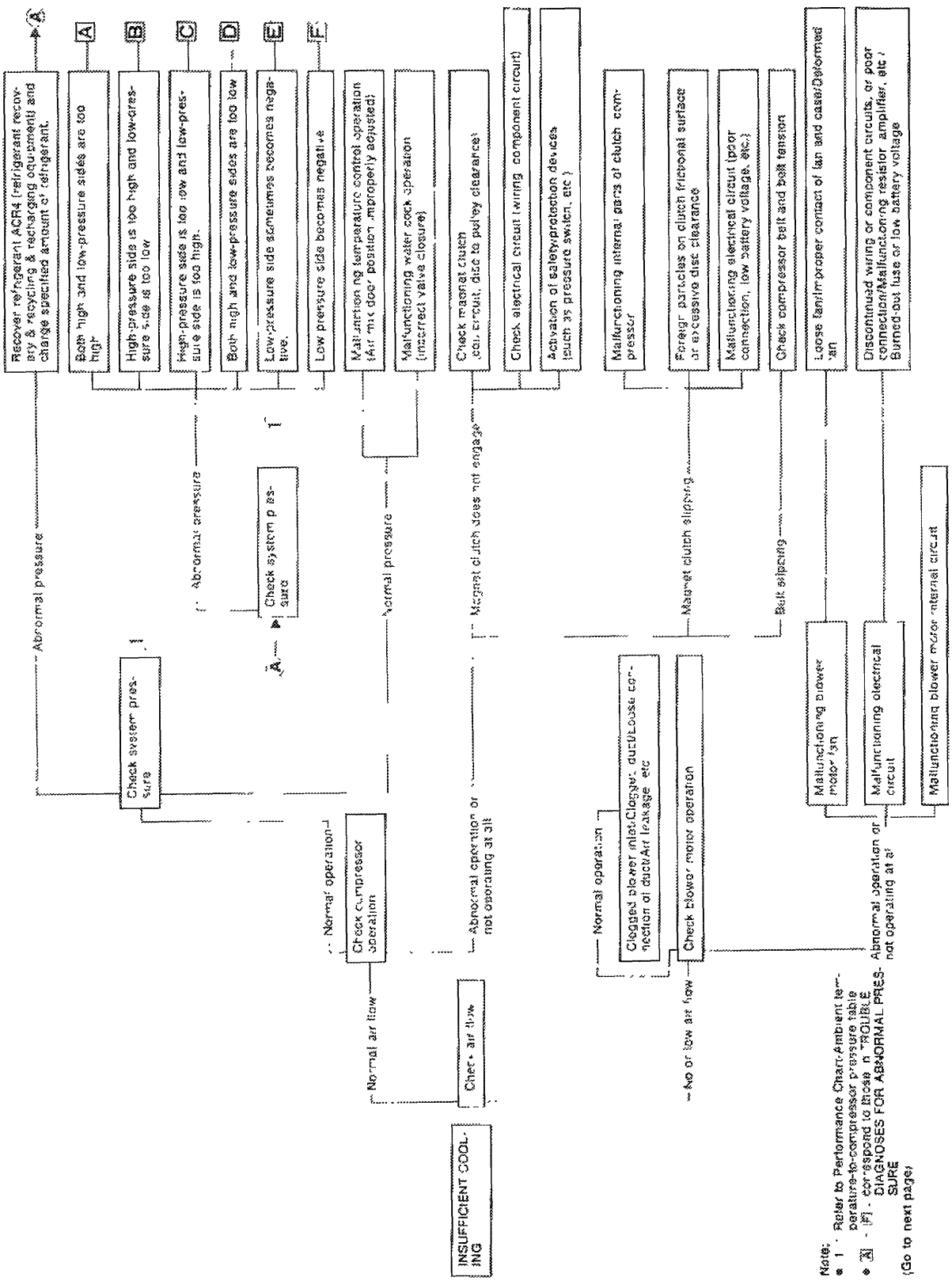
Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	7.8 - 10.4 (46 - 51)
	30 (86)	11.8 - 15.0 (53 - 59)
	35 (95)	15.8 - 19.4 (60 - 67)
60 - 70	25 (77)	10.4 - 13.0 (51 - 55)
	30 (86)	15.0 - 18.4 (59 - 65)
	35 (95)	19.4 - 24.0 (67 - 75)

Ambient air temperature-to-compressor pressure table

Ambient air		High-pressure (Discharge side) kPa (kg/cm², psi)	Low-pressure (Suction side) kPa (kg/cm², psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	25 (77)	941 - 1,138 (9.6 - 11.6, 137 - 165)	167 - 206 (1.7 - 2.1, 24 - 30)
	30 (86)	1,079 - 1,314 (11.0 - 13.4, 156 - 191)	186 - 245 (1.9 - 2.5, 27 - 36)
	35 (95)	1,216 - 1,491 (12.4 - 15.2, 176 - 216)	206 - 284 (2.1 - 2.9, 30 - 41)
	40 (104)	1,363 - 1,657 (13.9 - 16.9, 198 - 240)	226 - 324 (2.3 - 3.3, 33 - 47)

Performance Test Diagnoses

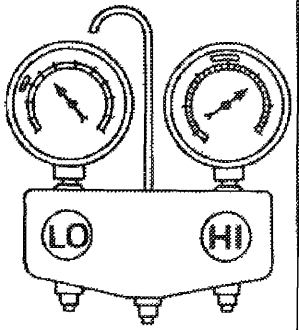
INSUFFICIENT COOLING



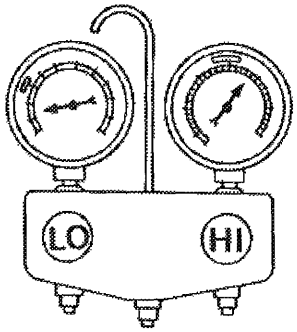
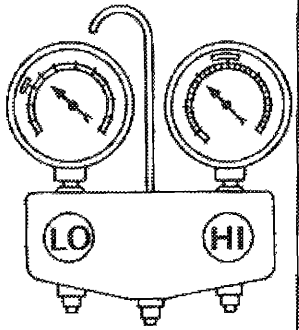
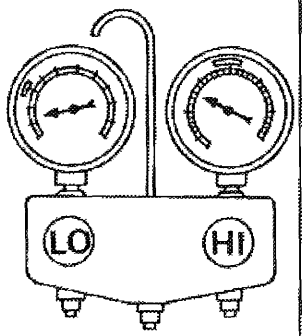
Performance Test Diagnoses (Cont'd)

TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE

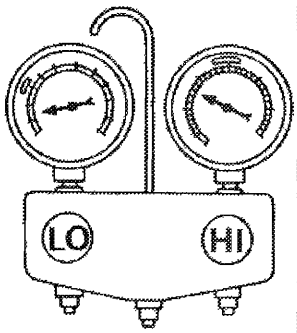
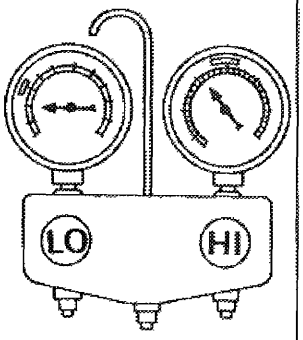
Whenever abnormal pressure of high and/or low sides of the system is noted, diagnosis must be conducted by using a manifold gauge. The large-line zone on the gauge scale (see illustrations.) shown in the following table refers to the standard (normal) pressure range for the corresponding pressure side (high or low). Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to HA-20 ("Ambient air temperature-to-compressor pressure table").

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high and low-pressure sides are too high A  AC359A	• Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by radiator or condenser fan is insufficient	Insufficient condenser cooling performance ↓ ① Condenser fins are clogged. ② Improper rotation of radiator fan or condenser fan	• Clean condenser. • Check and repair radiator or condenser fan as necessary.
	• Low-pressure pipe is not cold • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction	Check and repair each engine cooling system.
	• Areas near low-pressure pipe connection and service valves are considerably cold compared with areas near expansion valve outlet or evaporator • Plates are sometimes covered with frost.	• Excessive liquid refrigerant on low-pressure side • Excessive refrigerant discharge flow • Expansion valve is open a little compared with the specification ↓ ① Improper thermal valve installation ② Improper expansion valve adjustment	Replace expansion valve.

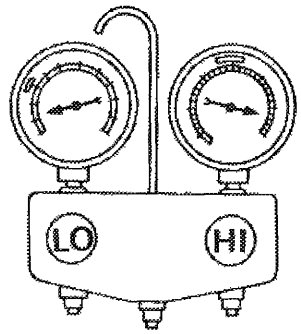
Performance Test Diagnoses (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low B  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed	• Check and repair or replace malfunctioning parts. • Check compressor oil for contamination.
High-pressure side is too low and low-pressure side is too high. C  AC356A	High and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings	Replace compressor.
	No temperature difference between high and low-pressure sides	Compressor discharge capacity does not change. (Compressor stroke is set at maximum.)	Replace compressor.
Both high- and low-pressure sides are too low. D  AC353A	• There is a big temperature difference between receiver drier outlet and inlet. Outlet temperature is extremely low. • Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is clogged a little.	• Replace liquid tank. • Check compressor oil for contamination.
	• Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. • Expansion valve inlet may be frosted. • Temperature difference occurs somewhere in high-pressure side	High-pressure pipe located between receiver drier and expansion valve is clogged.	• Check and repair malfunctioning parts. • Check compressor oil for contamination.

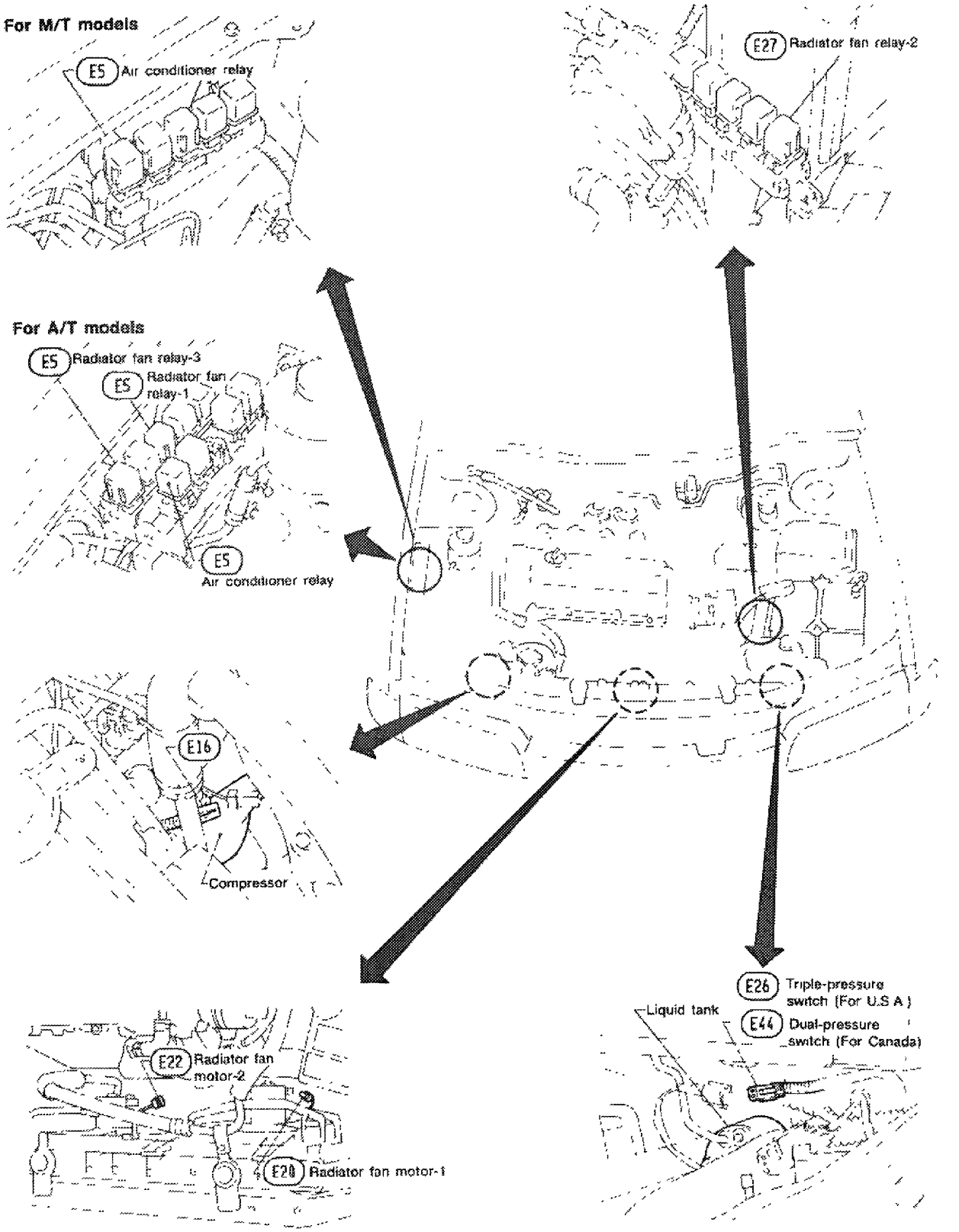
Performance Test Diagnoses (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low. D  AC353A	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted	Expansion valve closes a little compared with the specification. ↓ ① Improper expansion valve adjustment ② Malfunctioning thermal valve ③ Outlet and inlet may be clogged	• Remove foreign particles by using compressed air. • Check compressor oil for contamination.
	Areas near low-pressure pipe connection and service valve are extremely cold as compared with areas near expansion valve outlet and evaporator.	Low-pressure pipe is clogged or crushed.	• Check and repair malfunctioning parts. • Check compressor oil for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen. ↓ Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)	Replace compressor.
Low-pressure side sometimes becomes negative. E  AC354A	• Air conditioning system does not function and does not cyclically cool the compartment air. • The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet ↓ Water is mixed with refrigerant.	• Drain water from refrigerant or replace refrigerant. • Replace liquid tank

Performance Test Diagnoses (Cont'd)

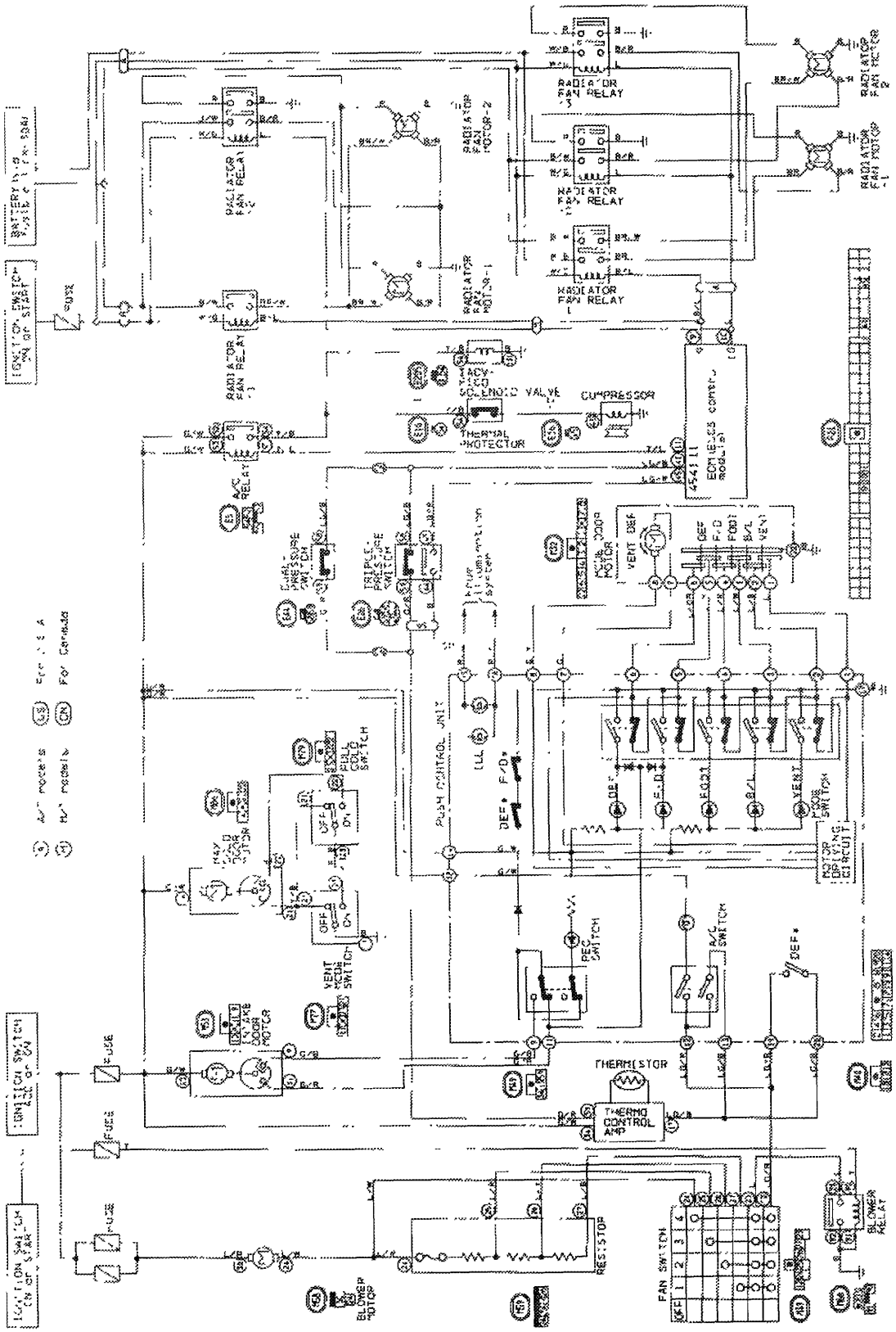
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative F  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	After the system is left at rest, start it again in order to confirm whether or not problem is caused by water or foreign particles. • If the problem is due to water, drain water from refrigerant or replace refrigerant • If it is due to foreign particles, remove expansion valve and remove them with dry and compressed air. • If either of the above methods cannot correct the problem, replace expansion valve. • Replace liquid tank. • Check compressor oil for contamination.

Harness Layout for A/C System



RHA885D

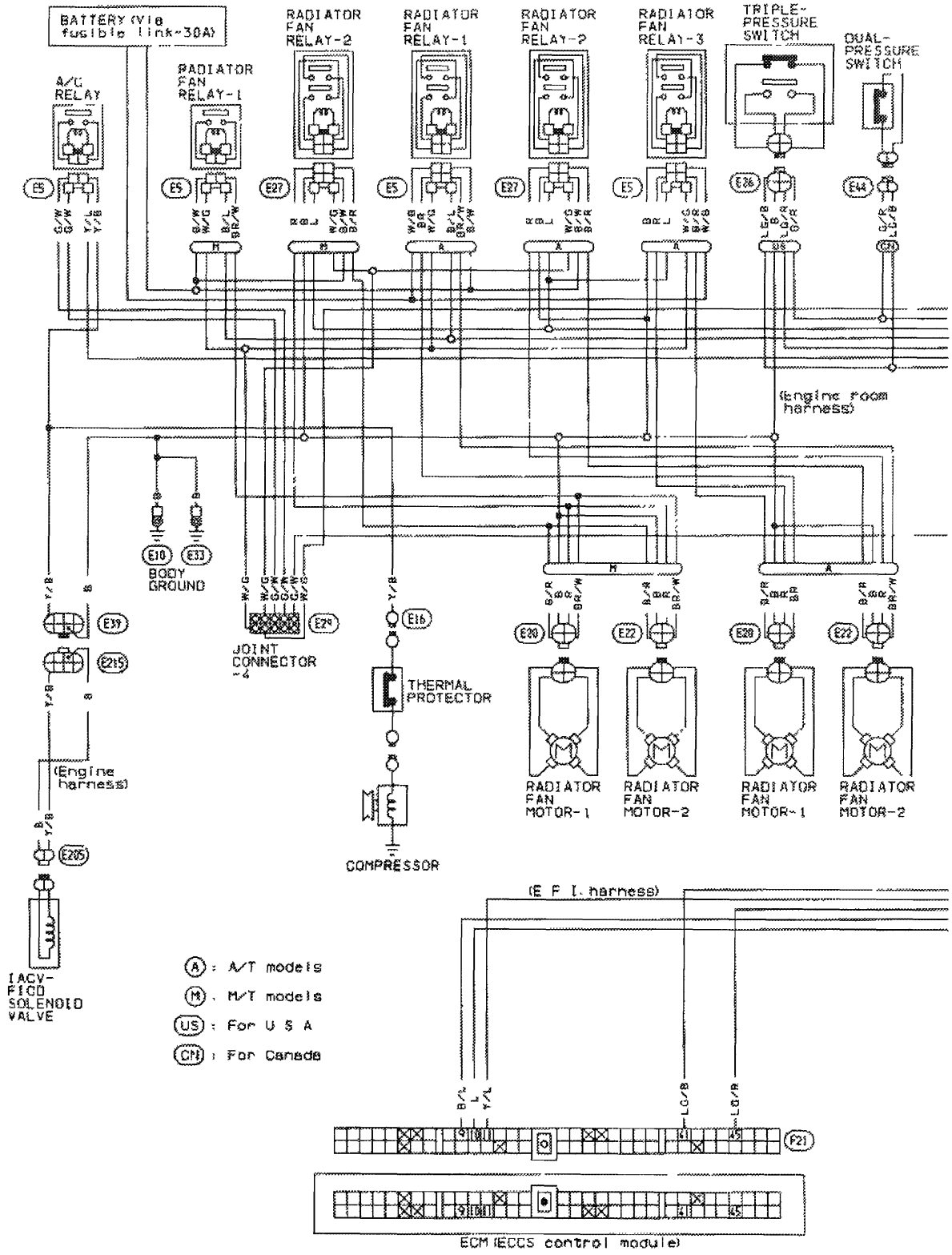
Circuit Diagram for Quick Pinpoint Check



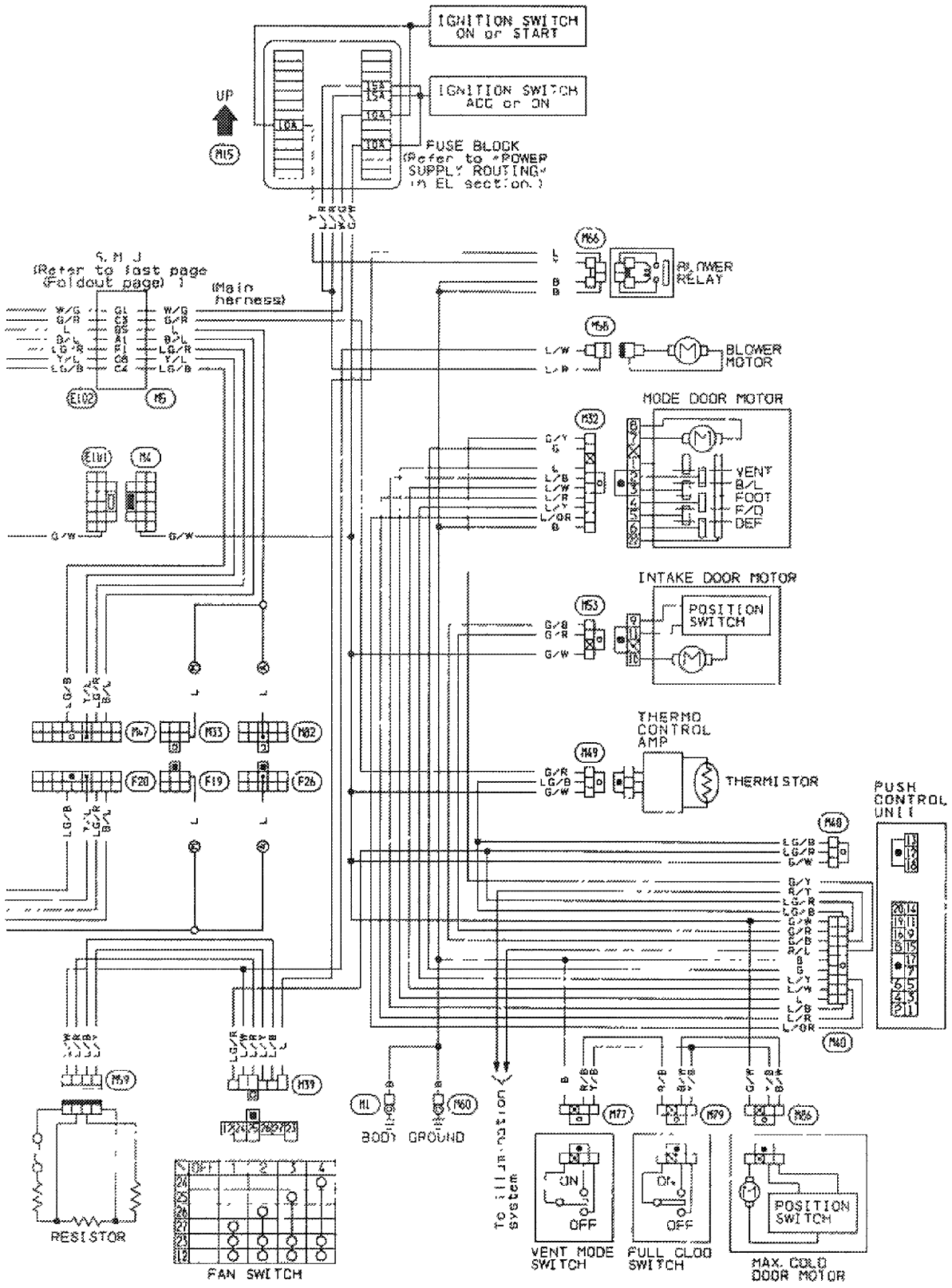
- All connectors shown in this illustration are unit side connectors.
- The unit side connectors with a double circle "◎" are connected to the harness side connectors shown in the "Harness Layout for A/C System". (See page HA-26.)
- The terminal numbers in the connector coincide with the circuit numbers surrounded by a single circle "○".
- These switches are built into push control unit and mechanically linked to corresponding switches

MHA190A

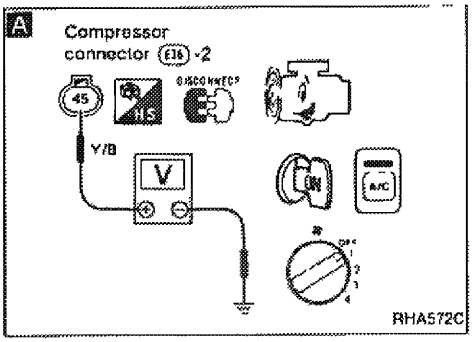
Wiring Diagram

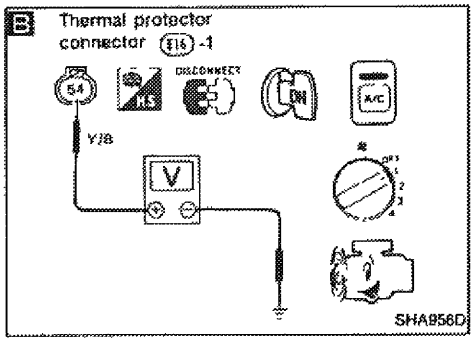


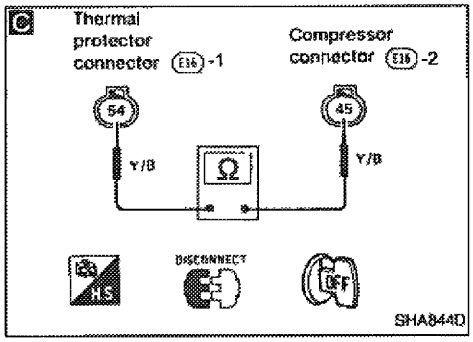
Wiring Diagram (Cont'd)



MHA189A



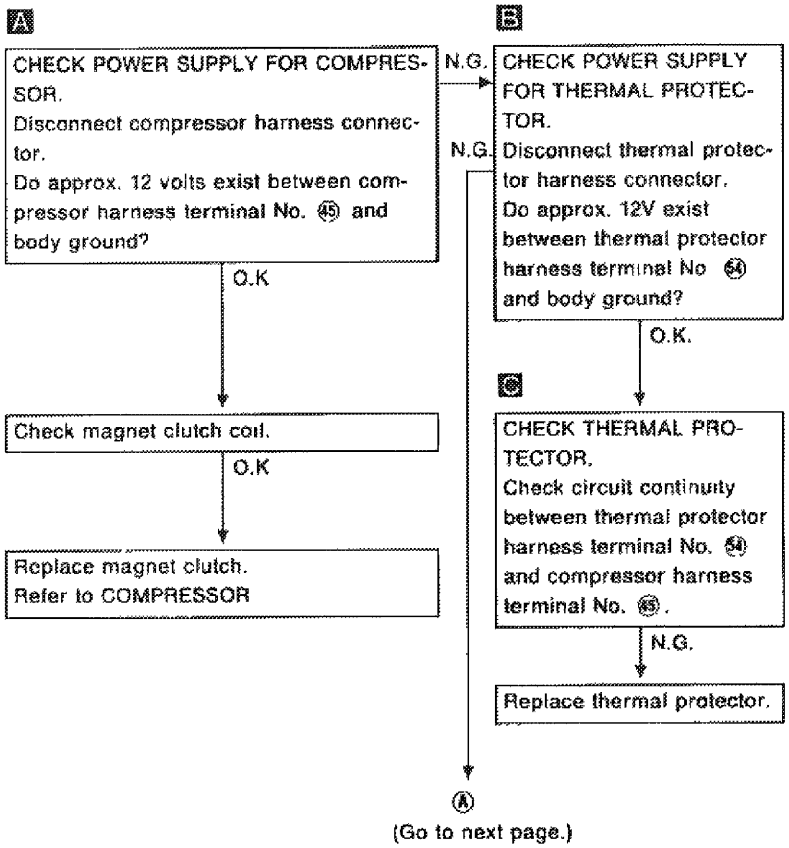




Diagnostic Procedure 4

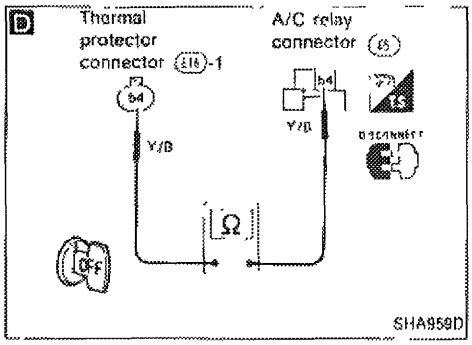
SYMPTOM: Magnet clutch does not operate when A/C switch and fan switch are ON.

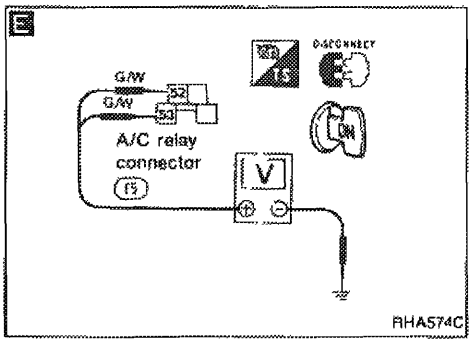
- **Perform PRELIMINARY CHECK 2 before referring to the following flow chart.**

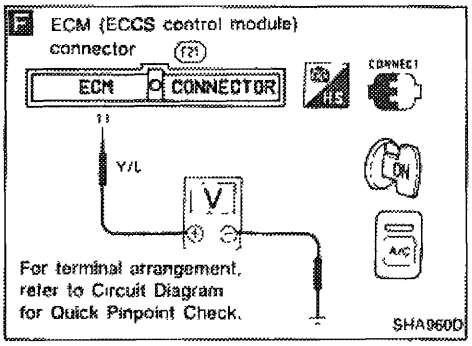


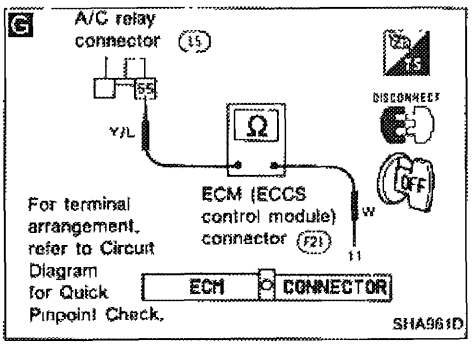
(Go to next page.)

Diagnostic Procedure 4 (Cont'd)









(A)

Disconnect A/C relay harness connector.

D — Note

Check circuit continuity between A/C relay harness terminal No. 64 and thermal protector harness terminal No. 64.

O.K. → E

E

CHECK POWER SUPPLY FOR A/C RELAY
Disconnect A/C relay
Do approx 12 volts exist between A/C relay harness terminal No 52 , 53 and body ground?

O.K. → CHECK A/C RELAY AFTER DISCONNECTING IT. (Refer to HA-70 in 1993 G20 SERVICE MANUAL.)

N.G. → CHECK POWER SUPPLY CIRCUIT AND 10A FUSE AT FUSE BLOCK. (Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

CHECK A/C RELAY AFTER DISCONNECTING IT. (Refer to HA-70 in 1993 G20 SERVICE MANUAL.)

N.G. → Replace A/C relay.

O.K.

Reconnect A/C relay

F

CHECK COIL SIDE CIRCUIT OF A/C RELAY.
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. 11 and body ground?

N.G. → G

G

Check circuit continuity between A/C relay harness terminal No. 55 and ECM (ECCS control module) harness terminal No. 11.

O.K.

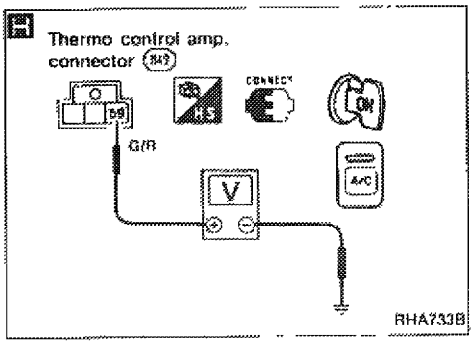
(B)

(Go to next page.)

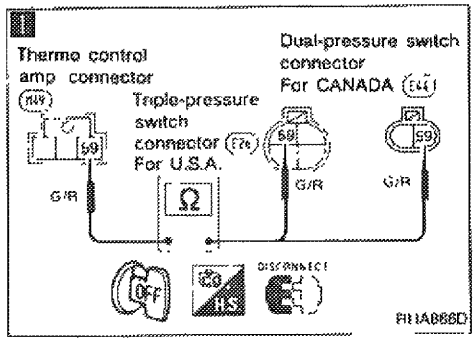
Note:
If the result is N.G. after checking circuit continuity, repair harness or connector.

Diagnostic Procedure 4 (Cont'd)

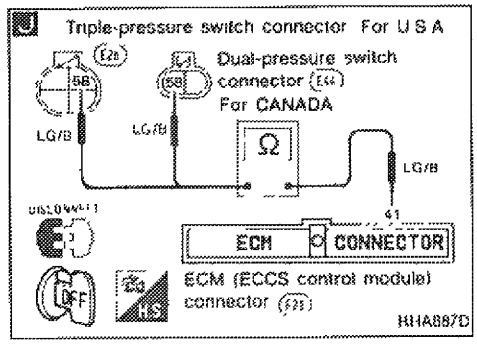
H



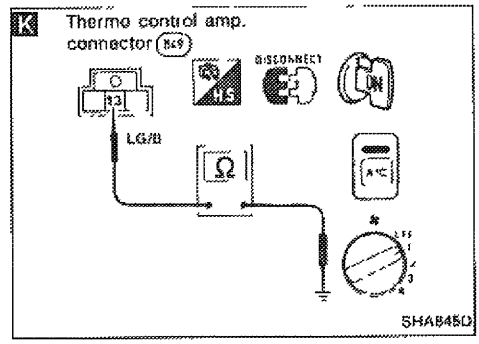
I



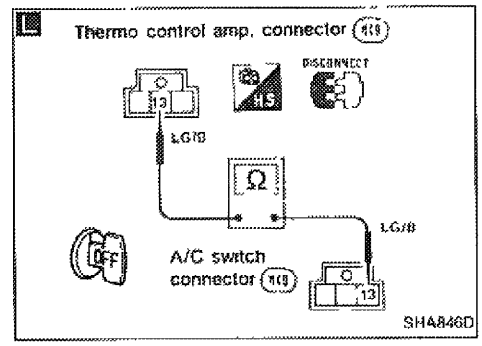
J



K



L



(B)

H — CHECK VOLTAGE FOR THERMO CONTROL AMP.
Do more than 8 volts exist between thermo control amp. harness terminal No. (59) and body ground?

N.G → I — Note: Check circuit continuity between thermo control amp. harness terminal No. (59) and triple or dual-pressure switch terminal No. (58)

O.K. → (C)

O K → CHECK TRIPLE OR DUAL-PRESSURE SWITCH. (Refer to Electrical Components Inspection.)

O.K. → J — Note: Check circuit continuity between ECM (ECCS control module) harness terminal No. (41) and triple or dual-pressure switch harness terminal No. (58)

N.G. → Replace triple or dual-pressure switch.

O K → CHECK ECM (ECCS CONTROL MODULE). (Refer to EF & EC section.)

(C)

CHECK POWER SUPPLY FOR THERMO CONTROL AMP. (Refer to HA-54 in 1993 G20 SERVICE MANUAL.)

O.K → K — CHECK BODY GROUND CIRCUIT FOR THERMO CONTROL AMP.
Disconnect thermo control amp. harness connector
Does continuity exist between thermo control amp. harness terminal No. (13) and body ground?

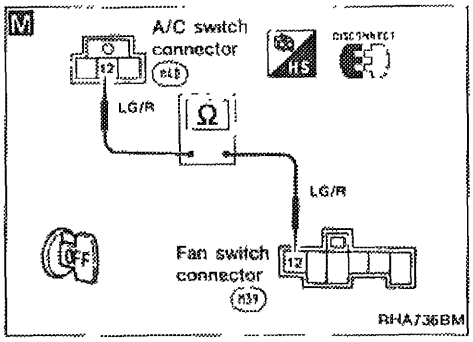
N.G → Disconnect A/C switch harness connector. → L — Note: Check circuit continuity between thermo control amp. harness terminal No. (13) and A/C switch harness terminal No. (13).

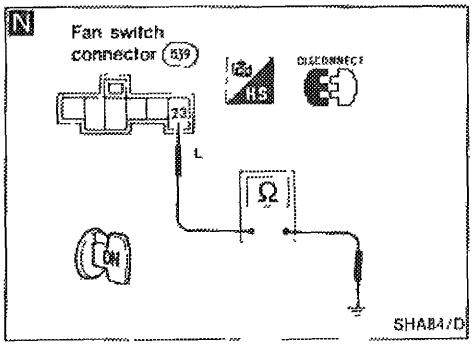
O.K. → (D)

O K → Replace thermo control amp.

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

Diagnostic Procedure 4 (Cont'd)





Ⓓ

CHECK A/C SWITCH.
(Refer to HA-69 in 1993 G20 SERVICE MANUAL)

N.G. → Replace A/C switch.

O.K

Disconnect fan switch harness connector.

M

Note

Check circuit continuity between A/C switch harness terminal No. ⑫ and fan switch harness terminal No ⑫.

O.K.

N

Note N.G. → Ⓔ (Go to next page)

CHECK BODY GROUND CIRCUIT FOR FAN SWITCH
Does continuity exist between fan switch harness terminal No. ㉓ and body ground?

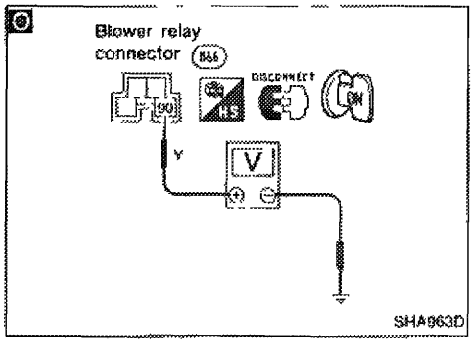
O K.

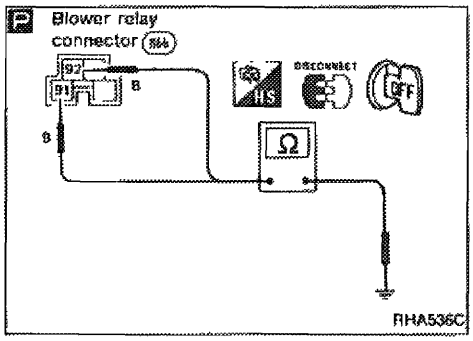
CHECK FAN SWITCH.
(Refer to HA-69 in 1993 G20 SERVICE MANUAL.)

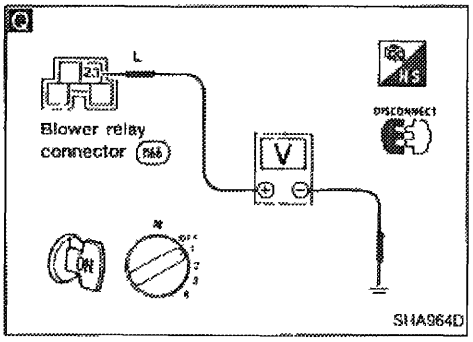
Replace fan switch

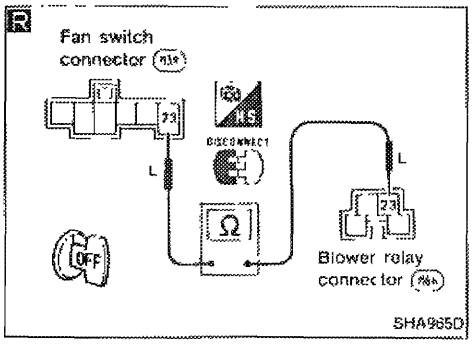
Note:
If the result is N.G. after checking circuit continuity, repair harness or connector.

Diagnostic Procedure 4 (Cont'd)









(E)

CHECK POWER SUPPLY FOR BLOWER RELAY.
Disconnect blower relay harness connector.
Do approx. 12 volts exist between blower relay harness terminal No. 86 and body ground?

N.G. → Check 10A fuse at fuse block.
(Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

O K.

Note

Check circuit continuity between blower relay harness terminal No. 91, 92 and body ground

O K.

Reconnect fan switch harness connector.

CHECK FAN SWITCH CIRCUIT BETWEEN FAN SWITCH AND BLOWER RELAY.
Do approx. 12 volts exist between blower relay harness terminal No. 23 and body ground?

N.G. → Disconnect fan switch harness connector.

O.K

Note

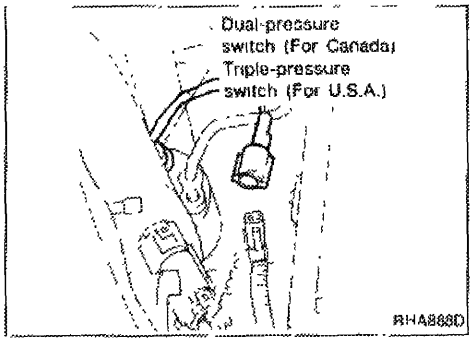
Check circuit continuity between fan switch harness terminal No. 23 and blower relay harness terminal No. 23.

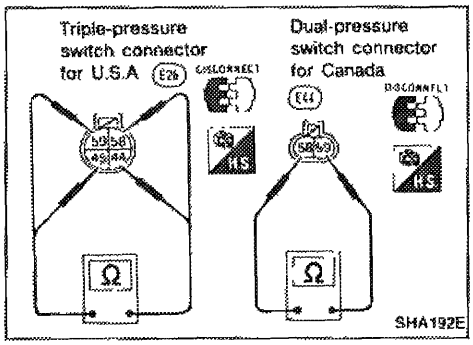
CHECK BLOWER RELAY AFTER DISCONNECTING IT
(Refer to HA-70 in 1993 G20 SERVICE MANUAL)

N G.

Replace blower relay

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





Electrical Components Inspection

TRIPLE-PRESSURE SWITCH (For U.S.A.)

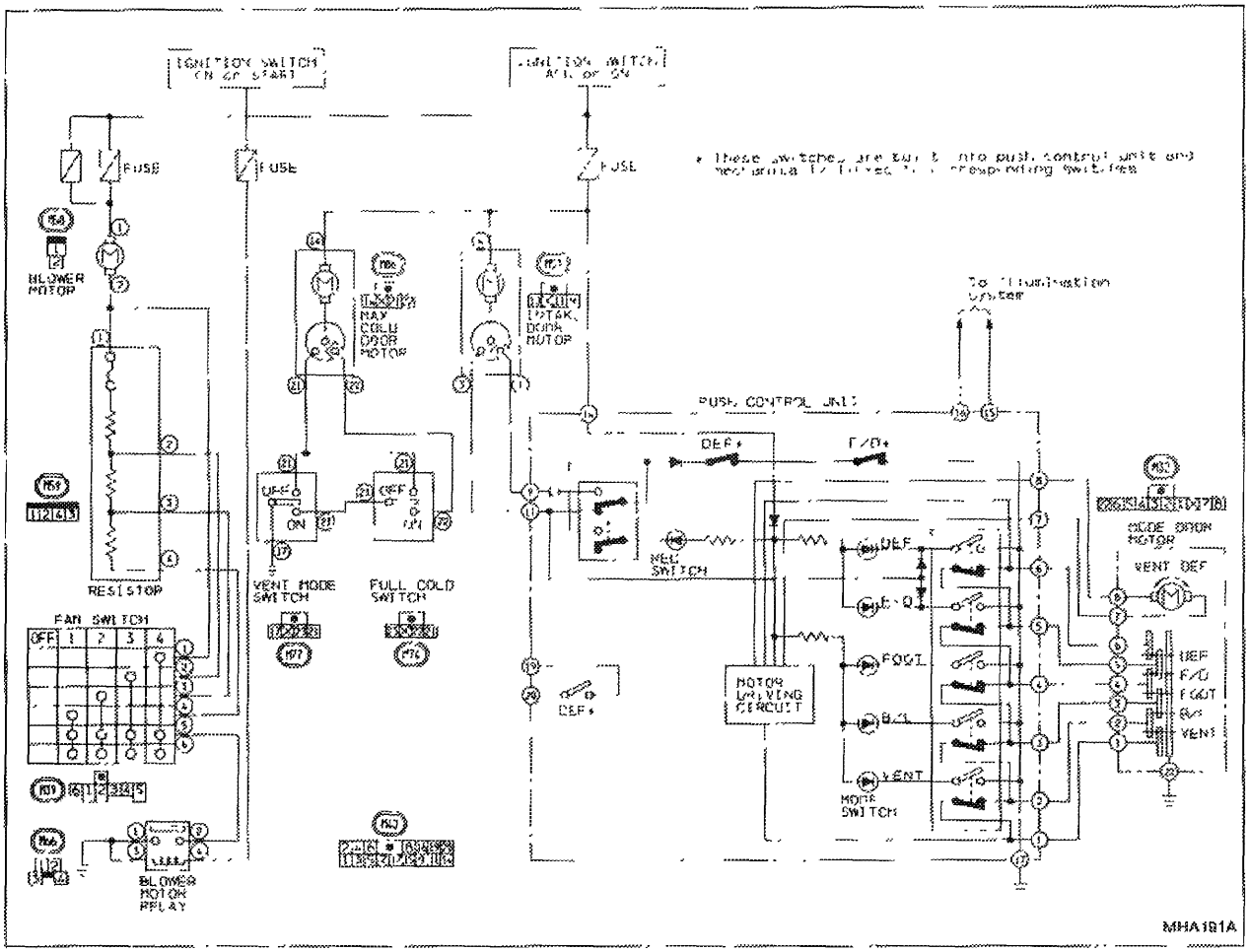
	Terminals	ON kPa (kg/cm², psi)	OFF kPa (kg/cm², psi)
Low-pressure side	⑬ - ⑱	Increasing to 157 - 226 (1.6 - 2.3, 23 - 33)	Decreasing to 152.0 - 201.0 (1.55 - 2.05, 22.0 - 29.2)
Medium-pressure side*	⑮ - ⑭	Increasing to 1,422 - 1,618 (14.5 - 16.5, 206 - 235)	Decreasing to 1,030 - 1,422 (10.5 - 14.5, 149 - 206)
High-pressure side	⑯ - ⑱	Decreasing to 1,667 - 2,452 (17 - 25, 242 - 356)	Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)

* For radiator fan motor operation

DUAL-PRESSURE SWITCH (For Canada)

	ON kPa (kg/cm², psi)	OFF kPa (kg/cm², psi)
Low-pressure side	Increasing to 157 - 216 (1.6 - 2.2, 23 - 31)	Decreasing to 157 - 196 (1.6 - 2.0, 23 - 28)
High-pressure side	Decreasing to 392 - 785 (4.0 - 8.0, 57 - 114)	Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)

Push Control System



This push control system operates the intake and mode door motors to activate their corresponding doors.

Switches and their control functions

Switch		Indicator illuminates							Air outlet	Intake air	Compressor
		A/C									
A/C		○							Refer to "Air Flow", (See page HA-7 in 1993 G20 SERVICE MANUAL.)	—	ON*1
Mode			○							—	—
				○						—	—
					○					—	—
						○				FRE	—
							○			FRE	ON*1
								○*2		REC*2	—

*1: Compressor is operated by thermo control amp.

*2: Depending on mode switch position

General Specifications

COMPRESSOR

Model	DKV-14C
Type	Vane rotary
Displacement cm³ (cu in)/Rev	140 (8.54)
Direction of rotation	Clockwise (Viewed from drive end)
Drive belt	Poly V

LUBRICATION OIL

Model	ZEXEL make DKV-14C
Name	Nissan A/C System Oil Type R
Part number	KLH00-PAGR0
Capacity ml (US fl oz, Imp fl oz)	
Total in system	200 (6.8, 7.0)
Compressor (Service parts) charging amount	200 (6.8, 7.0)

REFRIGERANT

Type		R134a
Capacity	kg (lb)	0.78 - 0.80 (1.54 - 1.76)

Inspection and Adjustment

ENGINE IDLING SPEED

When A/C is ON
Refer to EF & EC section.

BELT TENSION

Refer to Checking Drive Belts (MA section).

COMPRESSOR

Model	DKV-14C
Clutch disc-to-pulley clearance mm (in)	0.3 - 0.6 (0.012 - 0.024)

ELECTRICAL SYSTEM

SECTION EL

When you read wiring diagrams:
- **Read GI section, "HOW TO READ WIRING DIAGRAMS".**

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WIRING DIAGRAM REFERENCE CHART

ECCS (Ignition system) ..... FOLDOUT PAGE
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ANTI-LOCK BRAKING SYSTEM ..... BR SECTION
FUEL FILLER LID OPENER, TRUNK LID OPENER, POWER WINDOW AND POWER DOOR LOCK, SUPPLEMENTAL RESTRAINT SYSTEM, MULTI-REMOTE CONTROL SYSTEM, POWER SEAT, SUN ROOF, DOOR MIRROR ..... BF SECTION
HEATER AND AIR CONDITIONER ..... HA SECTION

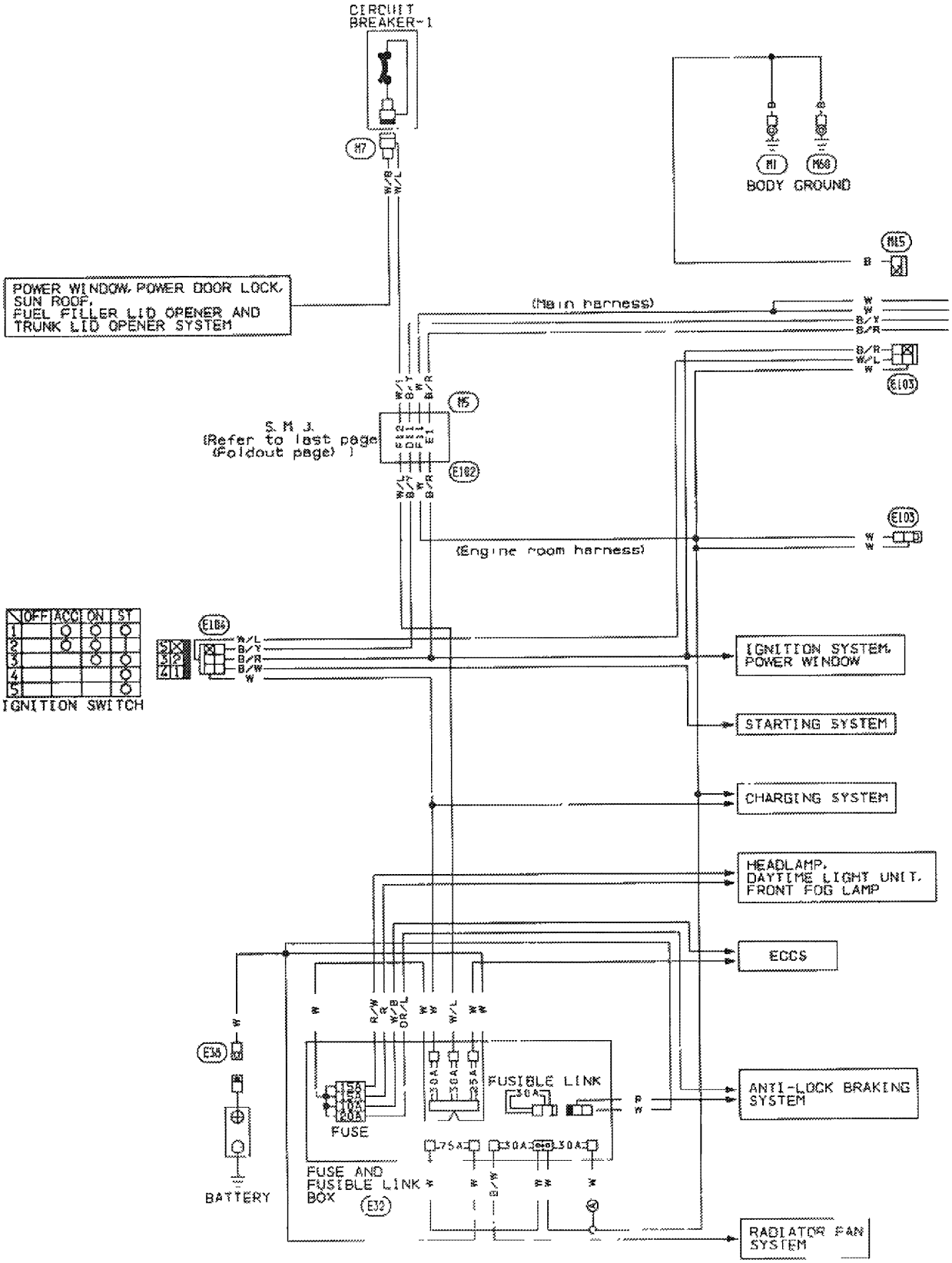
Supplemental Restraint System "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner" help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, sensors, a diagnosis unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **BF section** of this Service Manual.

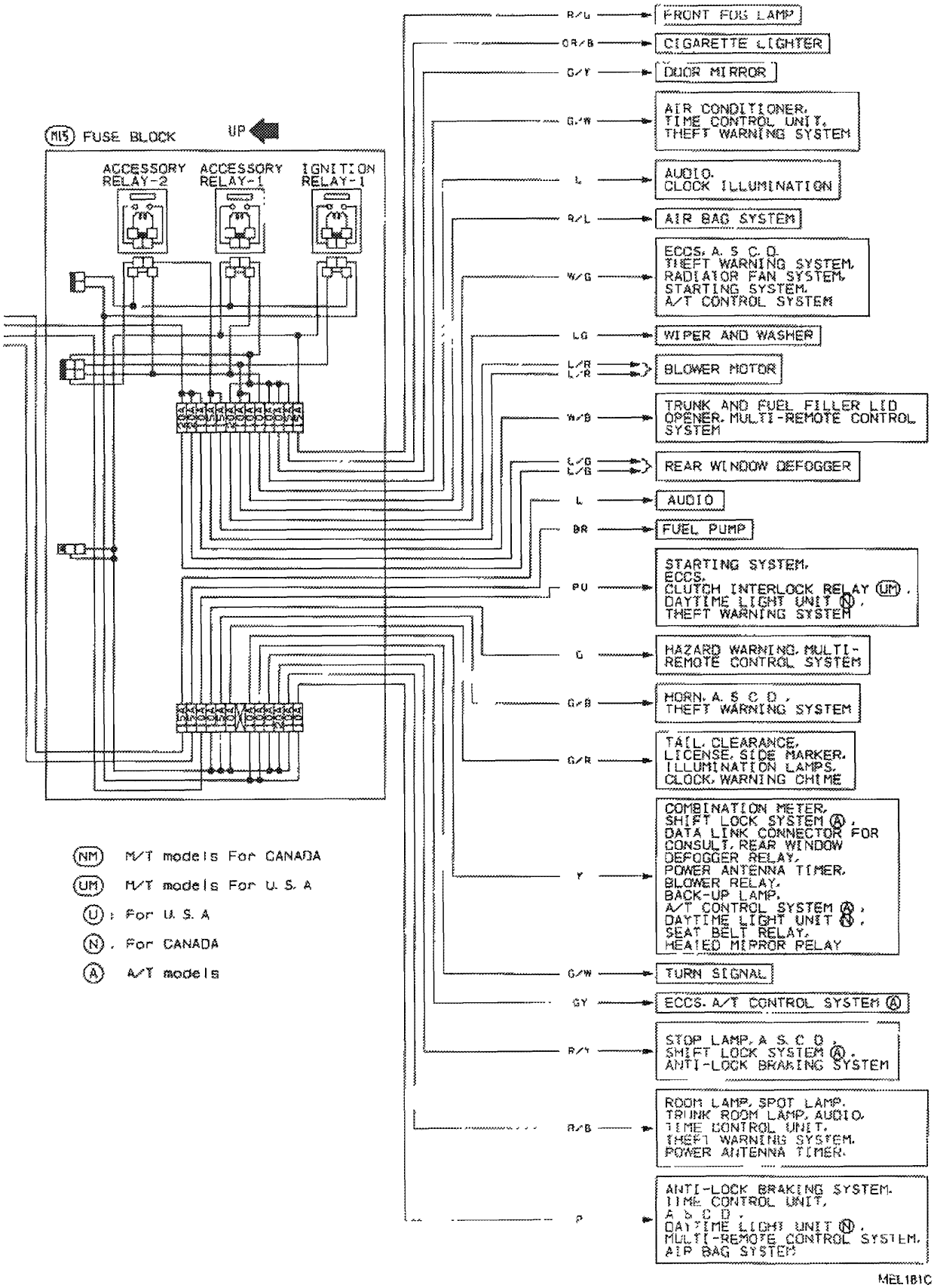
WARNING:

- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **All SRS air bag electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS SYSTEM.**

Wiring Diagram



Wiring Diagram (Cont'd)



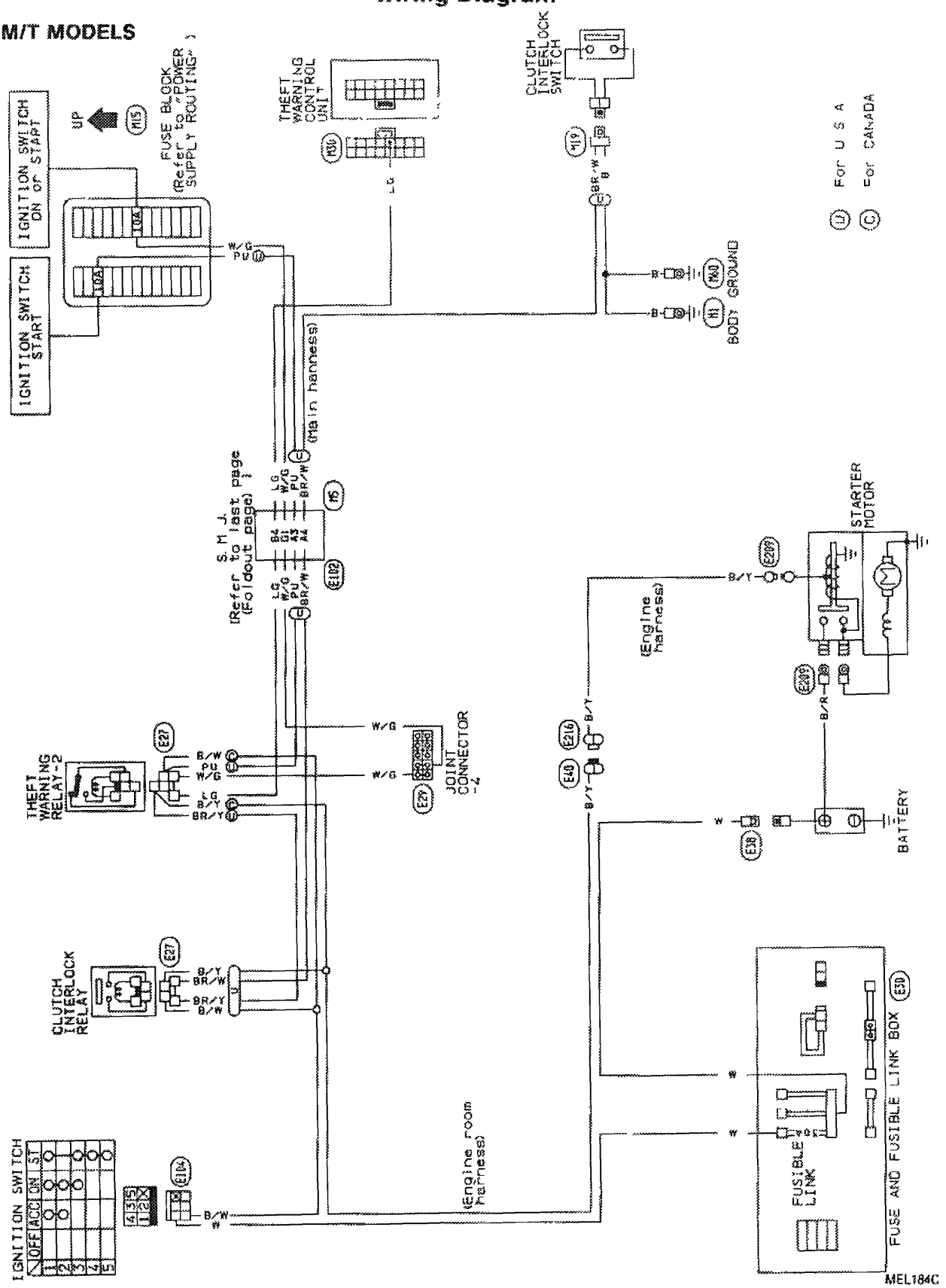
MEL181C

Service Data and Specifications (S.D.S.)

Type		80D26L
Capacity	V-AH	12-65
Cold cranking current (For reference value)	A	582

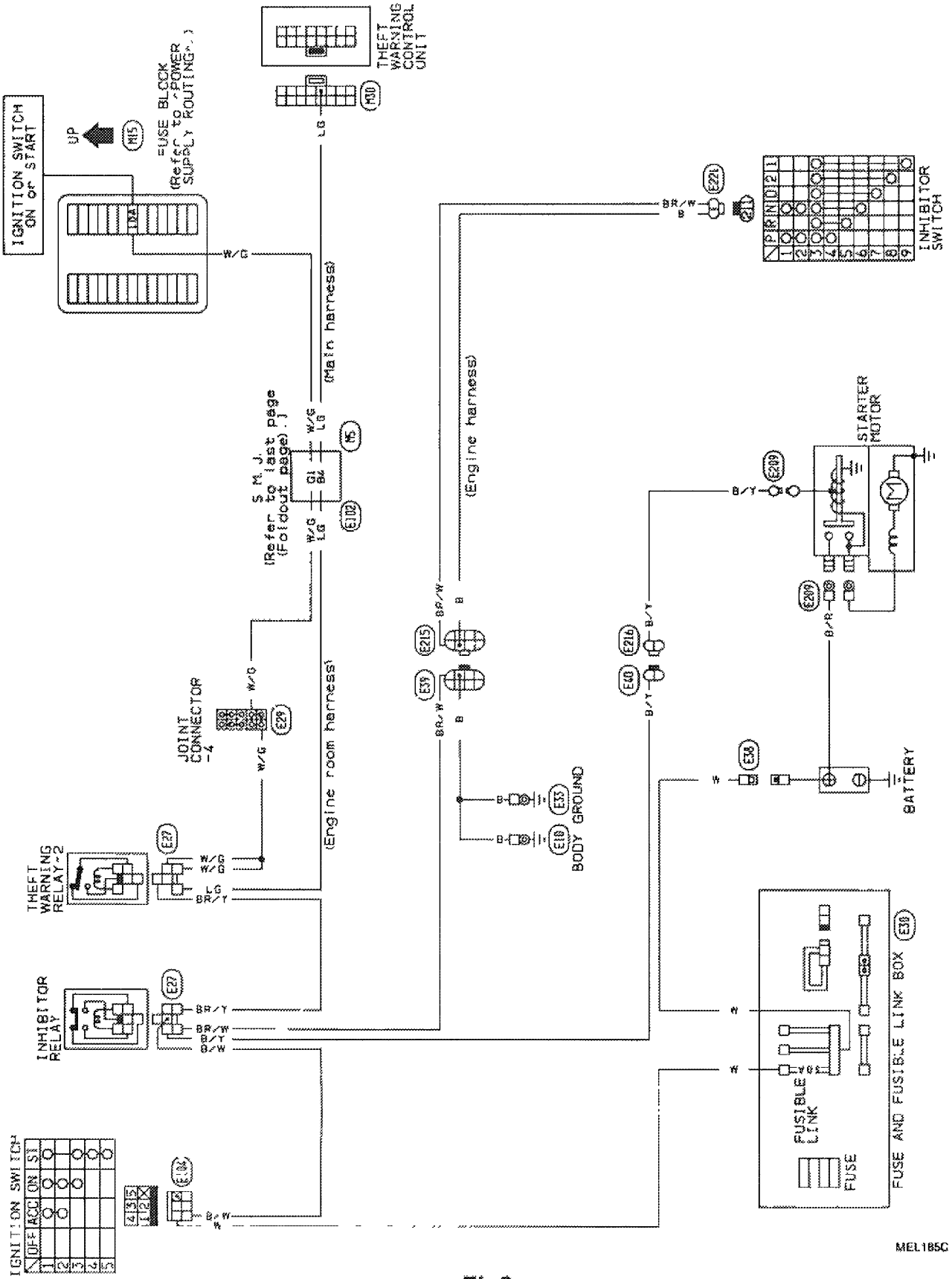
Wiring Diagram

M/T MODELS

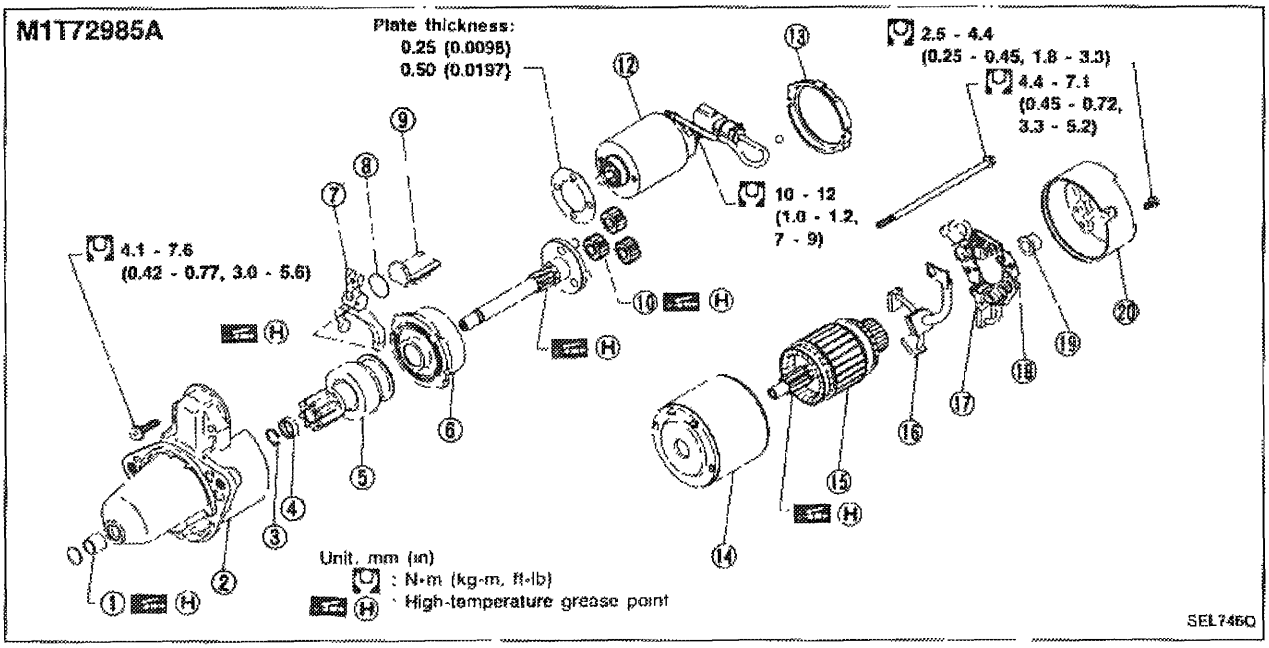


Wiring Diagram (Cont'd)

A/T MODELS



Construction



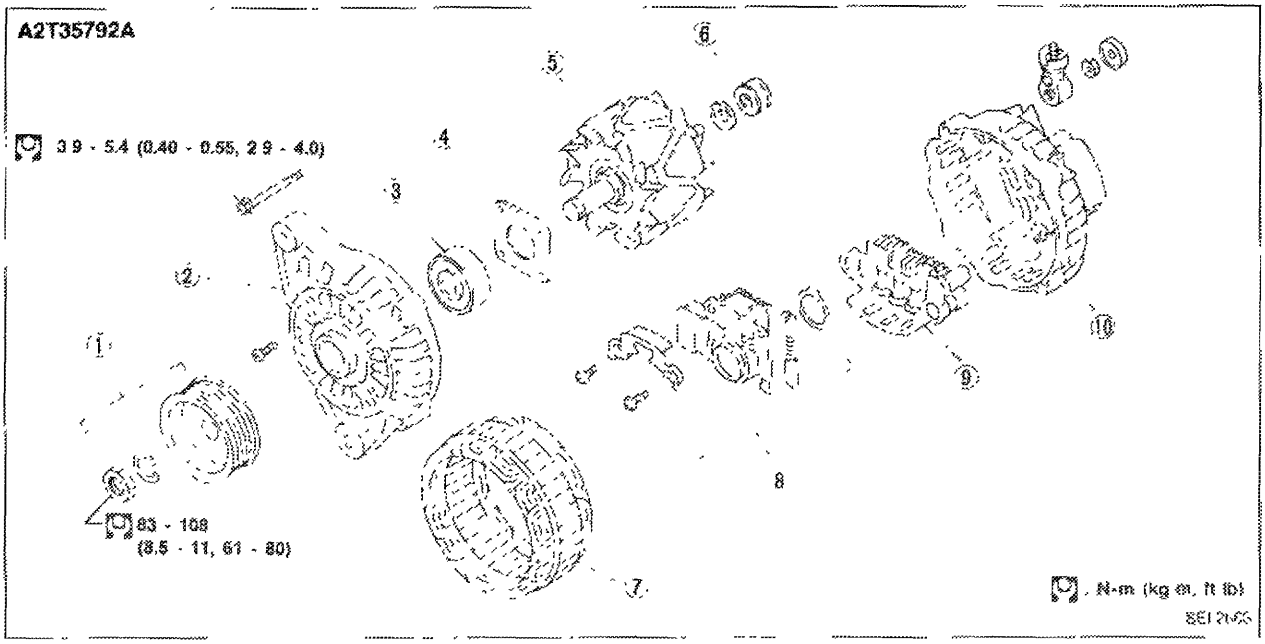
① Sleeve bearing
② Gear case
③ Stopper clip
④ Pinion stopper
⑤ Pinion assembly
⑥ Internal gear
⑦ Shift lever
⑧ Plate
⑨ Packing
⑩ Planetary gear
⑪ Adjusting plate
⑫ Magnetic switch assembly
⑬ Packing
⑭ Yoke
⑮ Armature
⑯ Bearing
⑰ Brush (-)
⑱ Brush spring
⑲ Brush holder
⑳ Rear cover

Service Data and Specifications (S.D.S.)

STARTER

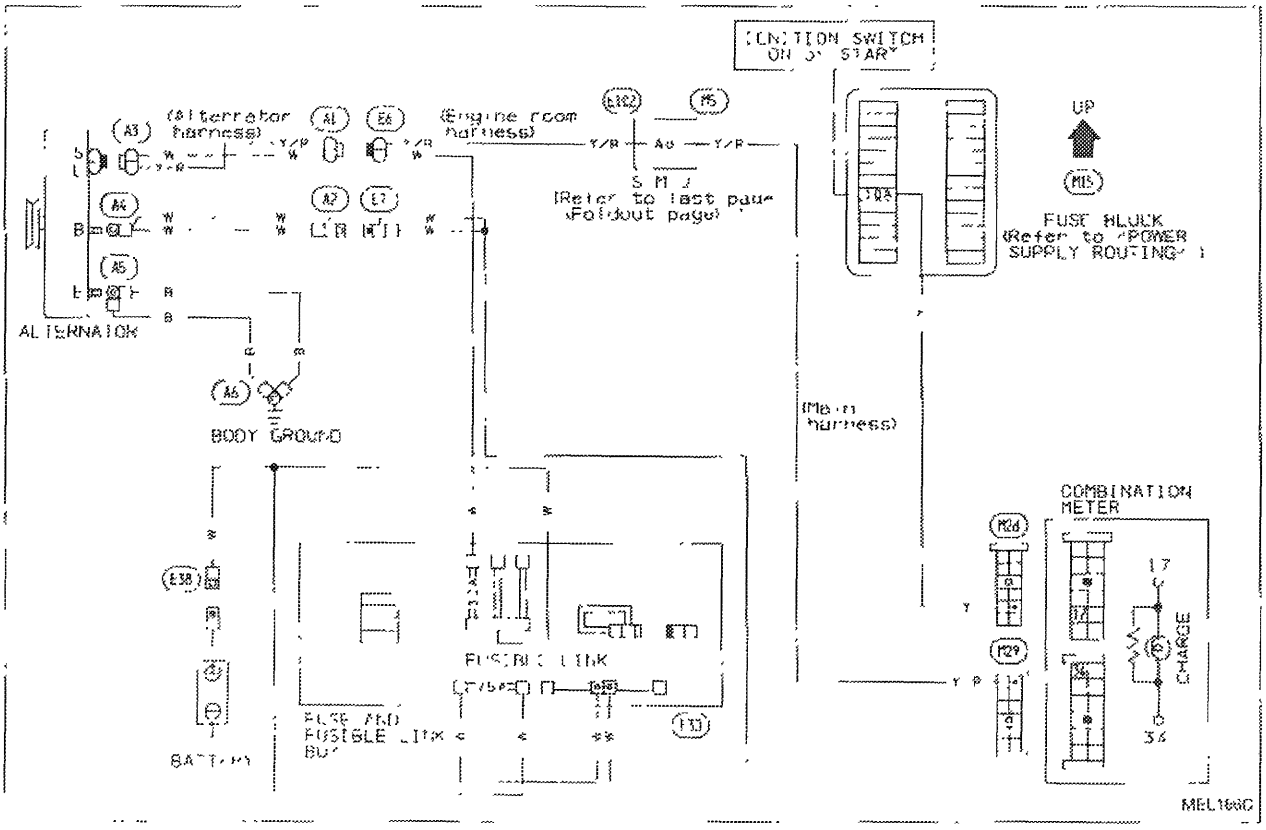
Type		M1T72985A MITSUBISHI Reduction gear
System voltage	V	12
No-load		
Terminal voltage	V	11.0
Current	A	50 - 75
Revolution	rpm	3,000 - 4,000
Minimum diameter of commutator	mm (in)	28.8 (1.134)
Minimum length of brush	mm (in)	12.0 (0.472)
Brush spring tension	N (kg, lb)	13.7 - 25.5 (1.4 - 2.6, 3.1 - 5.7)
Movement "L" in height of pinion assembly	mm (in)	—
Clearance of bearing metal and armature shaft	mm (in)	Less than 0.2 (0.008)
Clearance "L" between pinion front edge and pinion stopper	mm (in)	0.5 - 2.0 (0.020 - 0.079)

Construction



(1) Pulley assembly
(2) Front cover
(3) Front bearing
(4) Bearing retainer
(5) Rotor
(6) Rear bearing
(7) Stator
(8) IC voltage regulator
(9) Diode assembly
(10) Rear cover

Wiring Diagram

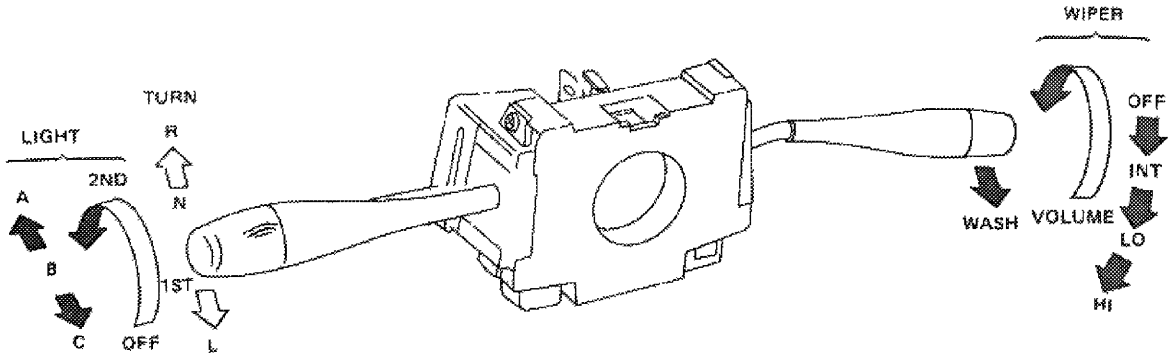


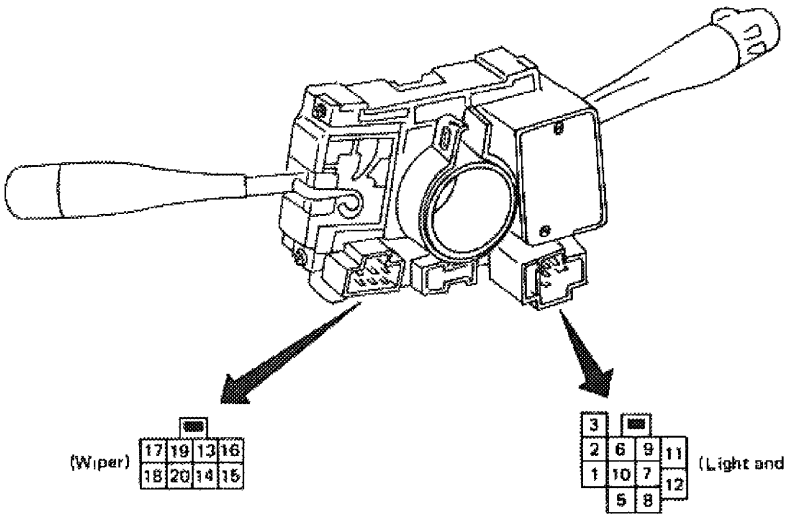
Service Data and Specifications (S.D.S.)

ALTERNATOR

Type		A2T35792A MITSUBISHI
Nominal rating	V-A	12 80
Ground polarity		Negative
Minimum revolution under no-load (When 13 5 volts is applied)	rpm	1,300
Hot output current	A/rpm	More than 22/1,300 More than 65/2,500
Regulated output voltage	V	14.1 - 14.7
Minimum length of brush	mm (in)	5 (0 20)
Brush spring pressure	N (g, oz)	4 609 - 5.786 (470 - 590, 16 58 - 20 81)
Slip ring minimum outer diameter	mm (in)	More than 22.1 (0.870)
Field coil resistance	Ω	2.4 - 2 9

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

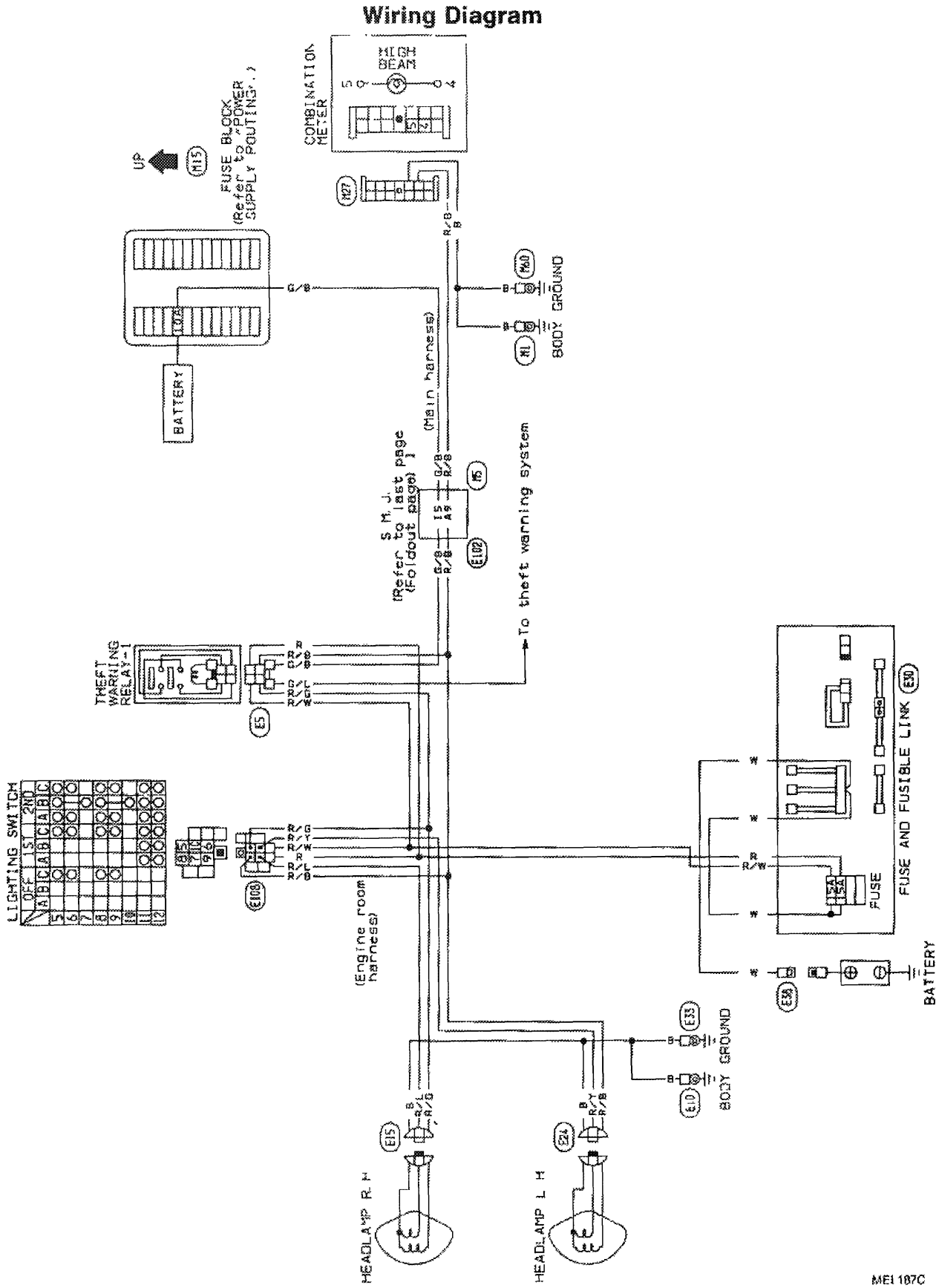


TURN SIGNAL SWITCH

	R	N	L
1	○		○
2	○		
3			○

MEL461C

Wiring Diagram



MEI187C

Operation

After starting the engine with the lighting switch in the "OFF" position or "1ST" position, the headlamp high beam automatically turns on. Lighting switch operations other than the above are the same as conventional light systems.

Engine		With engine stopped									With engine running								
Lighting switch		OFF			1ST			2ND			OFF			1ST			2ND		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Headlamp	High beam	X	X	O	X	X	O	O	X	O	△*	△*	O	△*	△*	O	O	X	O
	Low beam	X	X	X	X	X	X	X	O	X	X	X	X	X	X	X	X	O	X
Clearance and tail lamp		X	X	X	O	O	O	O	O	O	X	X	X	O	O	O	O	O	O
License and instrument illumination lamp		X	X	X	O	O	O	O	O	O	X	X	X	O	O	O	O	O	O

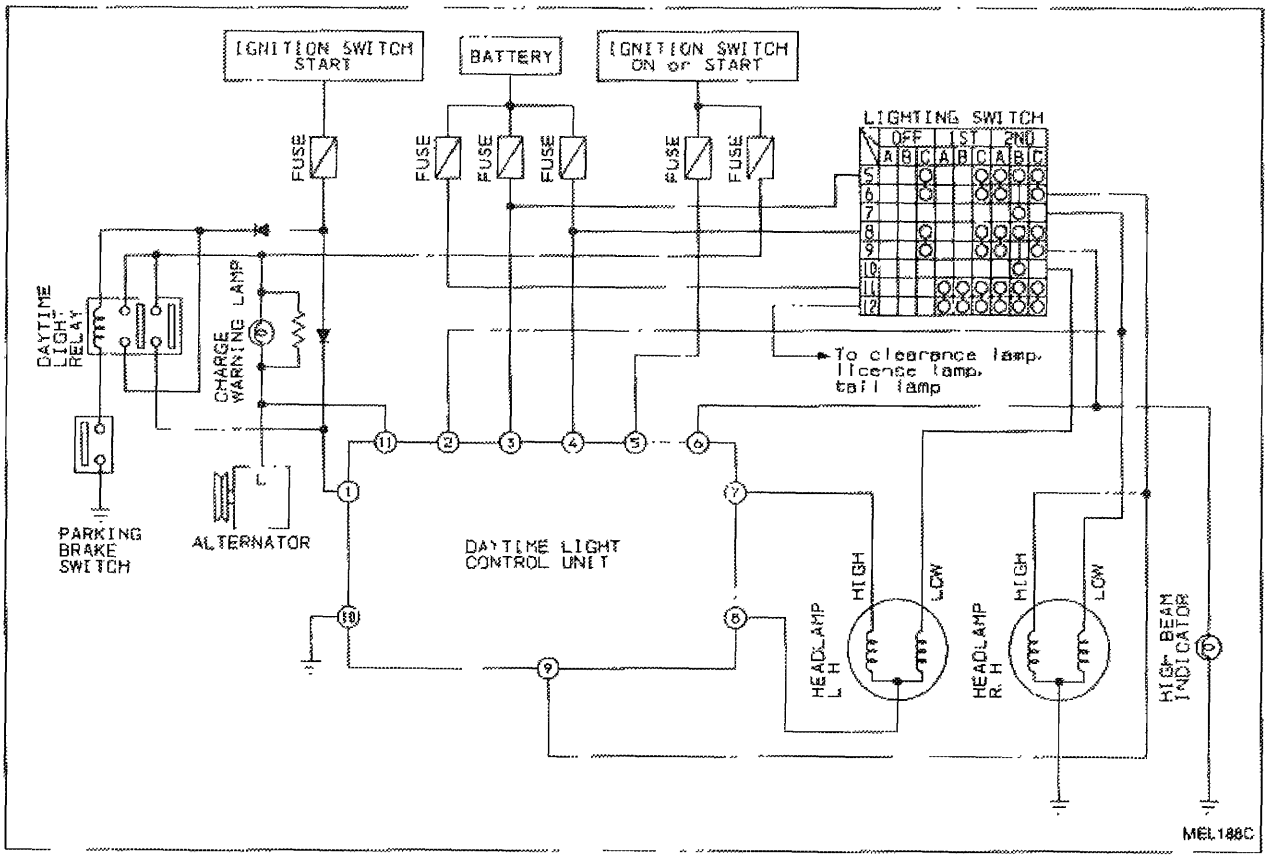
O : Lamp "ON"

X : Lamp "OFF"

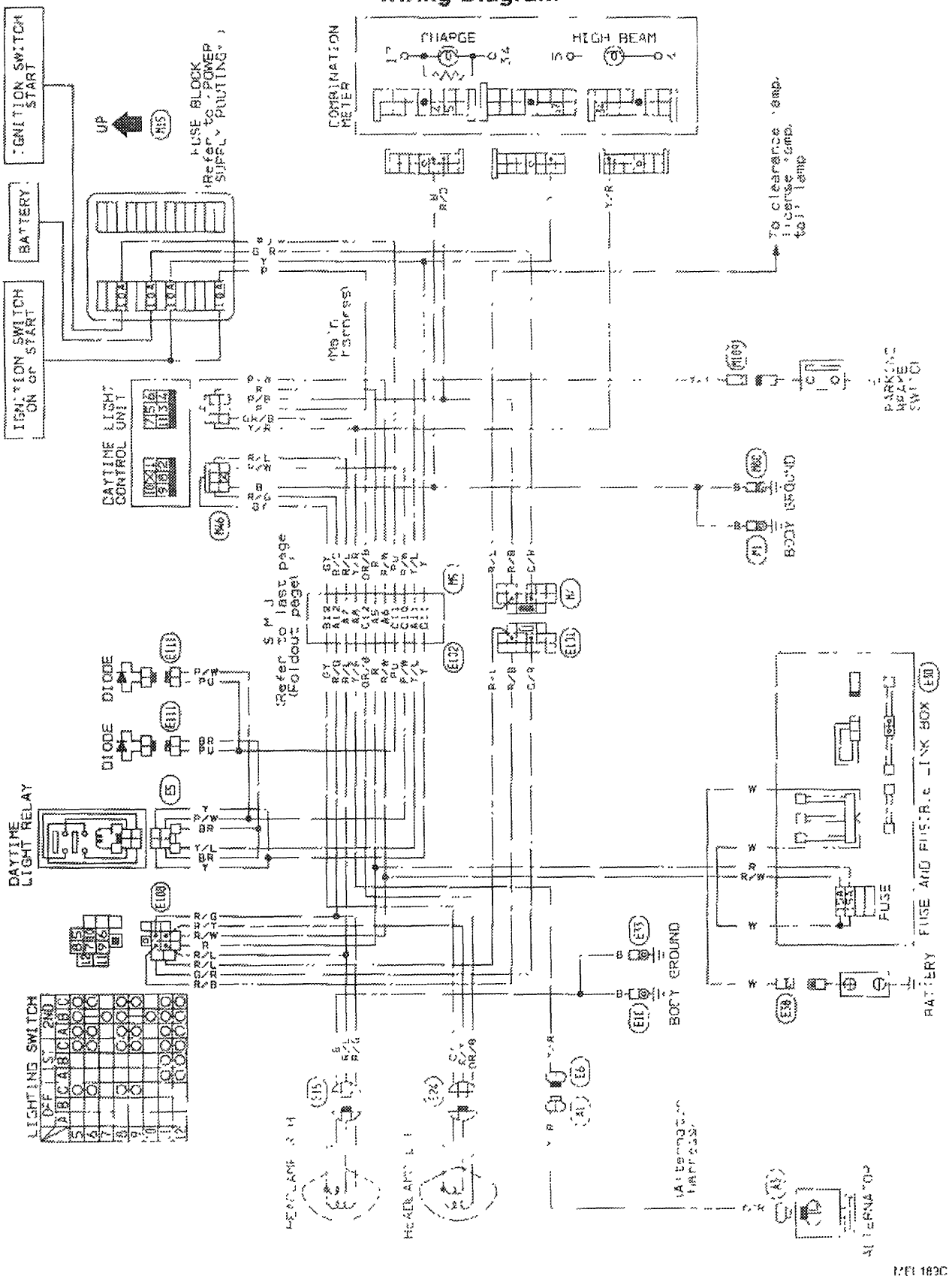
△ : Lamp dims.

*: When starting the engine with the parking brake released, the daytime lamp will come ON.
When starting the engine with the parking brake pulled, the daytime lamp will not come ON.

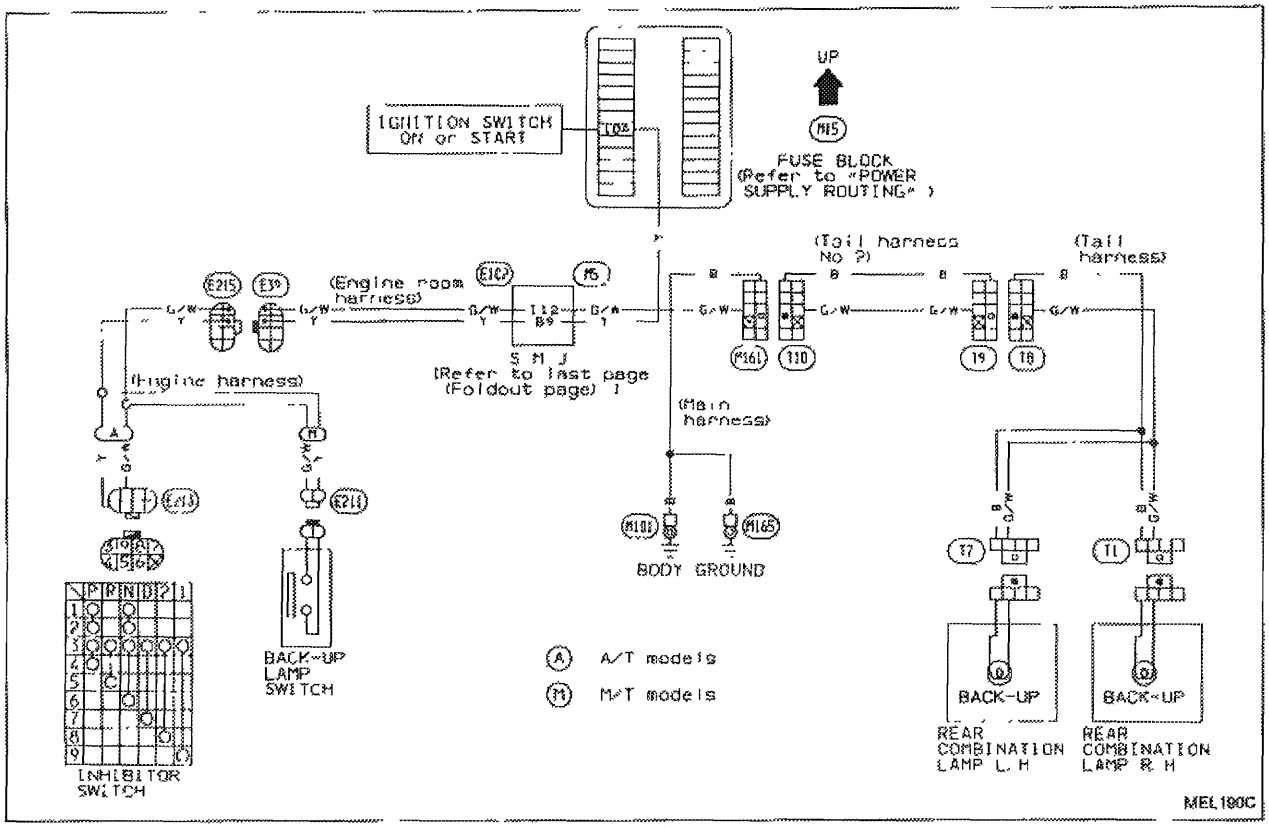
Schematic



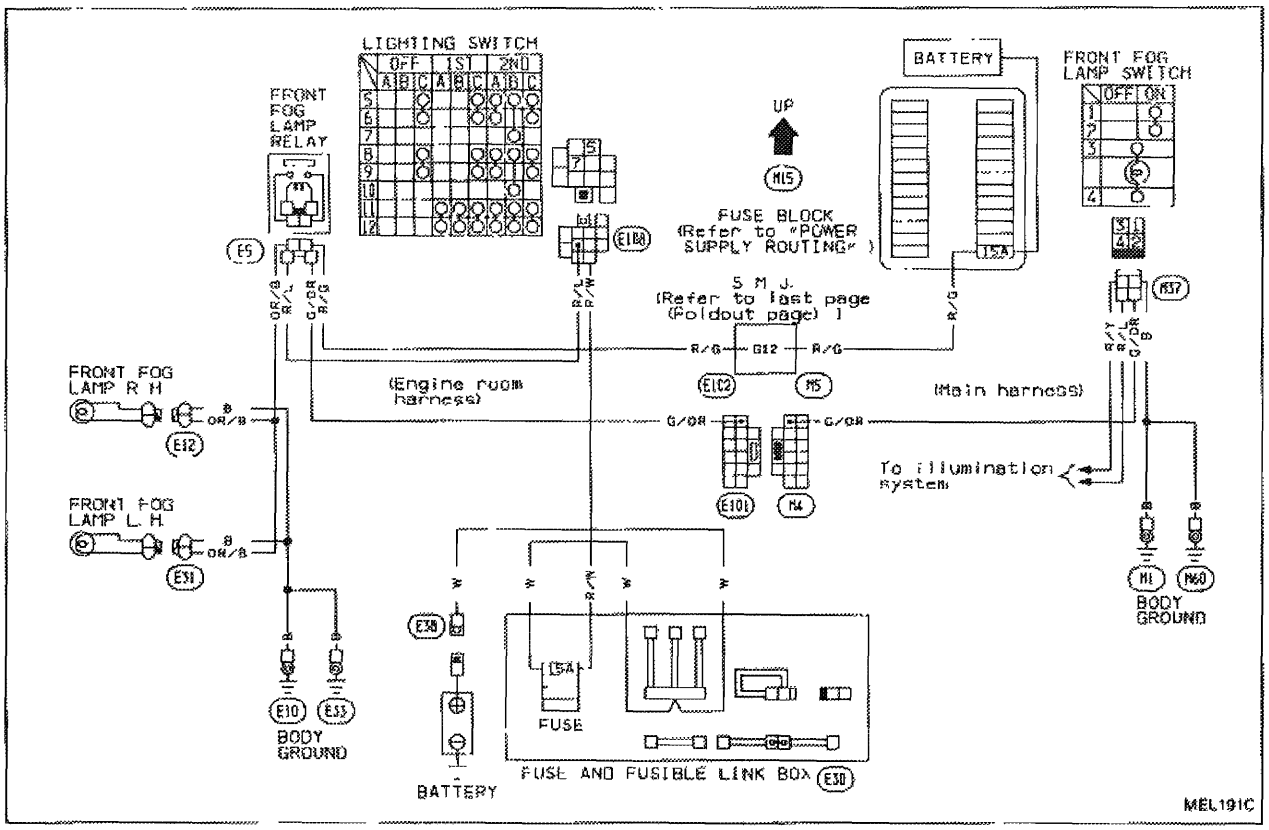
Wiring Diagram



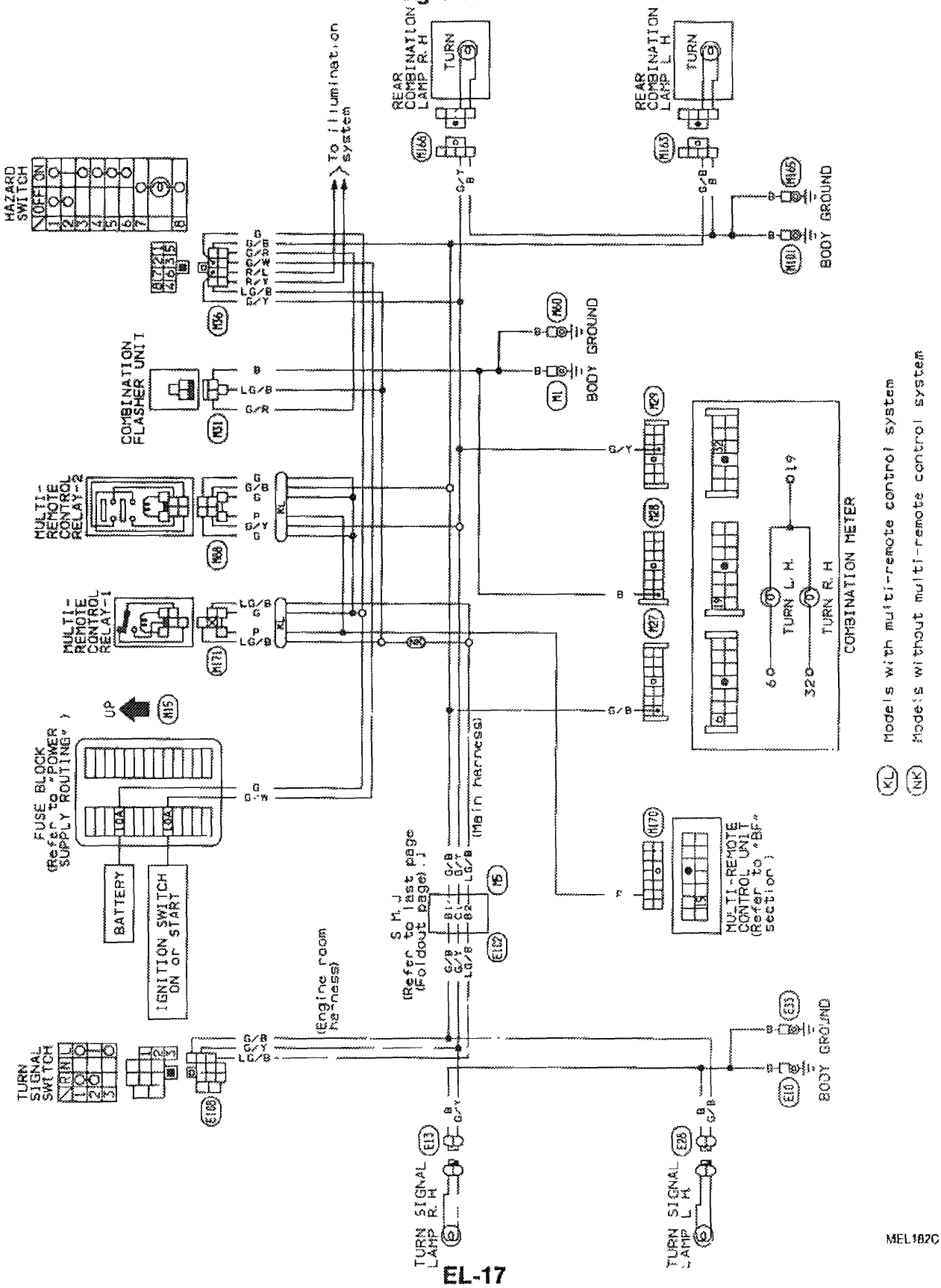
Back-up Lamp/Wiring Diagram



Front Fog Lamp/Wiring Diagram

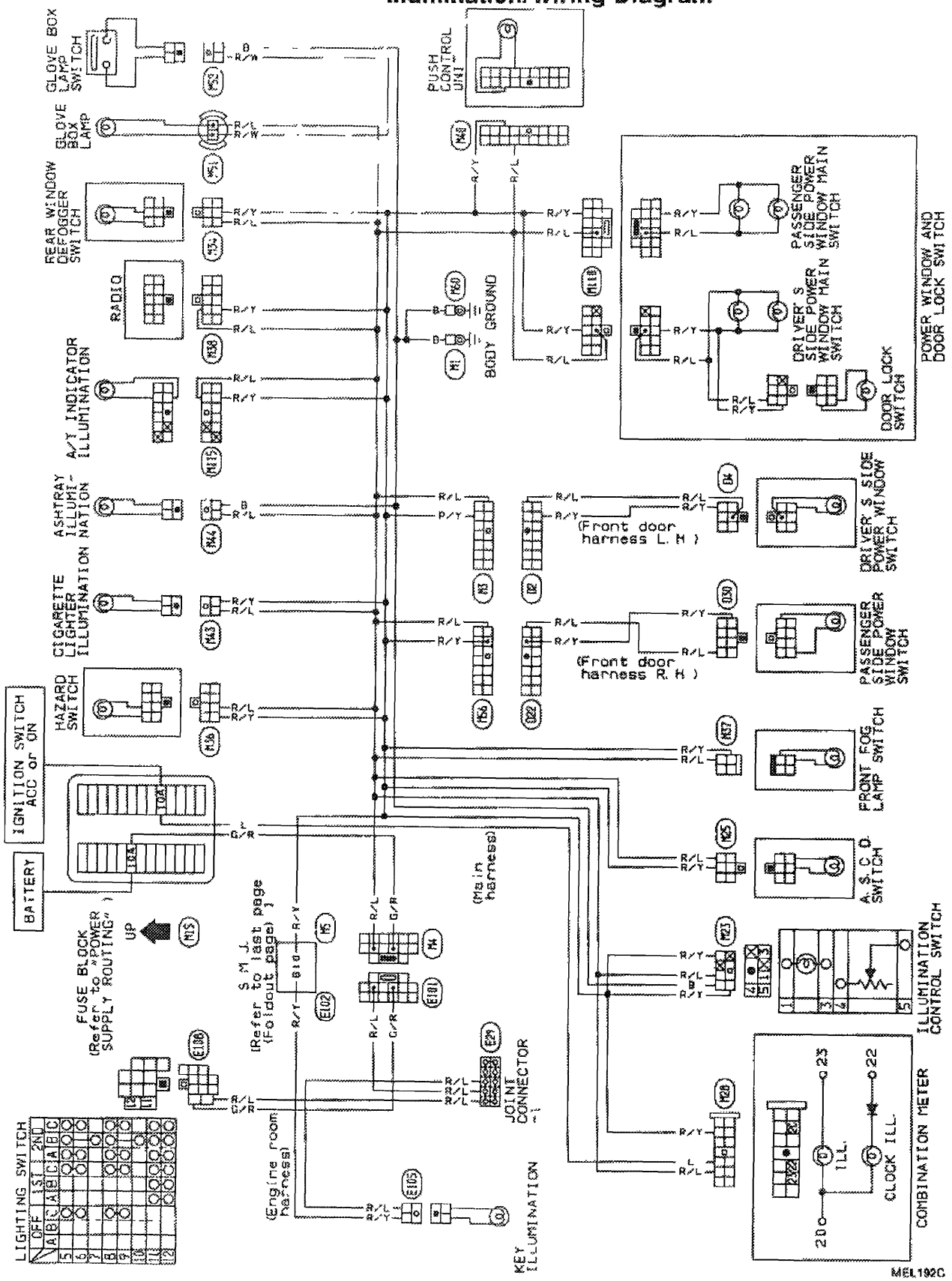


Turn Signal and Hazard Warning Lamps/Wiring Diagram

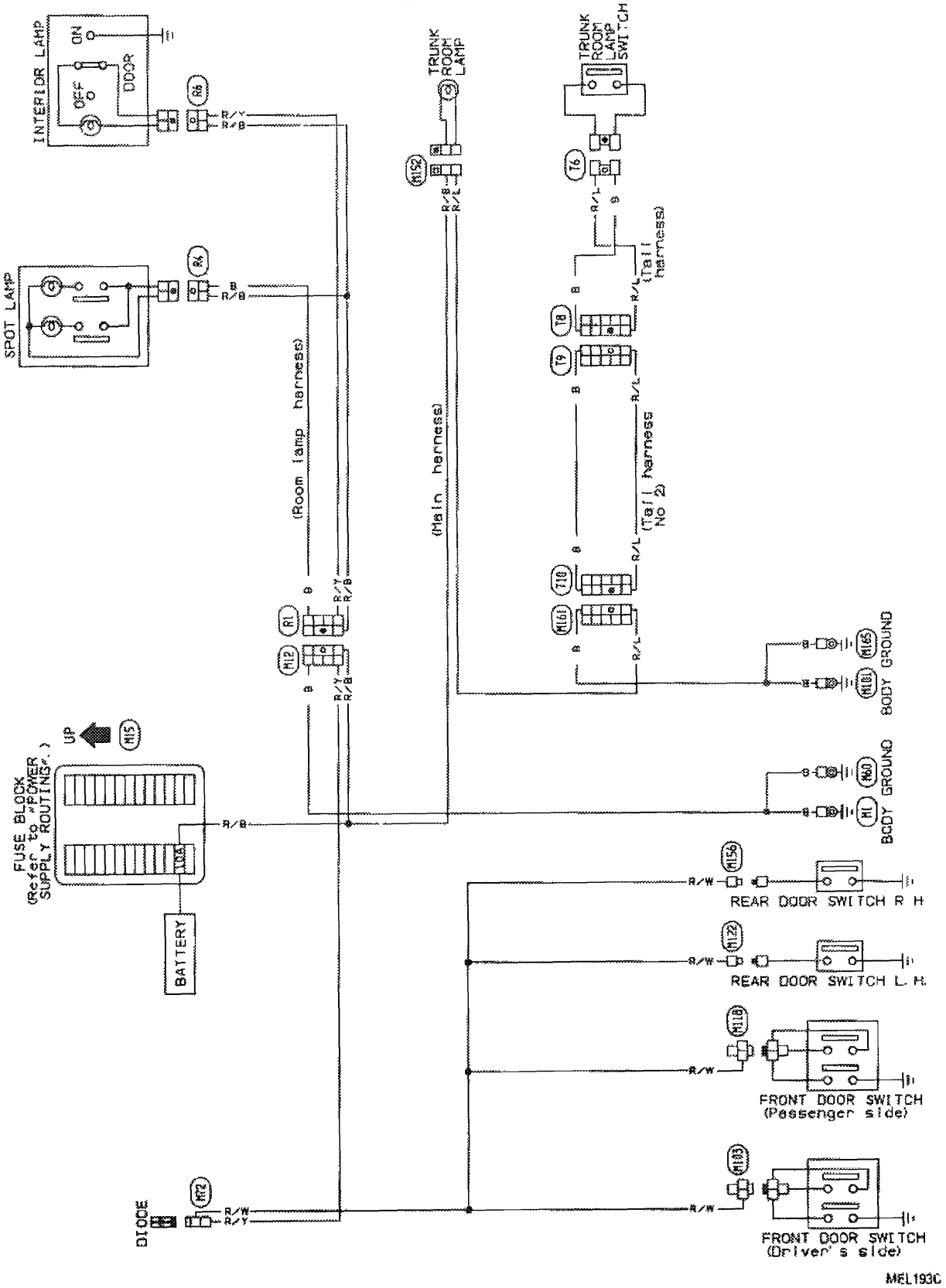


MEL182C

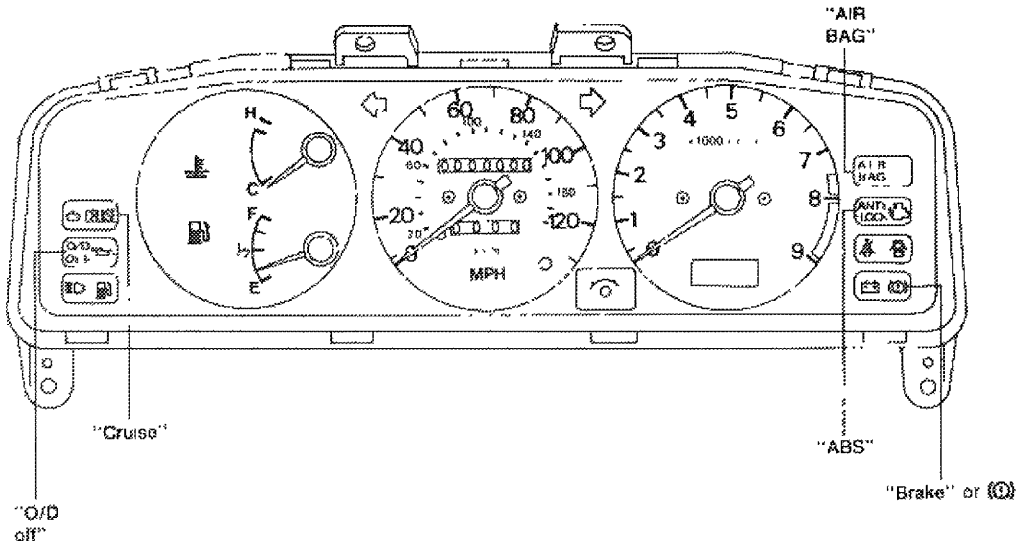
Illumination/Wiring Diagram

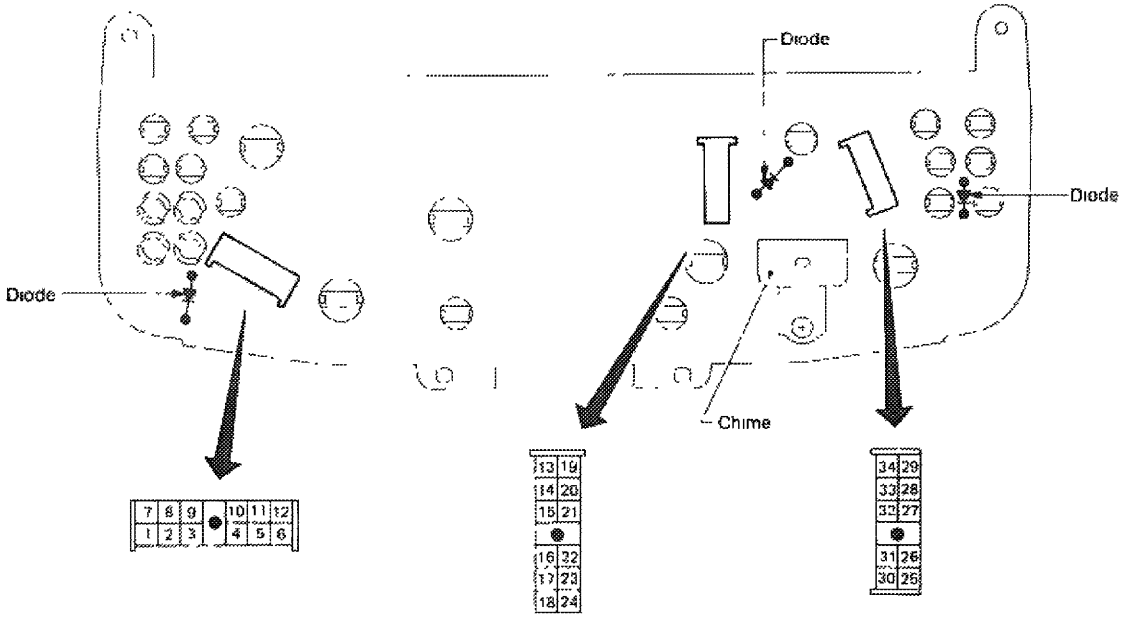


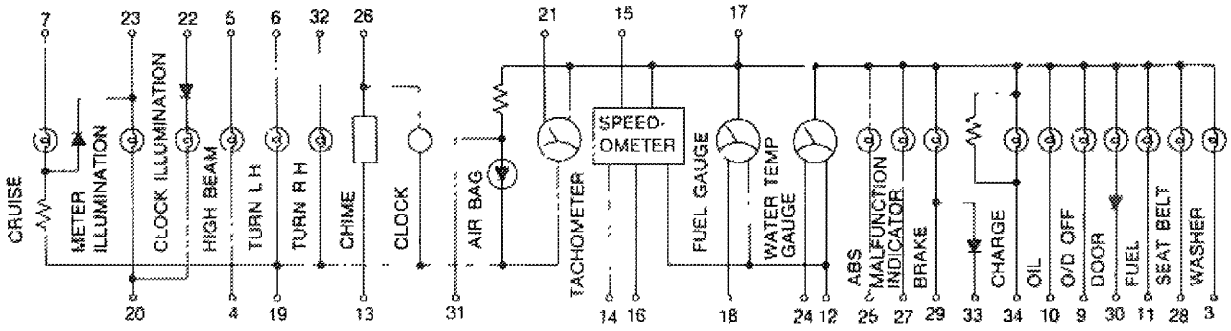
Interior, Spot and Trunk Room Lamps/Wiring Diagram



Combination Meter

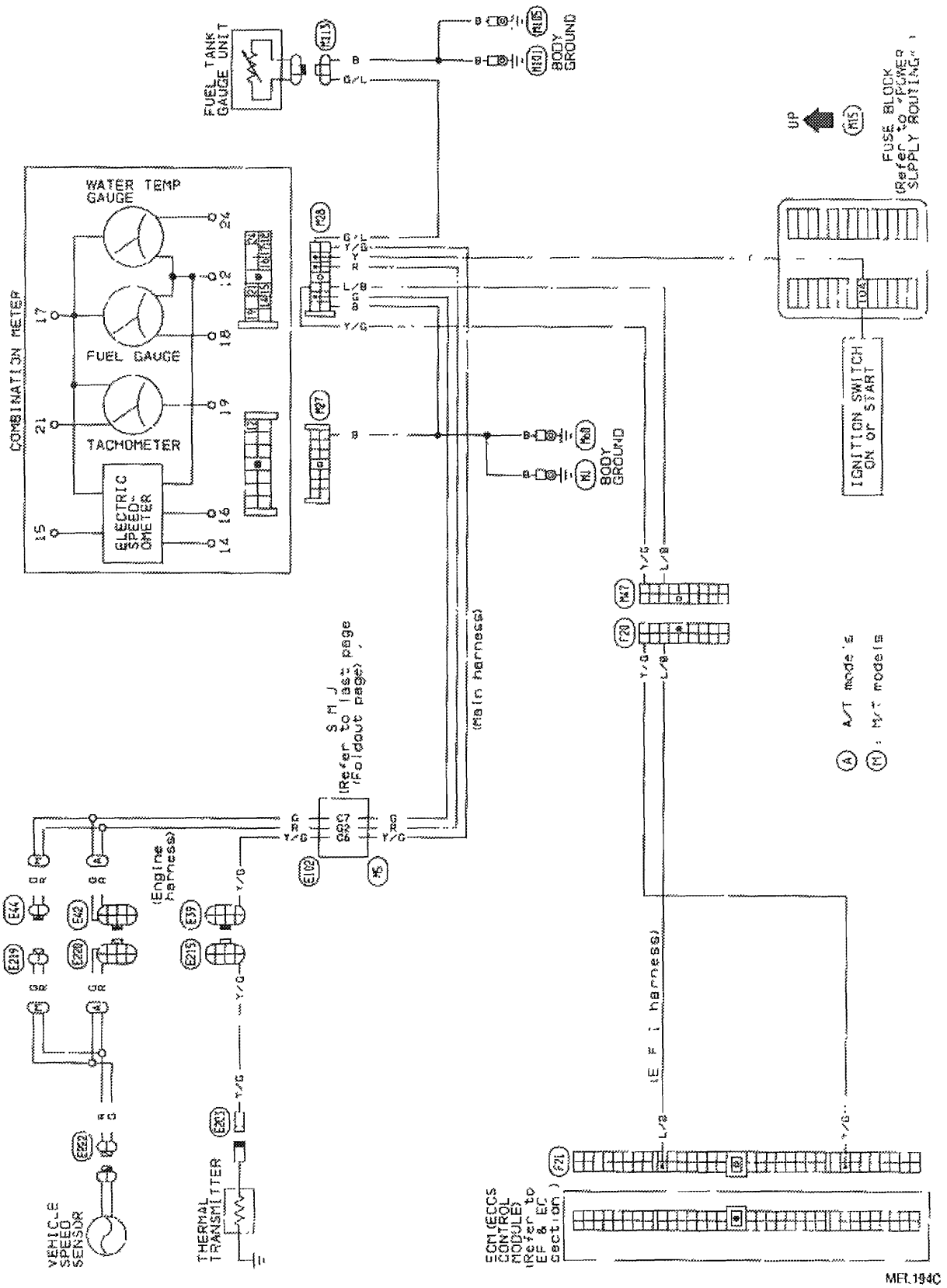




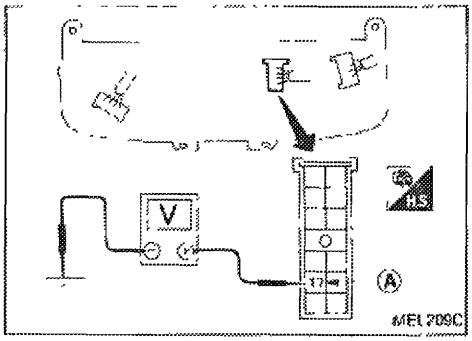


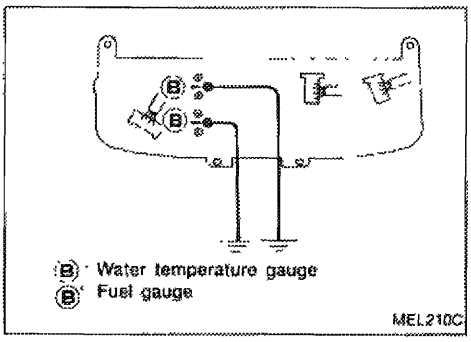
MFL208C

Speedometer, Tachometer, Temp., Oil and Fuel Gauges/Wiring Diagram

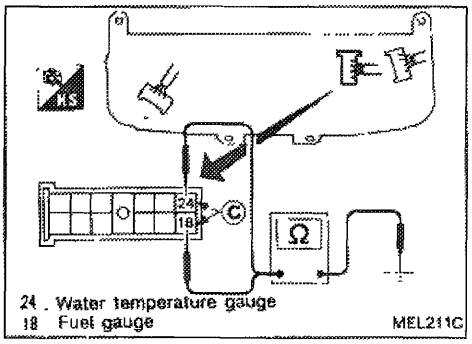


MEL194C





(B) : Water temperature gauge
(B) : Fuel gauge



24 : Water temperature gauge
18 : Fuel gauge

Inspection/Fuel Gauge and Water Temperature Gauge

INSPECTION START

CHECK POWER SOURCE.
1) Turn ignition switch "ON".
2) Check voltage between terminal (A) and ground
Battery voltage should exist.

N.G. → Check the following items
1) Harness continuity between battery terminal and combination meter
2) Ignition relay-1
3) Fusible link and fuse
4) Ignition switch

O.K

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

N.G. → Repair or replace gauge.

O.K.

Check harness continuity between component and combination meter (C).

N.G. → Repair or replace.

O.K.

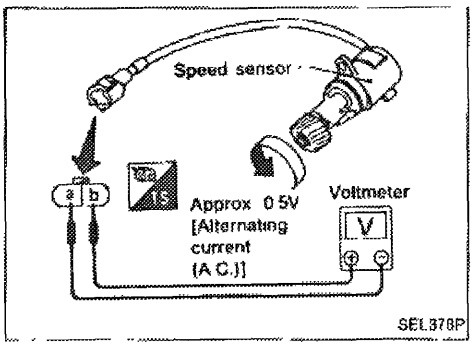
CHECK COMPONENT.
Check gauge units and harness.
Refer to "Fuel Tank Gauge Unit Check" and "Thermal Transmitter check".

N.G. → Repair or replace.
Refer to FE section. (Fuel tank gauge unit)

O K

Reinstall any part removed.

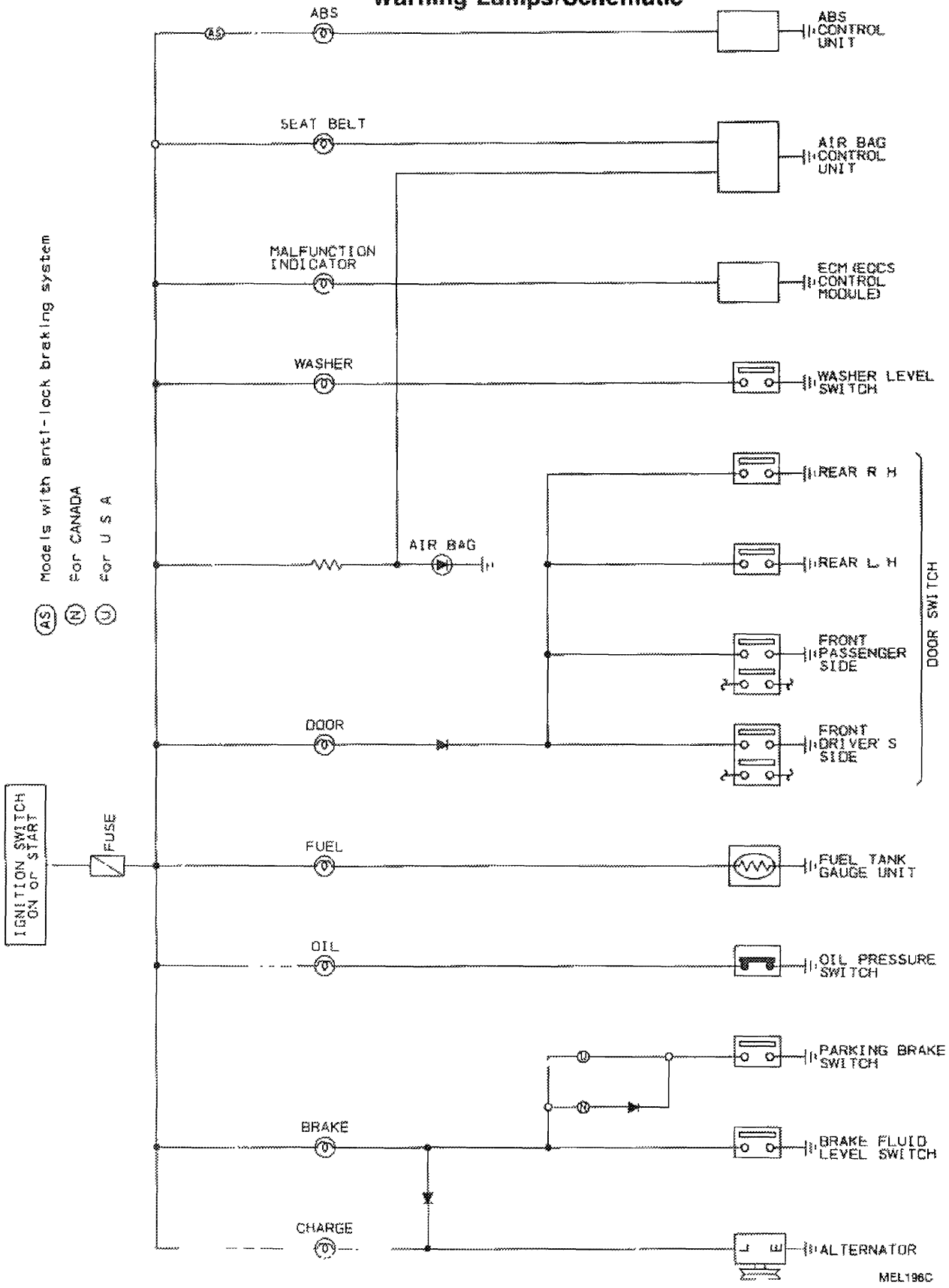
INSPECTION END



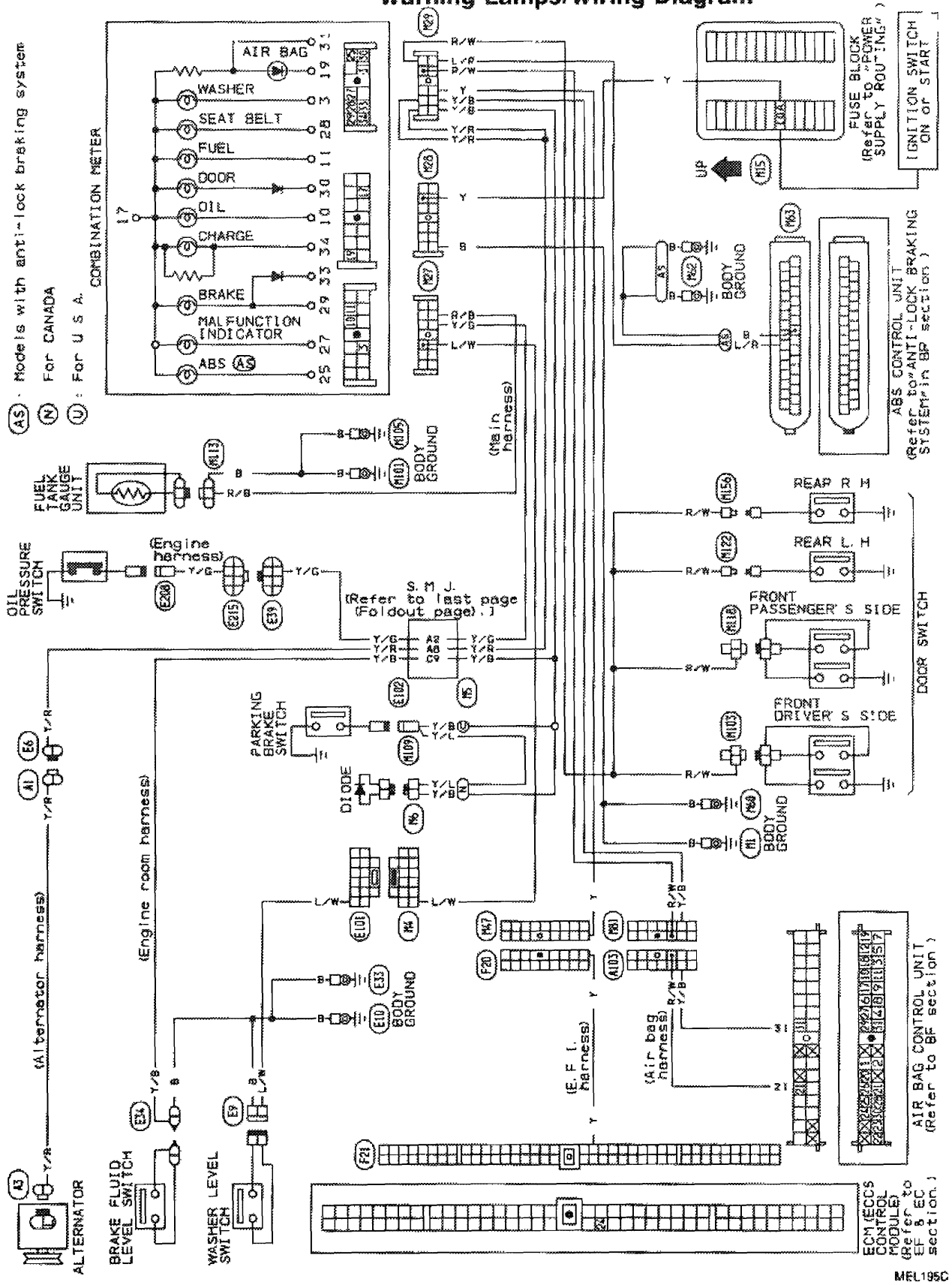
Speed Sensor Signal Check

1. Remove speed sensor from transaxle.
2. Turn speedometer pinion quickly and measure voltage across ⓐ and ⓑ.

Warning Lamps/Schematic

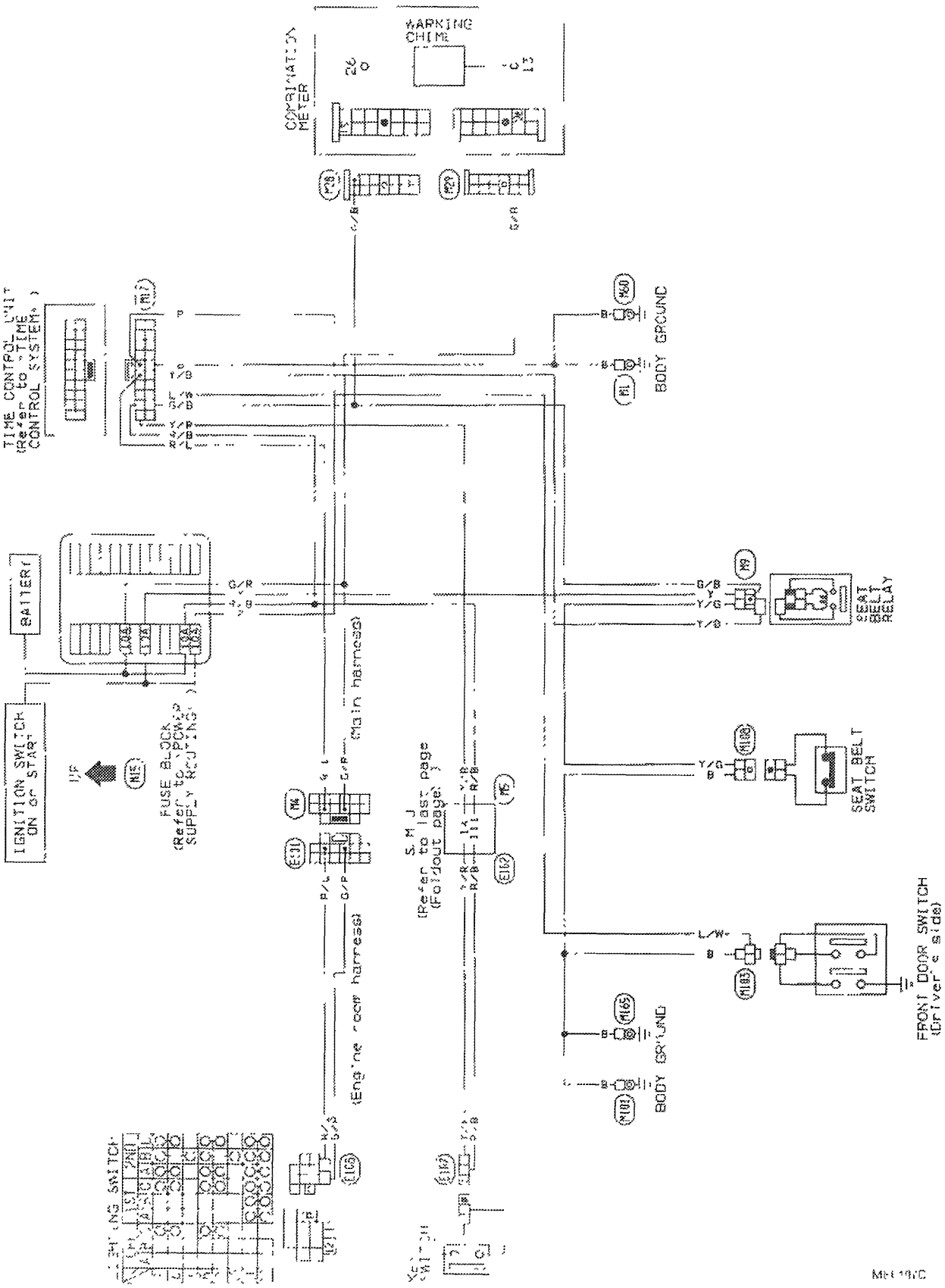


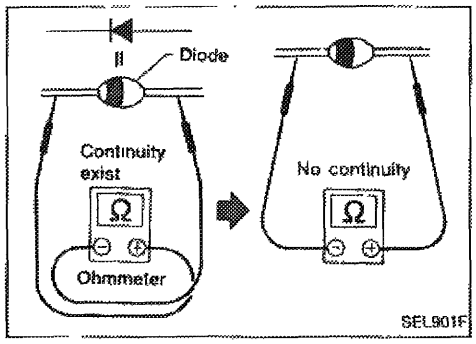
Warning Lamps/Wiring Diagram



MEL195C

Warning Chime/Wiring Diagram



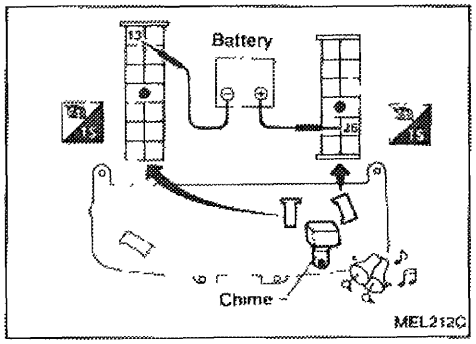


Diode Check

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

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

Refer to "Combination Meter".



Warning Chime Check

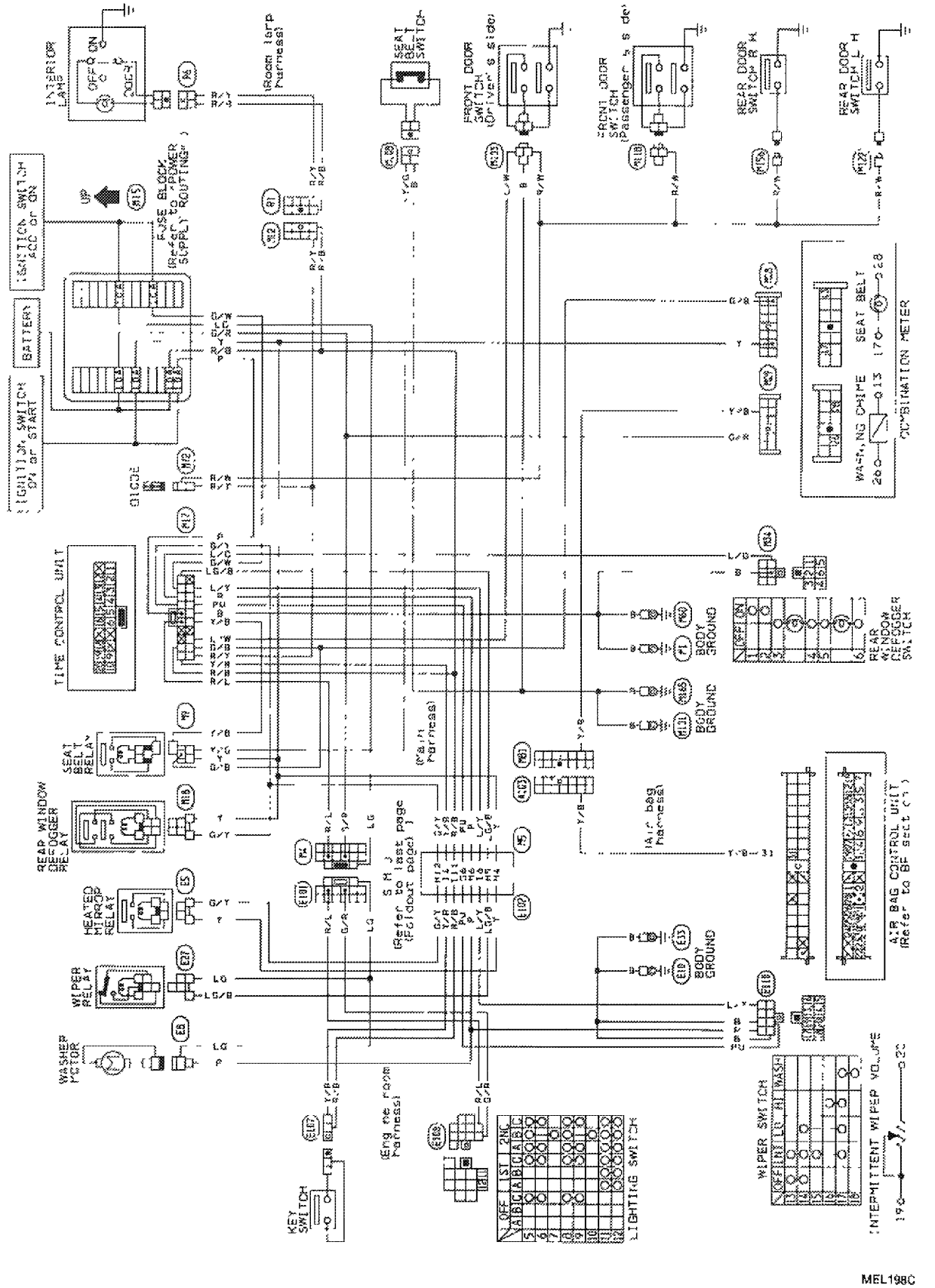
Description

FUNCTION

- Time control unit has the following functions.

Item		Details of control
1, 2	Intermittent wiper control	Regulates intermittent time from approximately 3 to 23 seconds depending on the intermittent wiper volume setting.
3	Washer and wiper combination control	Wiper is operated in conjunction with washer switch.
4	Light warning chime timer	When driver's door is opened with light switch ON and ignition switch OFF, warning chime sounds.
5	Ignition key warning chime timer	When driver's door is opened with ignition switch OFF, warning chime sounds.
6	Seat belt warning chime timer	Sounds warning chime for about 7 seconds if ignition switch is turned "ON" when seat belt switch is "ON" (seat belt is unfastened).
7	Rear defogger timer	Rear defogger operates for about 15 minutes when defogger switch is ON.
8	Interior lamp timer	Fades out interior lamp when driver's side door is opened and closed.

Wiring Diagram



Trouble Diagnoses

SYMPTOM CHART

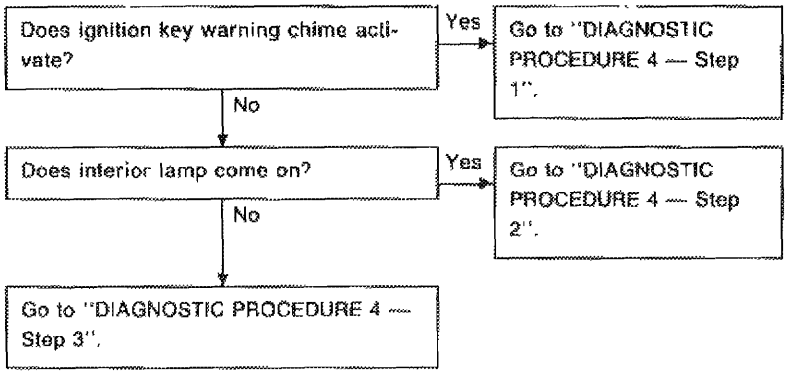
PROCEDURE		Preliminary Check			Main Power Supply and Ground Circuit Check	Diagnostic Procedure							
REFERENCE PAGE		EL-31	EL-31	EL-31	EL-32	EL-34	EL-35	EL-35	EL-36	EL-37	EL-38	EL-39	EL-40
SYMPTOM		Procedure 1	Procedure 2	Procedure 3	Main power supply and Ground circuit	Diagnostic Procedure 1	Diagnostic Procedure 2	Diagnostic Procedure 3	Diagnostic Procedure 4	Diagnostic Procedure 5	Diagnostic Procedure 6	Diagnostic Procedure 7	Diagnostic Procedure 8
Wiper & washer	Intermittent wiper does not operate.				○	○							
	Intermittent time of wiper cannot be adjusted						○						
	Wiper and washer activate individually but not in combination							○					
Warning	Light warning chime does not activate.	○			○				○				
	Ignition key warning chime does not activate.		○		○					○			
	Seat belt warning chime does not activate.			○	○						○		
Rear defogger	Rear defogger does not activate, or go off after activating				○							○	
Illumination	Interior lamp does not fade out after driver's door is closed				○								○

Trouble Diagnoses (Cont'd)

PRELIMINARY CHECK

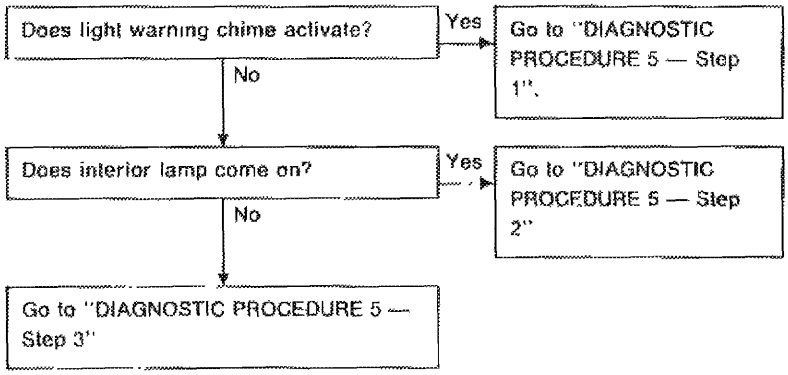
Preliminary check 1

- **Light warning chime does not activate.**



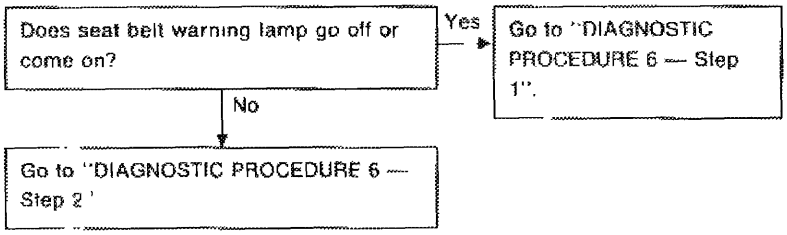
Preliminary check 2

- **Ignition key warning chime does not activate.**



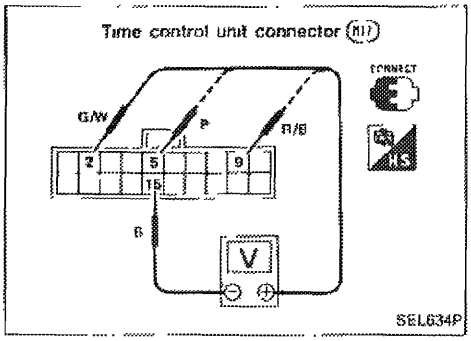
Preliminary check 3

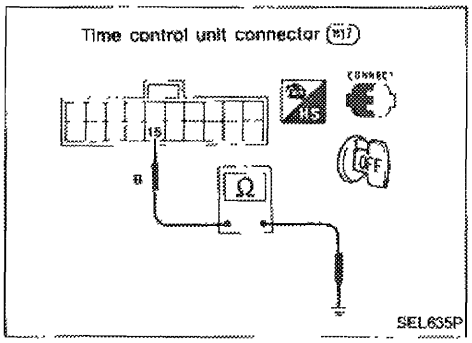
- **Seat belt warning chime does not activate.**



Trouble Diagnoses (Cont'd)

MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK





Main power supply

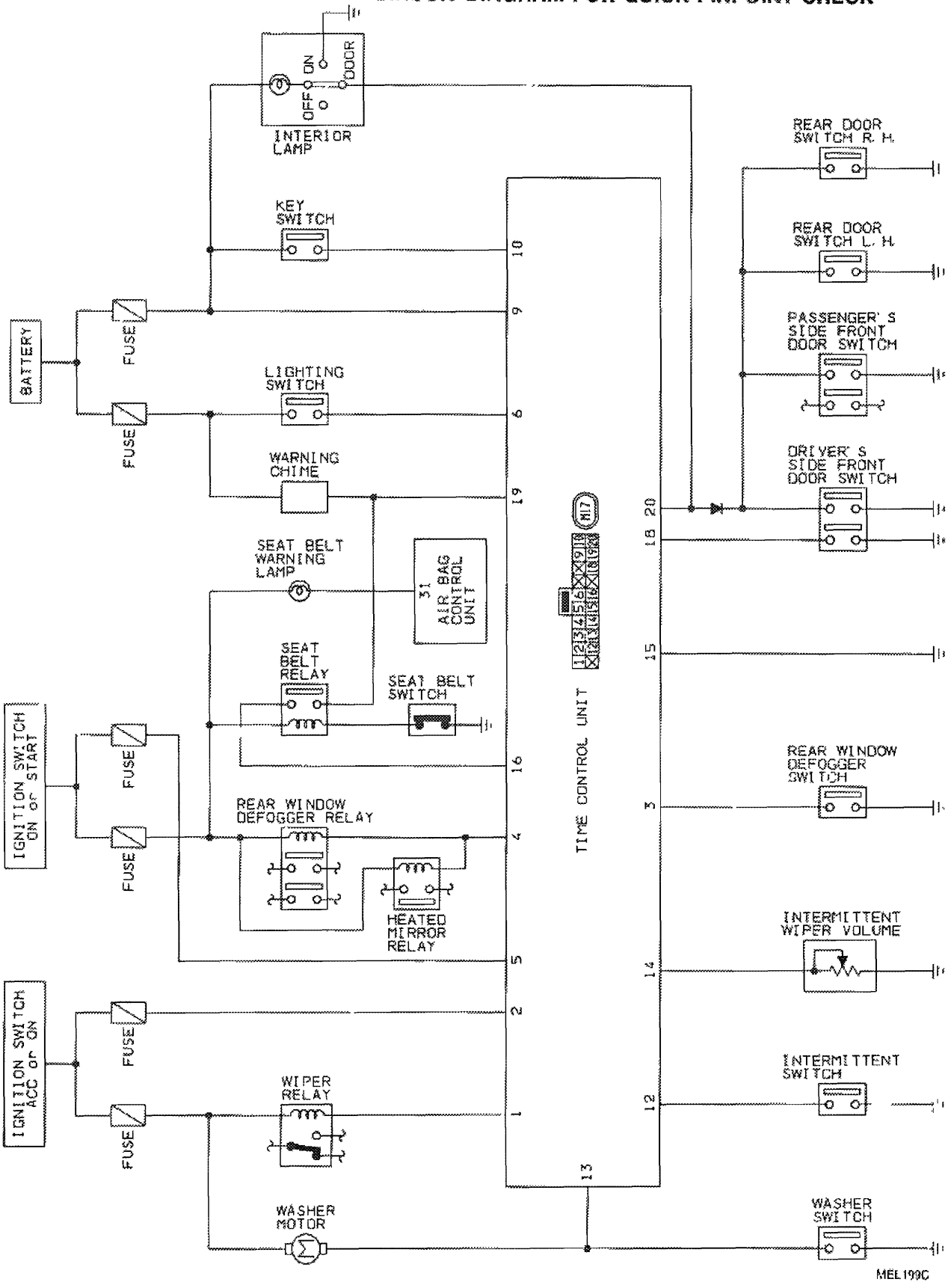
Terminals	Battery voltage existence condition		
	Ignition switch position		
	OFF	ACC	ON
⑨ - ⑮	Yes	Yes	Yes
⑤ - ⑮	No	No	Yes
② - ⑮	No	Yes	Yes

Ground circuit

Terminals	Continuity
⑮ - Ground	Yes

Trouble Diagnoses (Cont'd)

CIRCUIT DIAGRAM FOR QUICK PINPOINT CHECK

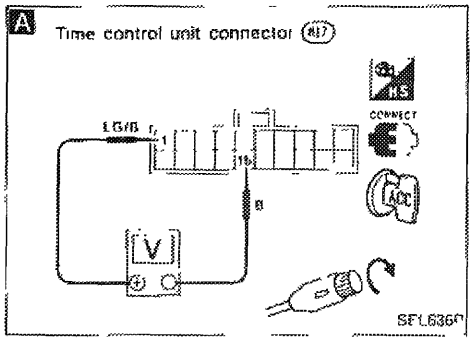


Trouble Diagnoses (Cont'd)

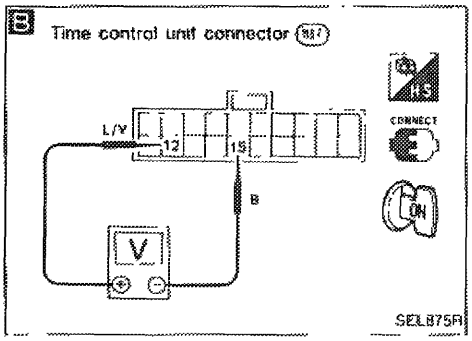
DIAGNOSTIC PROCEDURE 1

SYMPTOM: Intermittent wiper does not operate.

A



B



A

WIPER RELAY OUTPUT SIGNAL CHECK

1) Turn ignition switch to "ACC".
2) Turn wiper switch to "INT" or "OFF".
3) Measure voltage between control unit harness terminals (1) and (15).

Condition of wiper switch	Voltage [V]
OFF	Approx. 12
INT	Pointer swings from 0 to 12 every 3 to 23 seconds

O.K → Check wiper relay
Refer to "WIPER AND WASHER".

- O.K → Check wiper relay circuit.
- N.G. → Replace wiper relay.

N G

B

INTERMITTENT SWITCH INPUT SIGNAL CHECK

Measure voltage between control unit harness terminals (12) and (15)

Condition of wiper switch	Voltage [V]
OFF	Approx. 12
INT	0

N.G → Check wiper switch.
Check harness continuity between T.C.U and wiper switch

O K

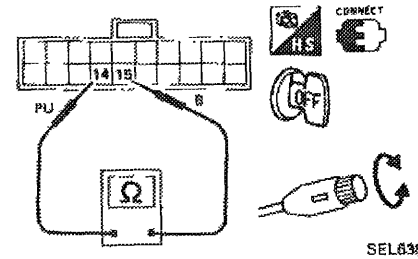
Replace control unit

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 2

SYMPTOM: Intermittent time of wiper cannot be adjusted.

A Time control unit connector (M17)



A

INTERMITTENT WIPER VOLUME INPUT SIGNAL CHECK
Measure resistance between control unit harness terminals (14) and (15) while turning intermittent wiper volume

Position of wiper knob	Resistance [Ω]
S	0
L	Approx. 1 k

O.K → Replace control unit

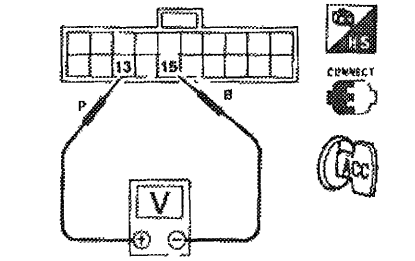
N.G.

Check intermittent wiper volume
Check harness continuity between T.C.U. and wiper switch.

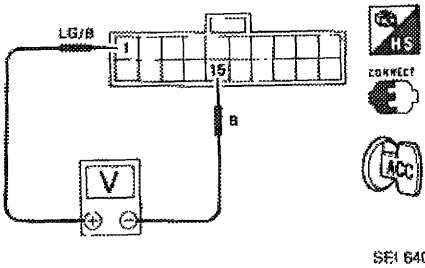
DIAGNOSTIC PROCEDURE 3

SYMPTOM: Wiper and washer activate individually but not in combination.

A Time control unit connector (M17)



B Time control unit connector (M17)



A

WASHER SWITCH INPUT SIGNAL CHECK
1) Turn ignition switch to "ACC".
2) Measure voltage between control unit harness terminals (13) and (15).

Condition of washer switch	Voltage [V]
OFF	Approx. 12
ON	0

N.G → Check harness continuity between T.C.U. and washer switch

O.K.

B

WIPER RELAY OUTPUT SIGNAL CHECK
Measure voltage between control unit harness terminals (1) and (15) after operating washer switch.
0V for approx. 3 seconds after washer has operated.

N.G. → Replace control unit.

O.K.

Replace wiper relay.

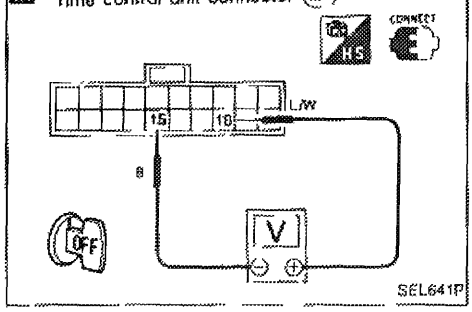
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 4

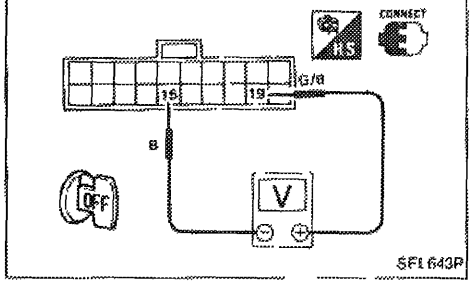
SYMPTOM: Light warning chime does not activate.

- Perform "PRELIMINARY CHECK — Procedure 1" before referring to the following flow chart.

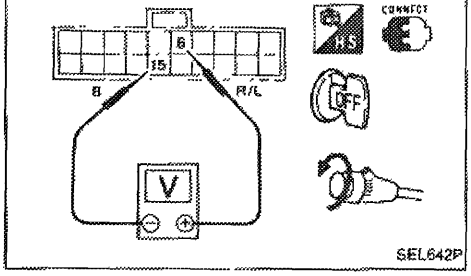
A Time control unit connector (M17)



B Time control unit connector (M17)



C Time control unit connector (M17)



A

Step 3

DOOR SWITCH INPUT SIGNAL CHECK
Measure voltage between control unit harness terminals ⑱ and ⑮

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

N.G. → Check door switch. Check harness continuity between T.C.U. and door switch.

O K

B

Step 2

CHIME OUTPUT SIGNAL CHECK
Measure voltage between control unit harness terminals ⑲ and ⑮.

Condition	Voltage [V]
Light switch is ON	Approx. 12
Light switch is OFF	0

O.K → Check chime. Check harness continuity between T.C.U. and chime.

N G.

C

Step 1

LIGHT SWITCH INPUT SIGNAL CHECK
Measure voltage between control unit harness terminals ⑥ and ⑮.

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

N.G → Check light switch. Check harness continuity between T.C.U. and light switch.

O K.

Replace control unit.

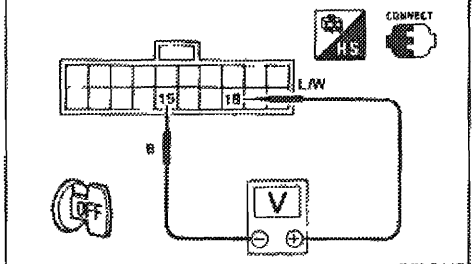
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 5

SYMPTOM: Ignition key warning chime does not activate.

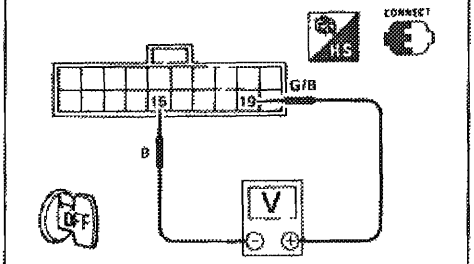
- Perform "PRELIMINARY CHECK — Procedure 2" before referring to the following flow chart.

A Time control unit connector (M17)



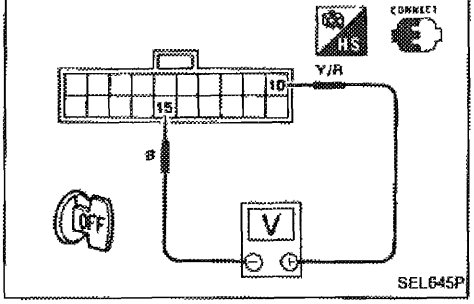
SEL644P

B Time control unit connector (M17)



SEL646P

C Time control unit connector (M17)



SEL645P

A Step 3

DOOR SWITCH INPUT SIGNAL CHECK
Measure voltage between control unit harness terminals (18) and (15).

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

N.G. → Check door switch
Check harness continuity between T.C.U. and door switch.

O.K

B Step 2

CHIME OUTPUT SIGNAL CHECK
Measure voltage between control unit harness between (19) and (15).

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

O.K. → Check chime.
Check harness continuity between T.C.U. and chime.

N.G.

C Step 1

IGNITION KEY SWITCH INPUT SIGNAL CHECK
Measure voltage between control unit harness terminals (10) and (15).

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

N.G. → Check ignition key switch.
Check harness continuity between T.C.U. and ignition key switch.

O.K.

Replace control unit.

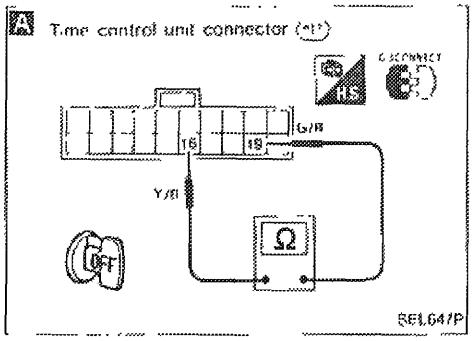
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

SYMPTOM: Seat belt warning chime does not activate.

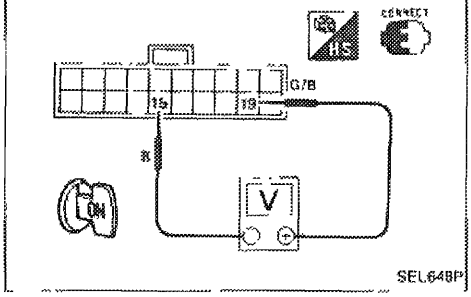
- Perform "PRELIMINARY CHECK — Procedure 3" before referring to the following flow chart.

A Time control unit connector (*1)



SEL647P

B Time control unit connector (M7)



SEL648P

A

Step 2

SEAT BELT SWITCH INPUT SIGNAL CHECK

Check continuity between control unit harness terminals (15) and (19).

Condition	Continuity
Unfastened	Yes
Fastened	No

N G → Check seat belt switch. Check harness continuity between T.C.U and seat belt switch.

O.K ↓

B

Step 1

CHIME OUTPUT SIGNAL CHECK

1) Connect T.C.U. harness connector
2) Turn ignition switch "ON".
3) Measure voltage between control unit harness terminals (19) and (15)

Condition of seat belt	Voltage [V]
Unfastened	Pointer deflects intermittently
Fastened	Approx. 12

O.K → Check chime. Check harness continuity between T.C.U and chime

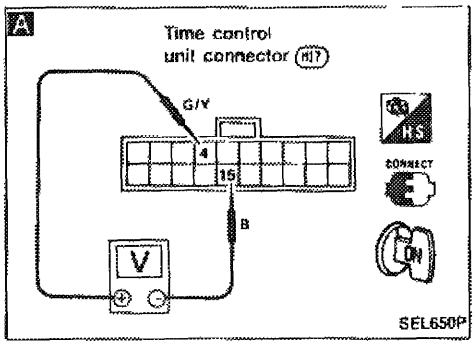
N.G. ↓

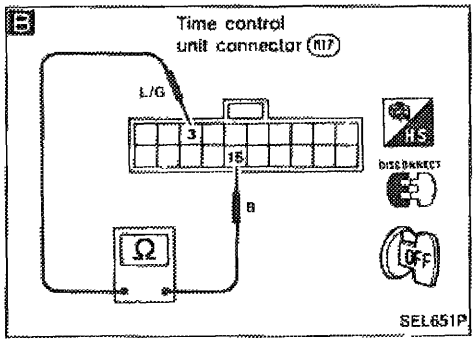
Replace control unit.

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 7

SYMPTOM: Rear defogger does not activate, or does not go off after activating.





A

REAR WINDOW DEFOGGER OUTPUT SIGNAL CHECK

Measure voltage between control unit harness ④ and ⑮.

Condition of defogger switch	Voltage [V]
Defogger switch is "OFF"	Approx. 12
Defogger switch is "ON"	0

O.K. → Check rear window defogger relay
Check rear window defogger circuit.

N G.

B

REAR WINDOW DEFOGGER SWITCH INPUT SIGNAL CHECK

1) Disconnect T.C.U. harness connector
2) Check continuity between control unit harness terminals ③ and ⑮.

Condition of defogger switch	Continuity
Defogger switch is "OFF"	No
Defogger switch is "ON"	Yes

N.G. → Check rear window defogger switch.
Check harness continuity between T.C.U and rear window defogger switch

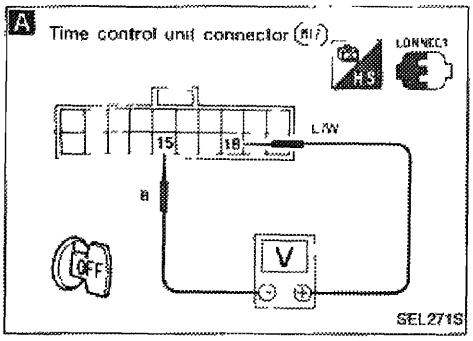
O.K.

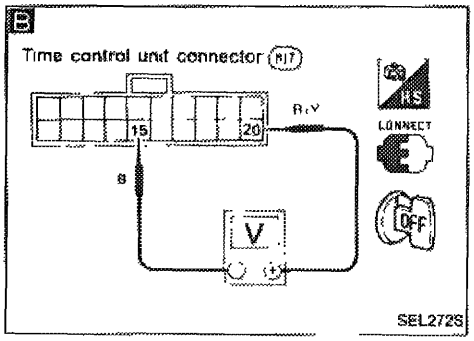
Replace control unit

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 8

SYMPTOM: Interior lamp does not fade out after driver's door is closed.





A

DOOR SWITCH INPUT SIGNAL CHECK
Measure voltage between control unit harness terminals ⑱ and ⑮.

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

N G → Check door switch. Check harness continuity between T.C.U. and door switch.

O.K.

B

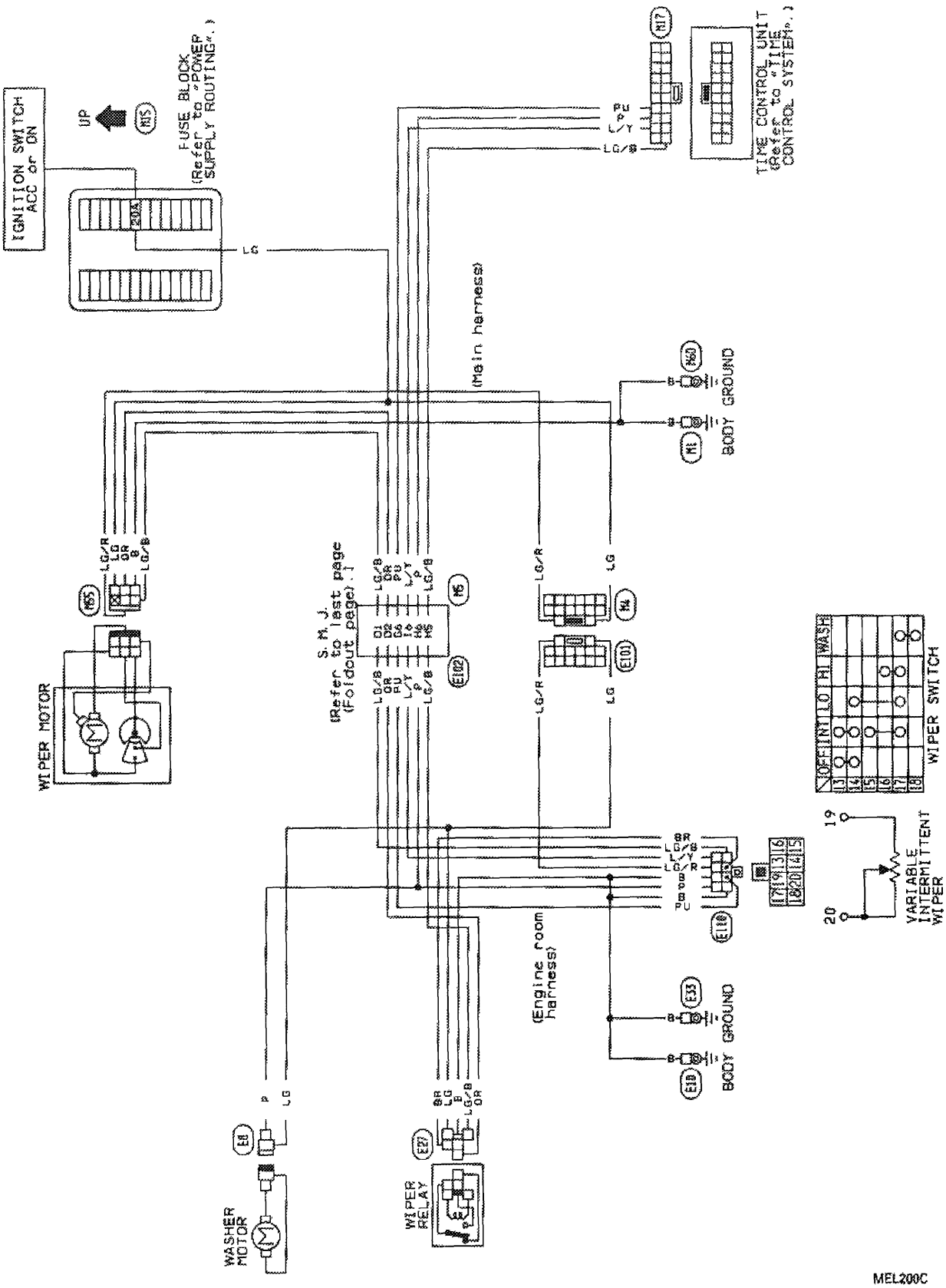
INTERIOR LAMP SIGNAL CHECK
Measure voltage between control unit harness terminals ⑳ and ⑮.

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

O K → Check interior lamp and harness between T.C.U. and interior lamp.

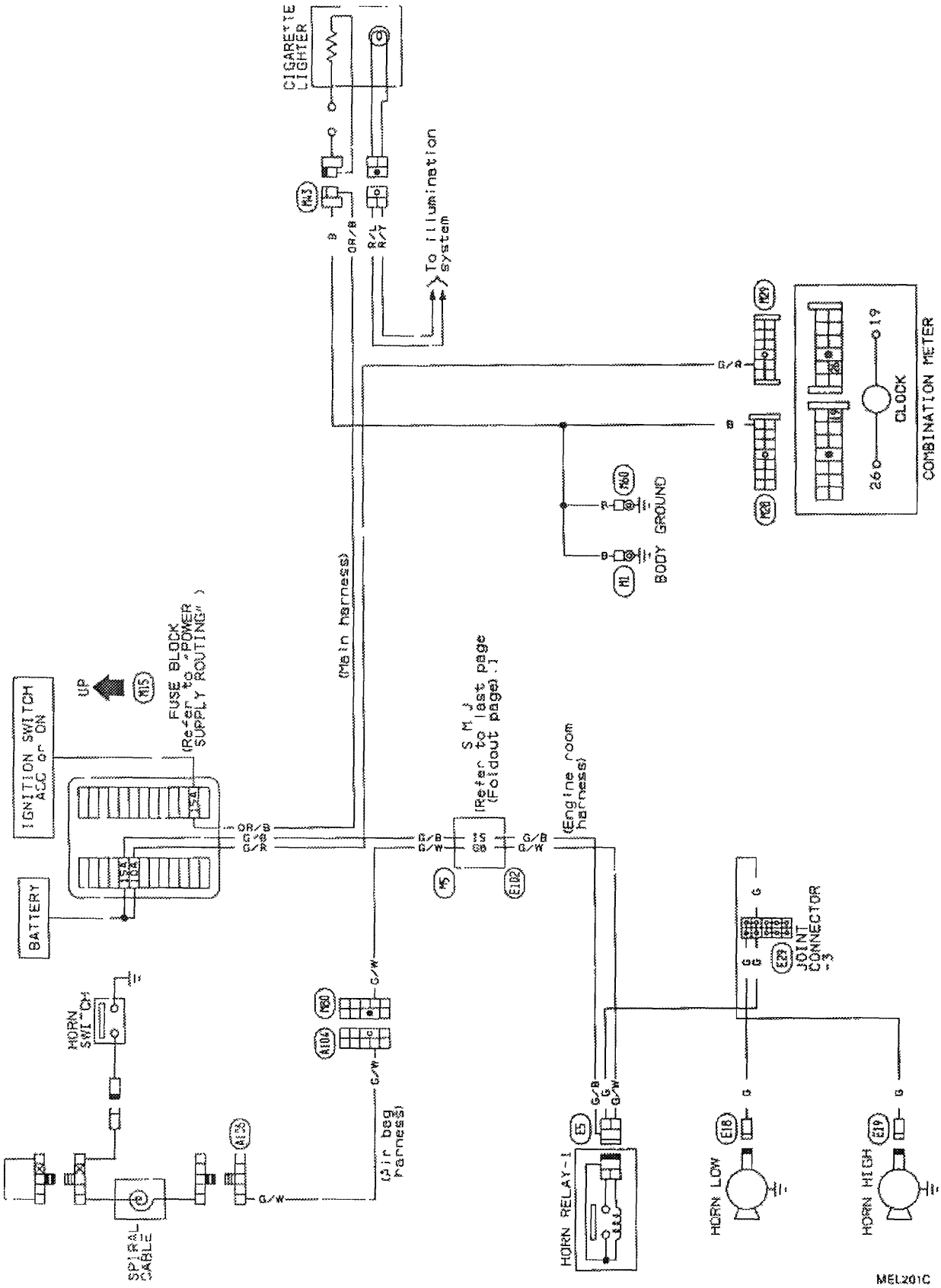
N G → Replace T.C.U.

Front Wiper and Washer/Wiring Diagram

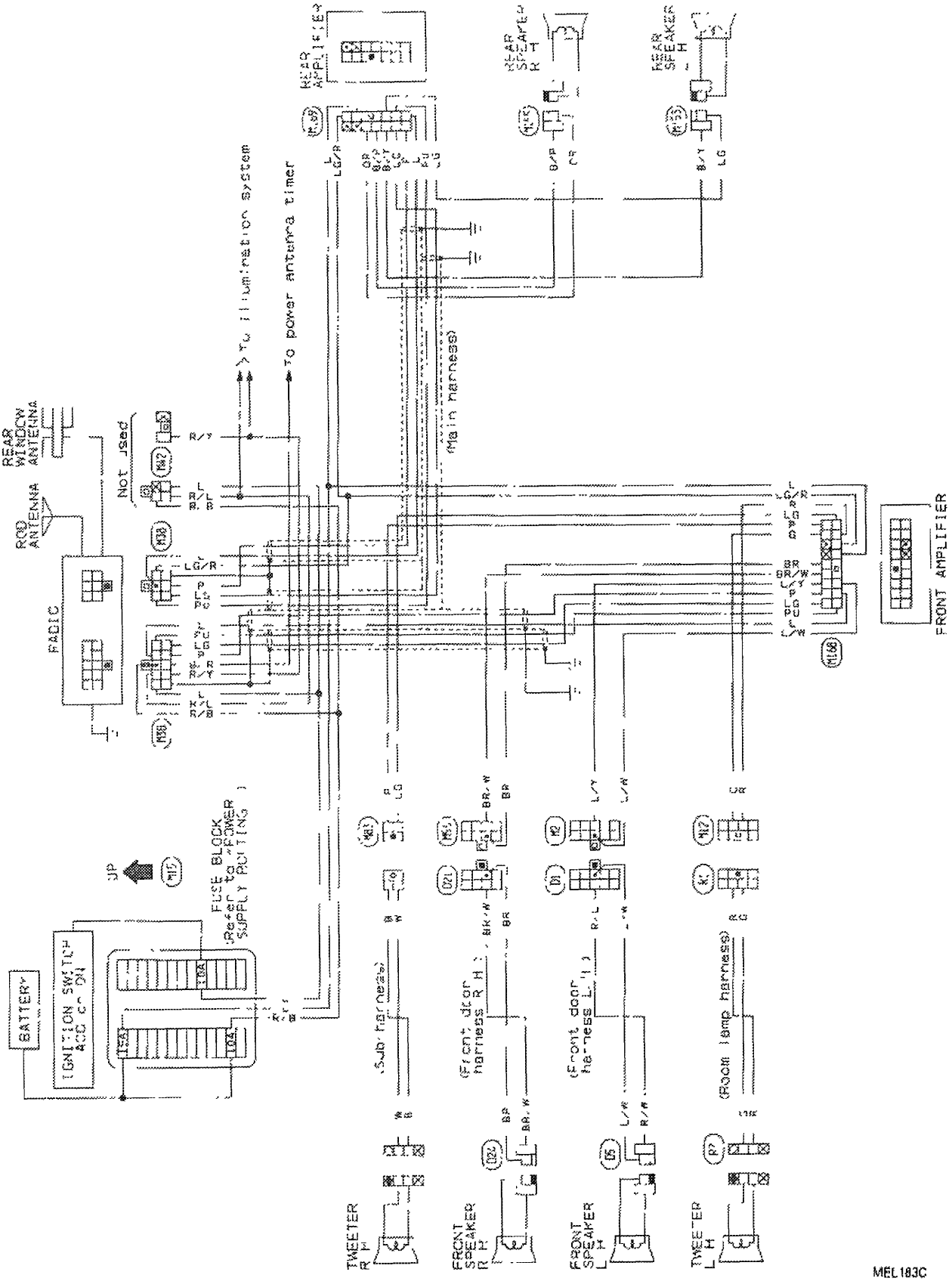


MEL200C

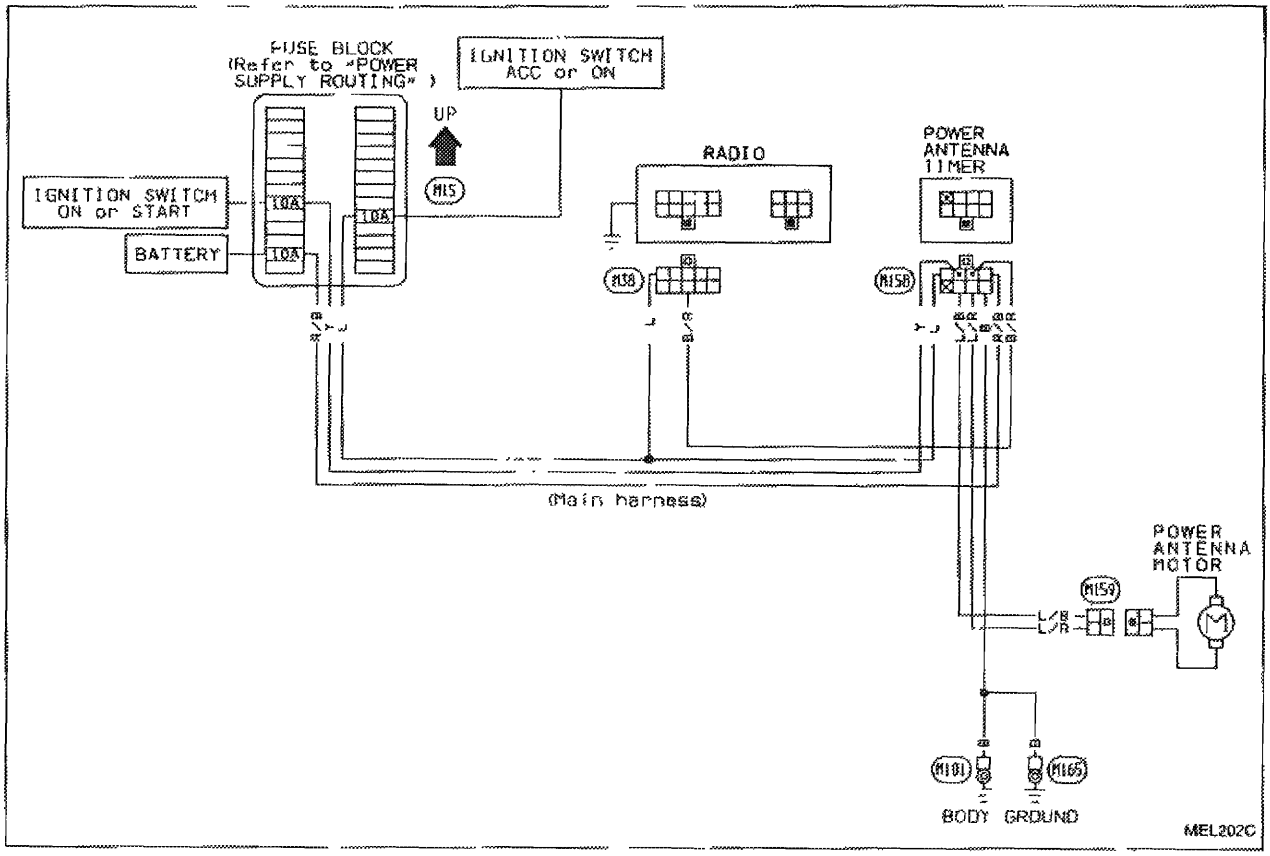
Wiring Diagram



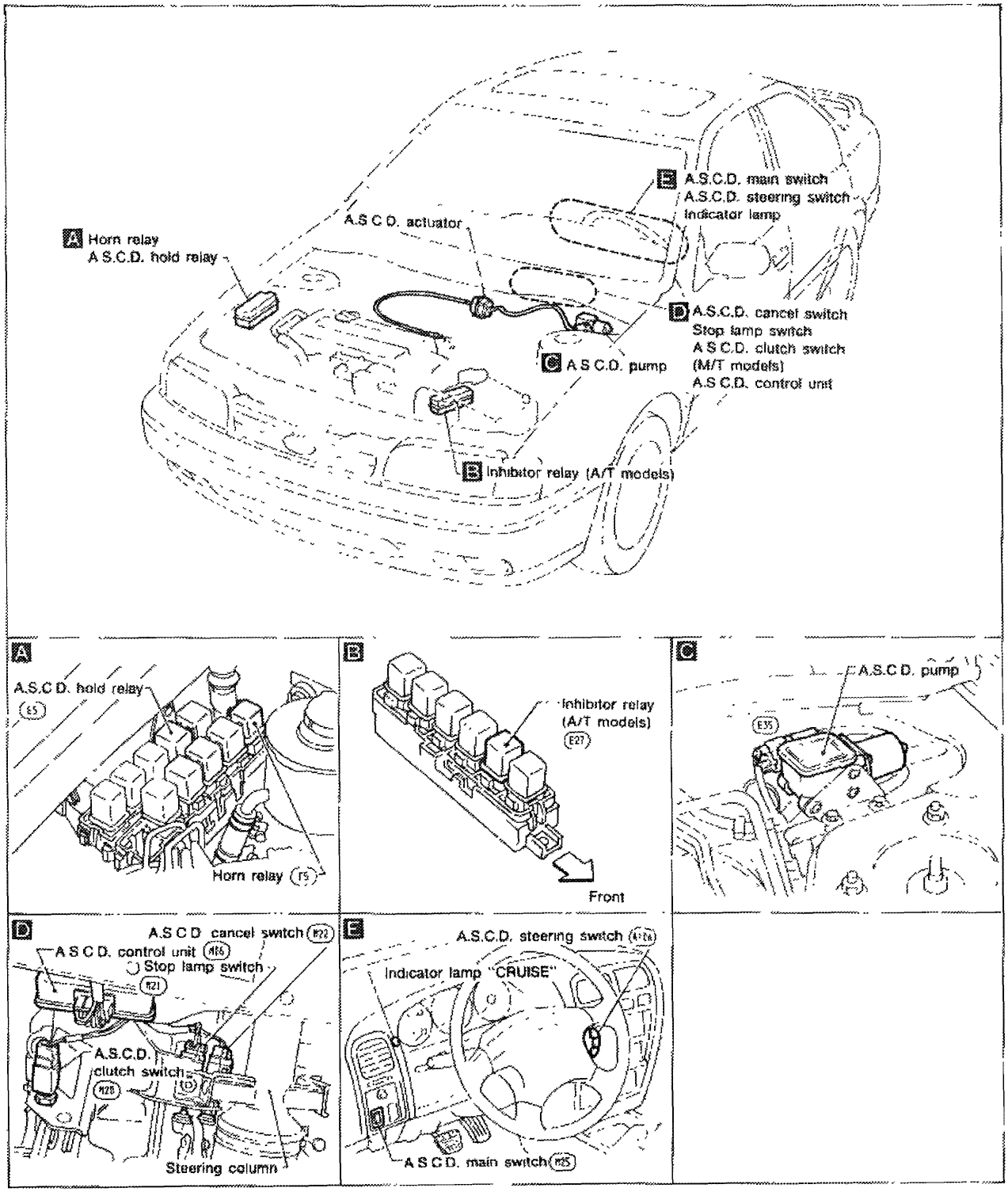
Audio/Wiring Diagram



Power Antenna/Wiring Diagram

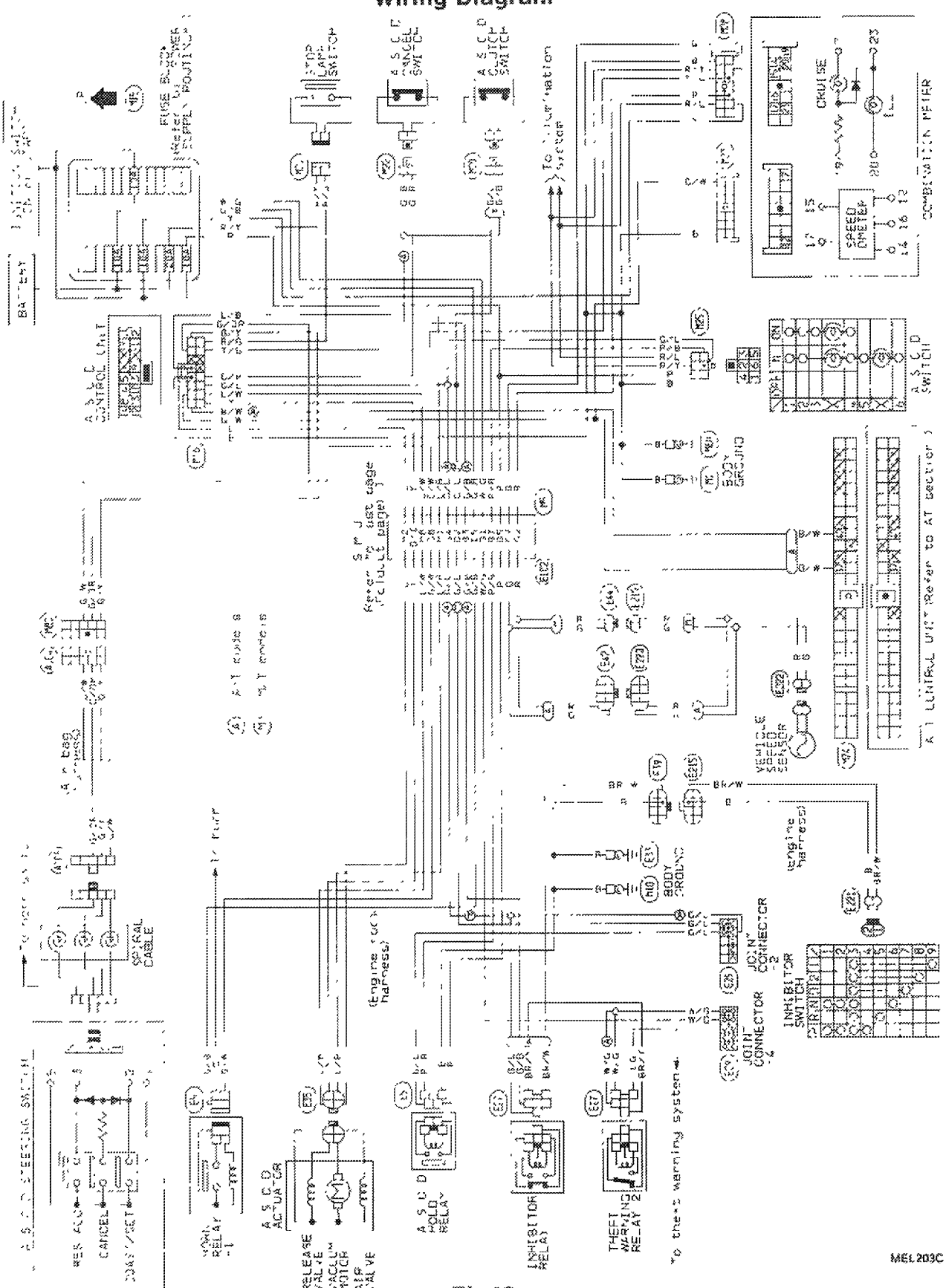


Component Parts and Harness Connector Location



SEL273S

Wiring Diagram



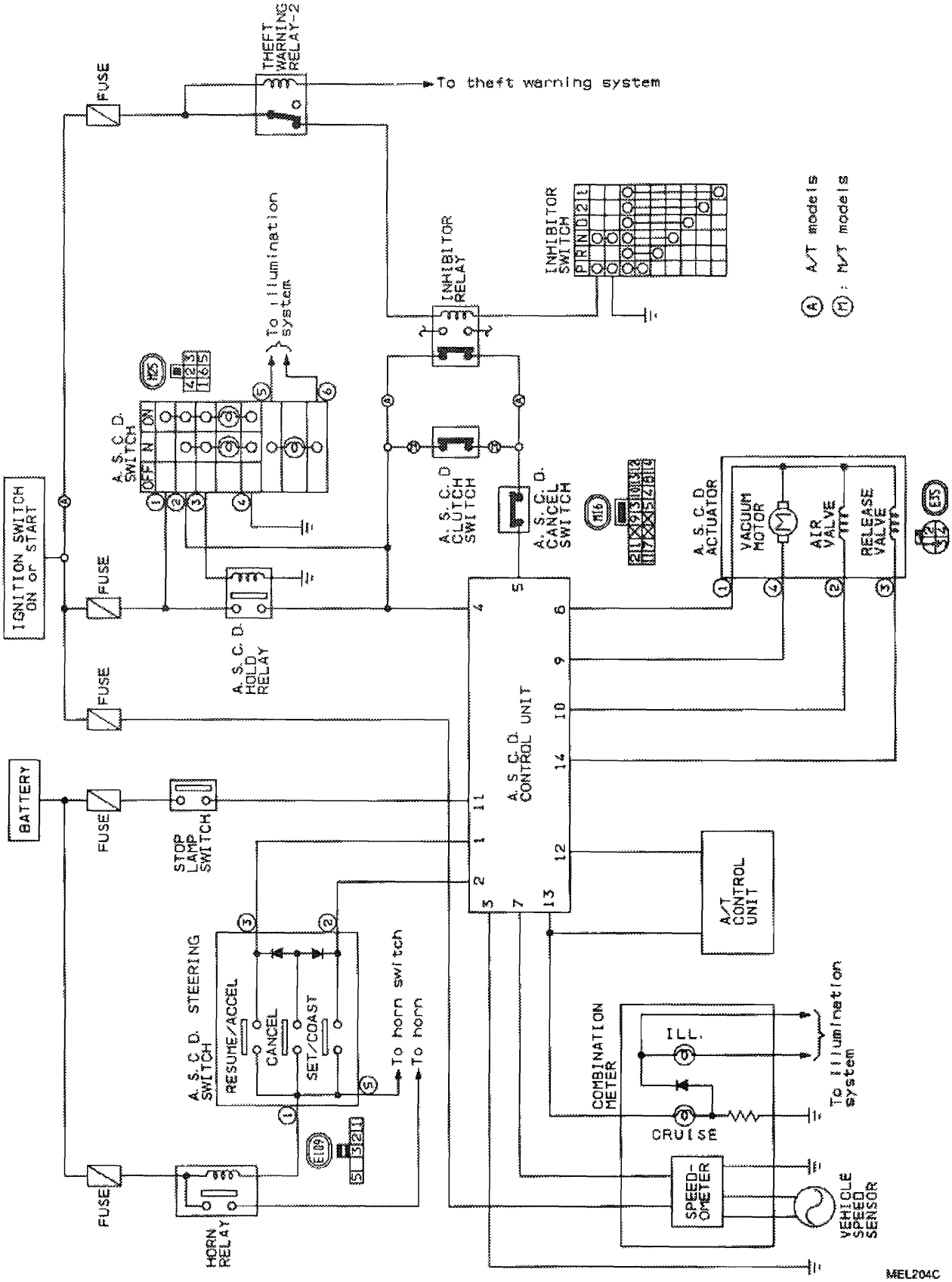
Trouble Diagnoses

SYMPTOM CHART

PROCEDURE	Diagnostic Procedure								Electrical Components Inspection							
REFERENCE PAGE	EL-49	EL-51	EL-51	EL-52	EL-53	EL-54	EL-55	EL-56	EL-57	EL-58	EL-58	EL-59	EL-59	EL-59	EL-59	EL-59
SYMPTOM	Diagnostic Procedure 1	Diagnostic Procedure 2	Diagnostic Procedure 3	Diagnostic Procedure 4	Diagnostic Procedure 5	Diagnostic Procedure 6	Diagnostic Procedure 7	Diagnostic Procedure 8	A.S.C.D. wire adjustment	A.S.C.D. actuator/A.S.C.D. pump	A.S.C.D. main switch	A.S.C.D. steering switch	A.S.C.D. cancel switch and stop lamp switch	A.S.C.D. clutch switch (For M/T models)	Inhibitor switch (For A/T models)	Speed sensor
A.S.C.D. control unit cannot be set properly.	○									○	○	○	○	○	○	○
Engine hunts		○							○	○						
Large difference between set speed and actual vehicle speed			○						○	○						
Deceleration is greatest immediately after A.S.C.D. has been set.				○					○	○						
ACCEL switch will not operate.	○				○							○				
RESUME switch will not operate.	○					○						○	○	○		
Set speed cannot be cancelled.							○		○	○			○	○		
"CRUISE" indicator lamp blinks.								○		○		○	○			

Trouble Diagnoses (Cont'd)

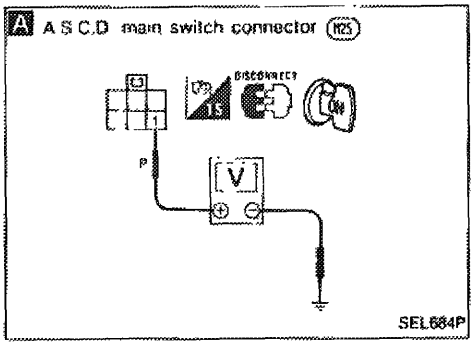
CIRCUIT DIAGRAM FOR QUICK PINPOINT CHECK

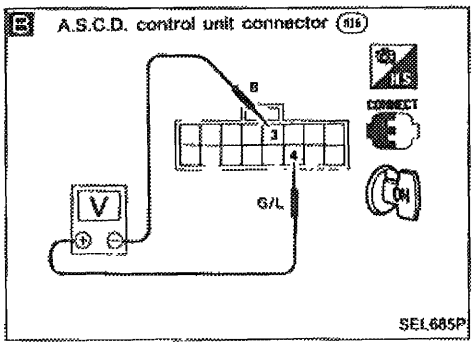


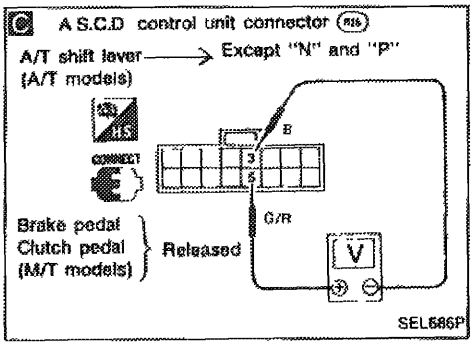
Trouble Diagnoses (Cont'd)

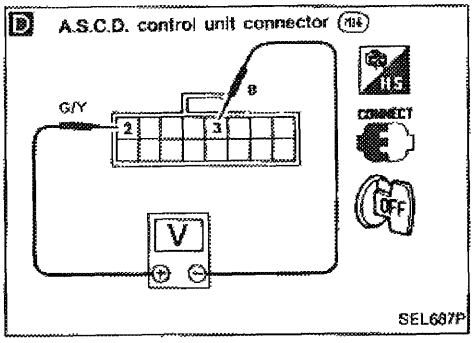
DIAGNOSTIC PROCEDURE 1

SYMPTOM: A.S.C.D. control cannot be set.









Turn A.S.C.D. main switch "OFF" and "ON" to make sure indicator illuminates — N.G. → A
- A: CHECK POWER SUPPLY FOR A.S.C.D. MAIN SWITCH.
  1. Disconnect main switch harness connector.
  2. Do approx. 12 volts exist between main switch harness terminal ① and body ground?
  - No → Check fuse and harness.
  - Yes → CHECK A.S.C.D. MAIN SWITCH. Refer to "Electrical Components Inspection". CHECK A.S.C.D. HOLD RELAY.

O.K.

B: CHECK POWER SUPPLY CIRCUIT FOR A.S.C.D. CONTROL UNIT.
1. Turn A.S.C.D. main switch "ON".
2. Check voltage between control unit harness terminal ④ and ③.
Battery voltage should exist.

N.G. → Check continuity between control unit harness terminal ④ and A.S.C.D. hold relay.

O.K.

C: CHECK CUT-OFF CIRCUIT FOR A.S.C.D. CONTROL UNIT.
Check voltage between control unit harness terminals ⑤ and ③.
Battery voltage should exist.

N.G. → CHECK A.S.C.D. CANCEL SWITCH, A.S.C.D. CLUTCH SWITCH (M/T models) AND INHIBITOR SWITCH (A/T models). Refer to "Electrical Components Inspection". CHECK INHIBITOR RELAY (A/T models) AND THEFT WARNING RELAY.

O.K.

D: CHECK SET/COAST SWITCH CIRCUIT FOR A.S.C.D. CONTROL UNIT.
1. Push and hold SET/COAST button on A.S.C.D. steering switch
2. Check voltage between control unit harness terminals ② and ③.
Battery voltage should exist.

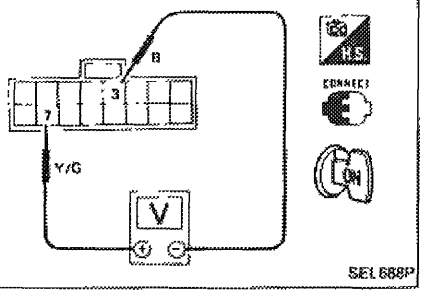
N.G. → Does horn work?
- No → Check fuse and horn relay.
- Yes → CHECK A.S.C.D. STEERING SWITCH. Refer to "Electrical Components Inspection".

O.K.

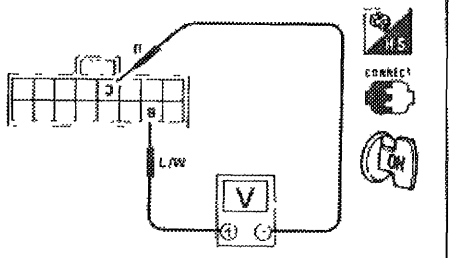
Ⓐ (Next page)

Trouble Diagnoses (Cont'd)

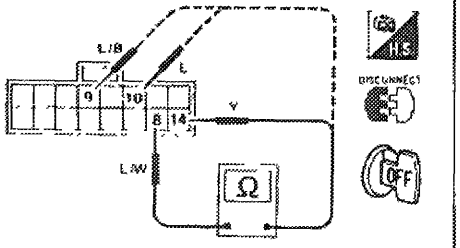
E A.S.C.D. control unit connector (M16)



F A.S.C.D. control unit connector (M16)



A.S.C.D. control unit connector (M16)



Ⓐ

E

CHECK SPEED SENSOR CIRCUIT.
1. Apply wheel chocks and jack up front of vehicle
2. Connect voltmeter between control unit harness terminals ⑦ and ③.
3. Slowly turn front wheel.
4. Check deflection of voltmeter pointer.

N.G. → CHECK SPEED SENSOR. Refer to "Electrical Components Inspection".

O.K. ↓

CHECK A.S.C.D. ACTUATOR/A.S.C.D. PUMP. Refer to "Electrical Components Inspection".

N.G. → Replace A.S.C.D. actuator/A.S.C.D. pump.

O.K. ↓

F

CHECK A.S.C.D. ACTUATOR/A.S.C.D. PUMP CIRCUIT.
1. Check voltage between control unit harness terminals ⑧ and ③. **Voltage is 0V.**
2. Disconnect A.S.C.D. control unit connector.
3. Measure resistance between control unit harness terminals ⑧ and ⑨, ⑩, ⑭.

N.G. → Repair short or open circuit in A.S.C.D. actuator/A.S.C.D. pump harness

Terminals		Resistance [Ω]
⑧	⑨	Approx. 8 - 45
	⑩	Approx. 65
	⑭	Approx. 65

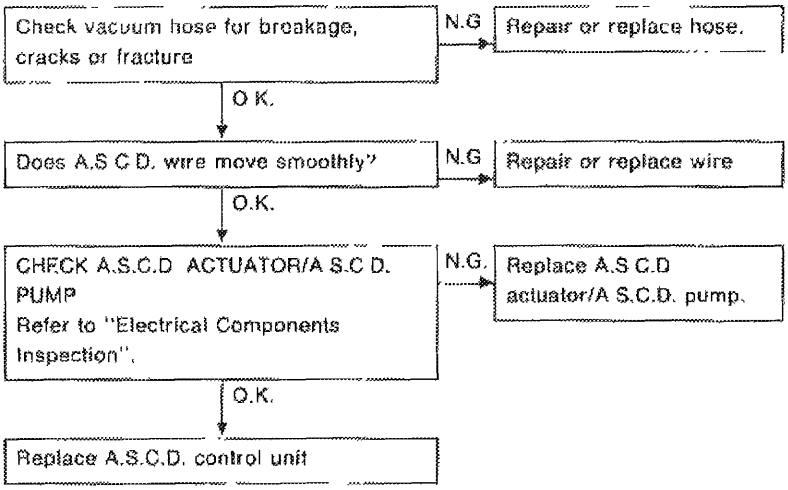
O.K. ↓

Replace A.S.C.D. control unit.

Trouble Diagnoses (Cont'd)

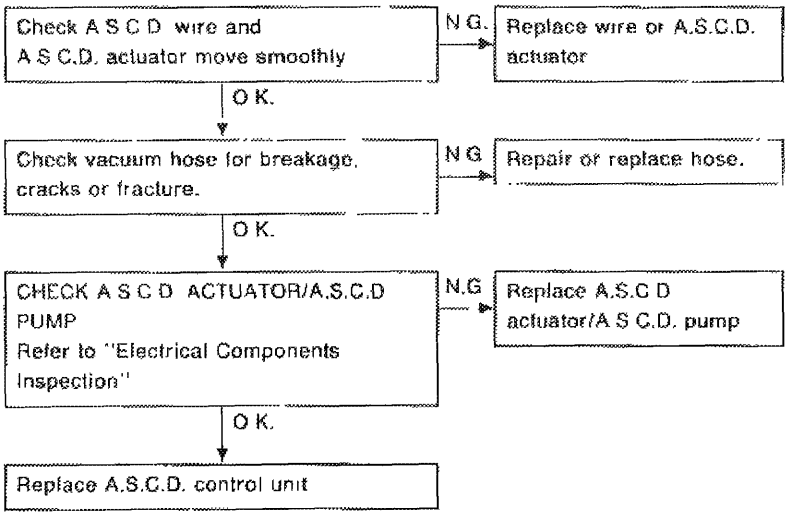
DIAGNOSTIC PROCEDURE 2

SYMPTOM: Engine hunts.



DIAGNOSTIC PROCEDURE 3

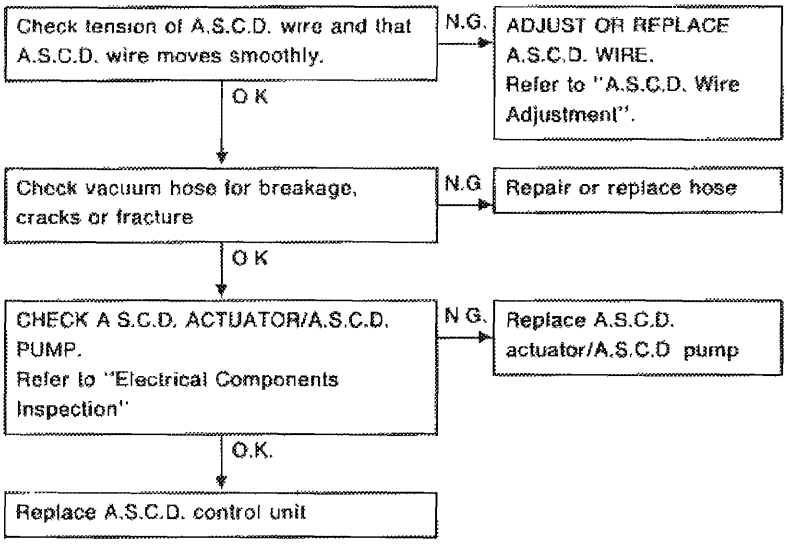
SYMPTOM: Large difference between set vehicle speed and actual speed.



Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 4

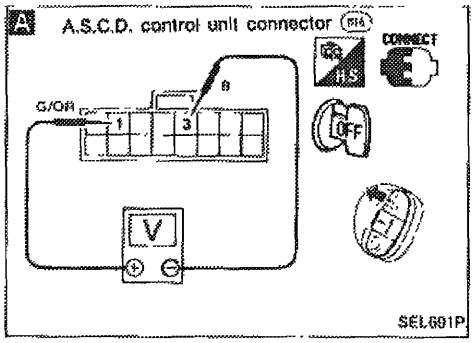
SYMPTOM: Deceleration is greatest immediately after A.S.C.D. has been set.

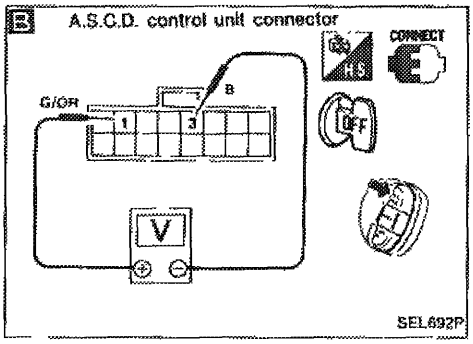


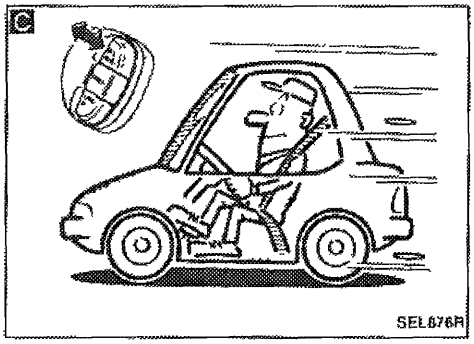
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 5

SYMPTOM: ACCEL switch will not operate.







Check constant-speed function for operating using SET/COAST switch.
- N.G. → Go to "DIAGNOSTIC PROCEDURE 1".
- O.K. ↓

A

Check voltage between control unit harness terminals ① and ③ after pressing and holding RESUME/ACCEL switch.
Battery voltage should exist.
- N.G. → (to CHECK A.S.C.D. STEERING SWITCH)
- O.K ↓

B

Check voltage between control unit harness terminals ① and ③ after releasing RESUME/ACCEL switch.
Voltage is 0V.
- N.G. → CHECK A.S.C.D. STEERING SWITCH. Refer to "Electrical Components Inspection".
- O K. ↓

C

Does vehicle accelerate when RESUME/ACCEL switch is pressed?
- No → Replace control unit.
- Yes ↓

C

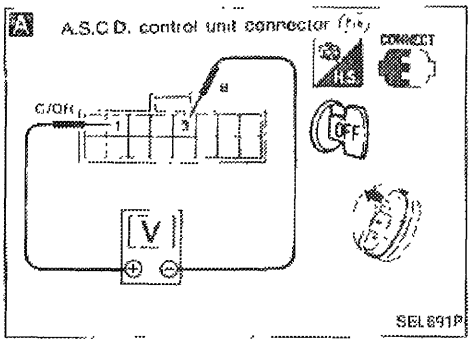
Does vehicle maintain the new (faster) speed when RESUME/ACCEL switch is released?
- No → Replace control unit.
- Yes ↓

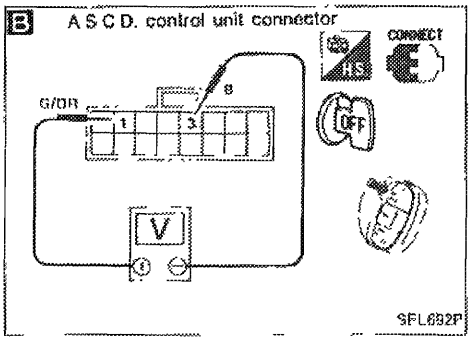
System is O K

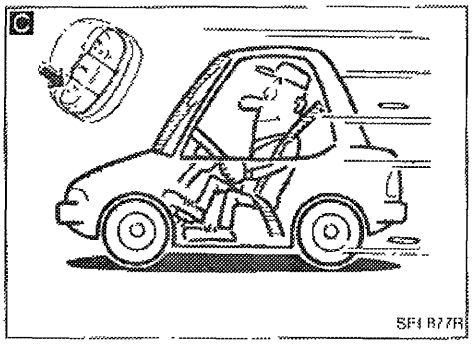
Trouble Diagnoses (Cont'd)

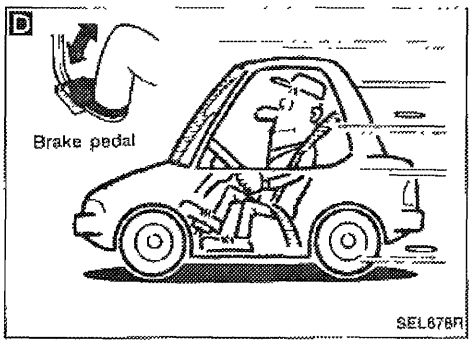
DIAGNOSTIC PROCEDURE 6

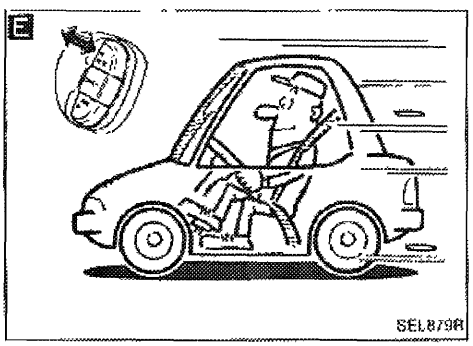
SYMPTOM: RESUME switch will not operate.











Check constant-speed function for operation using SET/COAST switch
- N.G. → Go to "DIAGNOSTIC PROCEDURE 1"
- O.K. ↓

A

Check voltage between control unit harness terminals ① and ③ after pressing and holding RESUME/ACCEL switch
Battery voltage should exist.
- N.G. → CHECK A.S.C.D. STEERING SWITCH. Refer to 'Electrical Components Inspection".
- O.K. ↓

B

Check voltage between control unit harness terminals ① and ③ after releasing RESUME/ACCEL switch
Voltage is 0V.
- N.G. → CHECK A.S.C.D. STEERING SWITCH. Refer to 'Electrical Components Inspection".
- O.K. ↓

C

Set vehicle speed at 80 km/h (50 MPH) by pressing SET/COAST switch.
- O.K. ↓

D

While cruising at set speed, depress and release brake pedal.
- O.K. ↓

Does speed control disengage and "CRUISE" lamp turn off?
- No → CHECK STOP LAMP SWITCH, A.S.C.D. CANCEL SWITCH AND A.S.C.D. CLUTCH SWITCH (M/T models). Refer to "Electrical Components Inspection".
- Yes ↓

E

Above 48 km/h (30 MPH), press and release RESUME/ACCEL switch.
- O.K. ↓

Does vehicle return to previously set speed [80 km/h (50 MPH)]?
- No → Replace control unit.
- Yes ↓

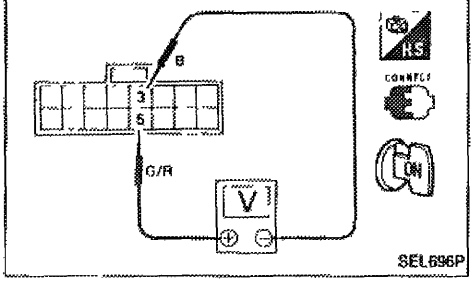
System is O.K.

Trouble Diagnoses (Cont'd)

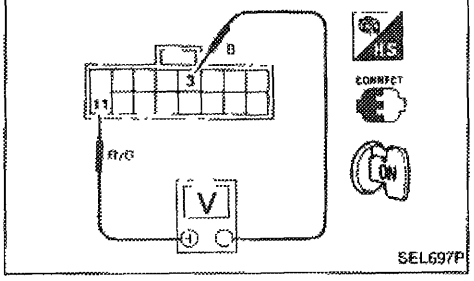
DIAGNOSTIC PROCEDURE 7

SYMPTOM: Set speed cannot be cancelled.

A A.S.C.D. control unit connector (R16)



B A.S.C.D. control unit connector (R16)



A

CHECK A.S.C.D. CANCEL, CLUTCH, INHIBITOR SWITCH CIRCUIT.
1. Turn A.S.C.D. main switch "ON".
2. Check voltage between control unit harness terminals ⑤ and ③.

Conditions			Voltage [V]
M/T	A.S.C.D. cancel switch	Depressed	0
		Released	Approx. 12
	A.S.C.D. clutch switch	Depressed	0
		Released	Approx. 12
A/T	A/T shift lever position is at any position except N or P.		Approx 12
	A/T shift lever position is at N or P		0

N.G. → CHECK A.S.C.D. CANCEL, CLUTCH, and INHIBITOR SWITCH.
Refer to "Electrical Components Inspection".

O.K.

B

CHECK STOP LAMP SWITCH CIRCUIT.
Check voltage between control unit harness terminals ⑪ and ③.

Condition		Voltage [V]
Stop lamp switch	Depressed	Approx. 12
	Released	0

N.G. → CHECK STOP LAMP SWITCH.
Refer to "Electrical Components Inspection".

O.K.

Check A.S.C.D. wire moves smoothly

N.G. → Replace A.S.C.D. wire.

O.K.

CHECK A.S.C.D. ACTUATOR/A.S.C.D. PUMP.
Refer to "Electrical Components Inspection".

N.G. → Replace A.S.C.D. actuator/A.S.C.D. pump.

O.K.

Replace A.S.C.D. control unit.

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 8

SYMPTOM: "CRUISE" indicator lamp blinks.

Does indicator lamp blink when A.S.C.D. main switch is turned to "ON" again?

Yes → Does indicator lamp blink when brake pedal is depressed slowly?

No → CHECK A.S.C.D. ACTUATOR/A.S.C.D. PUMP
Refer to "Electrical Components Inspection".

N.G → Replace A.S.C.D. actuator/ A.S.C.D. pump

O.K → CHECK A.S.C.D. ACTUATOR/A.S.C.D. PUMP CIRCUIT.

1. Check voltage between control unit harness terminals ⑧ and ③.
   Voltage is 0V.
2. Disconnect A.S.C.D. control unit connector.
3. Measure resistance between control unit harness terminals ⑧ and ⑨, ⑩, ⑭.

N.G → Repair short or open circuit in A.S.C.D. actuator/ A.S.C.D. pump harness

Terminals		Resistance [Ω]
⑧	⑨	Approx. 8 - 45
	⑩	Approx. 65
	⑭	Approx. 65

O.K → Replace A.S.C.D. control unit.

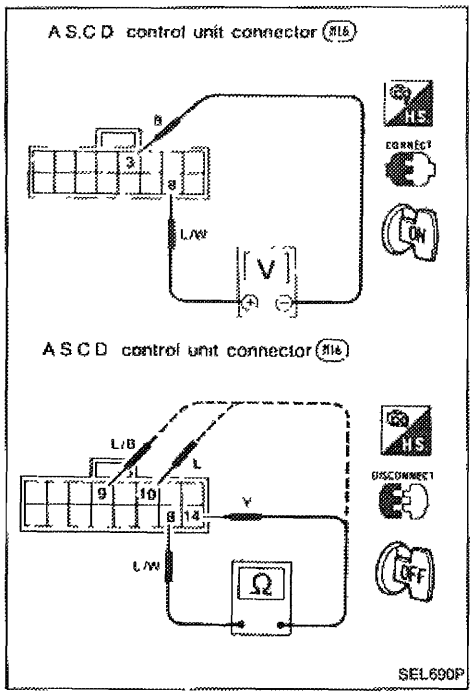
No → Does indicator lamp blink when brake pedal is depressed slowly?

No → CHECK A.S.C.D. STEERING SWITCH.
Refer to "Electrical Components Inspection".

N.G → Replace A.S.C.D. steering switch.

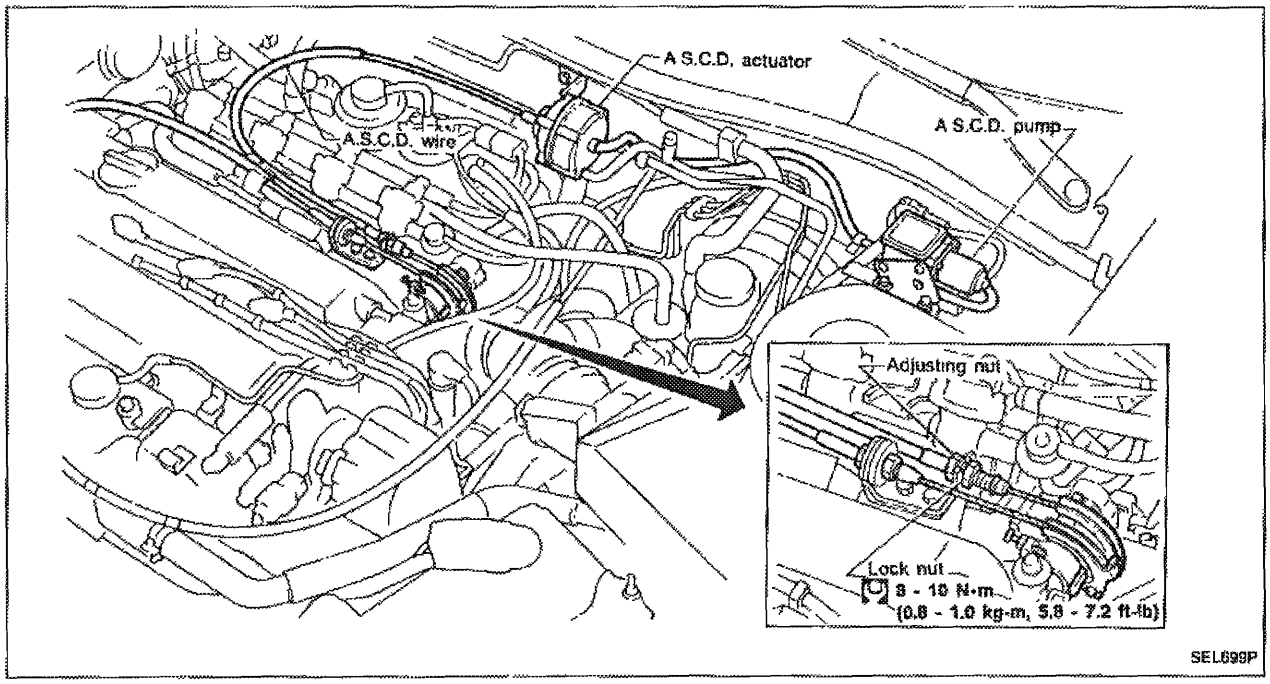
O.K → Replace control unit

Yes → Adjust installation of stop lamp switch and A.S.C.D. cancel switch.
Refer to BR section



Trouble Diagnoses (Cont'd)

A.S.C.D. WIRE ADJUSTMENT



CAUTION:

- **Be careful not to twist A.S.C.D. wire when removing it.**
- **Do not tense A.S.C.D. wire excessively during adjustment.**

After confirming that accelerator wire is properly adjusted, adjust the tension of A.S.C.D. wire in the following manner.

(1) After adjusting the length of the accelerator wire, turn a securing nut by 1/2 to 1 turn from throttle open starting position to the wire loosening direction to fix. (Must be securing carried out to prevent response delay of operation of the A.S.C.D.)

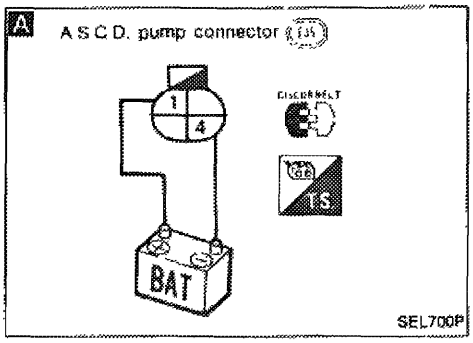
(2) Securely tighten lock nut to hold adjusting nut in place.

Trouble Diagnoses (Cont'd)

ELECTRICAL COMPONENTS INSPECTION

A.S.C.D. actuator/A.S.C.D. pump

1. Disconnect A.S.C.D. actuator/A.S.C.D. pump connector.
2. Check A.S.C.D. actuator/A.S.C.D. pump operations as shown.

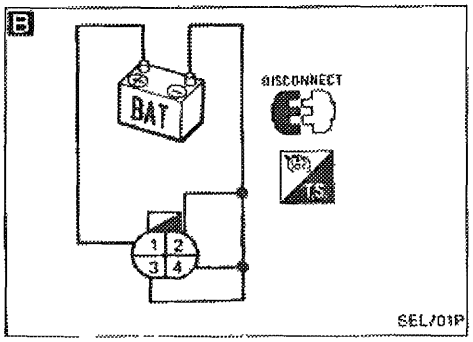


A

Check to see if motor starts when 12V D.C. is applied across ① and ④.

N.G. → Replace A.S.C.D. pump.

O.K



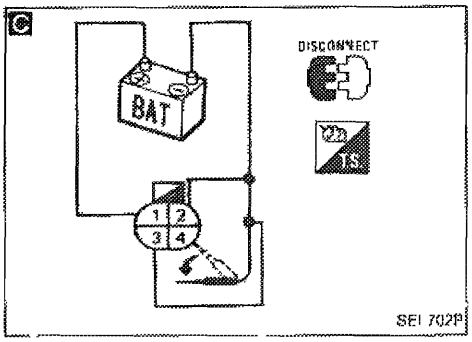
B

Check to see if A.S.C.D. wire is pulled when 12V D.C. is applied across ①, ②, ③ and ④.

N.G. → Disconnect vacuum hose from A.S.C.D. actuator and check for presence of vacuum pressure at A.S.C.D. pump.

- N.G. → Replace A.S.C.D. actuator.
- O.K.

O.K. (Wire is pulled.)

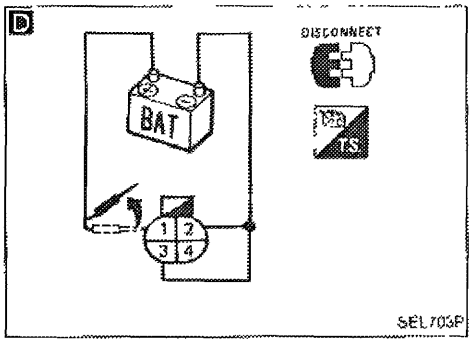


C

Check to see if A.S.C.D. wire returns to original position 50 to 60 seconds after disconnecting lead from ④.

N.G. → Replace A.S.C.D. pump.

O.K. (Wire does not return.)



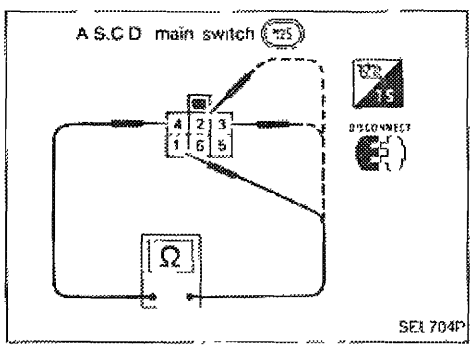
D

Disconnect lead from ① to see if A.S.C.D. wire returns immediately.

N.G. → Replace A.S.C.D. pump

O.K. (Wire returns.)

A.S.C.D. actuator/A.S.C.D. pump are O.K.

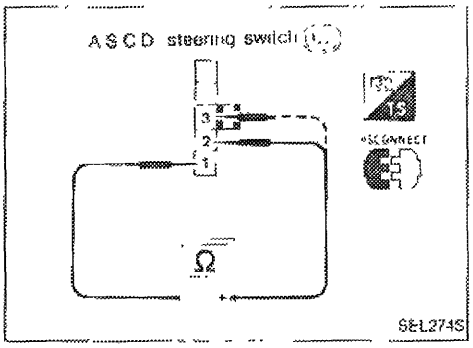


A.S.C.D. main switch

Check continuity between terminals by pushing switch to each position.

Switch position	Terminals					
	1	2	3	4	5	6
ON	○—	(·)···	○—⓪—○			
N		·(·)·	○—⓪—○		ILL ○—⓪—○	
OFF						

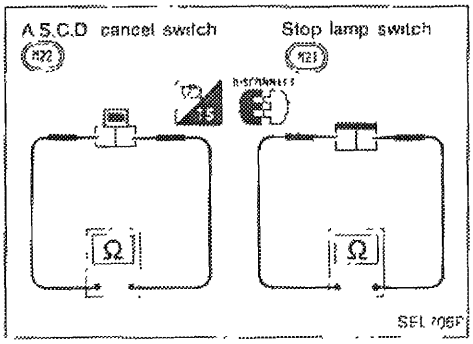
Trouble Diagnoses (Cont'd)



A.S.C.D. steering switch

Check continuity between terminals by pushing each button.

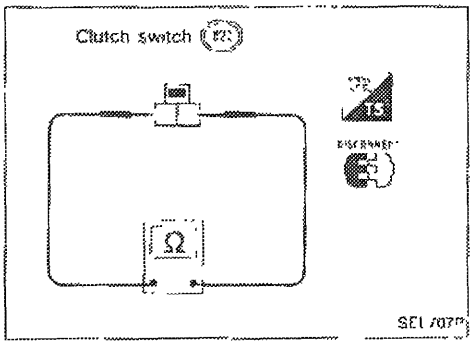
Button	Terminal		
	1	2	3
SET/COAST	○	○	
RESUME/ACCEL	○		○
CANCEL	○	○	
	○		○



A.S.C.D. cancel switch and stop lamp switch

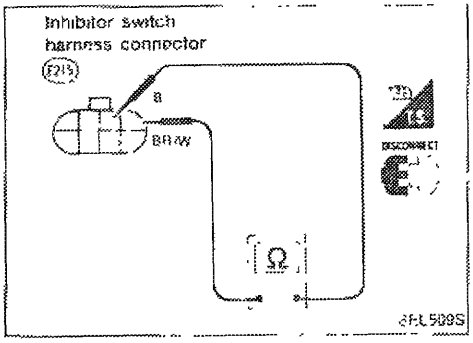
Condition	Continuity	
	A.S.C.D. cancel switch	Stop lamp switch
When brake pedal is depressed	No	Yes
When brake pedal is released	Yes	No

Check each switch after adjusting brake pedal — refer to BR section.



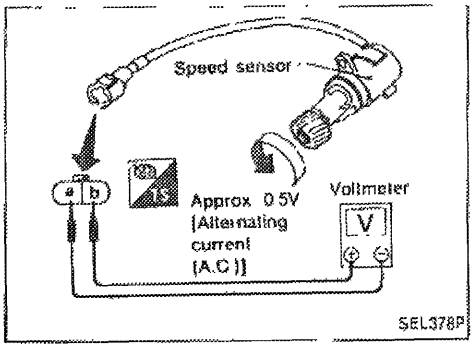
Clutch switch (For M/T models)

Condition	Continuity
When clutch pedal is depressed	No
When clutch pedal is released	Yes



Inhibitor switch (For A/T models)

Condition	Continuity
When shift lever position is "N" or "P"	Yes
When shift lever position is any position except "N" or "P"	No

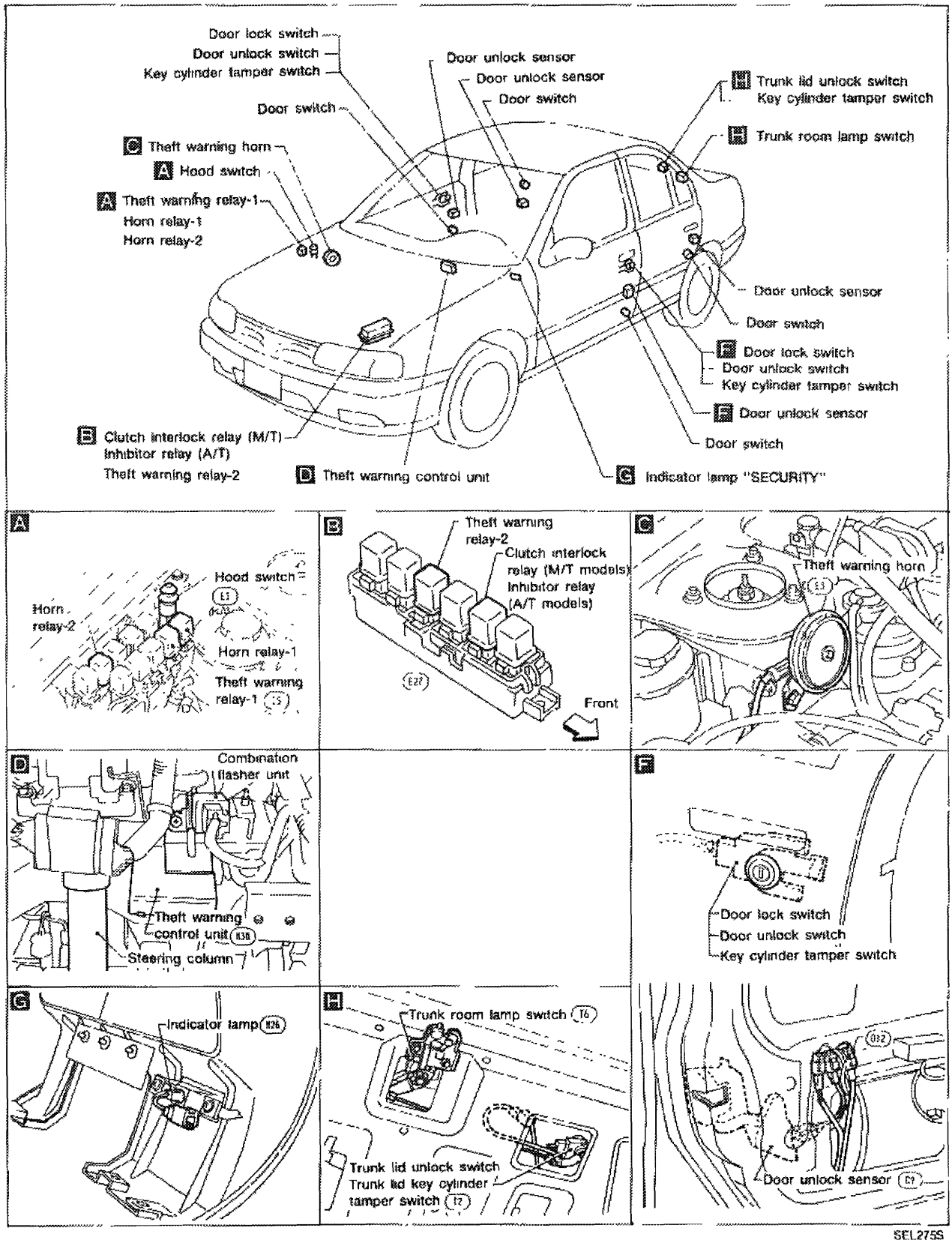


Speed sensor

1. Remove speed sensor from transaxle.
2. Turn speed sensor pinion quickly and measure voltage across (a) and (b).

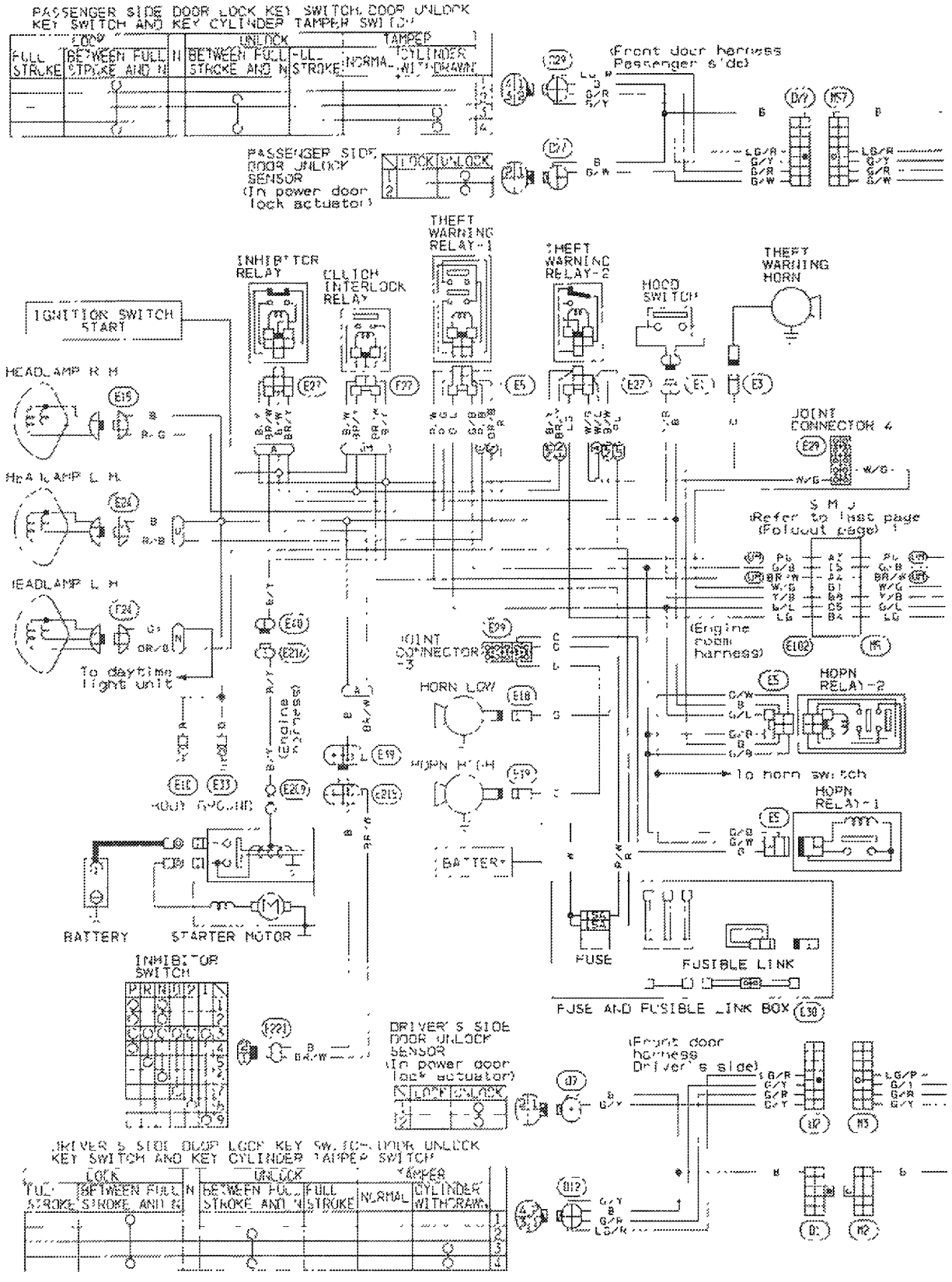
NOTE

Component Parts and Harness Connector Location

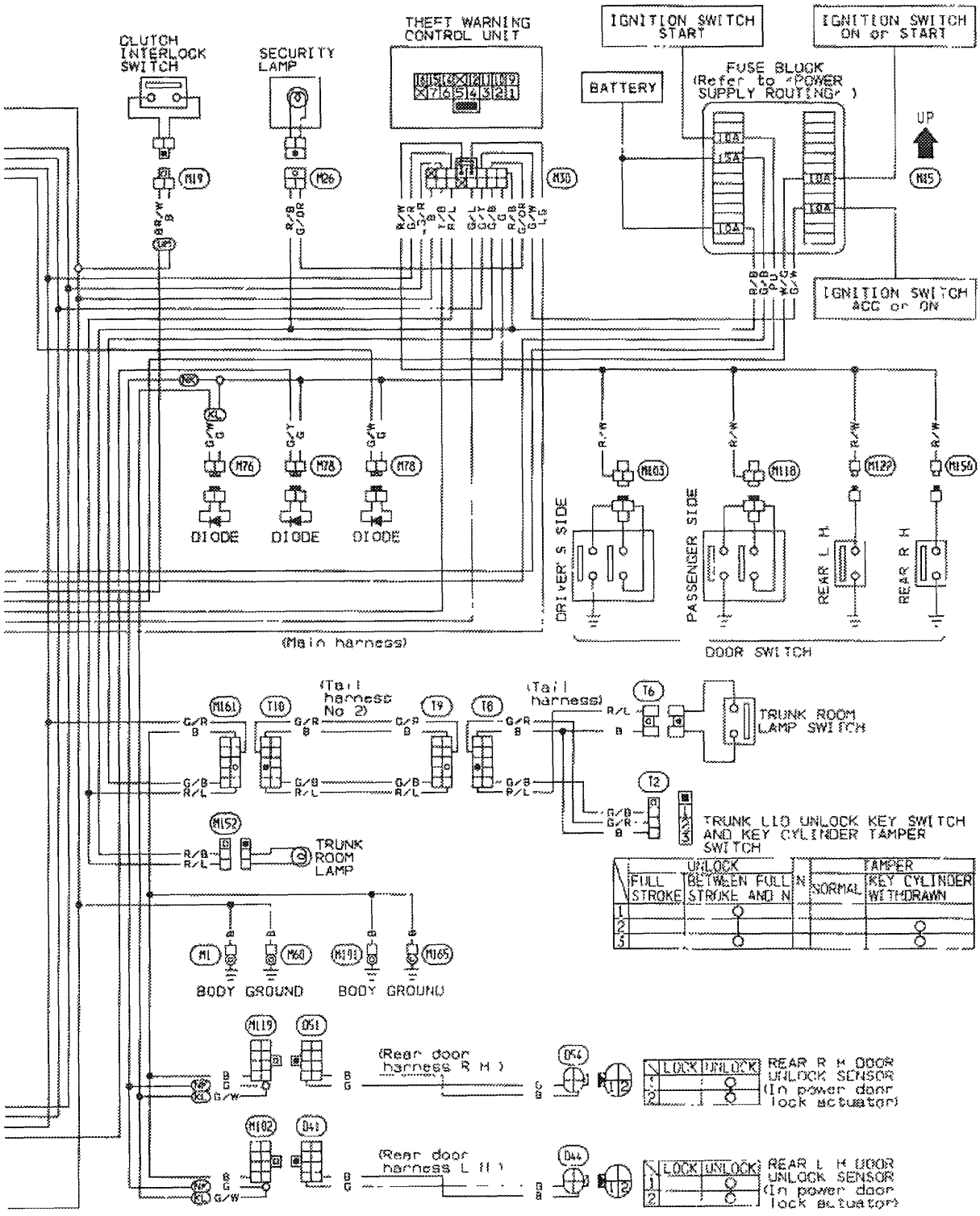


SEL275S

Wiring Diagram



Wiring Diagram (Cont'd)



UNLOCK			TAMPER	
	FULL STROKE	BETWEEN FULL STROKE AND N	NORMAL	KEY CYLINDER WITHDRAWN
1				
2				
5				

LOCK	UNLOCK
1	
2	

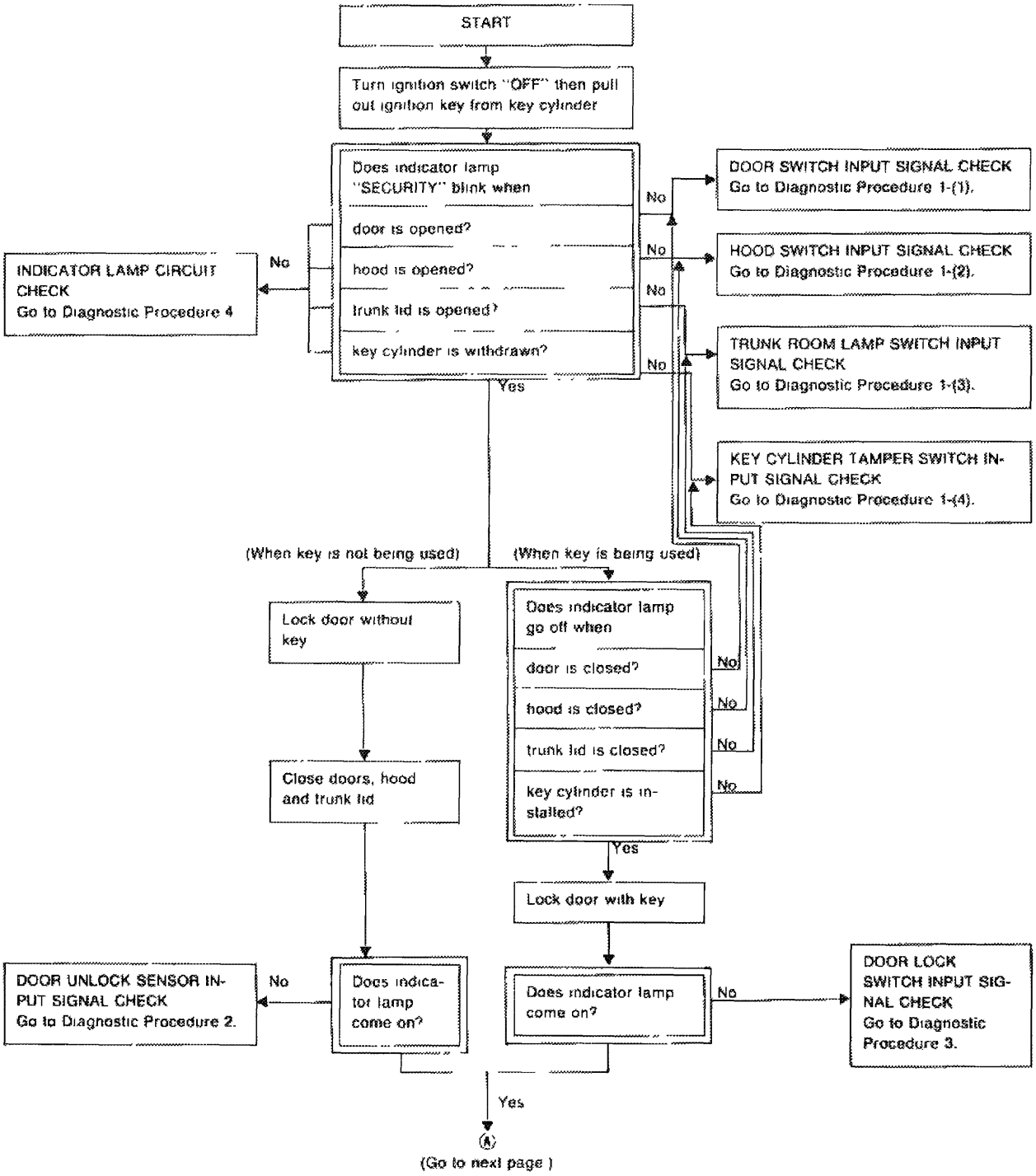
(A) A/T models (U) For U.S.A. (UM) M/T models for U.S.A.
(M) M/T models (N) For CANADA (NM) M/T models for CANADA (EN) Except for (A,M) models
(NK) Models without multi-remote control system (K) Models with multi-remote control system

MEI 205C

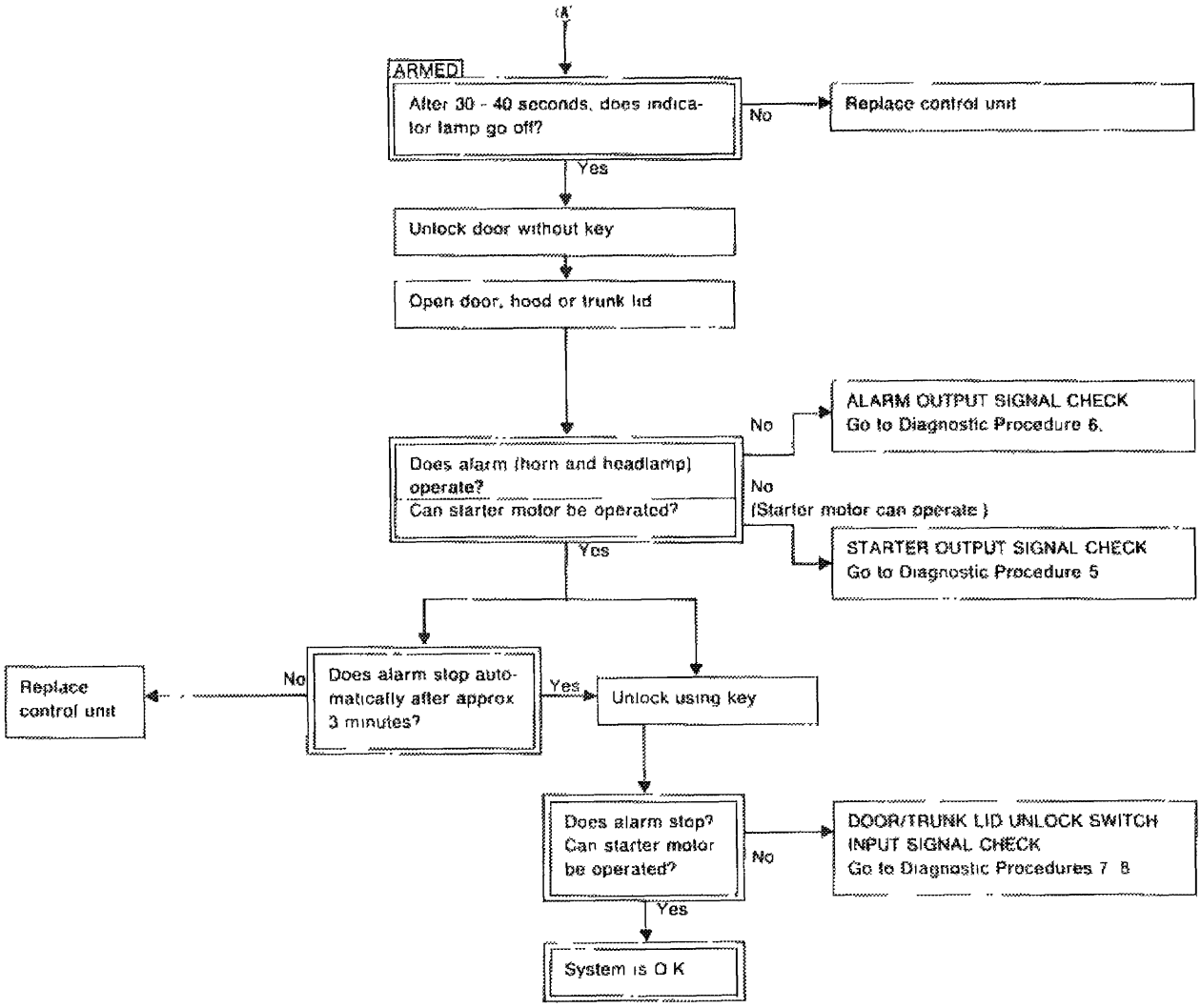
Trouble Diagnoses

SYSTEM OPERATION CHECK

If ignition switch is set in the "ACC" position in the step of START to ARMED or in the ARMED state shown in this flow chart, the system operation is canceled.

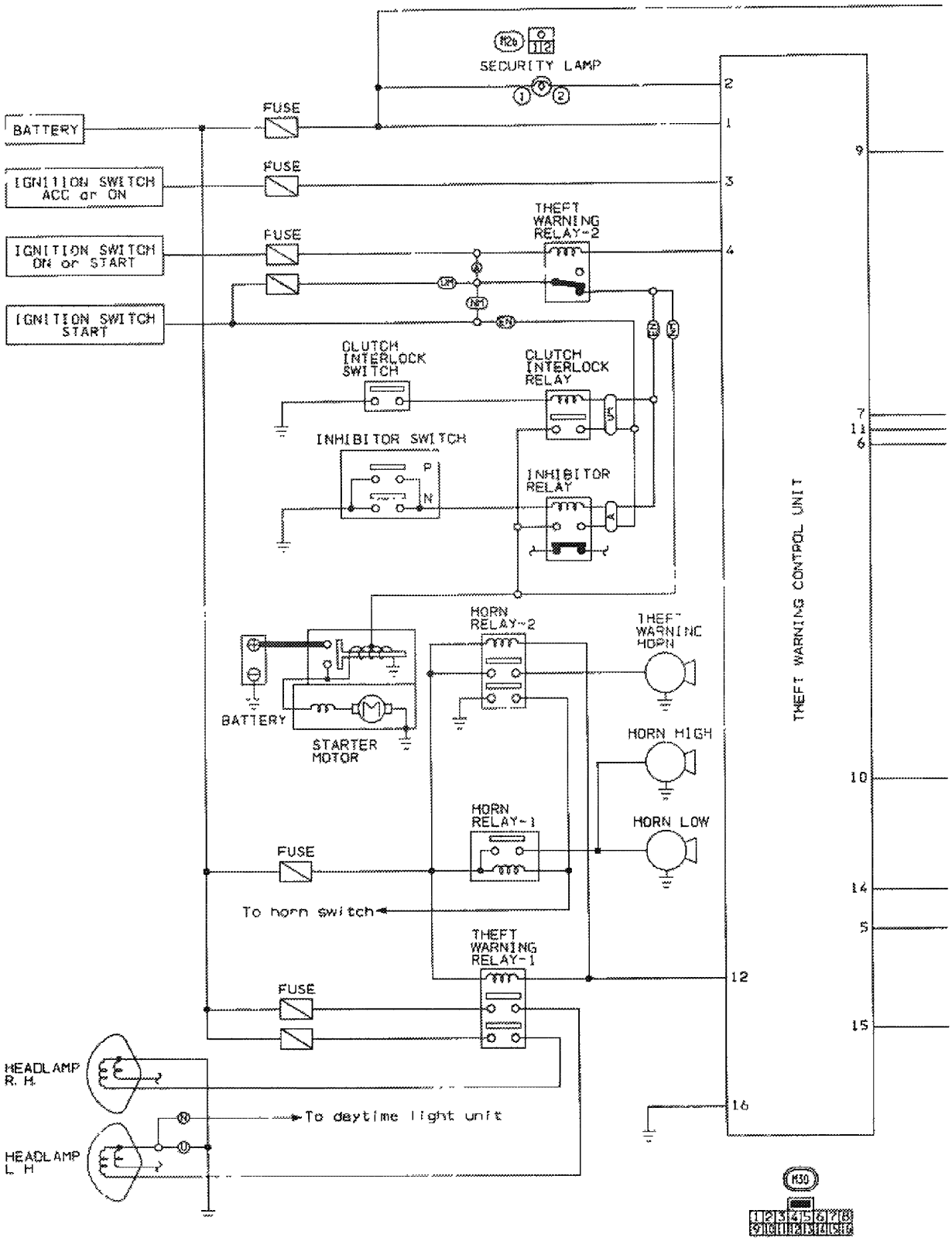


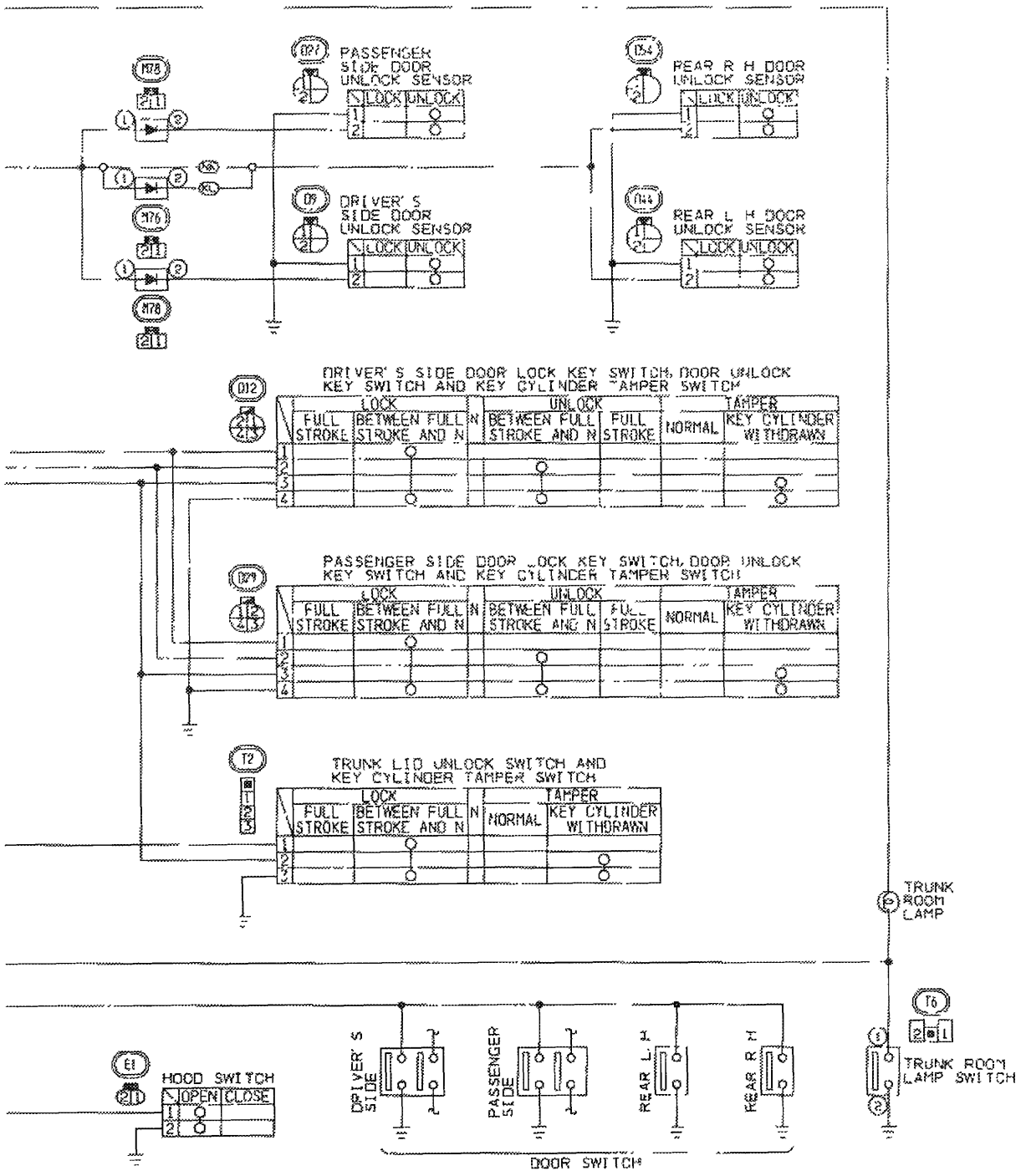
Trouble Diagnoses (Cont'd)



Trouble Diagnoses (Cont'd)

CIRCUIT DIAGRAM FOR QUICK PINPOINT CHECK



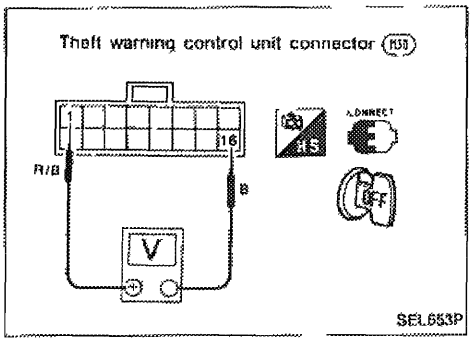


(A) : A/T models
(U) : For U S A
(N) : For CANADA
(EN) Except for (NM) models
(UM) M/T models for U S A
(NM) M/T models for CANADA
(KL) Models with multi-remote control system
(NK) Models without multi-remote control system

MEL206C

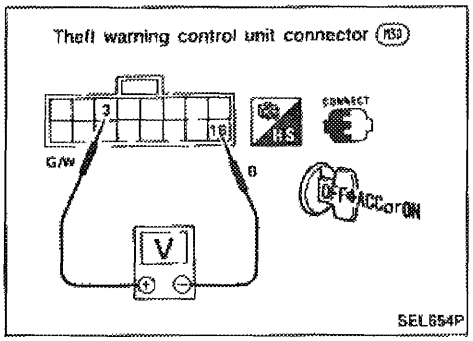
Trouble Diagnoses (Cont'd)

POWER SUPPLY AND GROUND CIRCUIT CHECK



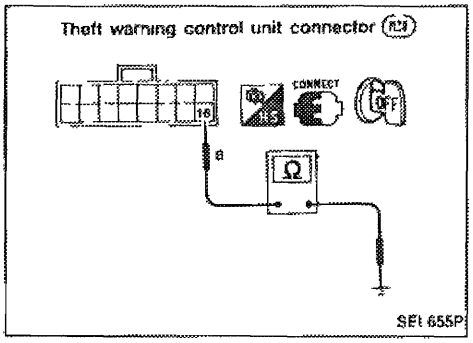
Main power supply circuit check

Terminals	Ignition switch position		
	OFF	ACC	ON
① - ⑯	Battery voltage	Battery voltage	Battery voltage



Power supply circuit check for system cancel

Terminals	Ignition switch position		
	OFF	ACC	ON
③ - ⑯	0V	Battery voltage	Battery voltage



Ground circuit check

Terminals	Continuity
⑯ - Ground	Yes

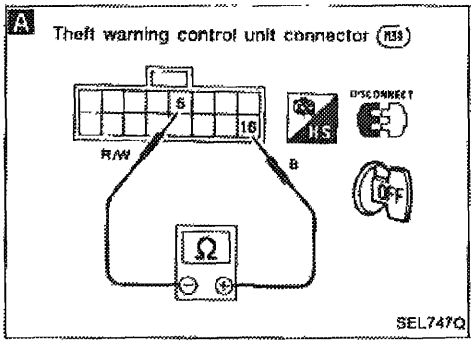
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 1

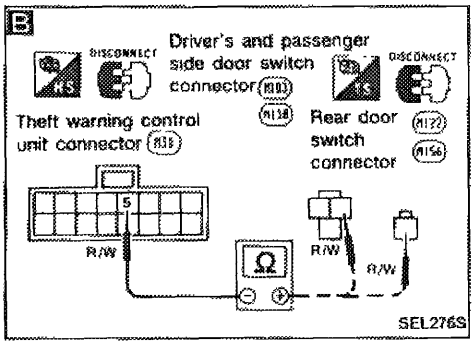
SYMPTOM: ● **Indicator lamp does not blink.**
● **Indicator lamp remains blinking.**

Diagnostic procedure 1-(1)

A



B



A

DOOR SWITCH INPUT SIGNAL CHECK
Check continuity between control unit harness terminals ⑤ and ⑯.

Condition	Continuity
All doors are closed	No
At least one door is open	Yes

O.K → Go to Diagnostic Procedure 4.

N.G.

DOOR SWITCH CHECK
Refer to "Electrical Components Inspection".

N.G. → Replace door switch.

O.K

B

DOOR SWITCH CIRCUIT CHECK
Check harness continuity between control unit harness terminal ⑤ and door switch harness terminal.
Continuity should exist.

N.G. → Repair harness or connectors.

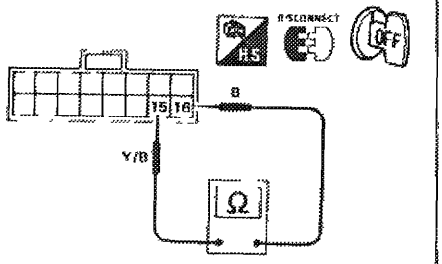
O.K.

CHECK THE CONNECTIONS AT EACH CONNECTOR

Trouble Diagnoses (Cont'd)

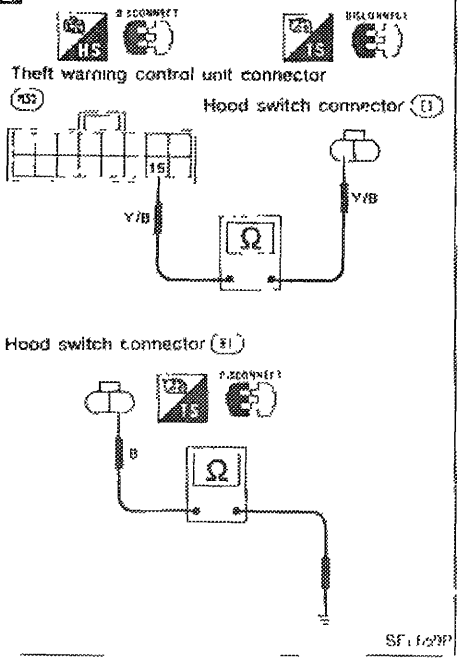
Diagnostic procedure 1-(2)

A Theft warning control unit connector (M31)



SEL 658P

B



SEL 659P

A

HOOD SWITCH INPUT SIGNAL CHECK
Check continuity between control unit harness terminals (15) and (16).

Condition	Continuity
Hood is open	Yes
Hood is closed	No

O.K → Go to Diagnostic Procedure 4.

N.G.

Check hood switch and hood fitting condition → N G → Adjust installation of hood switch or hood.

O.K

HOOD SWITCH CHECK
Refer to "Electrical Components Inspection".
→ N G. → Replace hood switch.

O K

B

HOOD SWITCH CIRCUIT CHECK
- Check harness continuity between control unit harness terminal (16) and hood switch harness terminal.
- Check harness continuity between hood switch terminal and body ground

Continuity should exist.

→ N.G. → Repair harness or connectors.

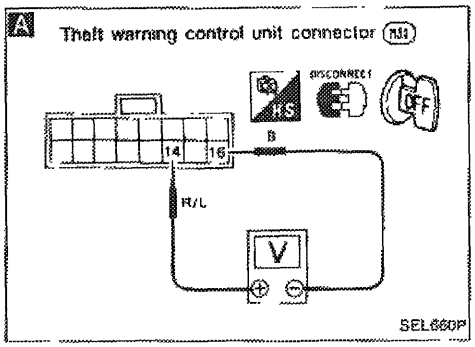
O.K

CHECK THE CONNECTIONS AT EACH CONNECTOR

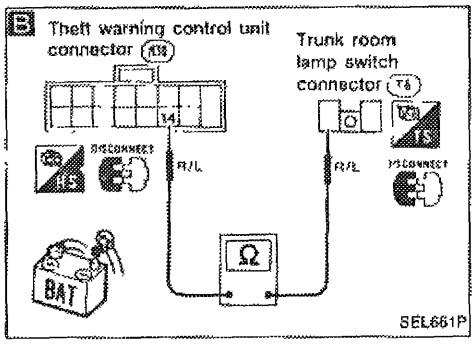
Trouble Diagnoses (Cont'd)

Diagnostic procedure 1-(3)

A



B



A

TRUNK ROOM LAMP SWITCH INPUT SIGNAL CHECK
Check voltage between control unit harness terminals ⑭ and ⑯.

Condition	Voltage
Trunk lid is open	Approx. 0V
Trunk lid is closed	Approx. 12V

O.K. → Go to Diagnostic Procedure 4.

N.G ↓

Does trunk room lamp come on?

Yes → B

No ↓

TRUNK ROOM LAMP SWITCH CHECK
Refer to "Electrical Components Inspection".

O.K. → B

N.G. ↓

Replace trunk room lamp switch.

B

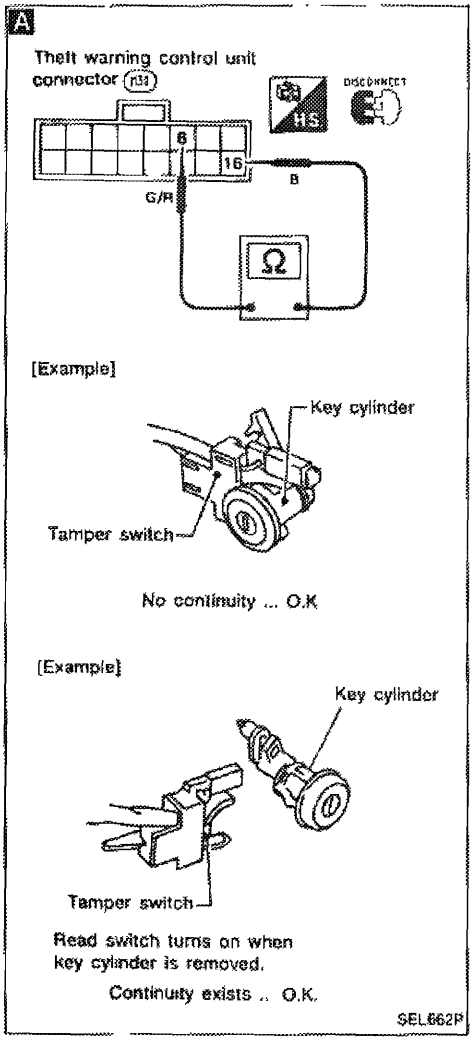
TRUNK ROOM LAMP SWITCH CIRCUIT CHECK
Check harness continuity between control unit harness terminal ⑭ and trunk room lamp harness terminal.

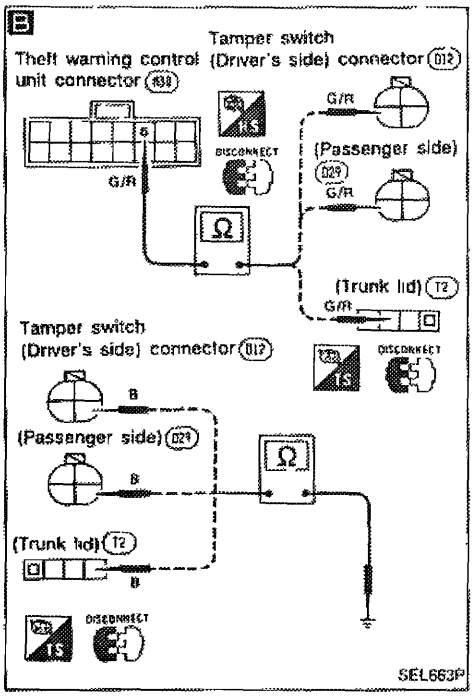
O.K. ↓

CHECK THE CONNECTIONS AT EACH CONNECTOR.

Trouble Diagnoses (Cont'd)

Diagnostic procedure 1-(4)





A

KEY CYLINDER TAMPER SWITCH INPUT SIGNAL CHECK Check continuity between control unit harness terminals (6) and (16).		
Condition	Continuity	
Tamper switch is		
Normal	No	O.K → Go to Diagnostic Procedure 4.
Removed	Yes	

N.G.

KEY CYLINDER TAMPER SWITCH CHECK Refer to "Electrical Components Inspection".	N.G. → Replace key cylinder tamper switch.

O.K.

B

KEY CYLINDER TAMPER SWITCH CIRCUIT CHECK • Check harness continuity between control unit harness terminal (6) and tamper switch harness terminal. • Check harness continuity between tamper switch terminal and body ground. **Continuity should exist.**	N.G. → Repair harness and connectors.

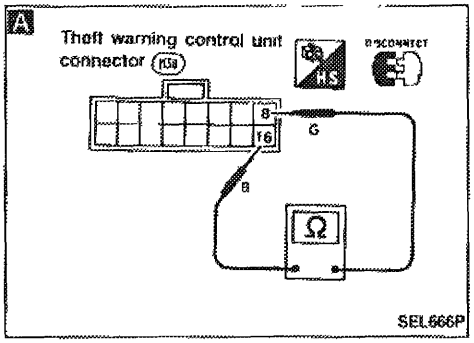
O.K.

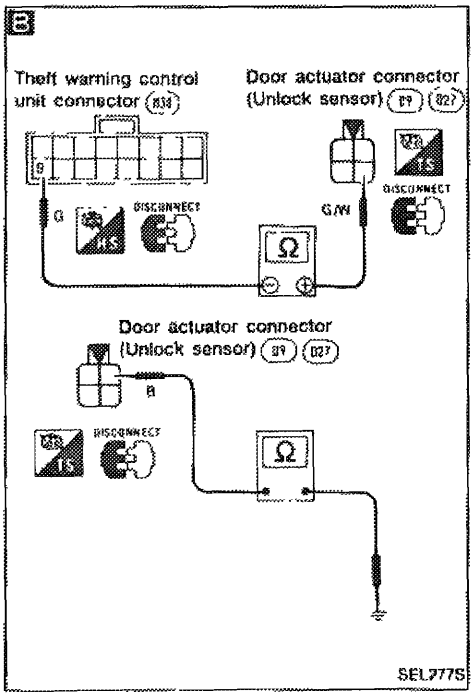
CHECK THE CONNECTIONS AT EACH CONNECTOR

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 2

SYMPTOM: Indicator lamp does not come on.





A

DOOR UNLOCK SENSOR INPUT SIGNAL CHECK
Check continuity between control unit harness terminals ⑧ and ⑯.

Condition	Continuity
Locked	No
Unlocked	Yes

O.K. → Go to Diagnostic Procedure 3.

O.K. → Replace control unit.

N.G.

DOOR UNLOCK SENSOR CHECK
Refer to "Electrical Components Inspection".

N.G. → Replace door lock actuator.

O.K

B

DOOR UNLOCK SENSOR CIRCUIT CHECK
- Check harness continuity between control unit harness terminal ⑨ and door actuator terminal.
- Check harness continuity between door actuator terminal and body ground.

Continuity should exist.

N.G. → Repair harness or connectors.

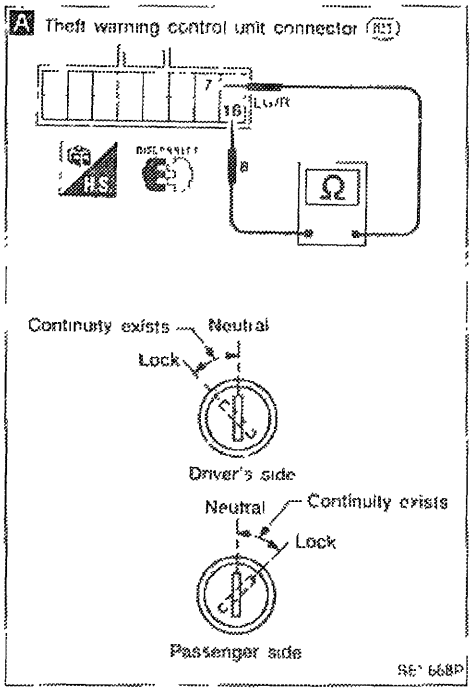
O.K.

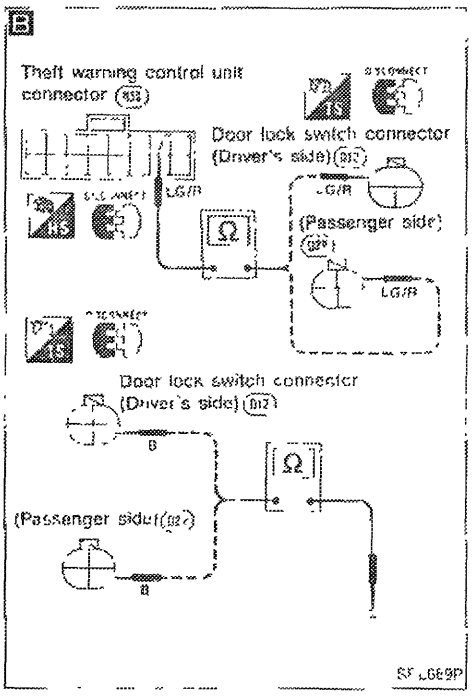
CHECK THE CONNECTIONS AT EACH CONNECTOR.

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 3

SYMPTOM: Indicator lamp does not come on.





A

DOOR LOCK SWITCH INPUT SIGNAL CHECK (LOCK SIGNAL)
Check continuity between control unit harness terminals (7) and (16).

Key position	Continuity
Neutral/Lock	No
Between neutral and lock	Yes

O.K. → Go to Diagnostic Procedure 2 → O.K. → Replace control unit.

N.G

DOOR LOCK SWITCH CHECK
Refer to "Electrical Components Inspection"

N.G → Replace key cylinder switch

O.K.

B

DOOR LOCK SWITCH CIRCUIT CHECK
- Check harness continuity between control unit harness terminal (7) and door lock switch terminal
- Check harness continuity between door lock switch terminal and body ground

Continuity should exist.

N.G → Repair harness or connectors

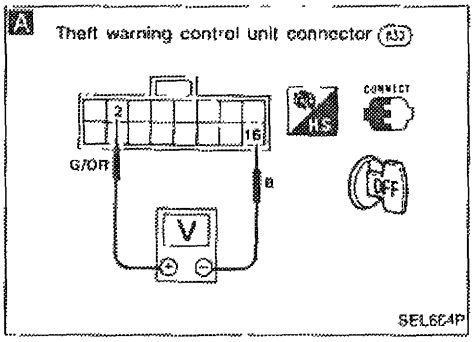
O.K.

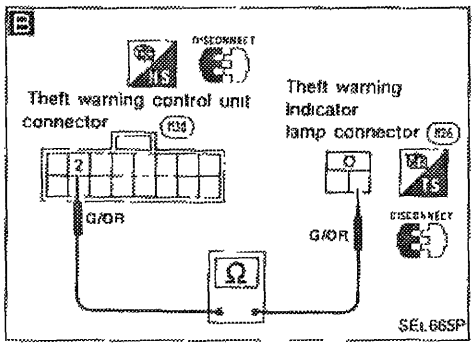
CHECK THE CONNECTIONS AT EACH CONNECTOR

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 4

SYMPTOM: Indicator lamp does not blink.





A

INDICATOR LAMP OUTPUT SIGNAL CHECK
Check voltage between control unit harness terminals ② and ⑯.
Pointer of voltmeter should deflect intermittently.

N.G. → Replace control unit.

O.K ↓

INDICATOR LAMP CHECK
Refer to "Electrical Components Inspection".

N.G. → Replace indicator lamp.

O.K ↓

B

INDICATOR LAMP CIRCUIT CHECK
Check harness continuity between control unit harness terminal ② and indicator lamp harness terminal
Continuity should exist.

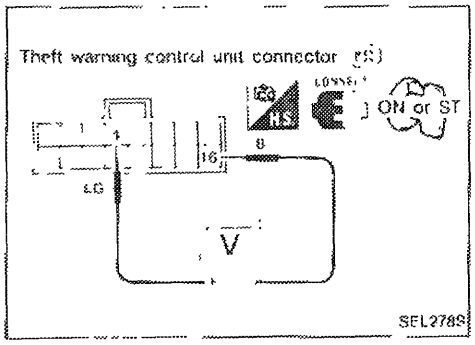
N.G. → Repair harness or connectors.

O.K ↓

CHECK THE CONNECTIONS AT EACH CONNECTOR

DIAGNOSTIC PROCEDURE 5

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



Approx 12V

STARTER MOTOR KILL OUTPUT SIGNAL CHECK
Check voltage between control unit harness terminals ⑭ and ⑯ when ignition switch is turned to ON or "START".

→ Replace control unit

Approx 0 volt ↓

Check theft warning relay-2

N.G. → Replace theft warning relay-2

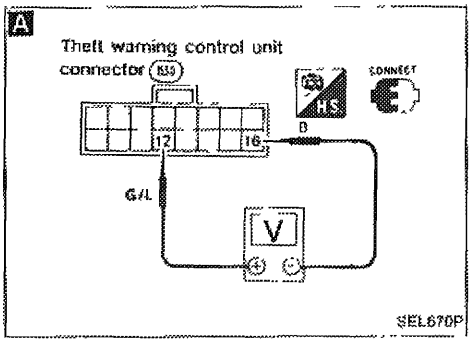
O.K. ↓

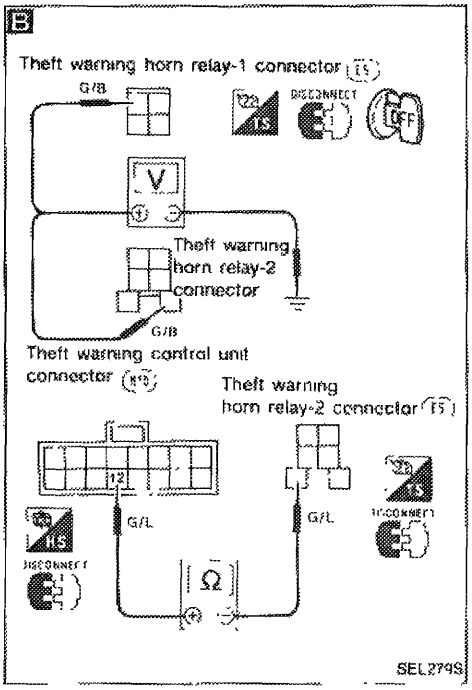
Repair harness between control unit and theft warning relay-2.

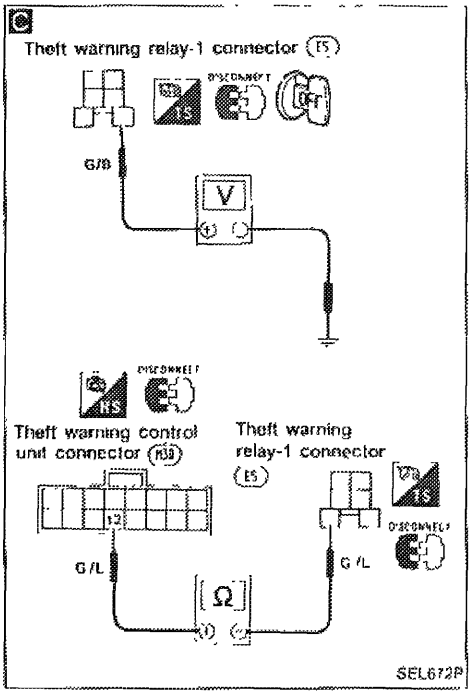
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

SYMPTOM: Alarm does not operate.







A

AI ARM SIGNAL OUTPUT CHECK
Check voltage between control unit harness terminals (12) and (16).

Condition	Voltmeter
Except alarm phase	12V
Alarm phase	Pointer deflects intermittently

N.G. → Replace control unit.

O.K.

Check theft warning horn relay. → N.G. → Replace relay

O.K.

B

THEFT WARNING HORN CIRCUIT CHECK
Check if voltage across theft warning horn relay-1 harness terminal and body is 12V.
Check continuity between theft warning horn relay-2 terminal and control unit harness terminal (12).
Continuity should exist.

N G → Repair harness and connectors.

O.K.

Check theft warning relay-1 → N.G. → Replace theft warning relay-1.

O K.

C

THEFT WARNING HEADLAMP CIRCUIT CHECK
Check if voltage across theft warning relay-1 harness terminal and body is 12V
Check continuity between theft warning relay-1 terminal and control unit harness terminals (12).

N.G. → Repair harness and connectors.

O.K

Does headlamp come on when turning lighting switch "ON"? → No → Check headlamp system. Refer to "HEADLAMP"

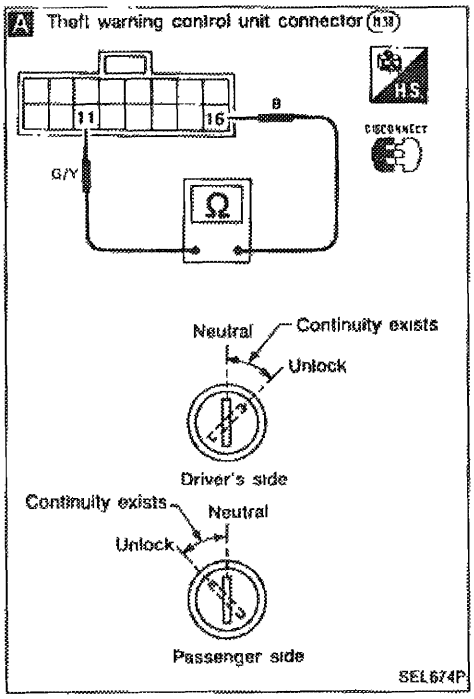
Yes

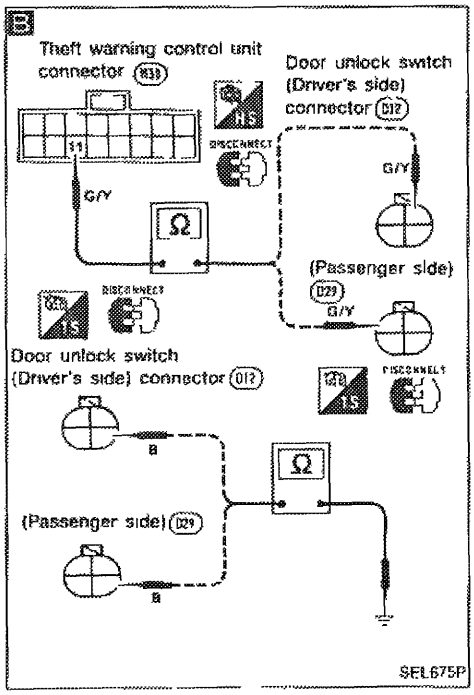
Repair harness and connectors between lamp relay and headlamp.

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 7

SYMPTOM: Alarm does not stop even if stop signal is given.





A

DOOR UNLOCK SWITCH INPUT SIGNAL CHECK (UNLOCK SIGNAL)
Check continuity between control unit harness terminals (11) and (16).

Key position	Continuity
Neutral/Unlock	No
Between neutral and unlock	Yes

O.K. → Replace control unit.

N G

DOOR UNLOCK SWITCH CHECK
Refer to "Electrical Components Inspection".

N.G. → Replace key cylinder switch.

O.K.

B

DOOR UNLOCK SWITCH CIRCUIT CHECK
- Check harness continuity between control unit harness terminal (11) and door unlock switch terminal.
- Check harness continuity between door unlock switch terminal and body ground.

Continuity should exist.

N.G → Repair harness or connectors.

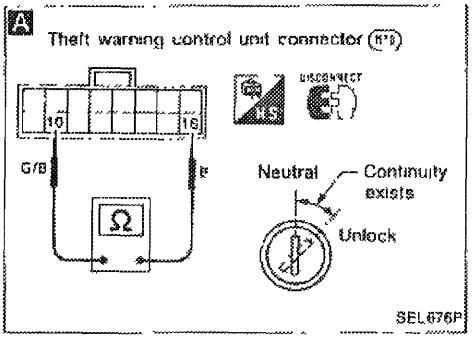
O.K.

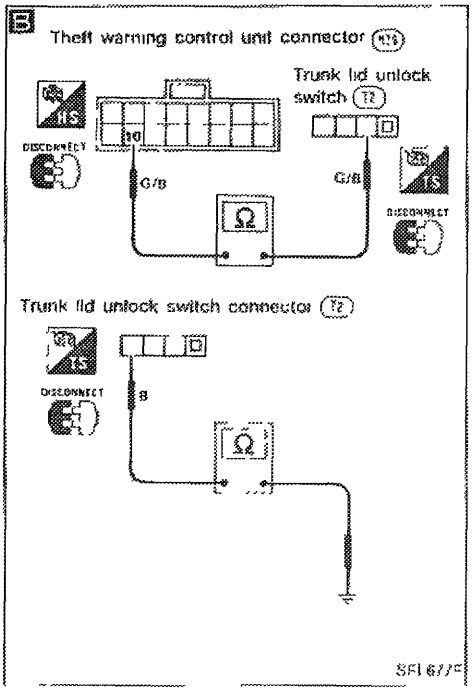
CHECK THE CONNECTIONS AT EACH CONNECTOR

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 8

SYMPTOM: Alarm does not stop even if stop signal is given.





A

TRUNK LID UNLOCK SWITCH INPUT SIGNAL CHECK (UNLOCK SIGNAL)
Check continuity between control unit harness terminals (10) and (16)

Key position	Continuity
Neutral/Unlock	No
Between neutral and unlock	Yes

O.K → Replace control unit.

N.G ↓

TRUNK LID UNLOCK SWITCH CHECK
Refer to "Electrical Components Inspection"

N.G. → Replace key cylinder switch.

O.K ↓

B

TRUNK LID UNLOCK SWITCH CIRCUIT CHECK
- Check harness continuity between control unit harness terminal (10) and trunk lid unlock switch terminal
- Check harness continuity between trunk lid unlock switch terminal and body ground

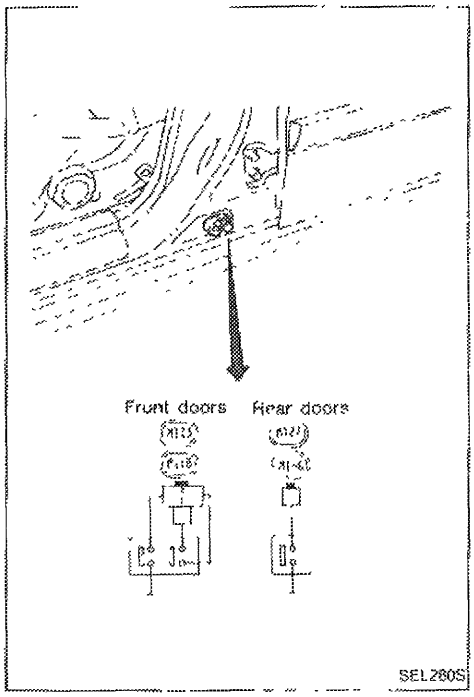
N.G → Repair harness or connectors.

O.K ↓

CHECK THE CONNECTIONS AT EACH CONNECTOR.

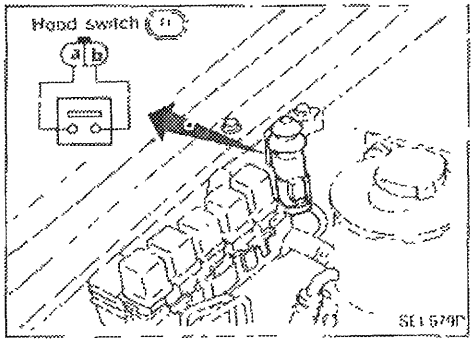
Trouble Diagnoses (Cont'd)

ELECTRICAL COMPONENTS INSPECTION



Door switches

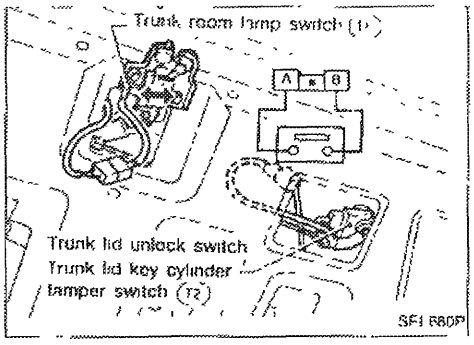
Check continuity between terminal and switch body.



Hood switch

Check continuity between terminals when hood switch is pushed and released

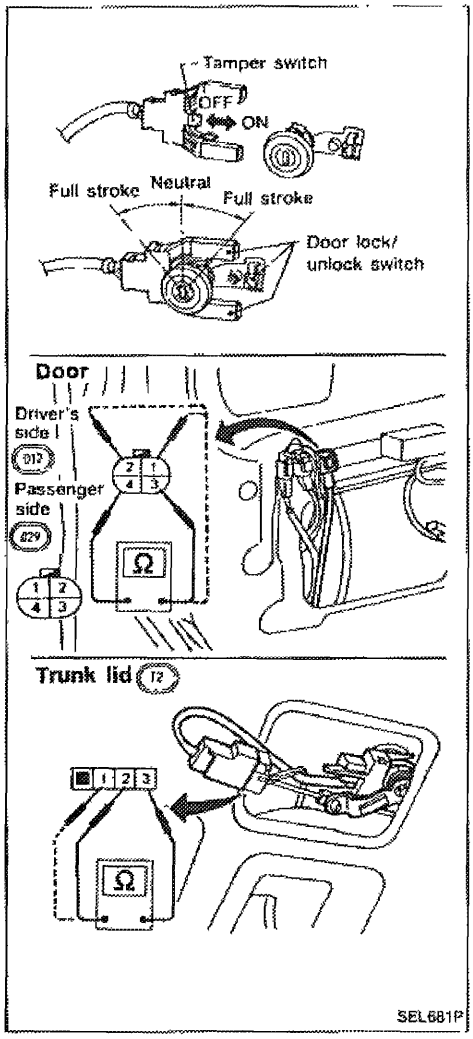
Terminal	Pushed	Released
a		
b		



Trunk room lamp switch

Terminal	Trunk lid	
	Closed	Open
a		
b		

Trouble Diagnoses (Cont'd)



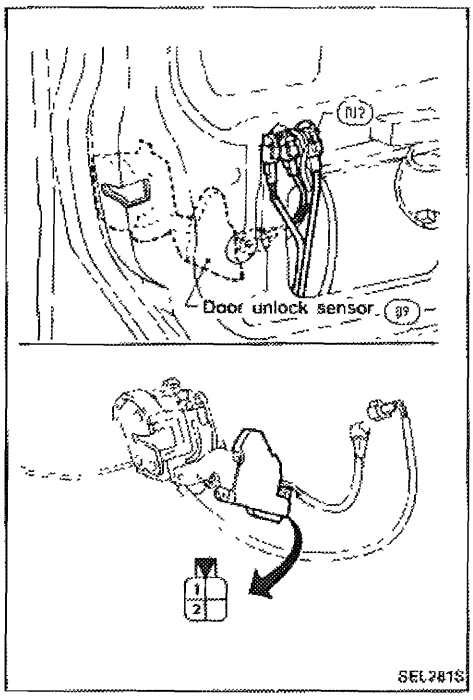
Key cylinder tamper switch, door lock switch and door unlock switch

- **Door**

	TAMPER SWITCH		DOOR LOCK SWITCH			DOOR UNLOCK SWITCH	
	Key cylinder is installed	Key cylinder is removed	Full stroke	Between full stroke and neutral	Neutral	Between full stroke and neutral	Full stroke
1				○			
2						○	
3		○					
4		○		○		○	

Trunk lid

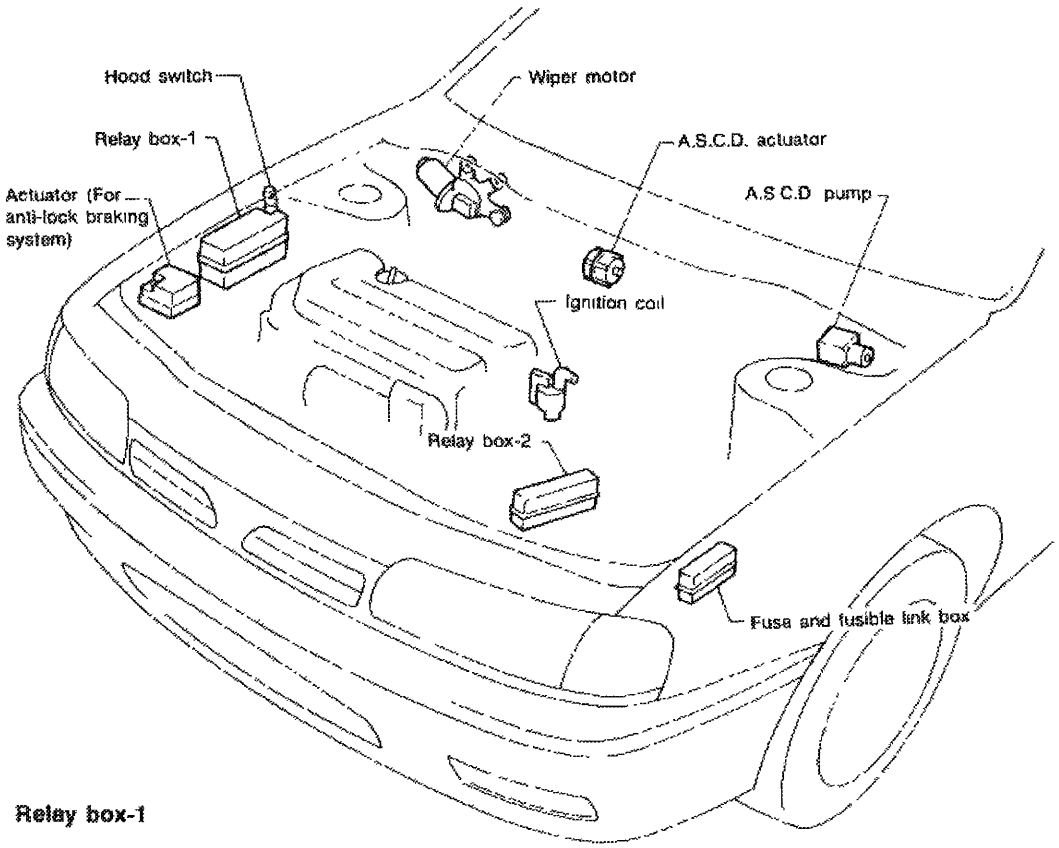
	TAMPER SWITCH		Trunk lid unlock switch		
	Key cylinder is installed	Key cylinder is removed	Full stroke	Between full stroke and neutral	Neutral
1				○	
2		○			
3		○		○	



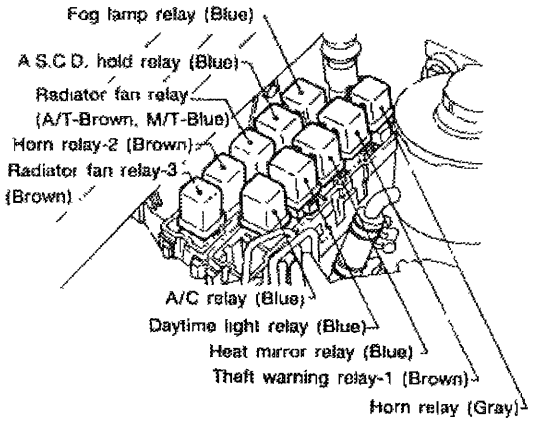
Door unlock sensor

	LOCK	UNLOCK
1		○
2		○

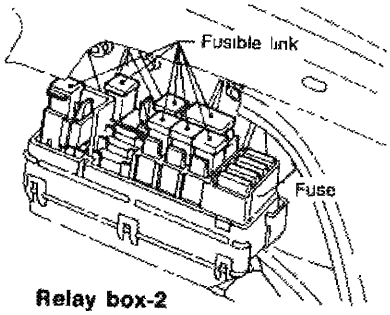
Engine Compartment



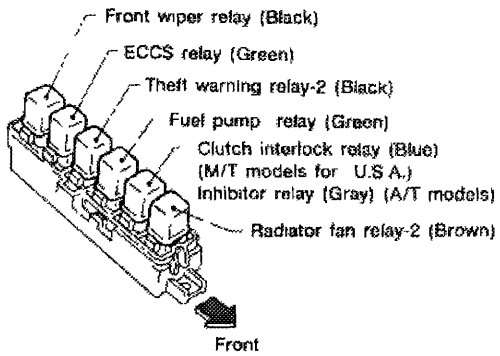
Relay box-1



Fuse and fusible link box

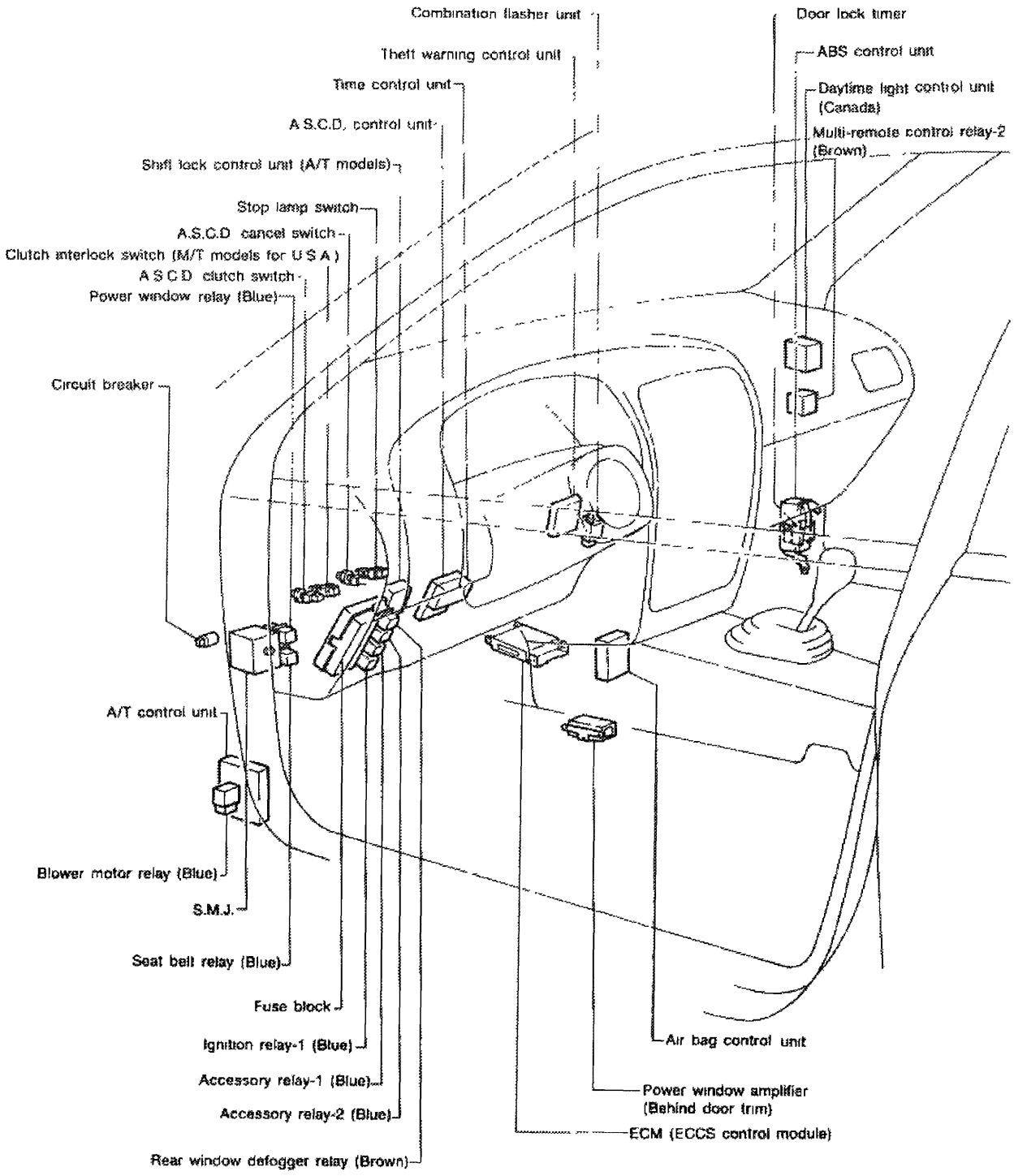


Relay box-2



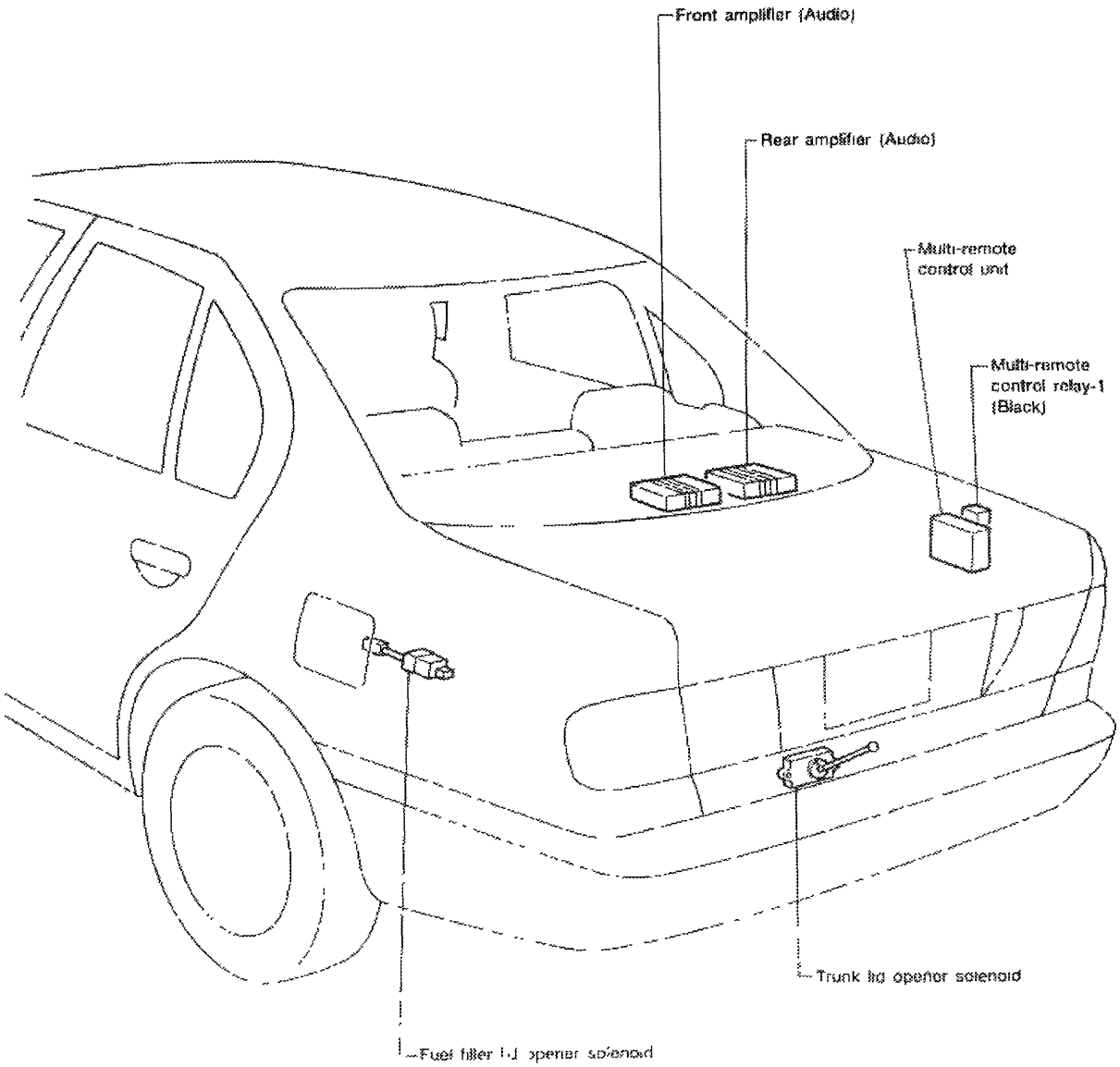
MEL213C

Passenger Compartment

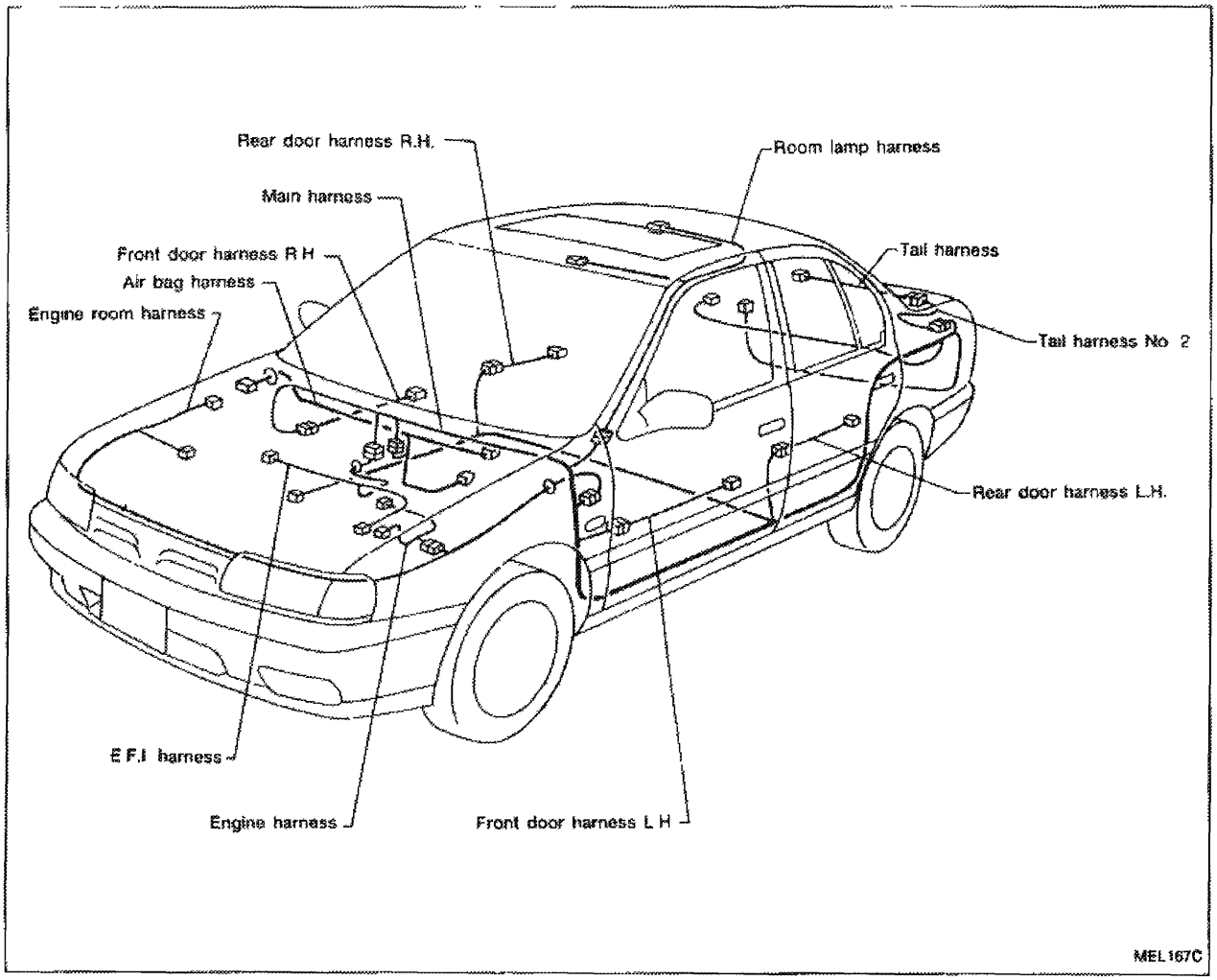


MEL214C

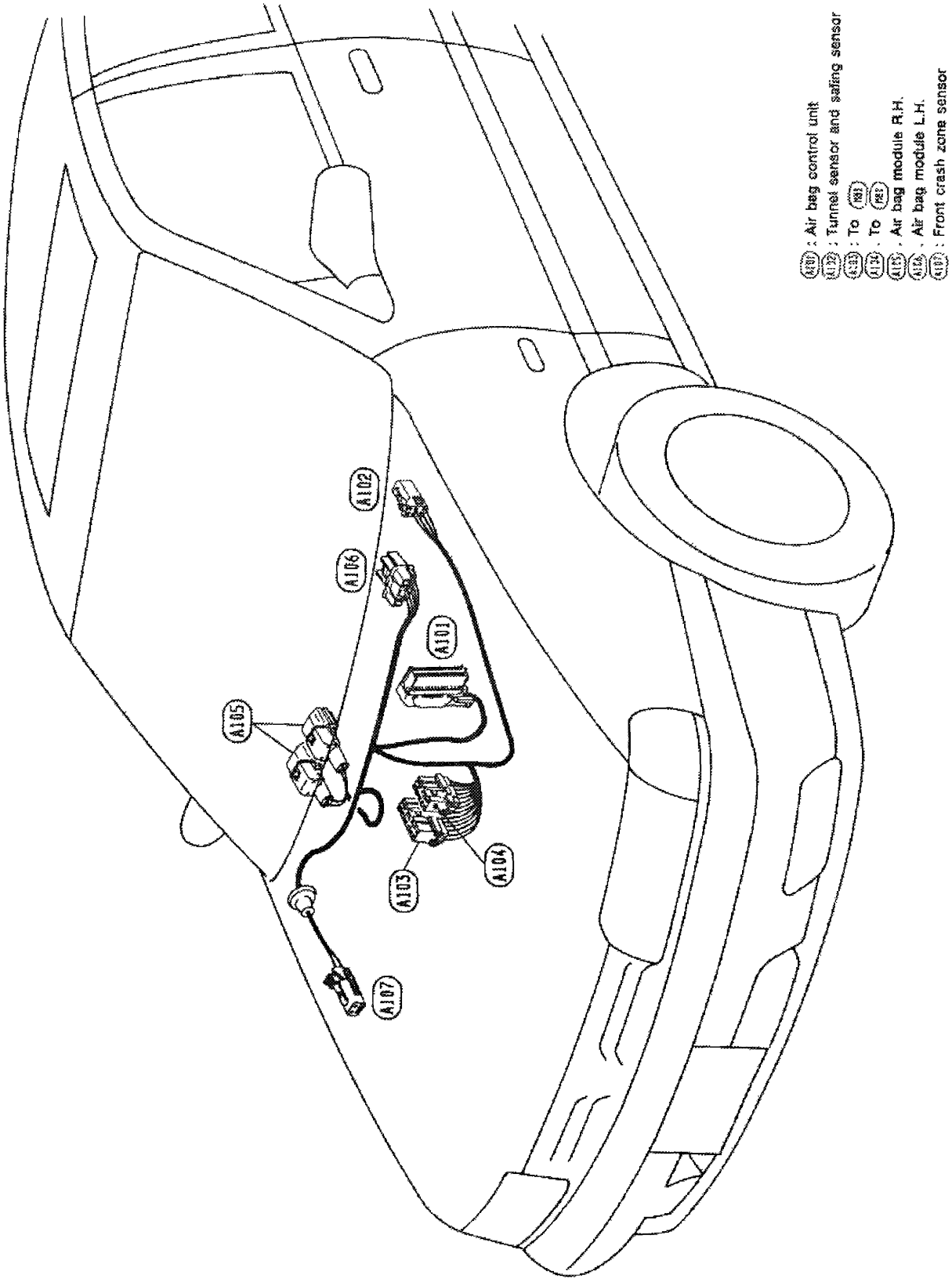
Luggage Compartment



Outline

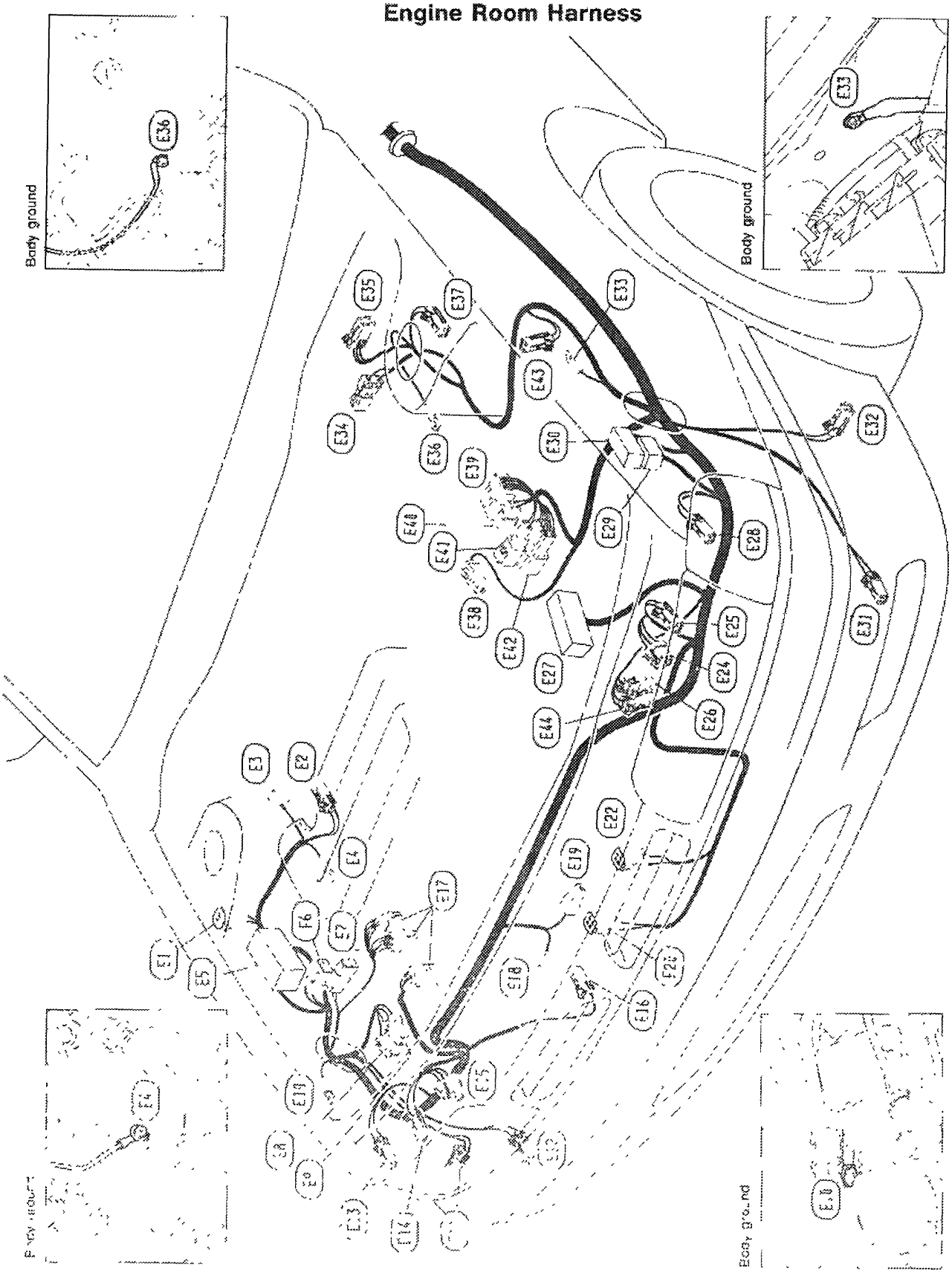

Rear door harness R.H.
Room lamp harness
Main harness
Front door harness R.H.
Tail harness
Air bag harness
Engine room harness
Tail harness No. 2
Rear door harness L.H.
E.F.I. harness
Engine harness
Front door harness L.H.
MEL167C

Air Bag Harness



MEL180C

Engine Room Harness



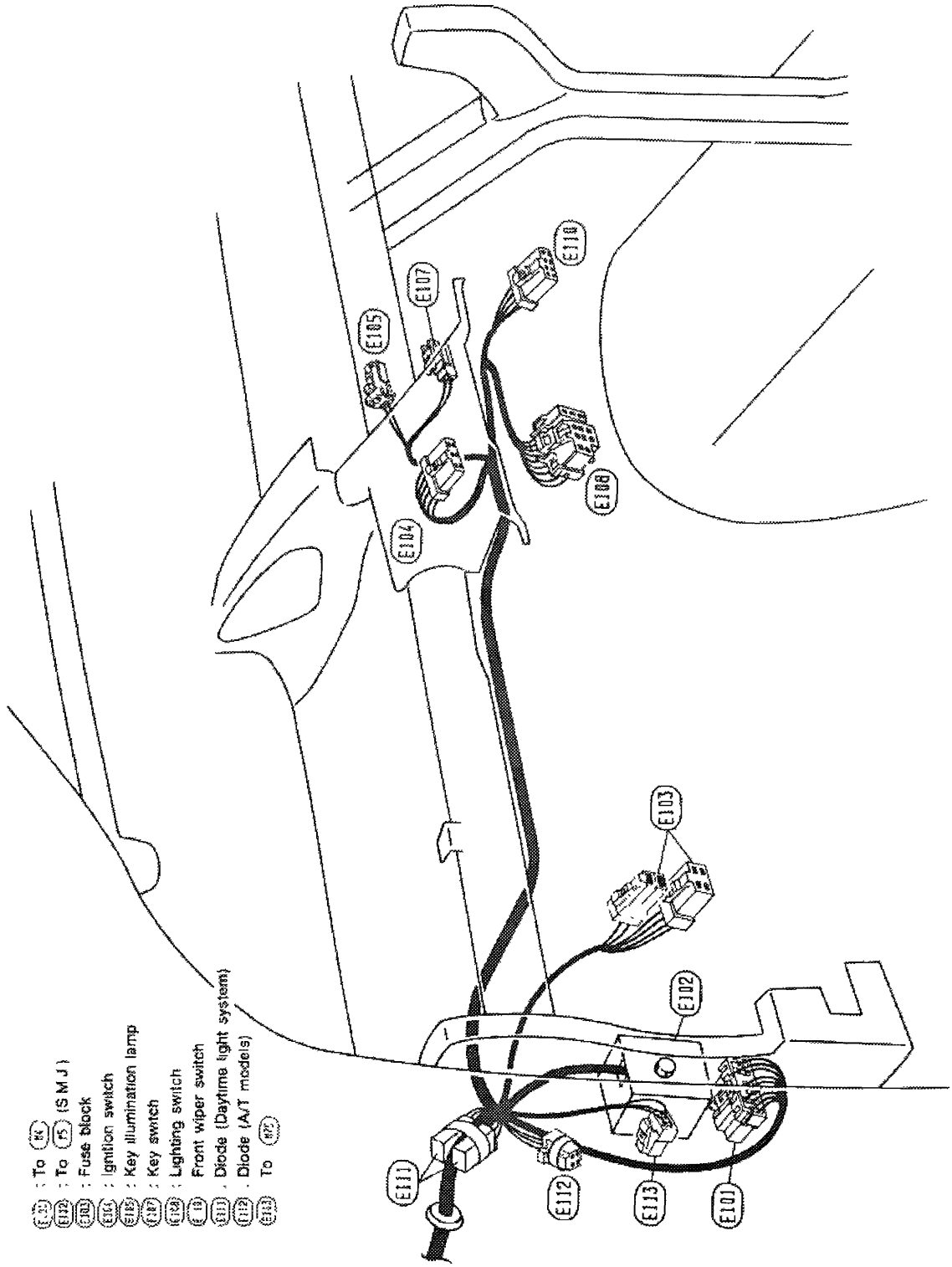
Engine Room Harness (Cont'd)

E1 : Hood switch
E2 : Front wheel sensor R.H. (For anti-lock braking system)
E3 : Theft warning horn
E4, E5 : Body ground (For anti-lock braking system)
E6 : Relay box-1 (Refer to "LOCATION OF ELECTRICAL UNITS".)
E7 : To E1
E8 : To E2
E9 : Front washer motor
E10 : Washer level switch
E11 : Body ground
E12 : Front side marker lamp R.H.
E13 : Front fog lamp R.H.
E14 : Front turn signal lamp R.H.
E15 : Clearance lamp R.H.
E16 : Headlamp R.H.
E17 : Compressor
E18 : Actuator (For anti-lock braking system)
E19 : Horn (Low)
E20 : Horn (High)
E21 : Radiator fan motor-1
E22 : Radiator fan motor-2
E23 : Headlamp L.H.
E24 : Clearance lamp L.H.
E25 : Triple-pressure switch (For U.S.A.)
E26 : Relay box-2 (Refer to "LOCATION OF ELECTRICAL UNITS".)
E27 : Front turn signal lamp L.H.
E28 : Joint connector box
E29 : Fuse and fusible link box
E30 : Front fog lamp L.H.
E31 : Front side marker lamp L.H.
E32 : Body ground
E33 : Brake fluid level switch
E34 : A.S.C.D. pump
E35 : Body ground (For anti-lock braking system)
E36 : Front wheel sensor L.H. (For anti-lock braking system)
E37 : Battery
E38 : To E23
E39 : To E24
E40 : To E27
E41 : To E28
E42 : To E29
E43 : Dropping resistor (A/T models)
E44 : Dual-pressure switch (For Canada)

Joint connector

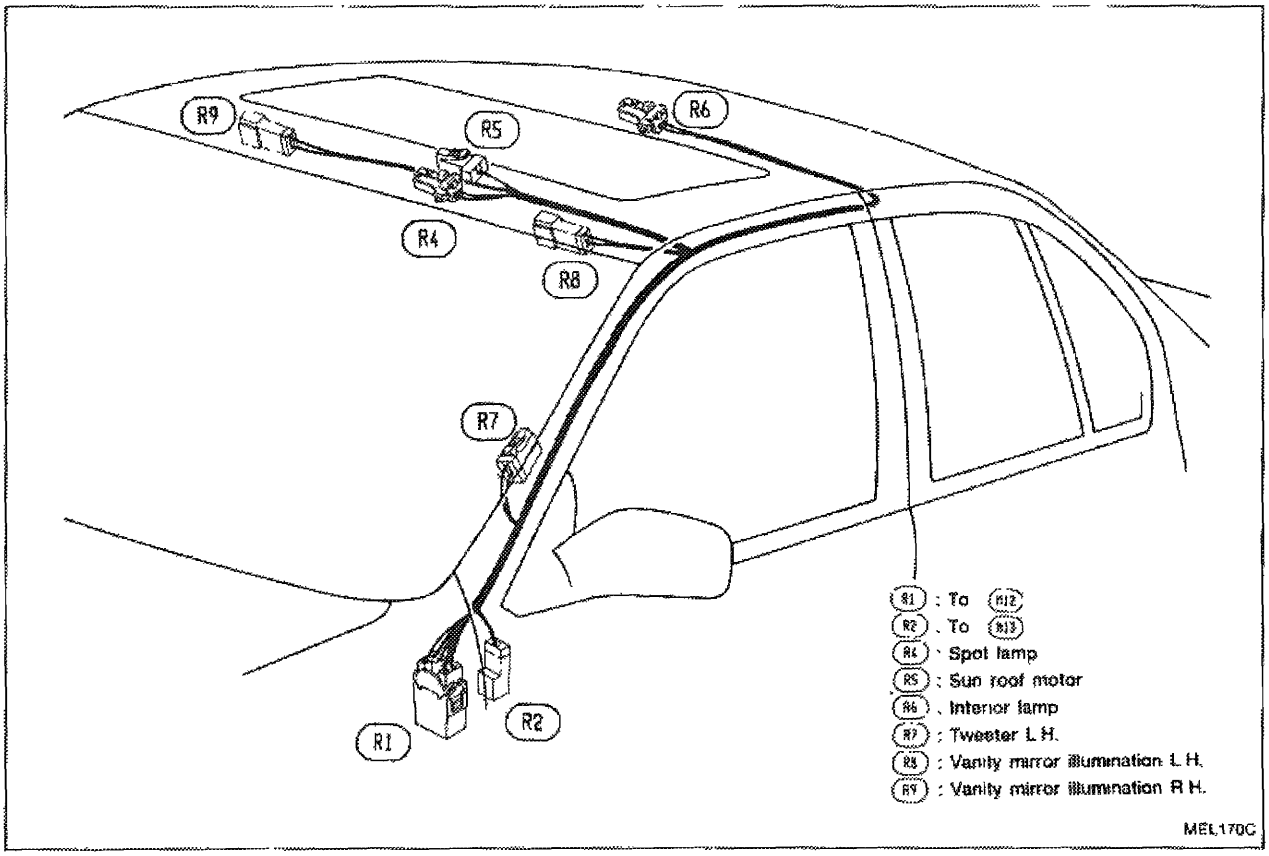
MEL168C

Engine Room Harness (Cont'd)

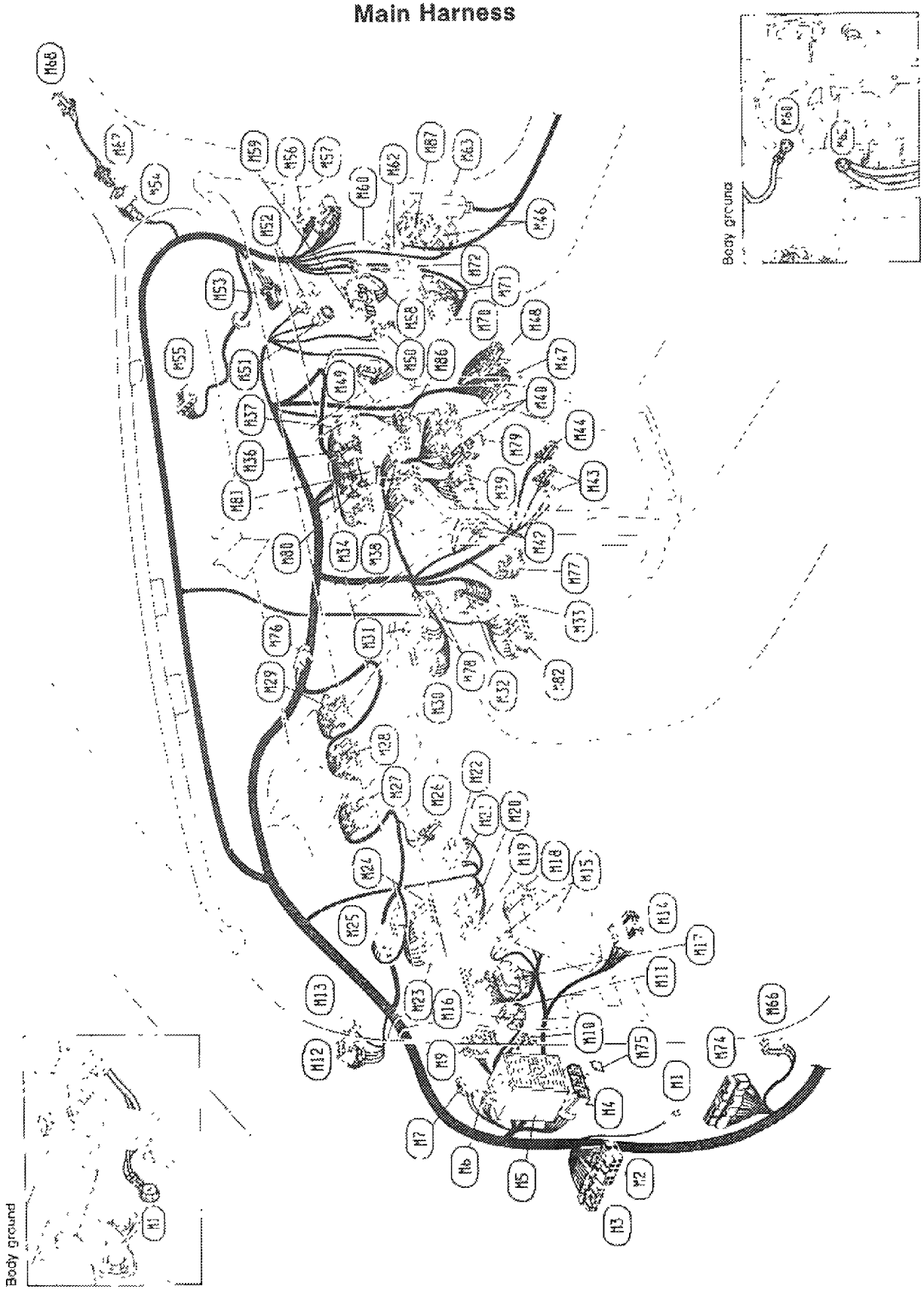


MEL169C

Room Lamp Harness

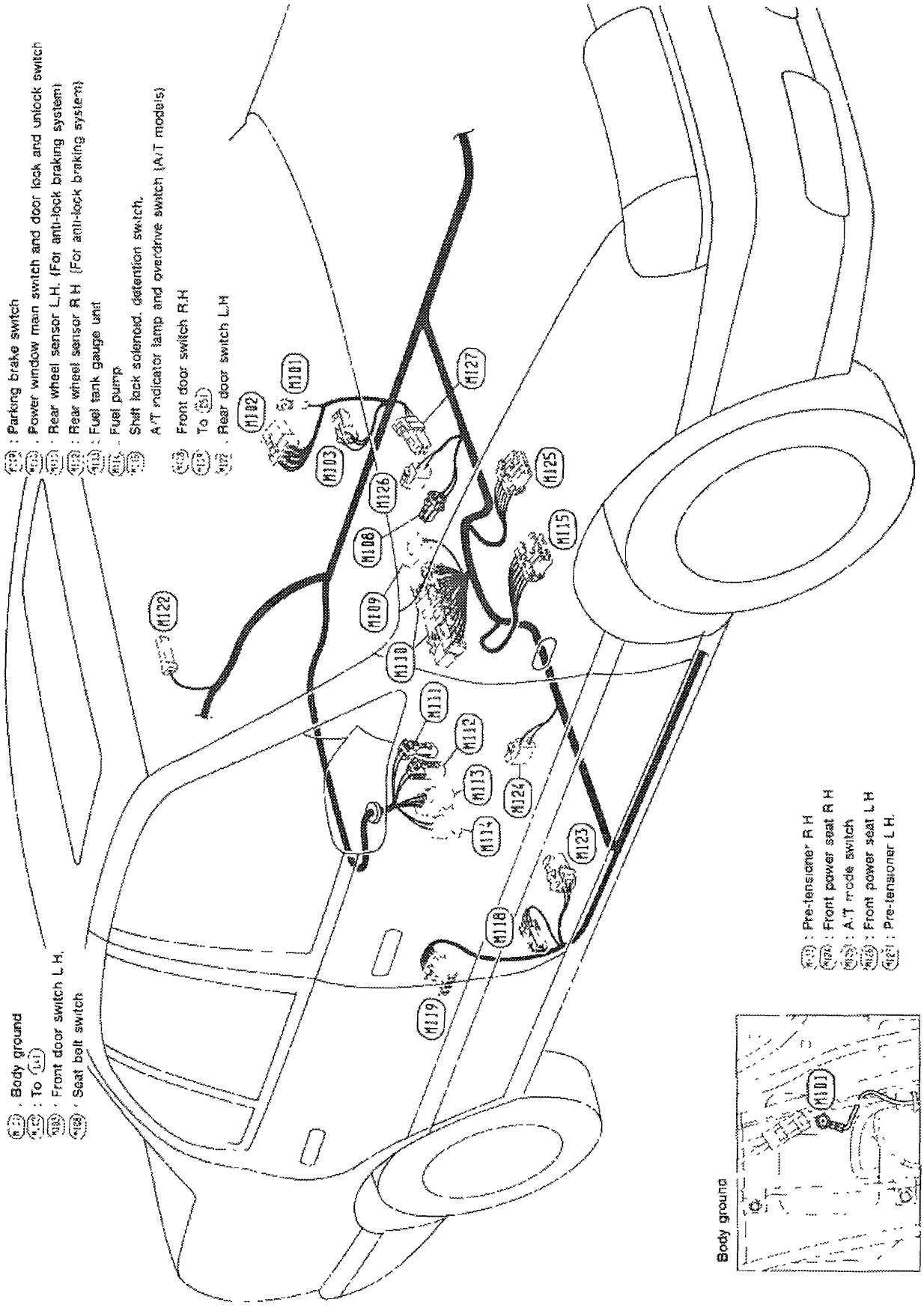


Main Harness

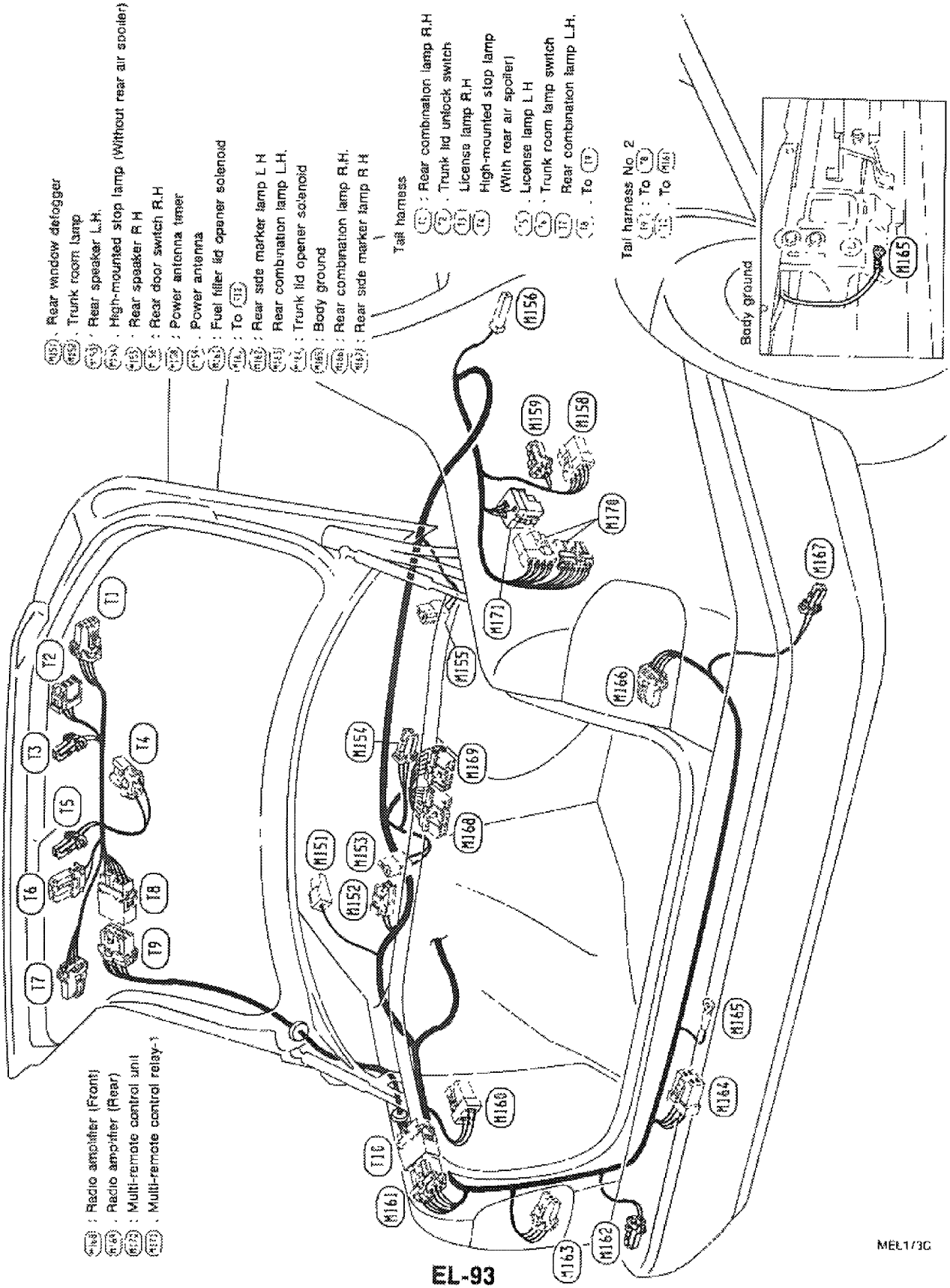


Main Harness (Cont'd)

Main Harness (Cont'd)

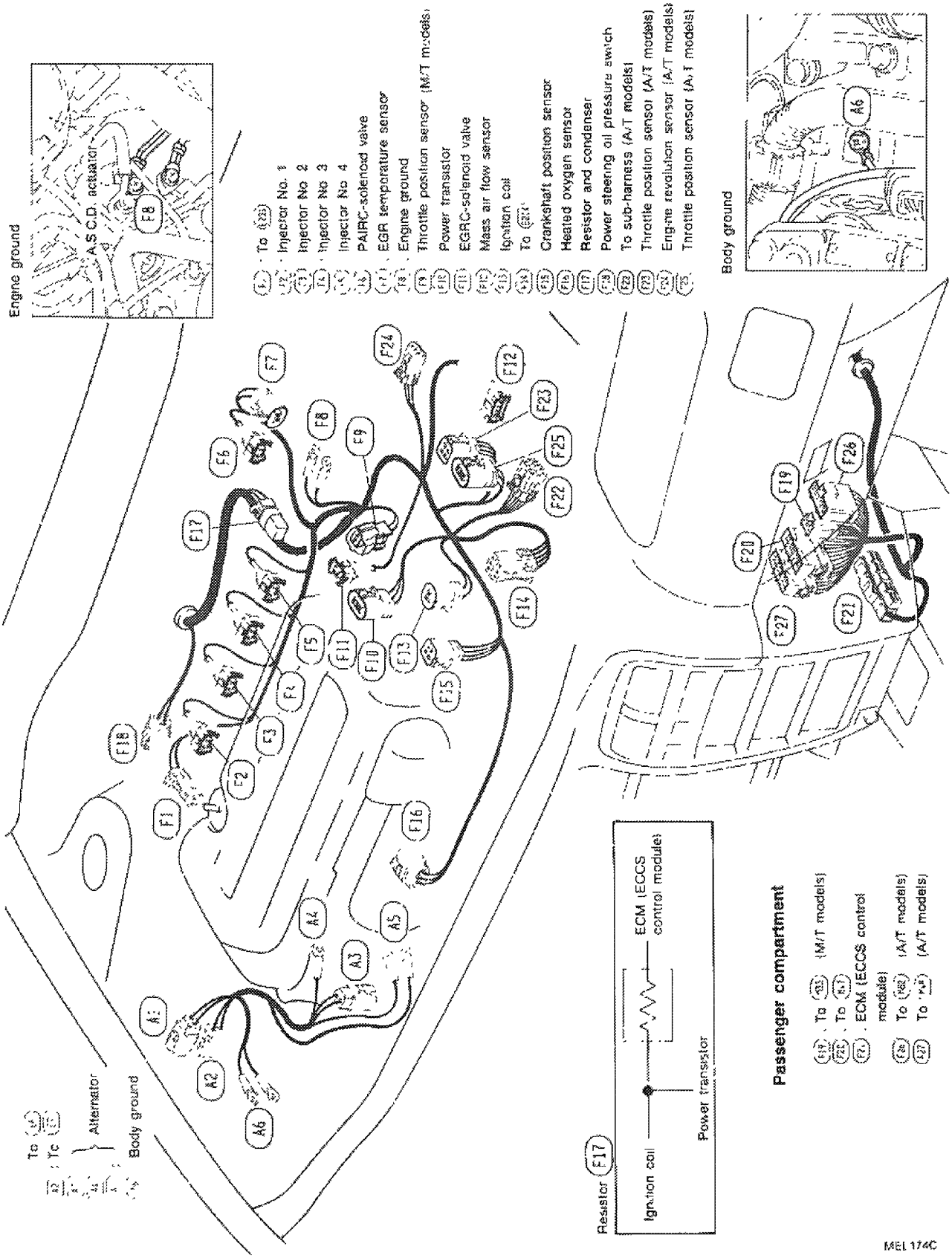


Main Harness, Tail Harness and Tail Harness No. 2

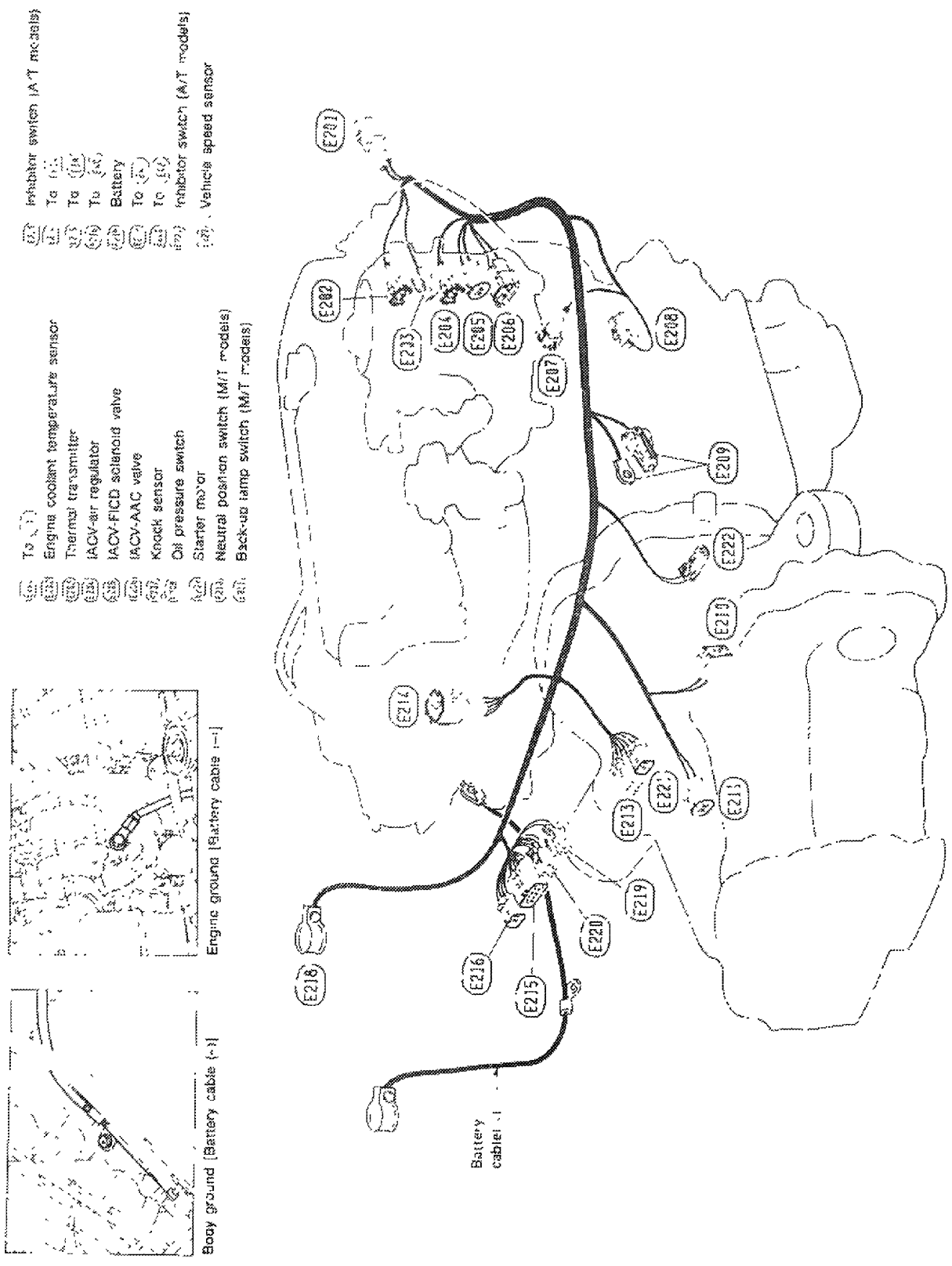


MEL1736

E.F.I. Harness and Alternator Harness



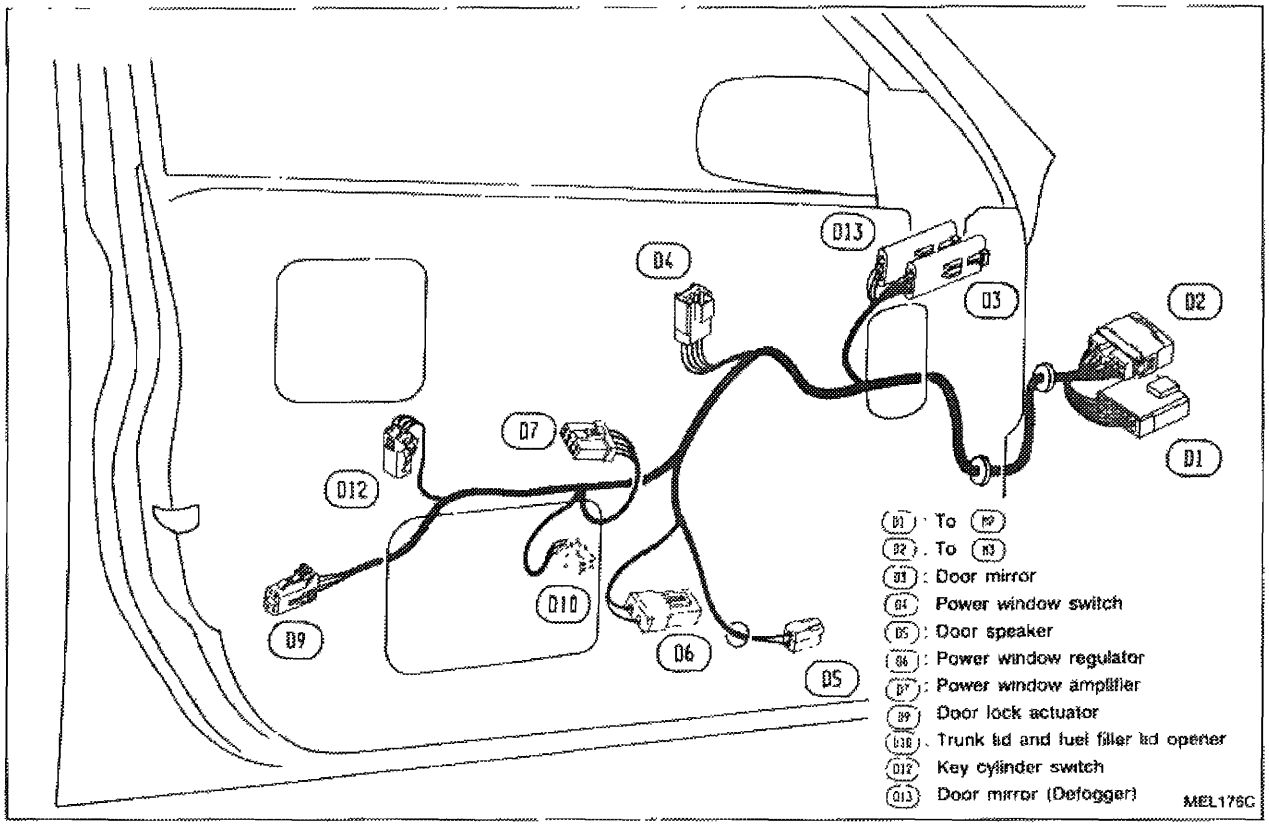
Engine Harness



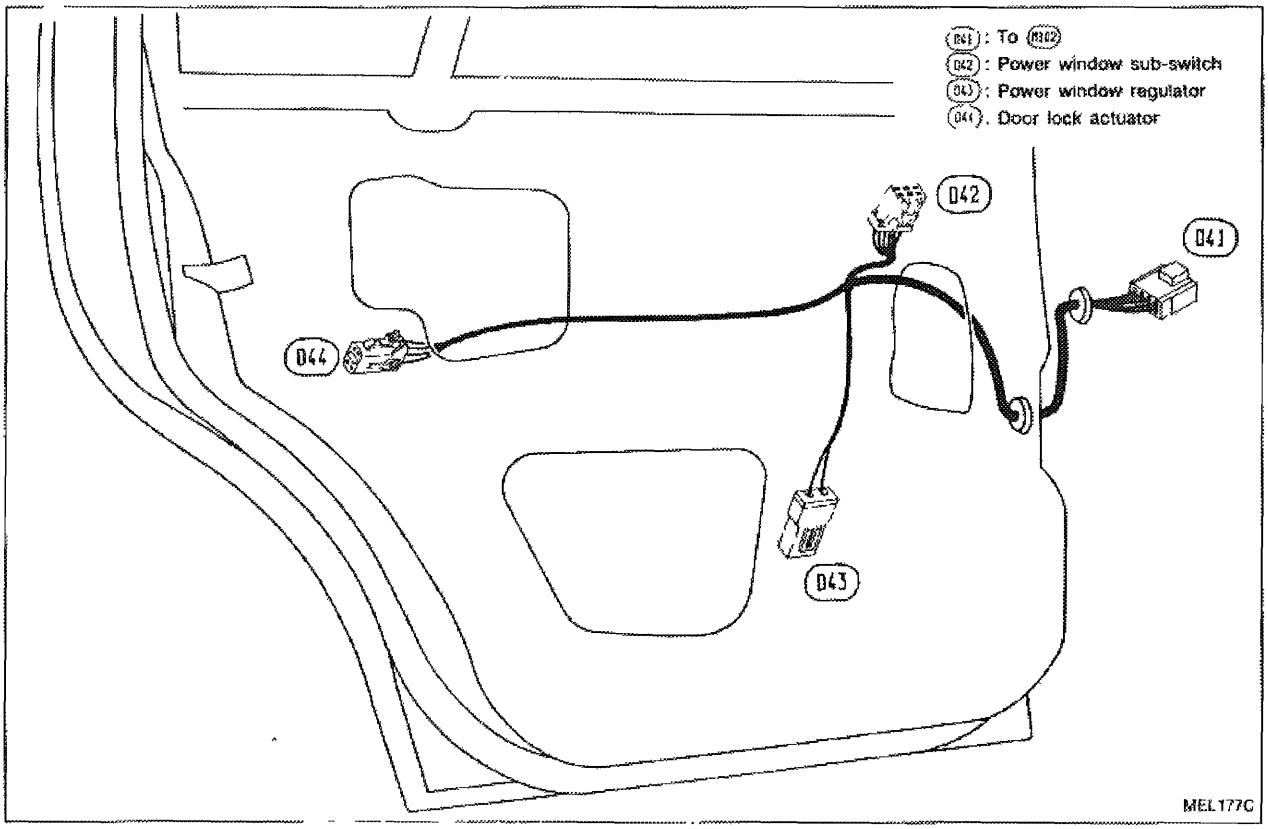
MEL175C

FRONT

Door Harness (L.H. side)

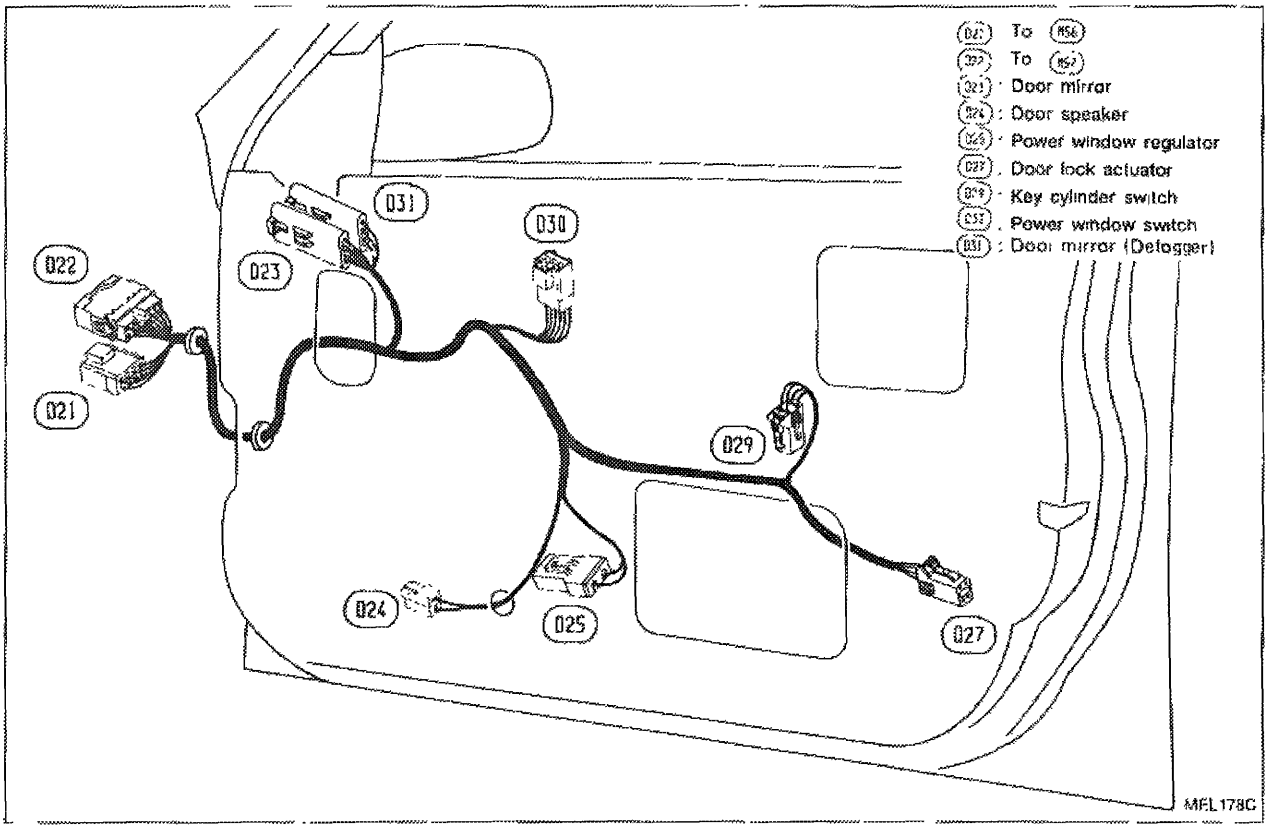


REAR

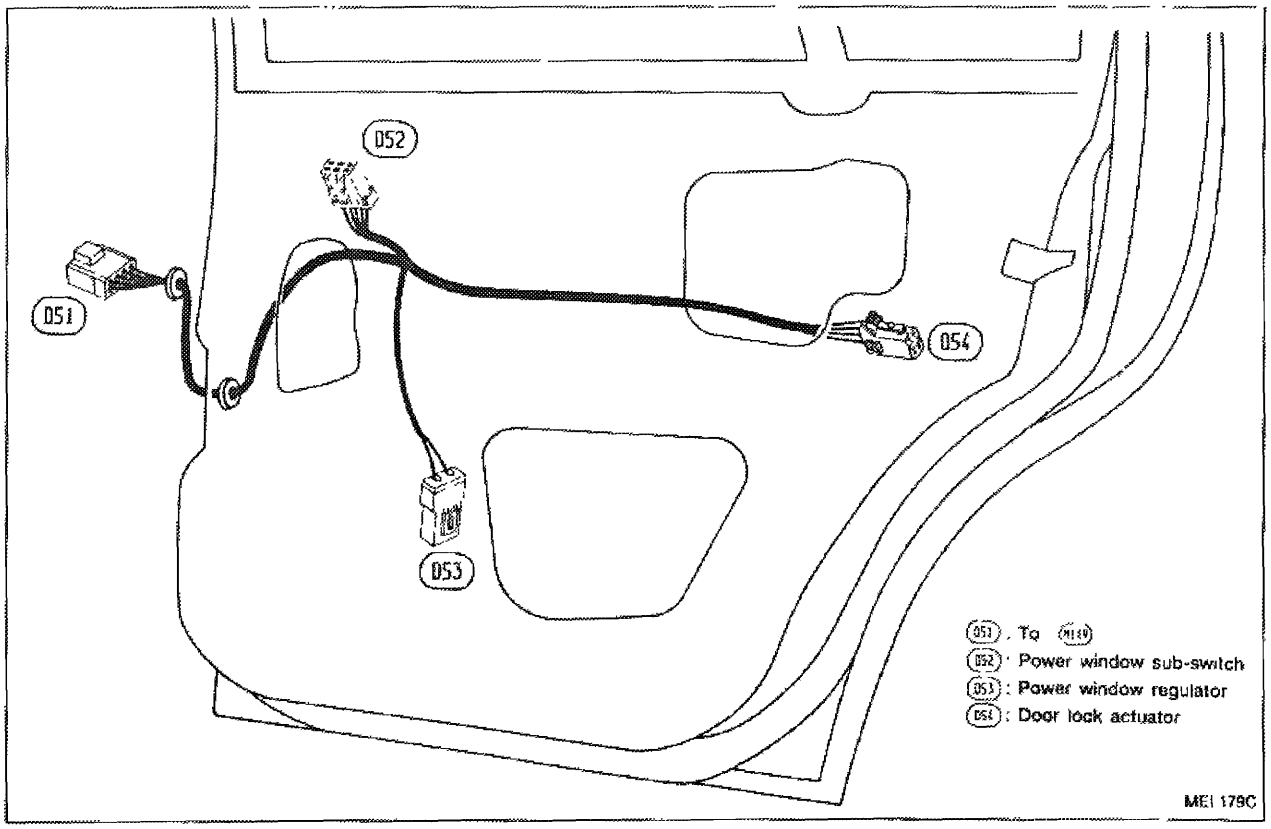


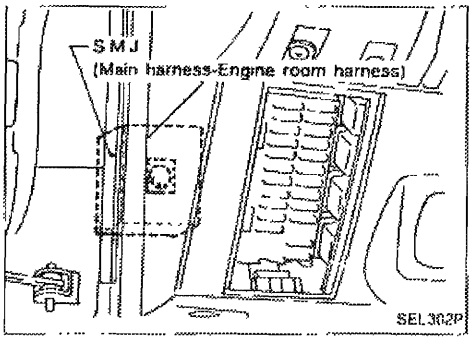
FRONT

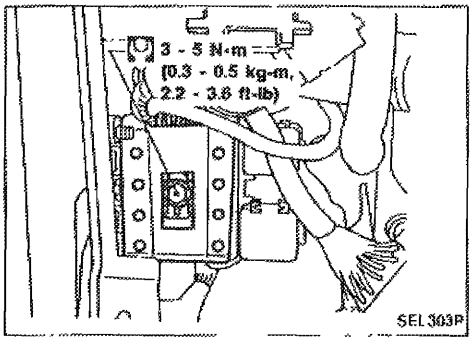
Door Harness (R.H. side)



REAR







INSTALLATION

To install S.M.J., tighten to specified torque as required.

: 3 - 5 N·m
(0.3 - 0.5 kg-m, 2.2 - 3.6 ft-lb)

CAUTION:

Do not overtighten bolts, otherwise, they may be damaged.

Terminal Arrangement

MAIN HARNESS

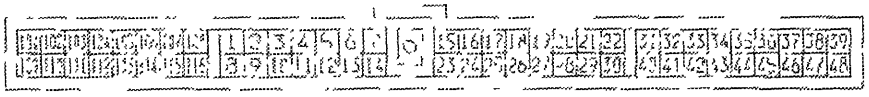
A1	A2	A3	A4	A5	A6		A7	A8	A9	A10	A11	A12
B1	B2	B3	B4	B5	B6		B7	B8	B9	B10	B11	B12
C1	C2	C3	C4	C5	C6		C7	C8	C9	C10	C11	C12
D1	D2									D11	D12	
E1	E2									E11	E12	
F1	F2									F11	F12	
G1	G2	G3	G4	G5	G6		G7	G8	G9	G10	G11	G12
H1	H2	H3	H4	H5	H6		H7	H8	H9	H10	H11	H12
I1	I2	I3	I4	I5	I6		I7	I8	I9	I10	I11	I12

T.S.

I1	I2	I3	I4	I5	I6		I7	I8	I9	I10	I11	I12
H1	H2	H3	H4	H5	H6		H7	H8	H9	H10	H11	H12
G1	G2	G3	G4	G5	G6		G7	G8	G9	G10	G11	G12
F1	F2									F11	F12	
E1	E2									E11	E12	
D1	D2									D11	D12	
C1	C2	C3	C4	C5	C6		C7	C8	C9	C10	C11	C12
B1	B2	B3	B4	B5	B6		B7	B8	B9	B10	B11	B12
A1	A2	A3	A4	A5	A6		A7	A8	A9	A10	A11	A12

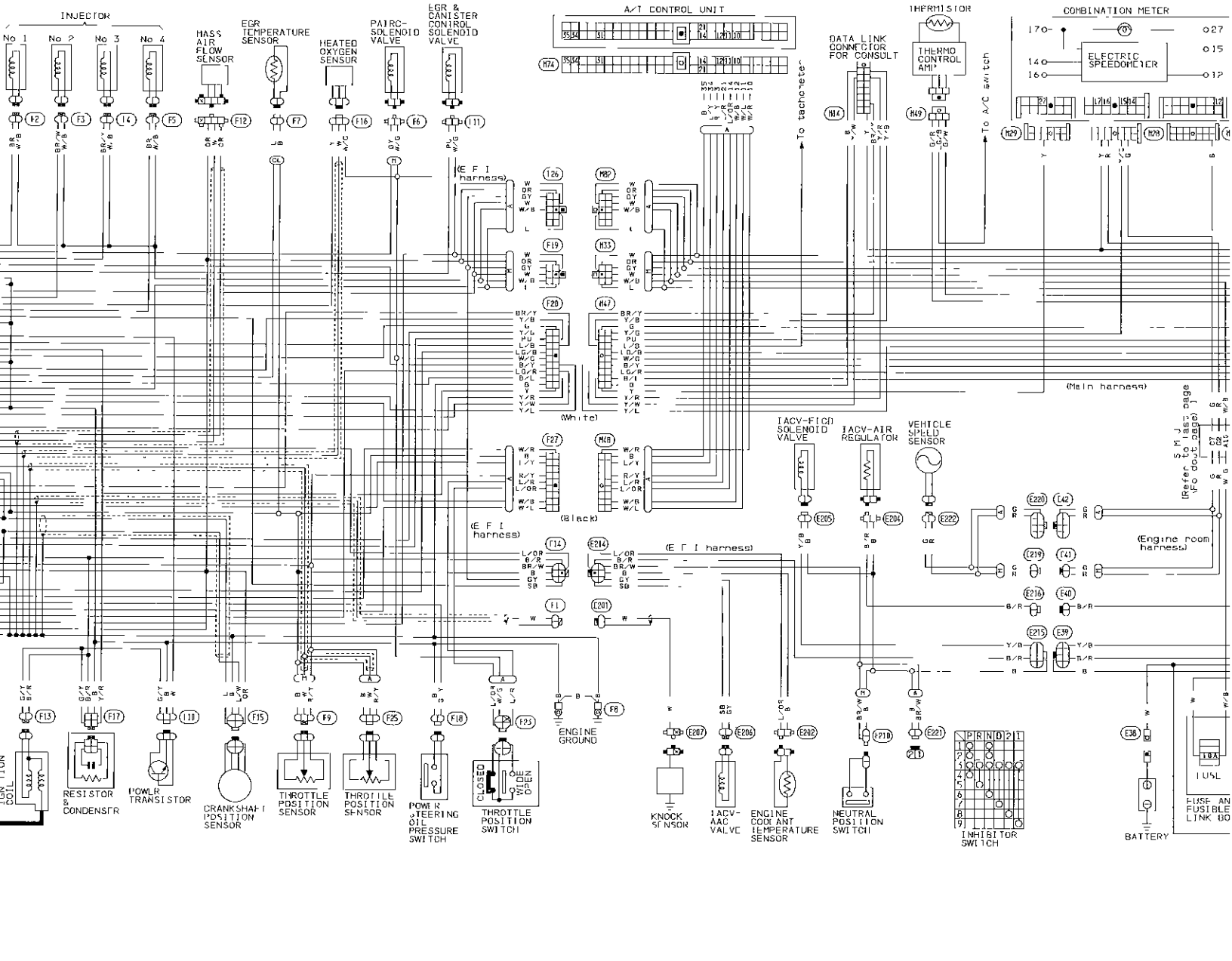
ENGINE ROOM HARNESS

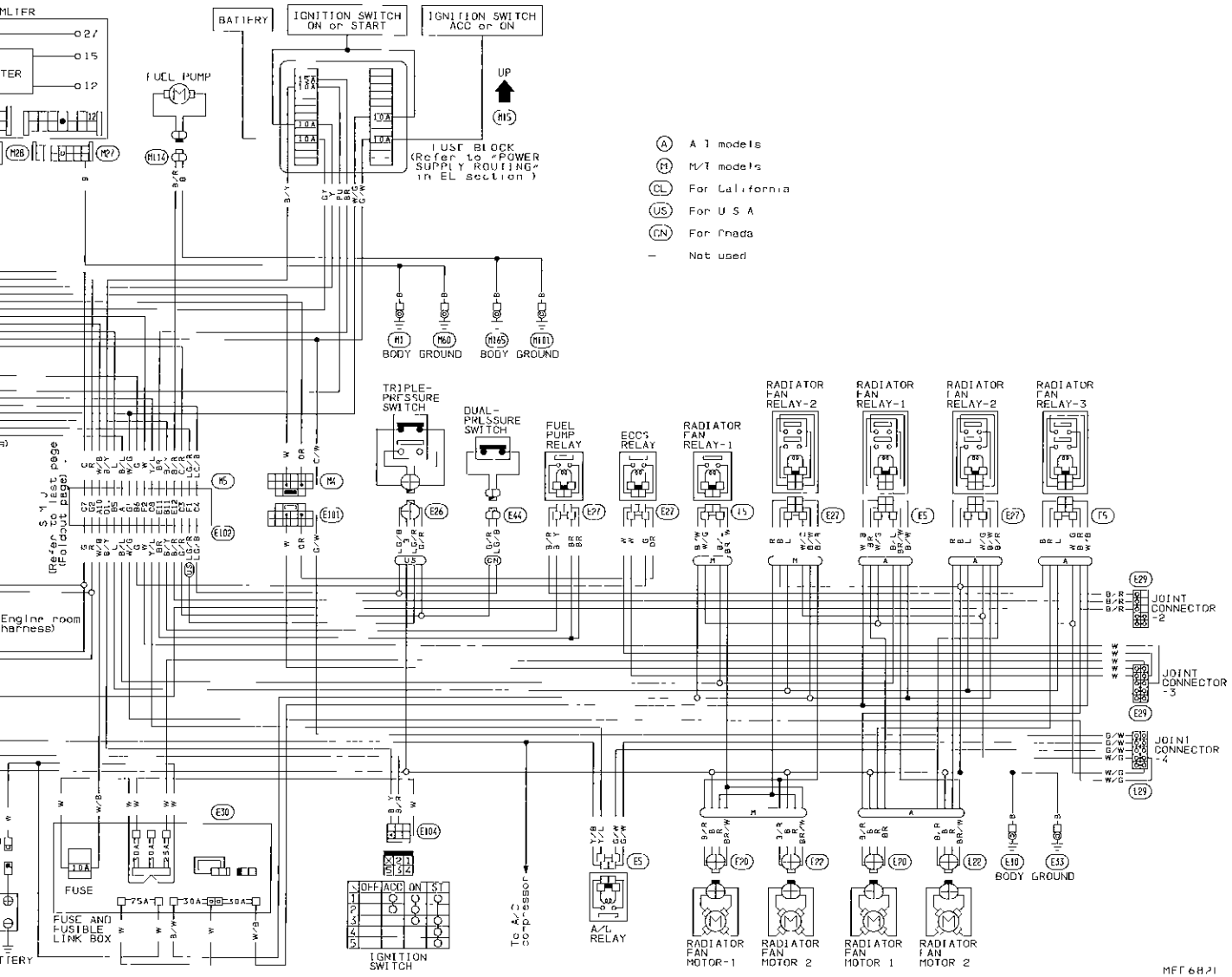
ECM (ECCS CONTROL MODULE)

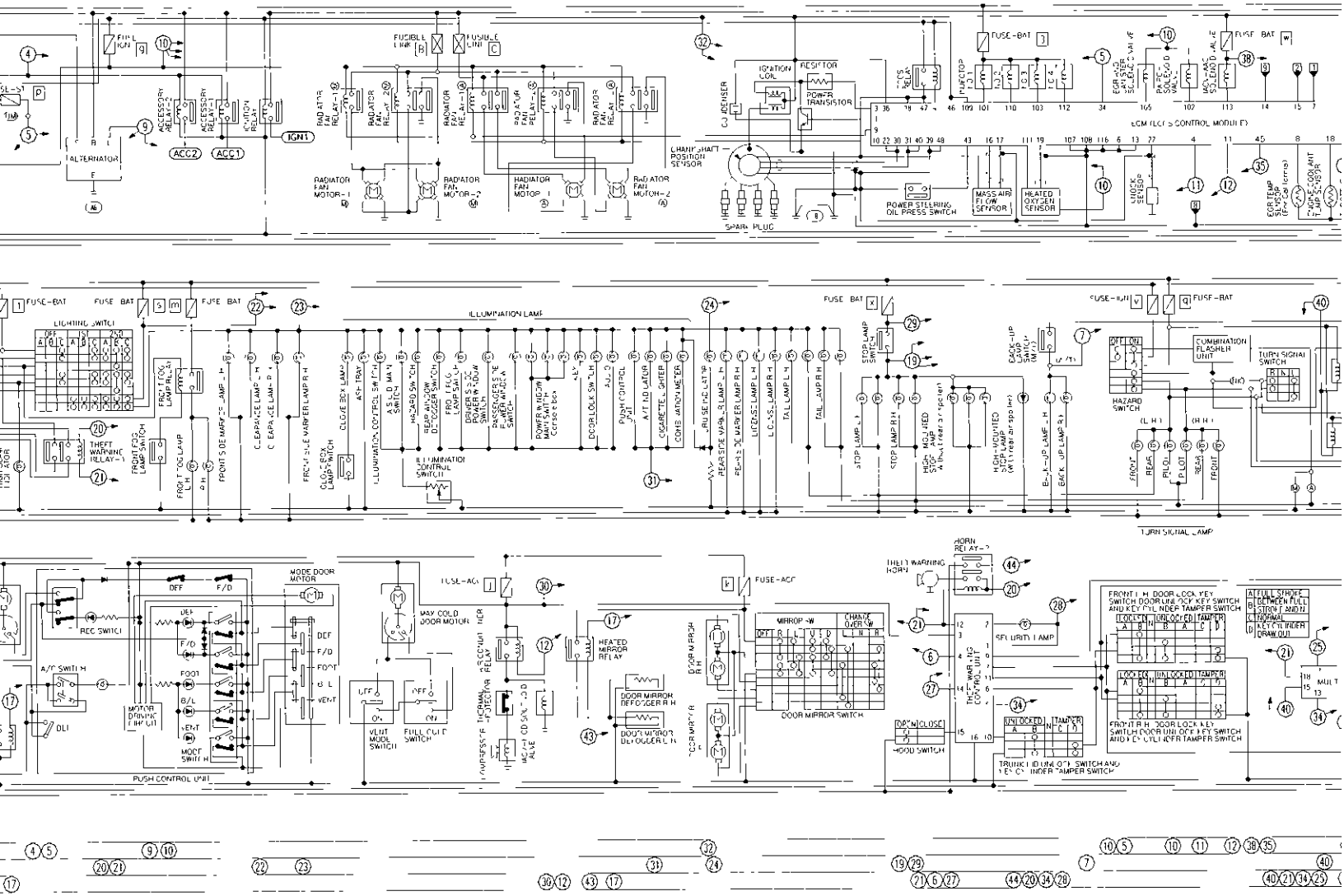


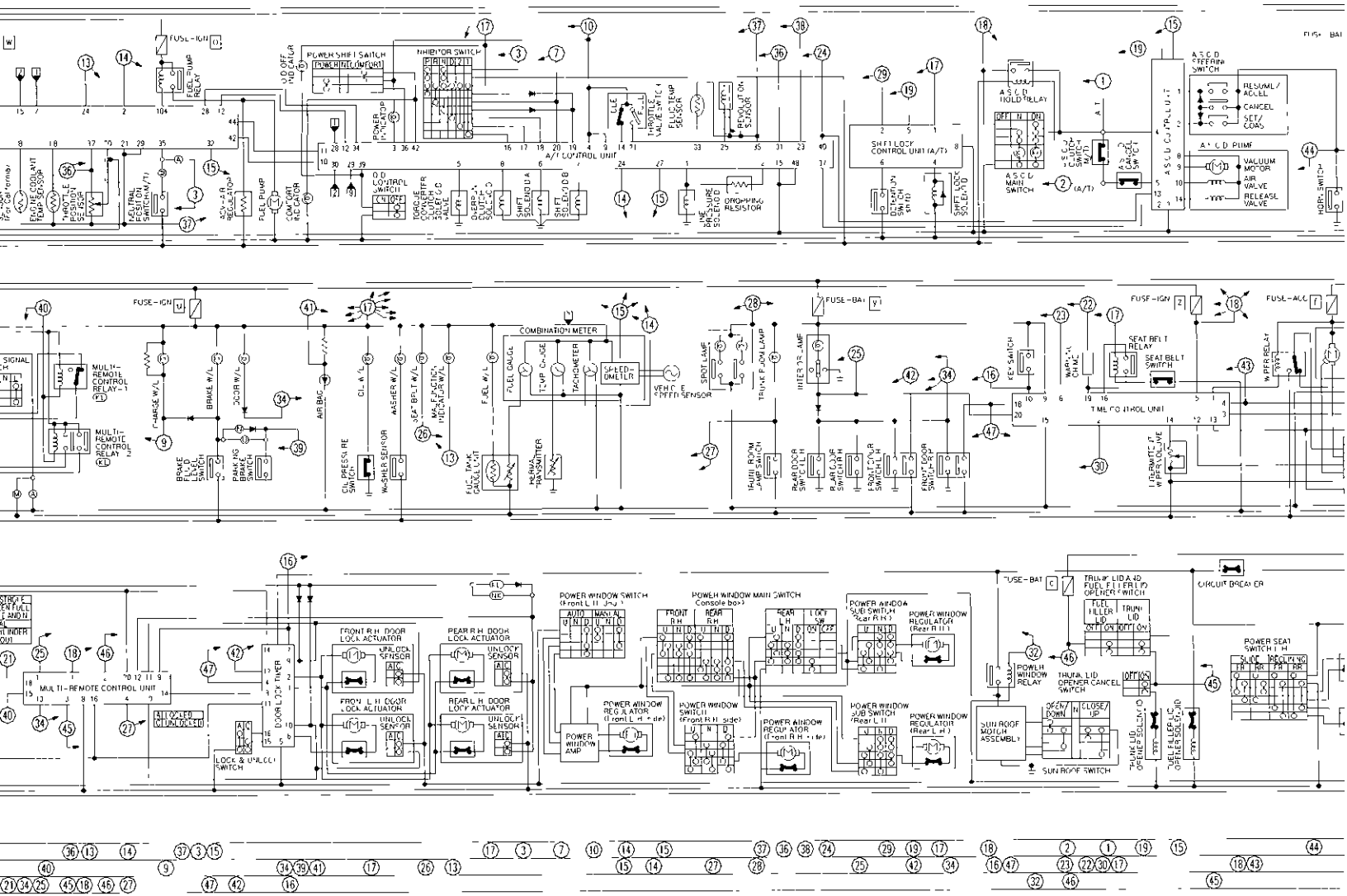
View from harness side

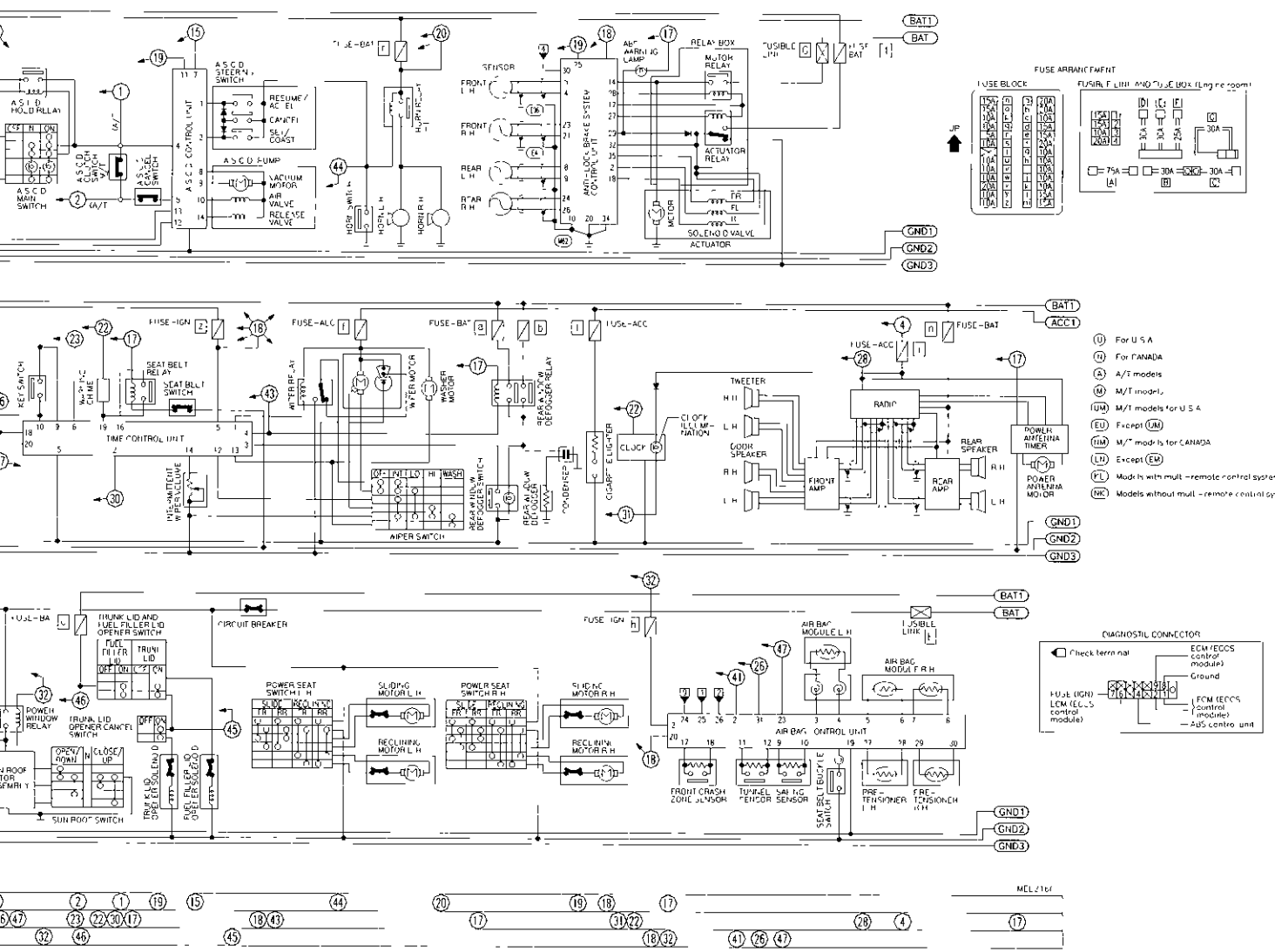



INJECTOR
No 1
No 2
No 3
No 4
MASS AIR FLOW SENSOR
EGR TEMPERATURE SENSOR
HEATED OXYGEN SENSOR
PAIRC-SOLENOID VALVE
EGR & CANISTER CONTROL SOLENOID VALVE
A/T CONTROL UNIT
THERMISTOR
THERMO CONTROL AMP.
DATA LINK CONNECTOR FOR CONSULT
COMBINATION METER
ELECTRIC SPEEDOMETER
To tachometer
To A/C switch
(E F I harness)
(White)
(Black)
(Main harness)
(Engine room harness)
IACV-FICD SOLENOID VALVE
IACV-AIR REGULATOR
VEHICLE SPEED SENSOR
RESISTOR & CONDENSER
POWER TRANSISTOR
CRANKSHAFT POSITION SENSOR
THROTTLE POSITION SENSOR
THROTTLE POSITION SENSOR
POWER STEERING OIL PRESSURE SWITCH
THROTTLE POSITION SWITCH
CLOSED
WIDE OPEN
ENGINE GROUND
KNOCK SENSOR
IACV-AAC VALVE
ENGINE COOLANT TEMPERATURE SENSOR
NEUTRAL POSITION SWITCH
INHIBITOR SWITCH
BATTERY
FUSE AN FUSIBLE LINK BO
10A
IUSL


BATTERY
IGNITION SWITCH ON or START
IGNITION SWITCH ACC or ON
FUEL PUMP
FUSE BLOCK (Refer to "POWER SUPPLY ROUTING" in EL section)
UP
A A T models
M/T models
For California
For U S A
For Canada
Not used
BODY GROUND
BODY GROUND
TRIPLE-PRESSURE SWITCH
DUAL-PRESSURE SWITCH
FUEL PUMP RELAY
ECCS RELAY
RADIATOR FAN RELAY-1
RADIATOR FAN RELAY-2
RADIATOR FAN RELAY-1
RADIATOR FAN RELAY-2
RADIATOR FAN RELAY-3
JOINT CONNECTOR -2
JOINT CONNECTOR -3
JOINT CONNECTOR -4
FUSE
FUSE AND FUSIBLE LINK BOX
IGNITION SWITCH
A/C RELAY
RADIATOR FAN MOTOR-1
RADIATOR FAN MOTOR 2
RADIATOR FAN MOTOR 1
RADIATOR FAN MOTOR 2
BODY GROUND
MEF68A21


FUSIBLE LINK
FUSE-BAT
IGN1
ACC2
ACC1
ALTERNATOR
RADIATOR FAN MOTOR-1
RADIATOR FAN MOTOR-2
RADIATOR FAN RELAY-1
RADIATOR FAN RELAY-2
RADIATOR FAN RELAY-3
IGNITION COIL
RESISTOR
POWER TRANSISTOR
CRANKSHAFT POSITION SENSOR
CAMSHAFT POSITION SENSOR
SPARK PLUG
POWER STEERING OIL PRESS SWITCH
MASS AIR FLOW SENSOR
HEATED OXYGEN SENSOR
ECM (ECU & CONTROL MODULE)
INJECTOR
EGR VALVE
PURGE SOLENOID VALVE
IACV-AAC SOLENOID VALVE
KNOCK SENSOR
ENGINE COOLANT TEMP SENSOR
FUSE-IGN
FUSE-ACC
LIGHTING SWITCH
ILLUMINATION LAMP
TURN SIGNAL LAMP
HAZARD SWITCH
COMBINATION FLASHER UNIT
TURN SIGNAL SWITCH
STOP LAMP SWITCH
BACK-UP LAMP SWITCH
THEFT WARNING RELAY-1
FRONT FOG LAMP SWITCH
FRONT FOG LAMP RELAY
CLOCK SPRING
ILLUMINATION CONTROL SWITCH
ASCD MAIN SWITCH
REAR WINDOW DEFOGGER SWITCH
DRIVER'S SIDE POWER WINDOW SWITCH
PASSENGER'S SIDE POWER WINDOW SWITCH
POWER WINDOW MAIN SWITCH
DOOR LOCK SWITCH
PUSH CONTROL UNIT
CIGARETTE LIGHTER
CONSTANT METER
REAR SIDE MARKER LAMP
LICENSE LAMP
TAIL LAMP
STOP LAMP
HIGH-MOUNTED STOP LAMP
BACK-UP LAMP
MODE DOOR MOTOR
REC SWITCH
A/C SWITCH
MOTOR DRIVING AMPLIFIER
PUSH CONTROL UNIT
MAX COLD DOOR MOTOR
COMPRESSOR THERMAL PROTECTOR
ASCD CUT RELAY
MAGNETIC CLUTCH
VENT MODE SWITCH
FULL CUT SWITCH
HEATED MIRROR RELAY
DOOR MIRROR DEFOGGER R.H
DOOR MIRROR DEFOGGER L.H
DOOR MIRROR R.H
DOOR MIRROR L.H
MIRROR SW
CHANGE OVER SW
DOOR MIRROR SWITCH
HORN RELAY
THEFT WARNING HORN
SECURITY LAMP
DOOR SW
CLOSE
HOOD SWITCH
TRUNK LID UNLOCK SWITCH AND KEY CYLINDER TAMPER SWITCH
FRONT R.H. DOOR LOCK KEY SWITCH DOOR UNLOCK KEY SWITCH AND KEY CYLINDER TAMPER SWITCH
FRONT L.H. DOOR LOCK KEY SWITCH DOOR UNLOCK KEY SWITCH AND KEY CYLINDER TAMPER SWITCH
LOCKED
UNLOCKED
TAMPER
A FULL STROKE
B BETWEEN FULL STROKE AND N
C NORMAL
D KEY CYLINDER DRAW OUT


FUSE-IGN
FUEL PUMP RELAY
POWER SHIFT SWITCH
INHIBITOR SWITCH
A/T CONTROL UNIT
SHIFT LOCK CONTROL UNIT (A/T)
A.S.C.D. HOLD RELAY
A.S.C.D. MAIN SWITCH
A.S.C.D. CONTROL UNIT
A.S.C.D. STEERING SWITCH
RESUME/ ACCEL
CANCEL
SET/ COAST
A.S.C.D. PUMP
VACUUM MOTOR
AIR VALVE
RELEASE VALVE
HORN SWITCH
ENGINE COOLANT TEMP. SENSOR
THROTTLE POSITION SENSOR
NEUTRAL POSITION SWITCH (M/T)
FUEL PUMP
COOLANT TEMP. INDICATOR
TORQUE CONVERTER CLUTCH SOLENOID VALVE
OVERDRIVE CUT-OFF SOLENOID
SHIFT SOLENOID A
SHIFT SOLENOID B
LINE PRESSURE SOLENOID
DROPPING RESISTOR
FUEL TEMP. SENSOR
THROTTLE VALVE SWITCH
KICKDOWN SWITCH
DATA LINK CONNECTOR (for CONSULT)
FUSE-BAT
FUSE-ACC
MULTI-REMOTE CONTROL RELAY-1
MULTI-REMOTE CONTROL RELAY-2
BRAKE FLUID LEVEL SWITCH
PARKING BRAKE SWITCH
AIR BAG
OIL PRESSURE SWITCH
WASHER SENSOR
SEAT BELT W/L
MALFUNCTION INDICATOR W/L
FUEL W/L
FUEL GAUGE
FUEL TANK GAUGE UNIT
THERMO TRANSMITTER
COMBINATION METER
TEMP. GAUGE
TACHOMETER
SPEEDOMETER
VEHICLE SPEED SENSOR
SPOT LAMP
TRUNK R. LAMP
INTERIOR LAMP
TRUNK ROOM LAMP SWITCH
REAR DOOR SW. (LH)
REAR DOOR SW. (RH)
FRONT DOOR SW. (LH)
FRONT DOOR SW. (RH)
KEY SWITCH
WARNING CHIME
TIME CONTROL UNIT
SEAT BELT RELAY
SEAT BELT SWITCH
WIPER RELAY
INTERMITT. WIPER VOLVE
MULTI-REMOTE CONTROL UNIT
DOOR LOCK TIMER
FRONT R.H. DOOR LOCK ACTUATOR
FRONT L.H. DOOR LOCK ACTUATOR
REAR R.H. DOOR LOCK ACTUATOR
REAR L.H. DOOR LOCK ACTUATOR
UNLOCK SENSOR
LOCK & UNLOCK SWITCH
POWER WINDOW SWITCH (Front L.H. door)
POWER WINDOW MAIN SWITCH (Console box)
POWER WINDOW SUB SWITCH (Rear R.H.)
POWER WINDOW REGULATOR (Rear R.H.)
POWER WINDOW AMP.
POWER WINDOW REGULATOR (Front L.H. side)
POWER WINDOW SWITCH (Front R.H. side)
POWER WINDOW REGULATOR (Front R.H. side)
POWER WINDOW SUB SWITCH (Rear L.H.)
POWER WINDOW REGULATOR (Rear L.H.)
SUN ROOF MOTOR ASSEMBLY
SUN ROOF SWITCH
POWER WINDOW RELAY
TRUNK LID & FUEL FILLER LID OPENER SWITCH
TRUNK LID OPENER CANCEL SWITCH
TRUNK LID OPENER SOLENOID
FUEL FILLER LID OPENER SOLENOID
CIRCUIT BREAKER
POWER SEAT SWITCH (LH)


BAT1
BAT
GND1
GND2
GND3
ACC1
FUSE ARRANGEMENT
FUSE BLOCK
FUSIBLE LINK AND FUSE BOX (Engine room)
JB
ASCD MAIN SWITCH
ASCD HOLD RELAY
ASCD CANCEL SWITCH
ASCD STEERING SWITCH
ASCD CONTROL UNIT
ASCD PUMP
VACUUM MOTOR
AIR VALVE
RELEASE VALVE
RESUME/ ACCEL
CANCEL
SET/ COAST
A/T
STOP LAMP SW
HORN RELAY
HORN
HORN SWITCH
SENSOR
FRONT LH
FRONT RH
REAR LH
REAR RH
ANTI-LOCK BRAKE SYSTEM CONTROL UNIT
ABS WARNING LAMP
RELAY BOX
MOTOR RELAY
ACTUATOR RELAY
SOLENOID VALVE
ACTUATOR
MOTOR
FUSIBLE LINK
IGN SW
BAT
FUSE-IGN
FUSE-ALT
FUSE-BAT
FUSE-ACC
KEY SW
SEAT BELT RELAY
SEAT BELT SWITCH
TIME CONTROL UNIT
WIPER REAR
WIPER MOTOR
WASHER MOTOR
REAR WINDOW DEFOGGER RELAY
REAR WINDOW DEFOGGER SWITCH
CONDENSER
WIPER SWITCH
CIGARETTE LIGHTER
CLOCK
TWEETER
DOOR SPEAKER
FRONT AMP
RADIO
REAR SPEAKER
REAR AMP
POWER ANTENNA TIMER
POWER ANTENNA MOTOR
(U) For U.S.A
(H) For CANADA
(A) A/T models
(M) M/T models
(UM) M/T models for U.S.A
(EU) Except (UM)
(HM) M/T models for CANADA
(LN) Except (EM)
(FL) Models with multi-remote control system
(NK) Models without multi-remote control system
FUSE-BAT
CIRCUIT BREAKER
TRUNK LID AND FUEL FILLER LID OPENER SWITCH
POWER WINDOW RELAY
TRUNK LID OPENER CANCEL SWITCH
SUN ROOF SWITCH
TRUNK LID OPENER SOLENOID
FUEL FILLER LID OPENER SOLENOID
POWER SEAT SWITCH LH
POWER SEAT SWITCH RH
SLIDING MOTOR LH
RECLINING MOTOR LH
SLIDING MOTOR RH
RECLINING MOTOR RH
FUSE-IGN
AIR BAG MODULE LH
AIR BAG MODULE RH
AIR BAG CONTROL UNIT
FRONT CRASH ZONE SENSOR
TUNNEL SENSOR
SATELLITE SENSOR
SEAT BELT BUCKLE SWITCH
PRE-TENSIONER LH
PRE-TENSIONER RH
DIAGNOSTIC CONNECTOR
Check terminal
ECM/ECCS control module
Ground
FUSE (IGN)
ECM (ECCS control module)
ABS control unit
MEL216F