



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.

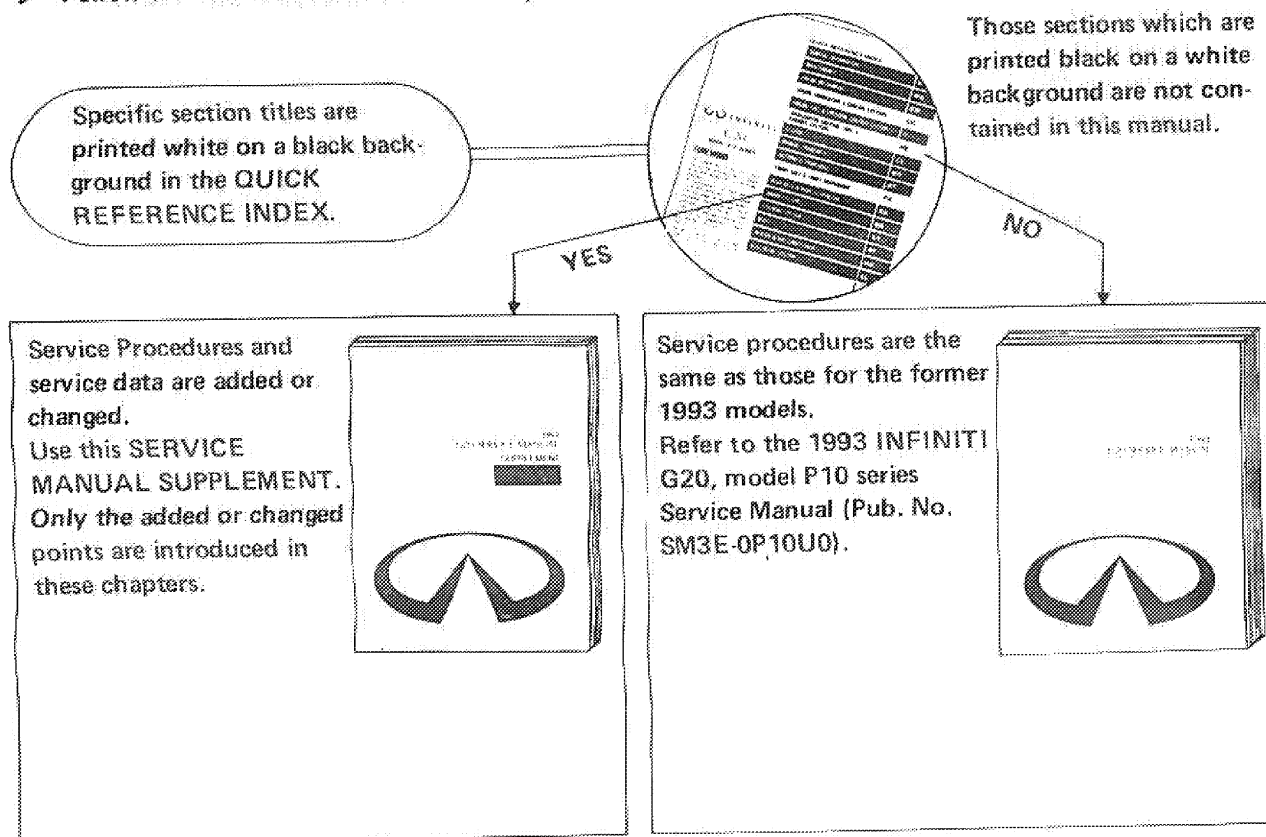
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ENGINE FUEL & EMISSION CONTROL SYSTEM _____	EF & EC
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HOW TO USE THIS MANUAL

- ▶ 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**



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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CONSULT CHECKING SYSTEM

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.

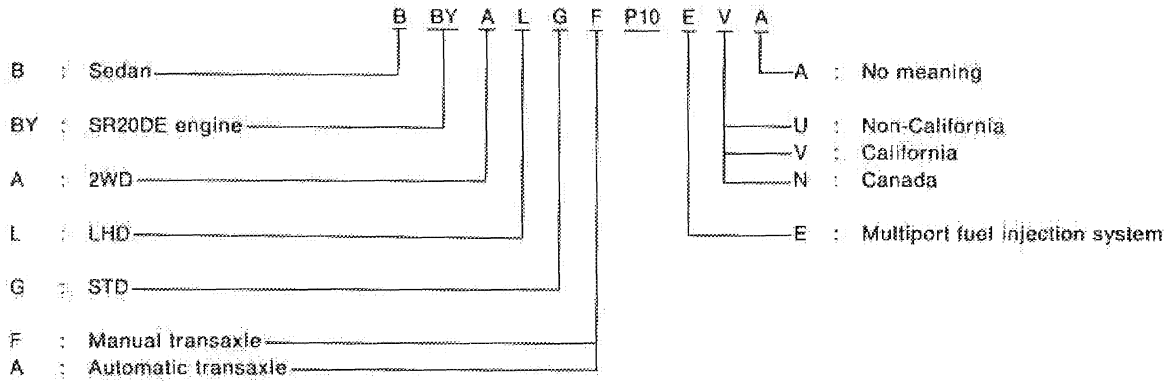
Tool name	Description
NISSAN CONSULT kit ① CONSULT unit and accessories ② Program card (UE920)	

IDENTIFICATION INFORMATION

Model Variation

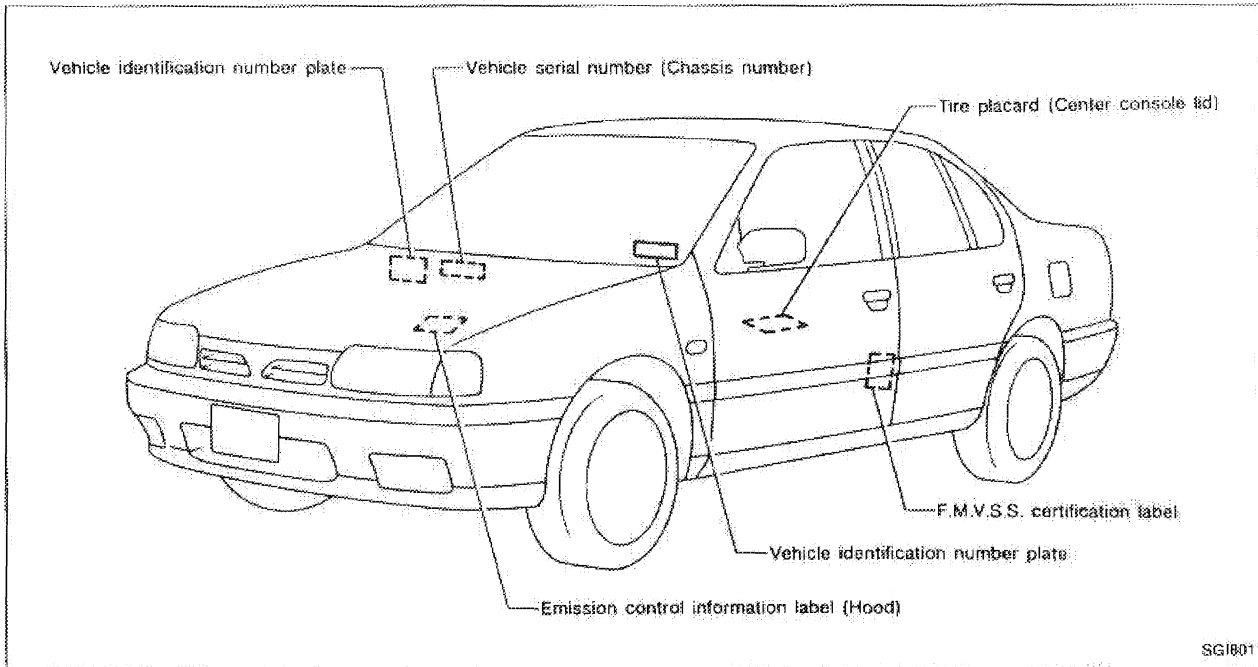
Body	Destination	Grade	Model	Engine	Transaxle
Sedan	Non-California	STD	BBYALGF P10 EUA	SR20DE	RS5F32A
			BBYALGA P10 EUA		RE4F03A
	California		BBYALGF P10 EVA		RS5F32A
			BBYALGA P10 EVA		RE4F03A
	Canada		BBYALGF P10 ENA		RS5F32A
			BBYALGA P10 ENA		RE4F03A

Prefix and suffix designations:

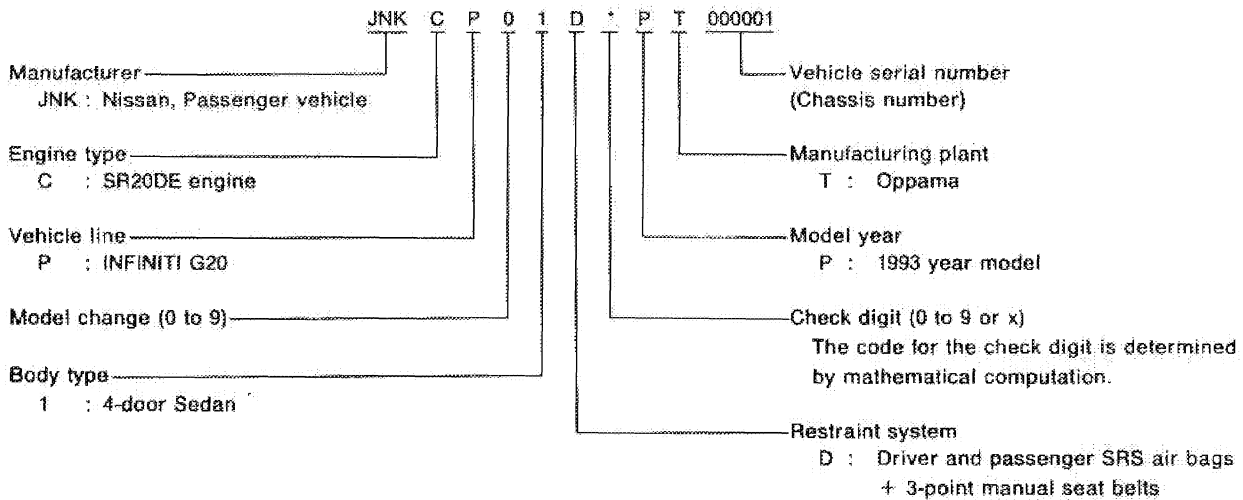


IDENTIFICATION INFORMATION

Identification Number



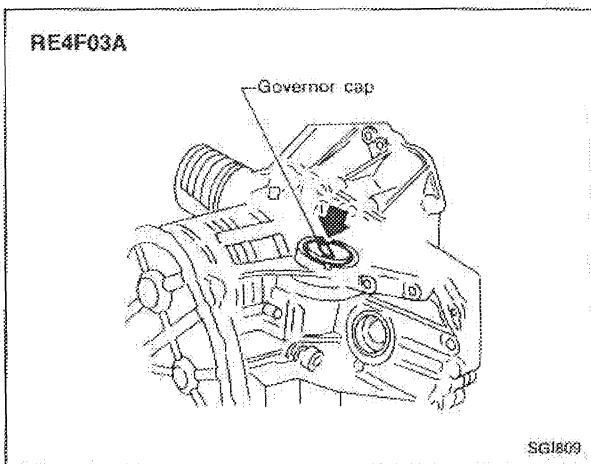
VEHICLE IDENTIFICATION NUMBER ARRANGEMENT



IDENTIFICATION INFORMATION

Identification Number (Cont'd)

AUTOMATIC TRANSAXLE NUMBER



Dimensions

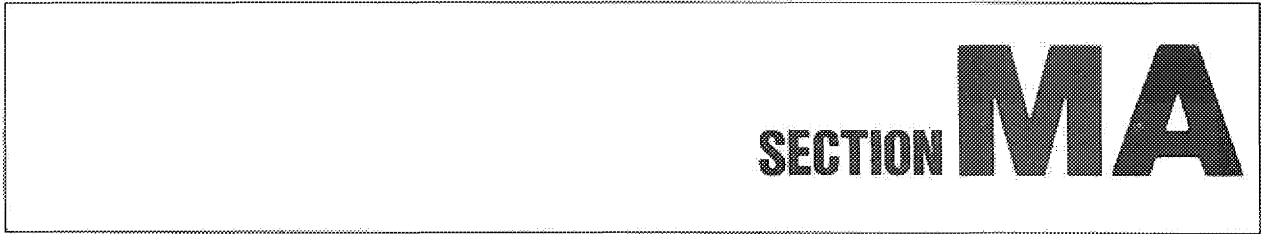
Unit: mm (in)

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	1,481 (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



MA

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PRECAUTIONS

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".

PERIODIC MAINTENANCE

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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PRECAUTIONS

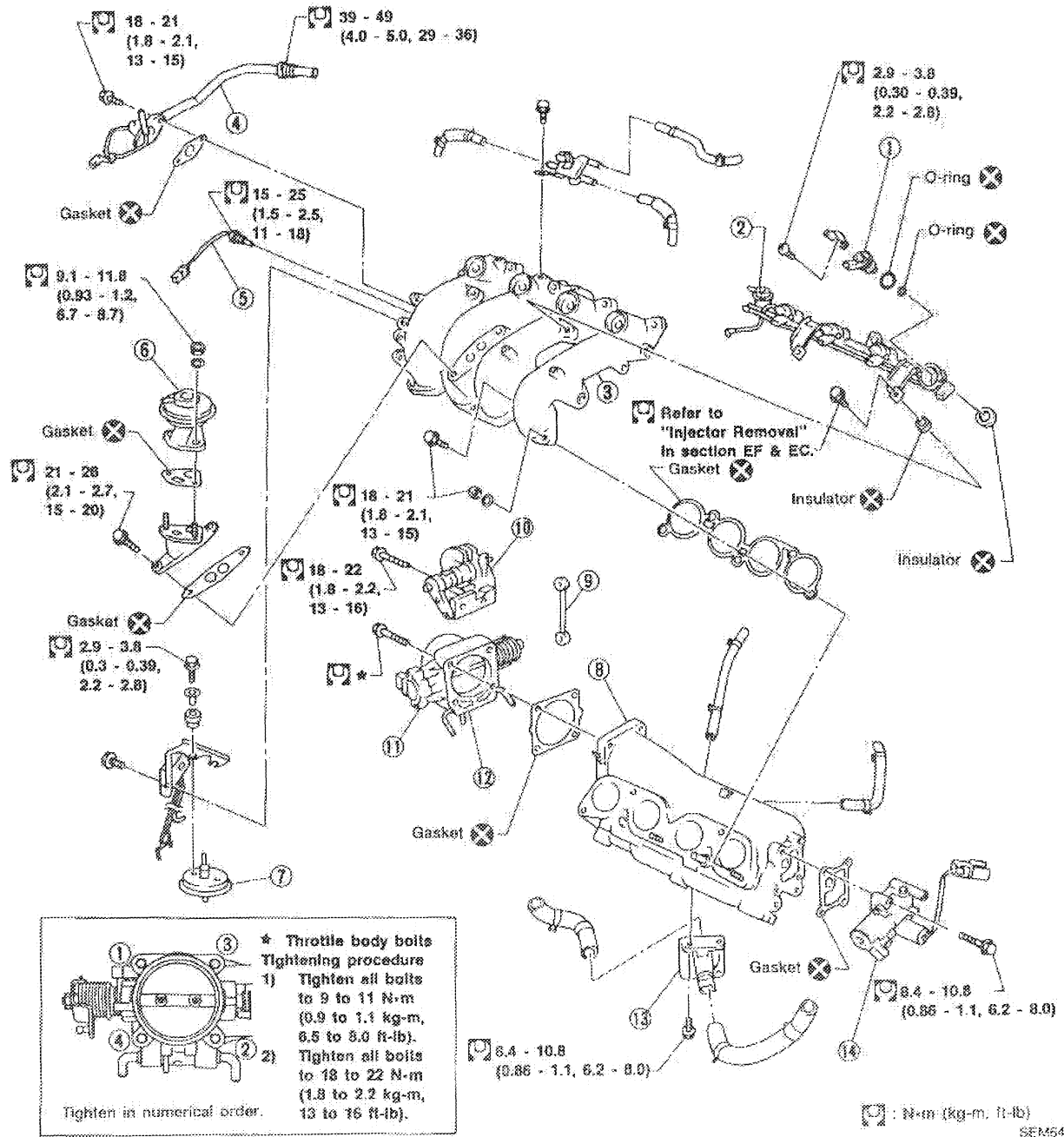
Supplemental Restraint System "AIR BAG" and "SEAT BELT PRE-TENSIONER"

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:

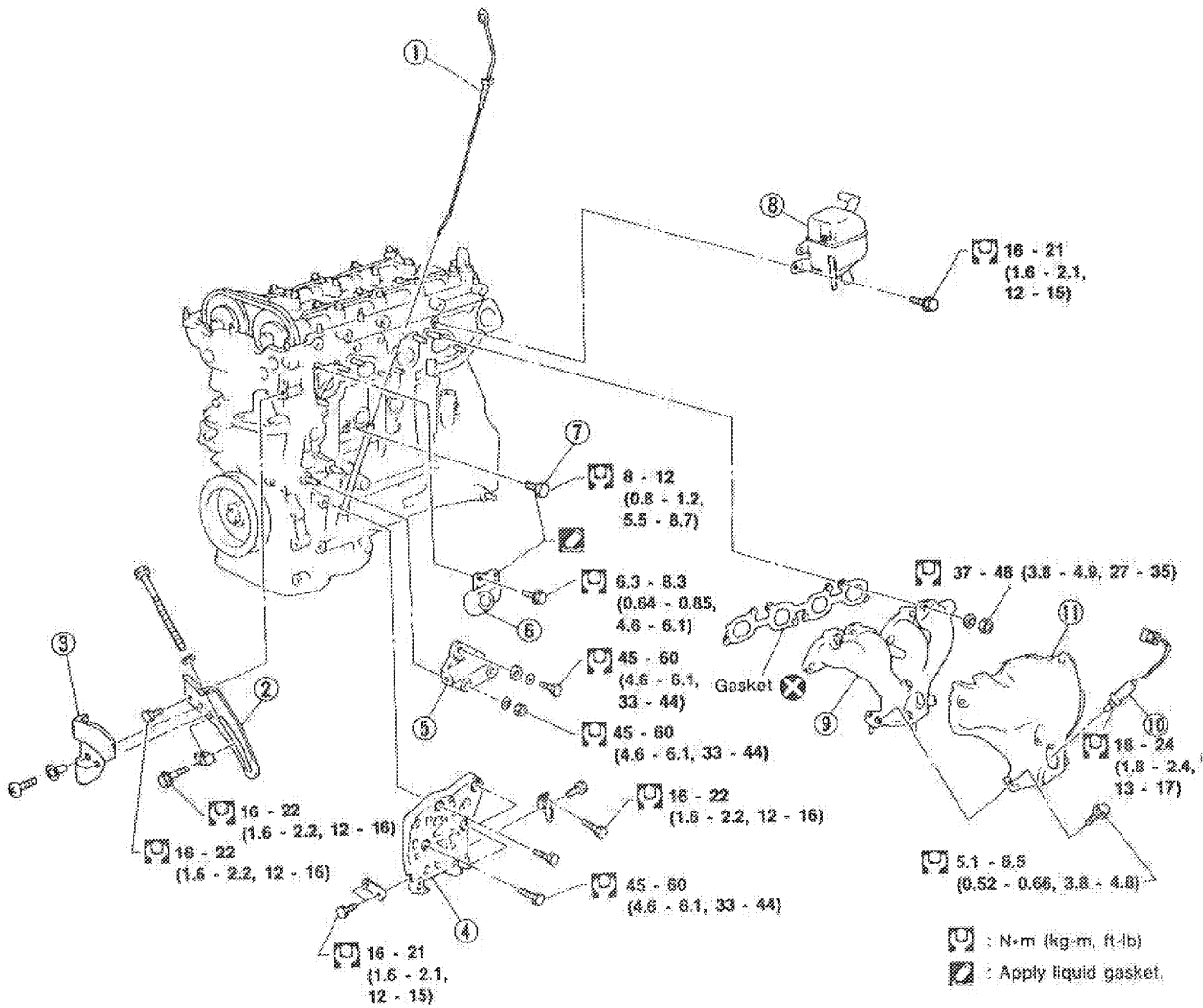
- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal 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.

OUTER COMPONENT PARTS



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

OUTER COMPONENT PARTS



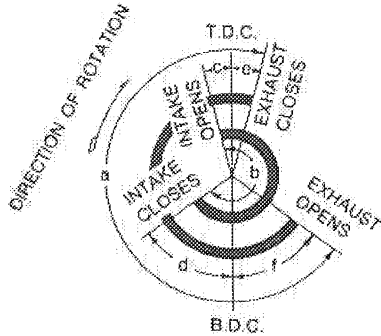
SEM648E

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

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

General Specifications

Valve timing



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

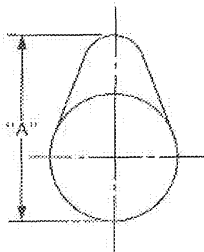
EM120
Unit: degree

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	27.933 - 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)



EM671

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).

EF &
EC

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Closed Throttle Position (CTP) Switch (A/T models)	4		

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".

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

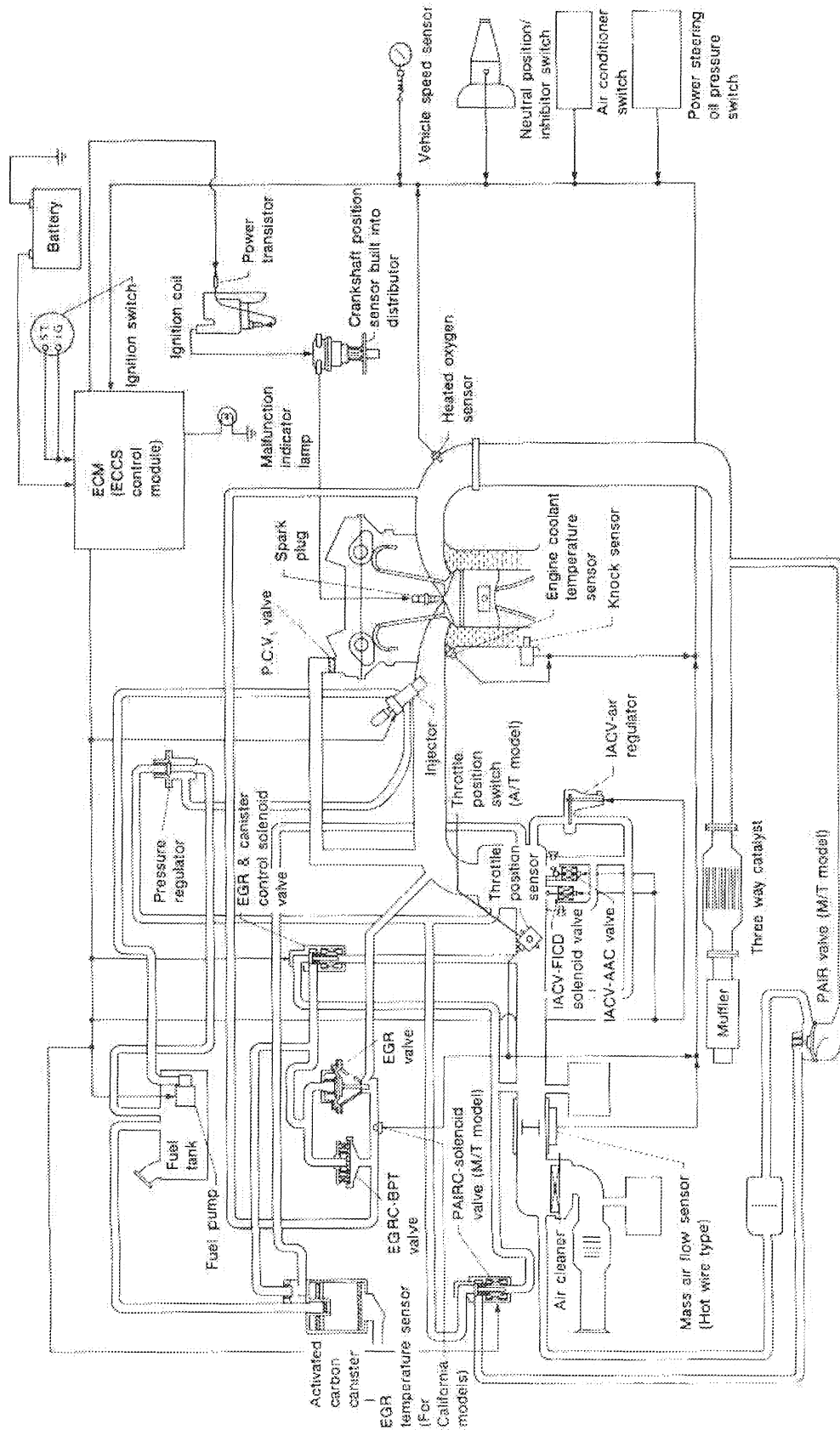
The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner" help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel 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.

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ENGINE AND EMISSION CONTROL OVERALL SYSTEM

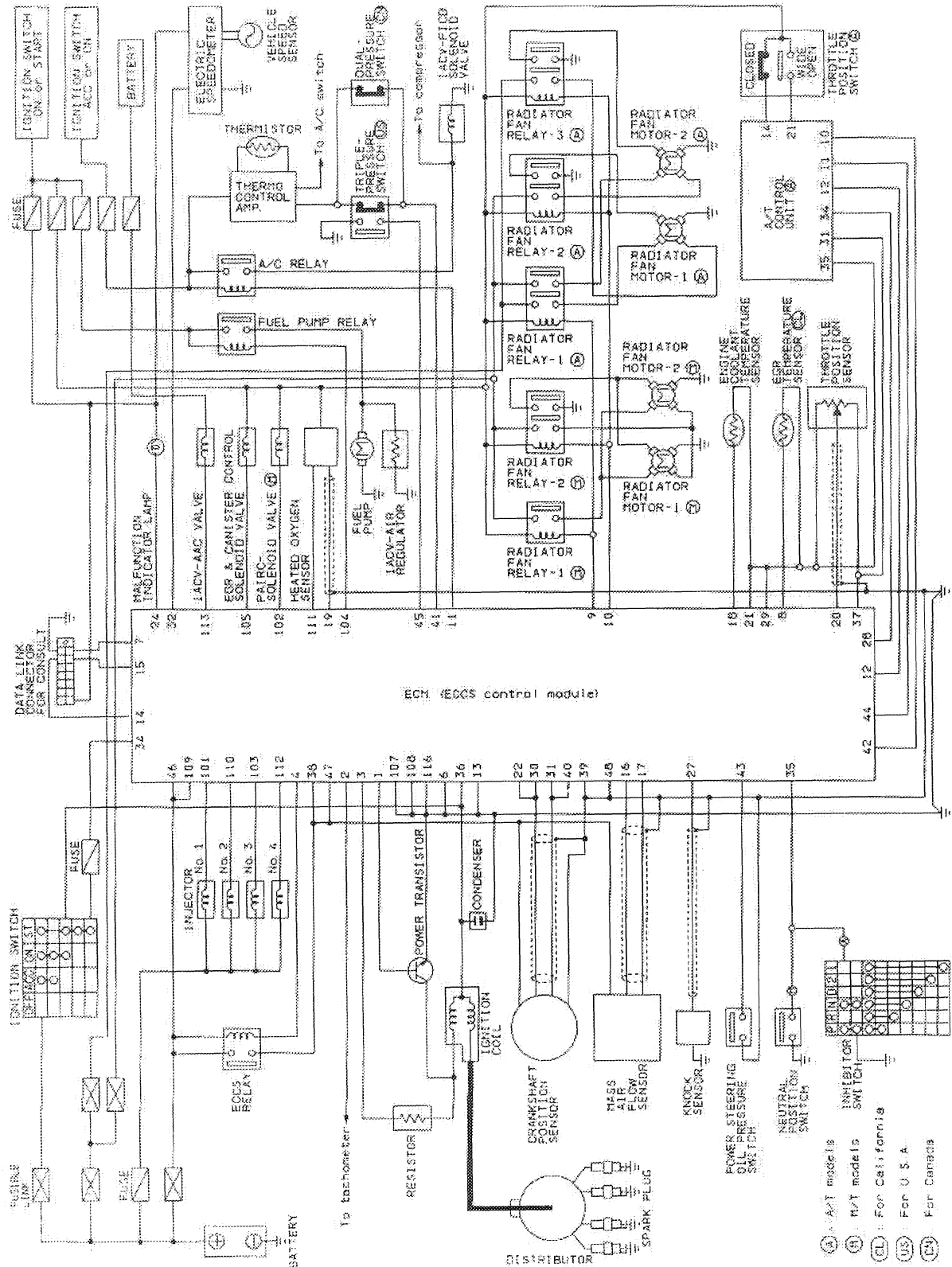
System Diagram



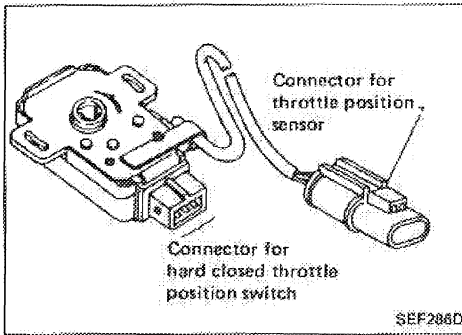
9EF225N

ENGINE AND EMISSION CONTROL OVERALL SYSTEM

Circuit Diagram



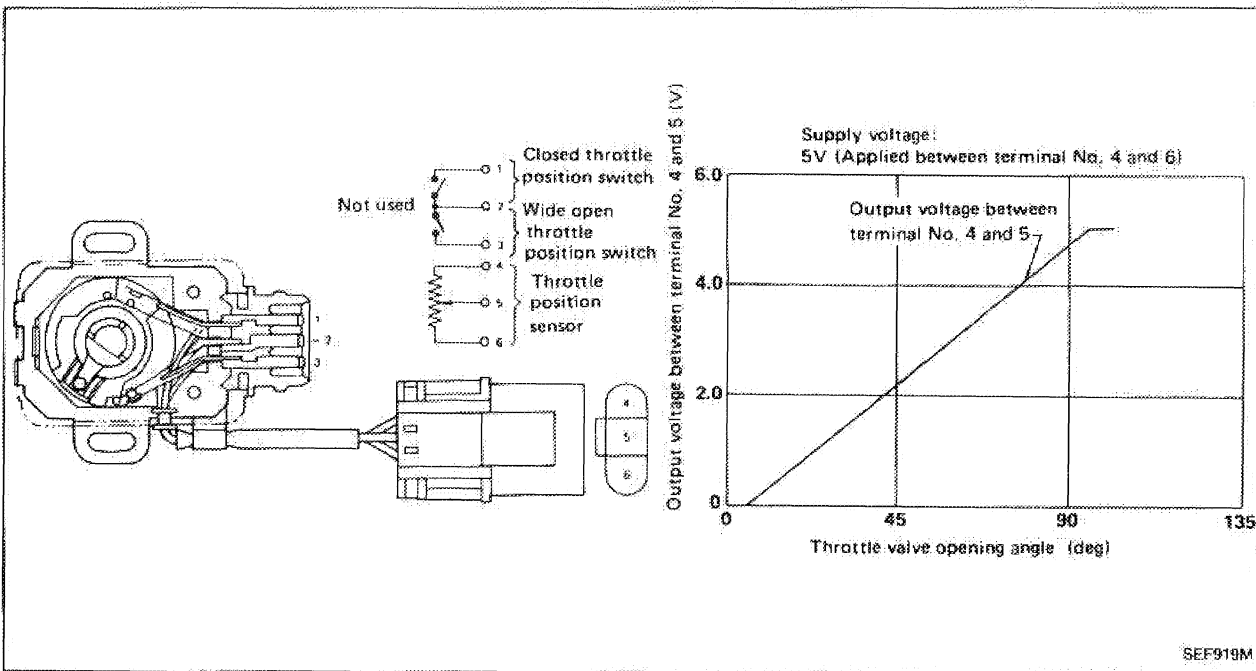
ENGINE AND EMISSION CONTROL PARTS DESCRIPTION



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.

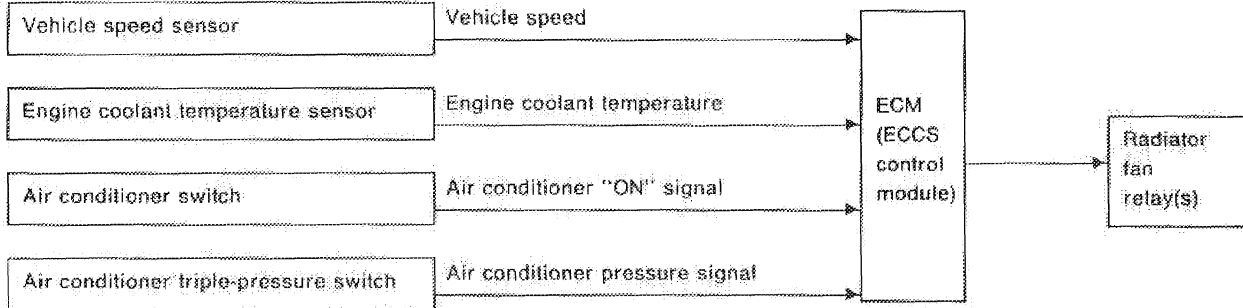
Idle position of the throttle valve is determined by the ECM receiving the signal from the throttle position sensor. This system is called "soft closed throttle position switch". This one controls engine operation such as fuel cut. On the other hand, "hard closed throttle position switch", which is built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



ENGINE AND EMISSION CONTROL SYSTEM DESCRIPTION

Radiator Fan Control

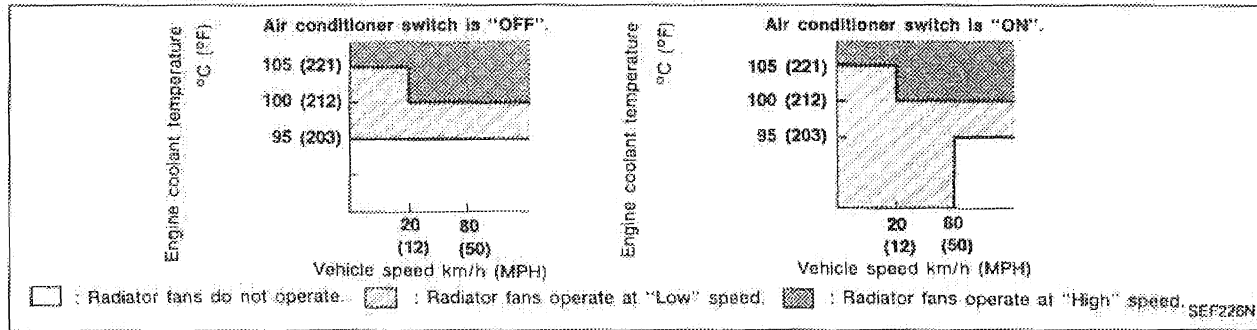
INPUT/OUTPUT SIGNAL LINE



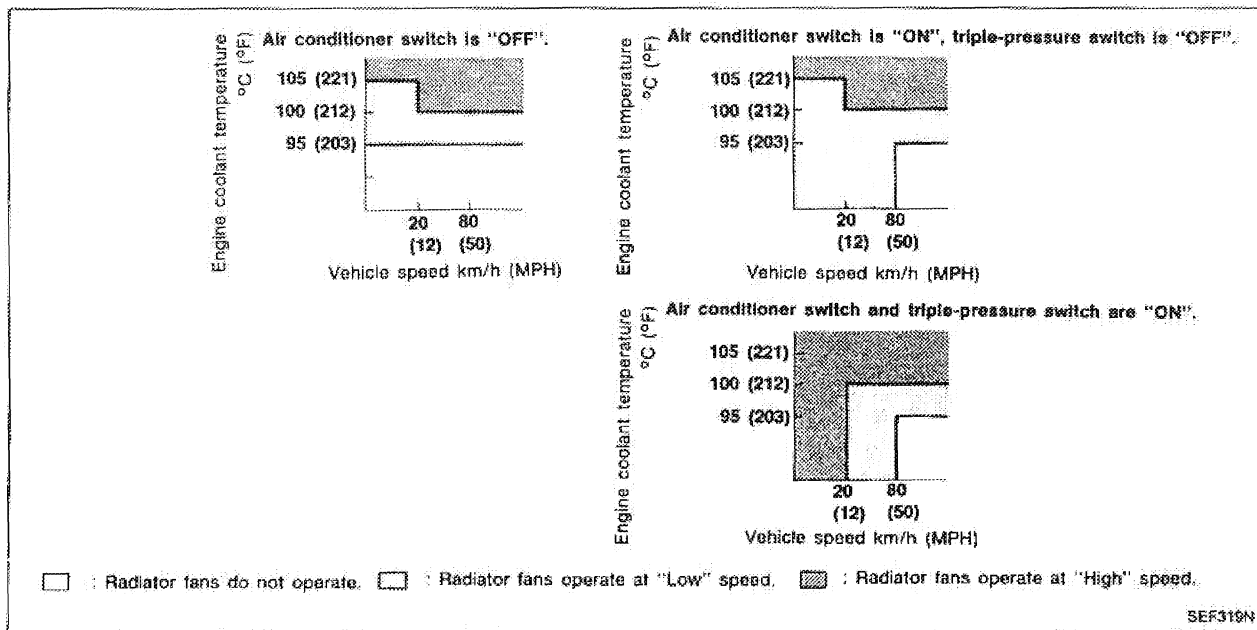
The ECM controls the radiator fan corresponding to the vehicle speed, engine coolant temperature, air conditioner system pressure and air conditioner ON signal. The control system has 3-step control [HIGH/LOW/OFF].

Operation

For Canada



For U.S.A.



IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION

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.

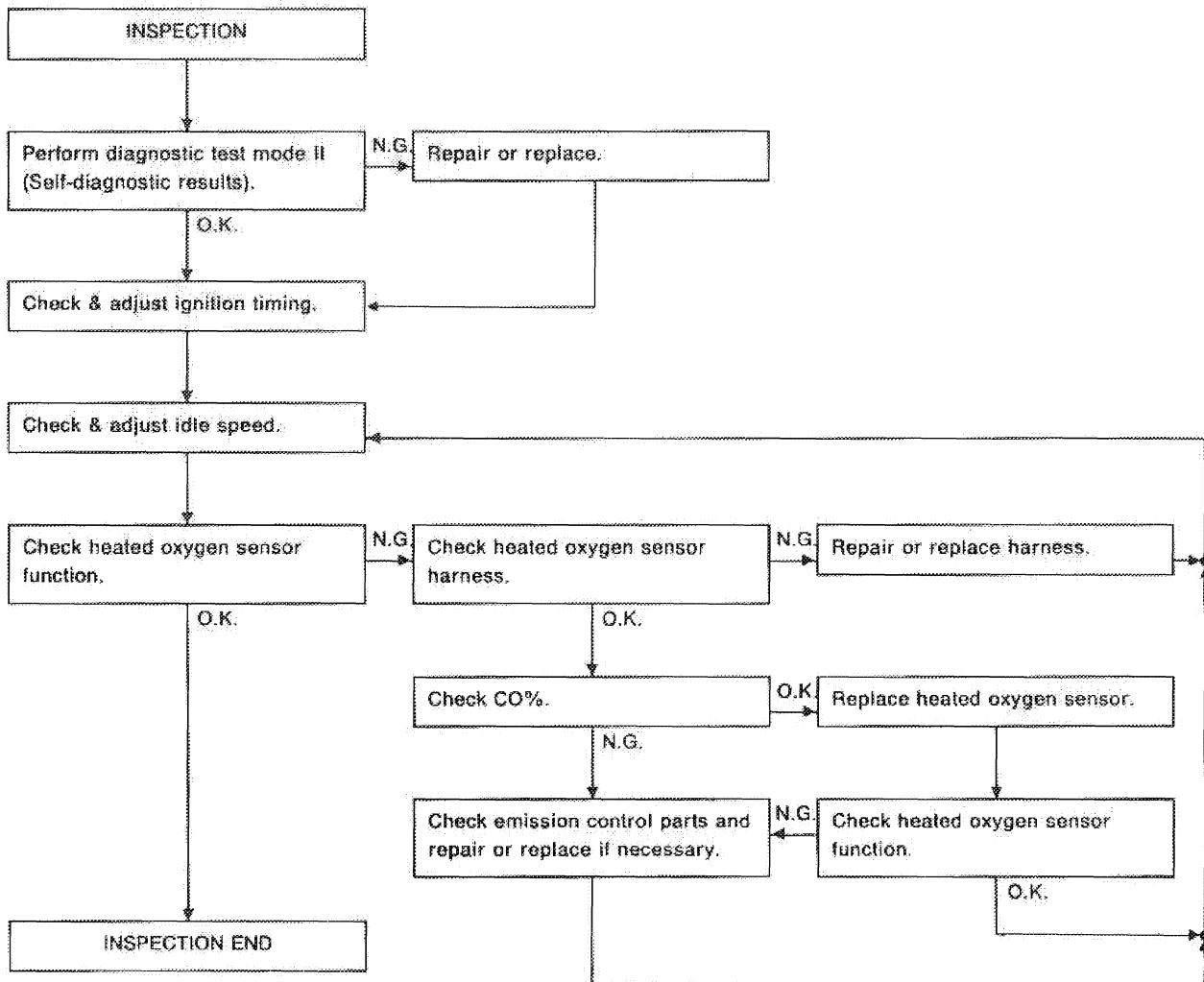
4. When measuring "CO" percentage, insert probe more than 40 cm (15.7 in) into tail pipe.

5. Turn off headlamps, heater blower, rear defogger.

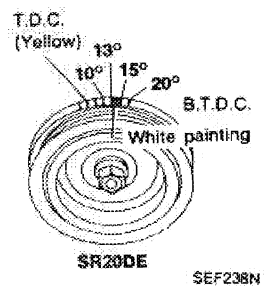
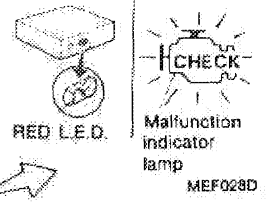
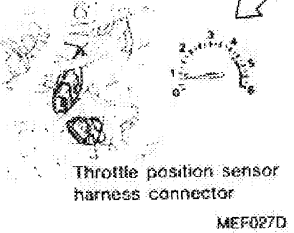
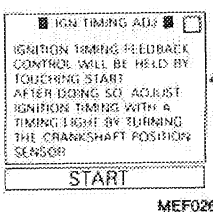
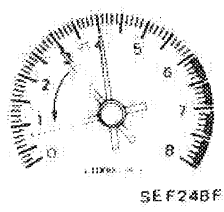
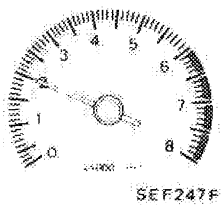
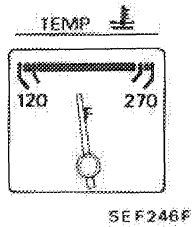
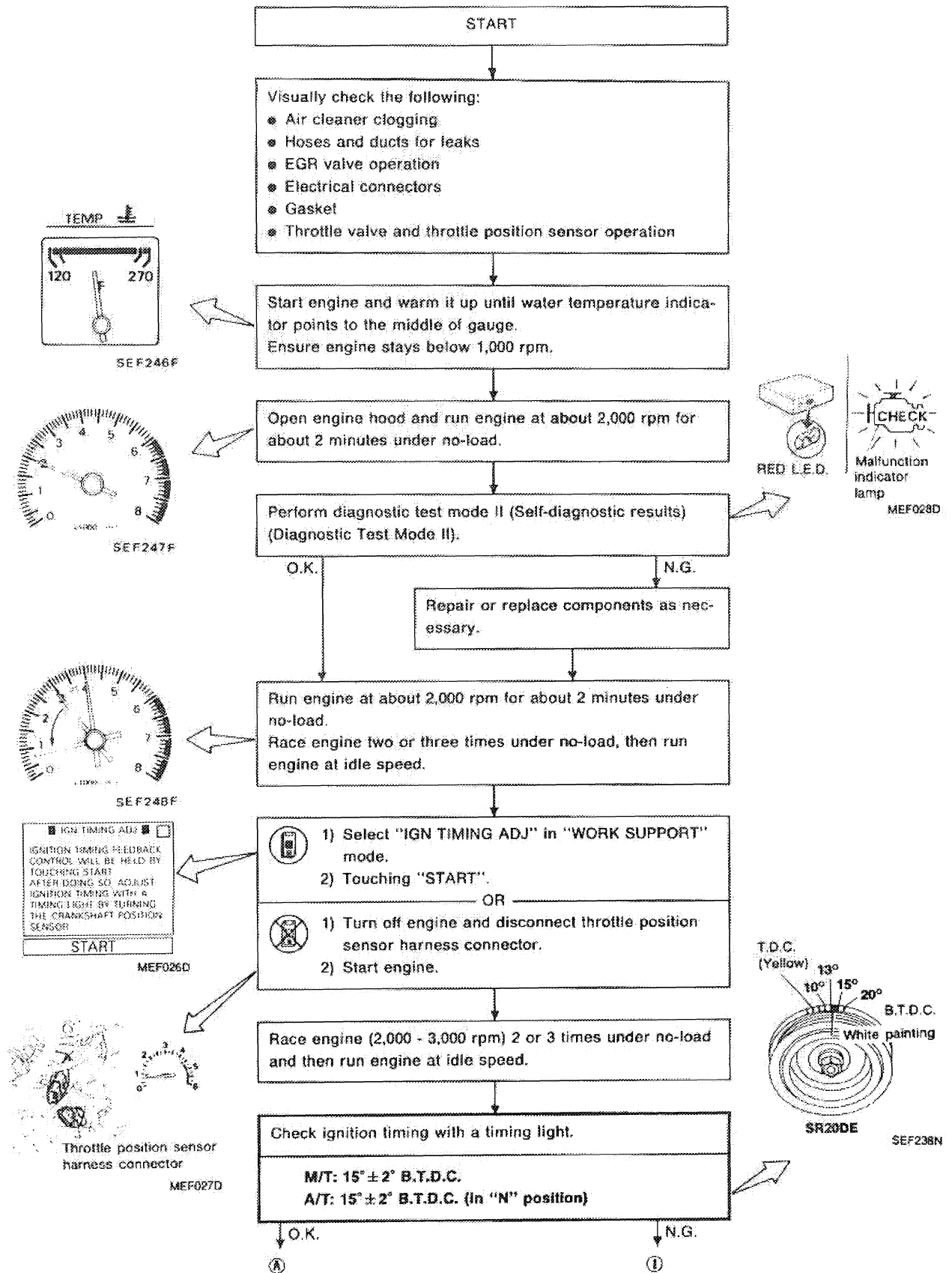
6. Keep front wheels pointed straight ahead.

7. Make the check after the radiator fan has stopped.

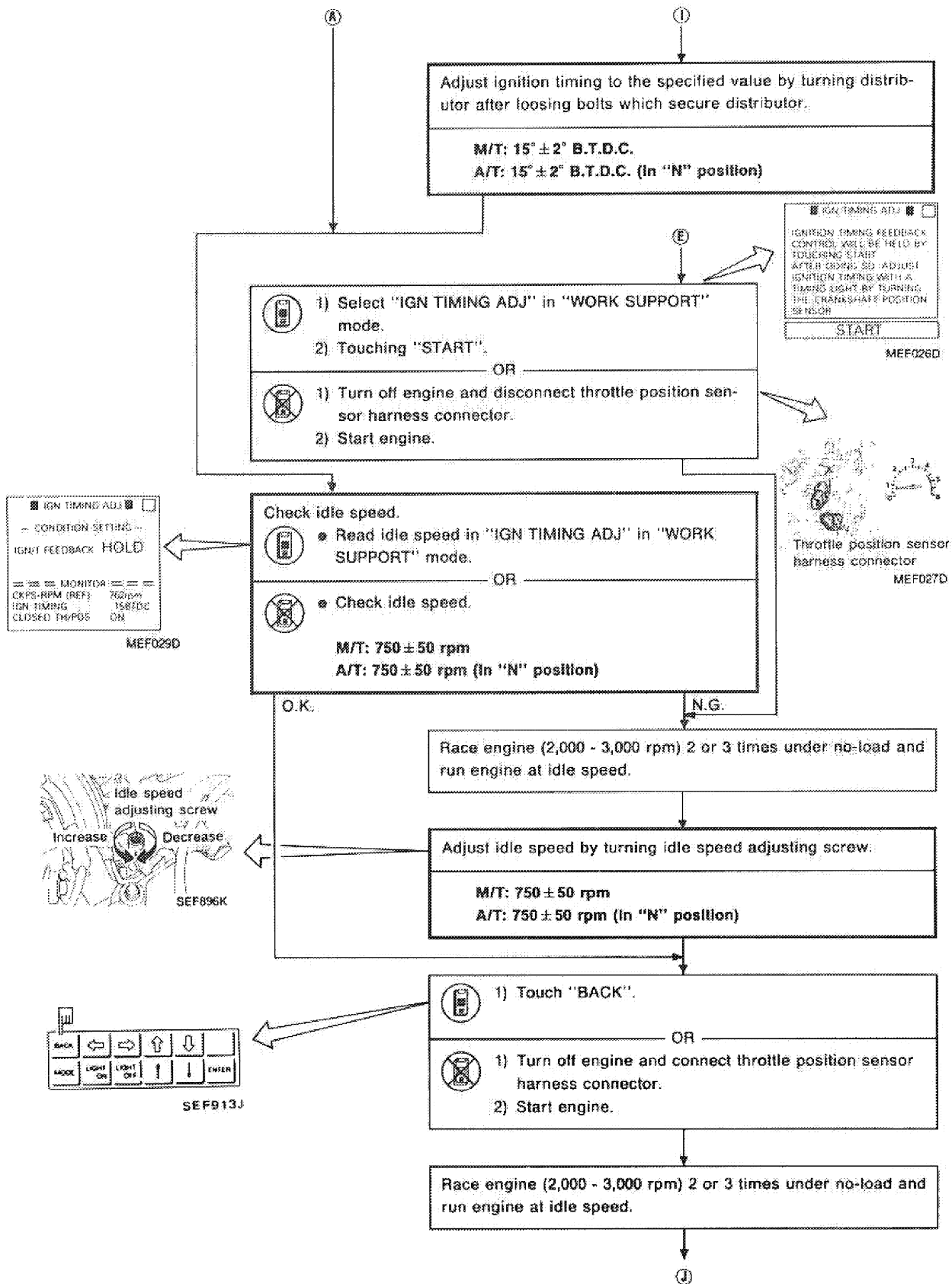
Overall inspection sequence



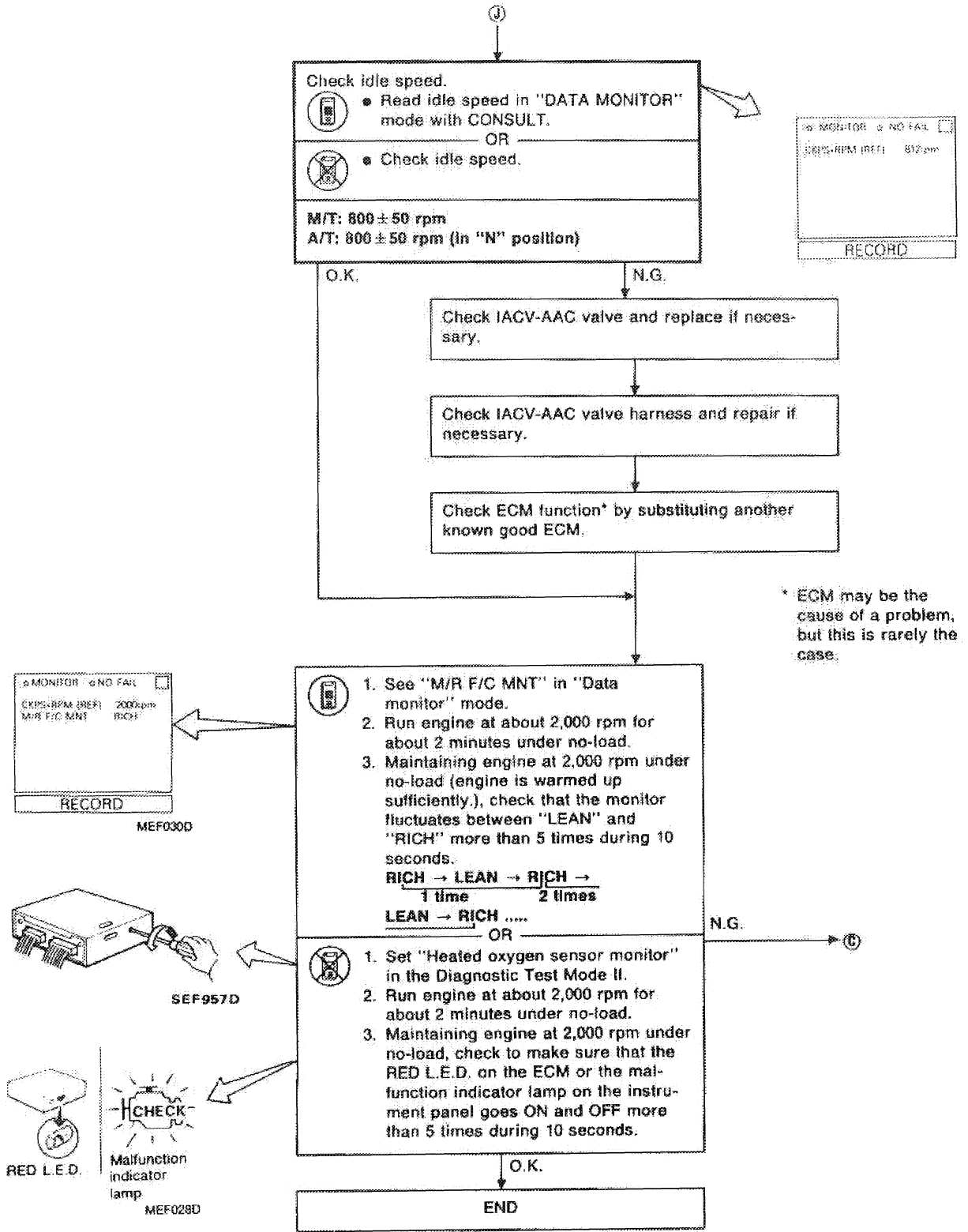
IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION



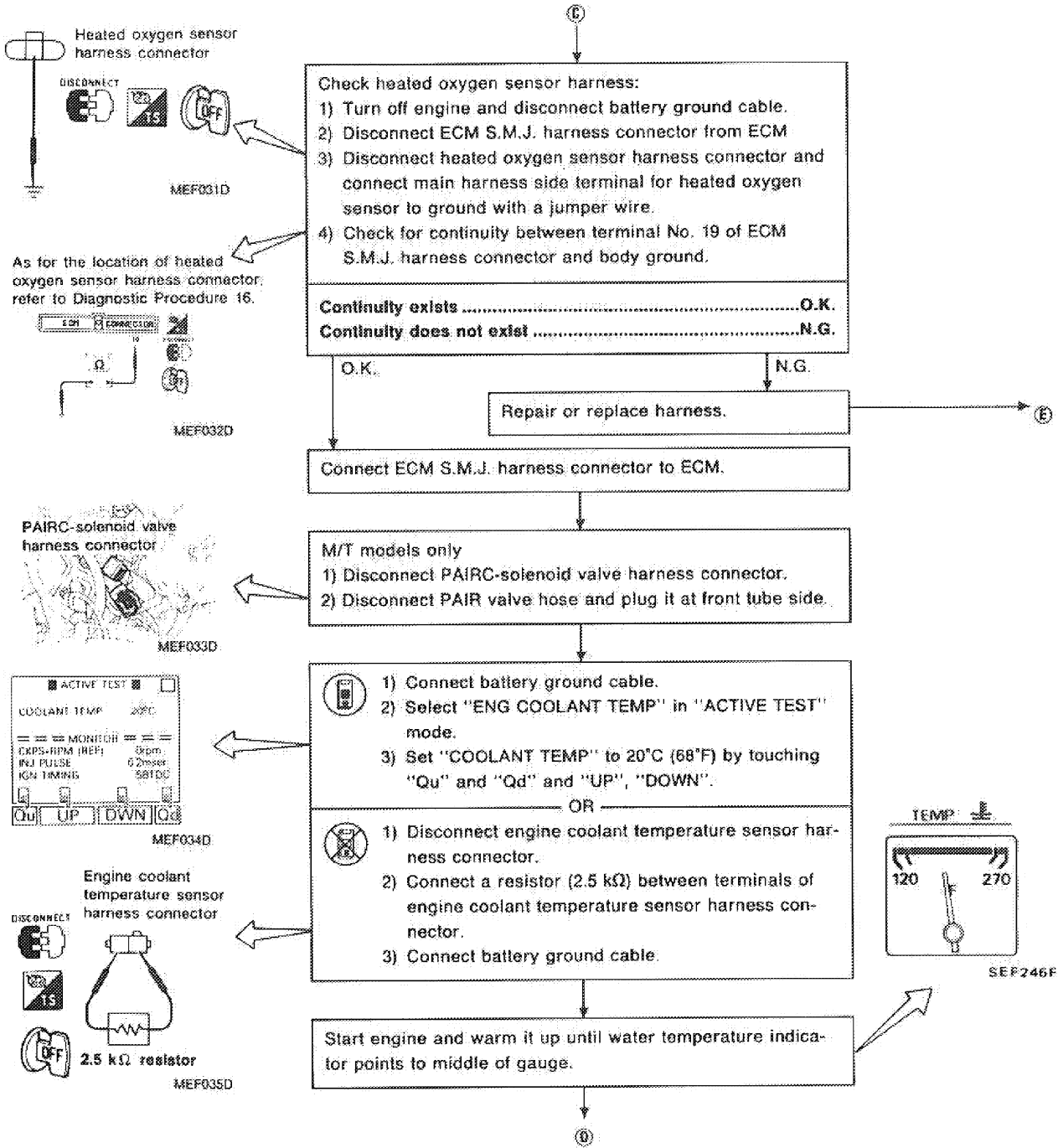
IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION



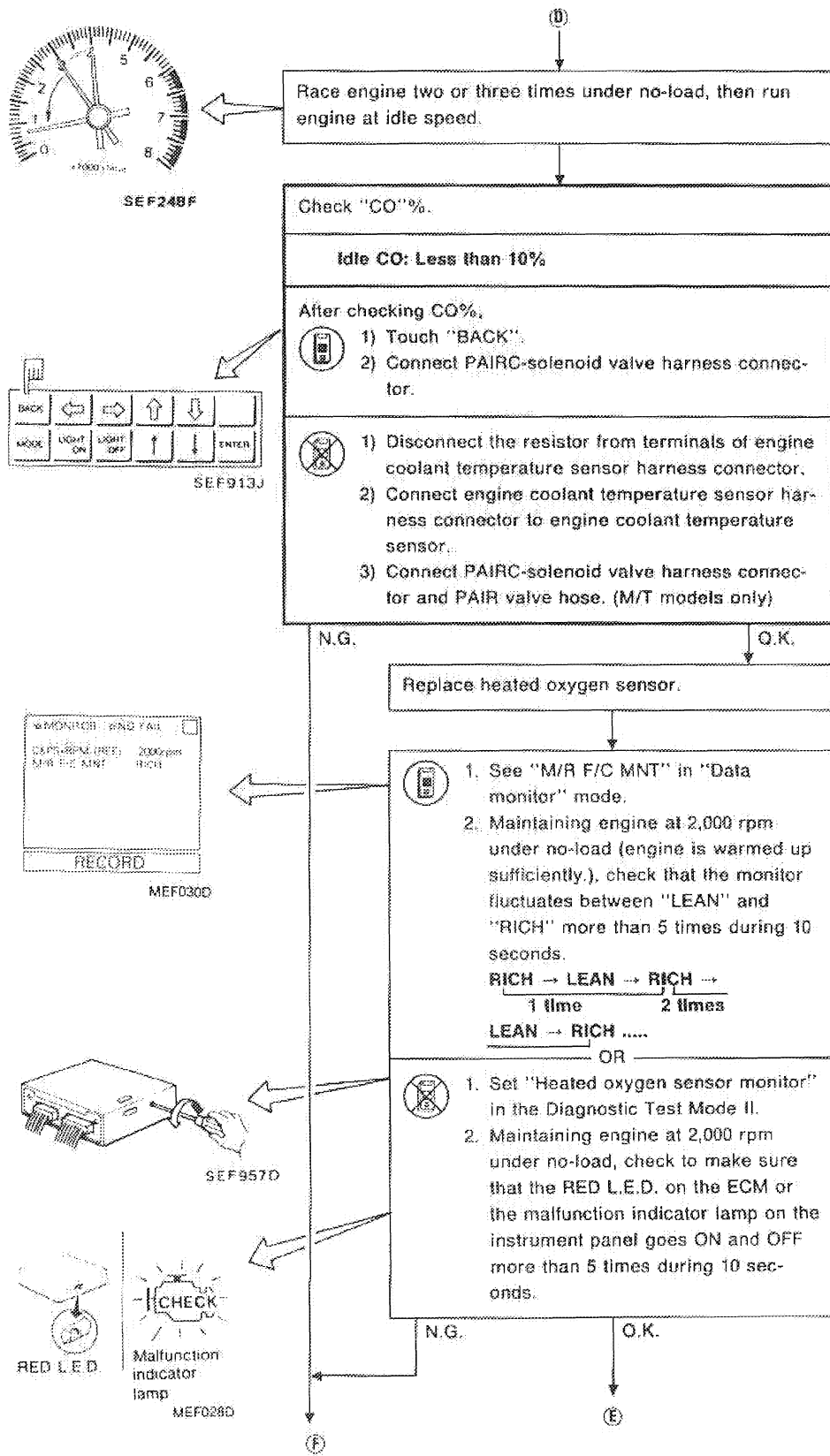
IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION



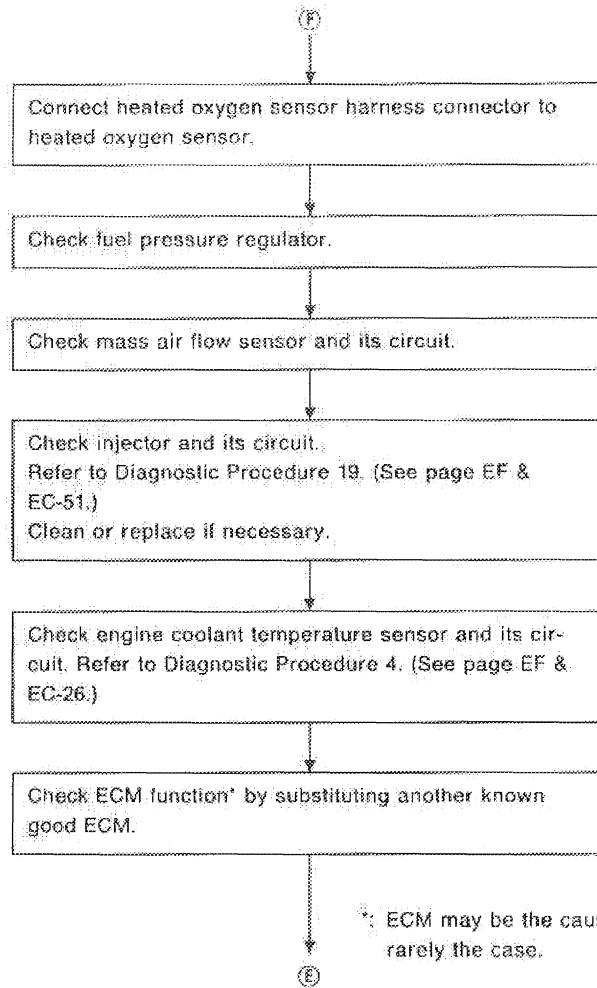
IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION



IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION










IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION



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

TROUBLE DIAGNOSES

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ENGINE COOLANT TEMPERATURE SENSOR (Diagnostic trouble code No. 13 )	EF & EC-26
Diagnostic Procedure 5	
VEHICLE SPEED SENSOR (Diagnostic trouble code No. 14 )	EF & EC-28
Diagnostic Procedure 6	
IGNITION SIGNAL (Diagnostic trouble code No. 21)	EF & EC-30
Diagnostic Procedure 7	
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HEATED OXYGEN SENSOR (Diagnostic trouble code No. 33 )	EF & EC-34
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TROUBLE DIAGNOSES

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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

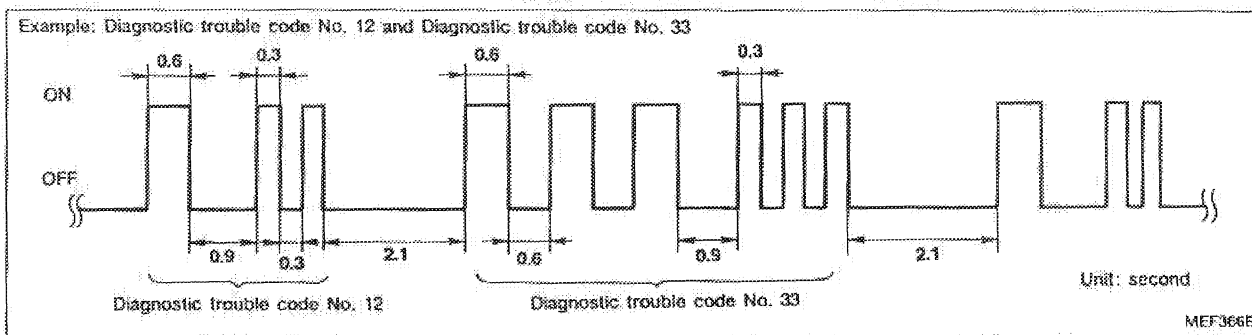
Electrical Components Inspection EF & EC-78

TROUBLE DIAGNOSES

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 	Mass air flow sensor circuit	X	X
13 	Engine coolant temperature sensor circuit	X	X
14 	Vehicle speed sensor circuit	X	X
21*	Ignition signal circuit	X	X
31 	ECM	X	X
32 	EGR function	X	—
33 	Heated oxygen sensor circuit	X	X
34	Knock sensor circuit	X	X
35 	EGR temperature sensor circuit	X	—
43 	Throttle position sensor circuit	X	X
45 	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

: 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.

TROUBLE DIAGNOSES

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	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● Harness and connector (If harness and connector are normal, replace crankshaft position sensor.)
12	Mass air flow sensor circuit	<ul style="list-style-type: none"> ● The mass air flow sensor circuit is open or shorted. (An abnormally high or low voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector (If harness and connector are normal, replace mass air flow sensor.)
13	Engine coolant temperature sensor circuit	<ul style="list-style-type: none"> ● The engine coolant temperature sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● Engine coolant temperature sensor
14	Vehicle speed sensor circuit	<ul style="list-style-type: none"> ● The vehicle speed sensor circuit is open or shorted. 	<ul style="list-style-type: none"> ● Harness and connector ● Vehicle speed sensor (reed switch)
*21	Ignition signal circuit	<ul style="list-style-type: none"> ● The ignition signal in the primary circuit is not entered during engine cranking or running. 	<ul style="list-style-type: none"> ● Harness and connector ● Power transistor unit
31	ECM	<ul style="list-style-type: none"> ● ECM calculation function is malfunctioning. 	[Replace ECM (ECGS control module).]
32	EGR function	<ul style="list-style-type: none"> ● EGR valve does not operate. (EGR valve spring does not lift.) 	<ul style="list-style-type: none"> ● EGR valve ● EGR & canister control solenoid valve.
33	Heated oxygen sensor circuit	<ul style="list-style-type: none"> ● The heated oxygen sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● Heated oxygen sensor ● Fuel pressure ● Injectors ● Intake air leaks
34	Knock sensor circuit	<ul style="list-style-type: none"> ● The knock sensor circuit is open or shorted. (An abnormally high or low voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● Knock sensor
35	EGR temperature sensor circuit	<ul style="list-style-type: none"> ● The EGR temperature sensor circuit is open or shorted. (An abnormally high or low voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● EGR temperature sensor
43	Throttle position sensor circuit	<ul style="list-style-type: none"> ● The throttle position sensor circuit is open or shorted. (An abnormally high or low voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● Throttle position sensor
45	Injector leak	<ul style="list-style-type: none"> ● Fuel leaks from injector. 	<ul style="list-style-type: none"> ● Injector
54	Signal circuit from A/T control unit to ECM (A/T only)	<ul style="list-style-type: none"> ● The A/T communication line is open or shorted. 	<ul style="list-style-type: none"> ● Harness and connector

*1: 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.

TROUBLE DIAGNOSES

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.

TROUBLE DIAGNOSES

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

TROUBLE DIAGNOSES

Consult (Cont'd)

SELF-DIAGNOSTIC MODE

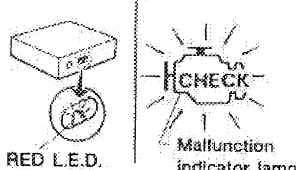


DIAGNOSTIC ITEM	DIAGNOSTIC ITEM IS DETECTED WHEN ...	CHECK ITEM (REMEDY)
CRANK POSITION SEN*	<ul style="list-style-type: none"> ● Either 1° or 180° signal is not entered for the first few seconds during engine cranking. ● Either 1° or 180° signal is not input often enough while the engine speed is higher than the specified rpm. 	<ul style="list-style-type: none"> ● Harness and connector (If harness and connector are normal, replace crankshaft position sensor.)
MASS AIR FLOW SEN	<ul style="list-style-type: none"> ● The mass air flow sensor circuit is open or shorted. (An abnormally high or low voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector (If harness and connector are normal, replace mass air flow sensor.)
COOLANT TEMP SEN	<ul style="list-style-type: none"> ● The engine coolant temperature sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● Engine coolant temperature sensor
VEHICLE SPEED SEN	<ul style="list-style-type: none"> ● The vehicle speed sensor circuit is open or shorted. 	<ul style="list-style-type: none"> ● Harness and connector ● Vehicle speed sensor (reed switch)
IGN SIGNAL-PRIMARY*	<ul style="list-style-type: none"> ● The ignition signal in primary circuit is not entered during engine cranking or running. 	<ul style="list-style-type: none"> ● Harness and connector ● Power transistor unit
ECM	<ul style="list-style-type: none"> ● ECM calculation function is malfunctioning. 	(Replace ECM (ECCS control module).)
EGR SOLENOID/V	<ul style="list-style-type: none"> ● EGR valve does not operate. (EGR valve spring does not lift.) 	<ul style="list-style-type: none"> ● EGR valve ● EGR & canister control solenoid valve
OXYGEN SEN	<ul style="list-style-type: none"> ● The heated oxygen sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● Heated oxygen sensor ● Fuel pressure ● Injectors ● Intake air leaks
KNOCK SENSOR	<ul style="list-style-type: none"> ● The knock sensor circuit is open or shorted. (An abnormally high or low voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● Knock sensor
EGR TEMP SENSOR**	<ul style="list-style-type: none"> ● The EGR temperature sensor circuit is open or shorted. (An abnormally high or low voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● EGR temperature sensor
THROTTLE POSI SEN	<ul style="list-style-type: none"> ● The throttle position sensor circuit is open or shorted. (An abnormally high or low voltage is entered.) 	<ul style="list-style-type: none"> ● Harness and connector ● Throttle position sensor
INJECTOR-LEAK**	<ul style="list-style-type: none"> ● Fuel leaks from injector. 	<ul style="list-style-type: none"> ● Injector
A/T COMM LINE	<ul style="list-style-type: none"> ● The A/T communication line is open or shorted. 	<ul style="list-style-type: none"> ● 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.

TROUBLE DIAGNOSES

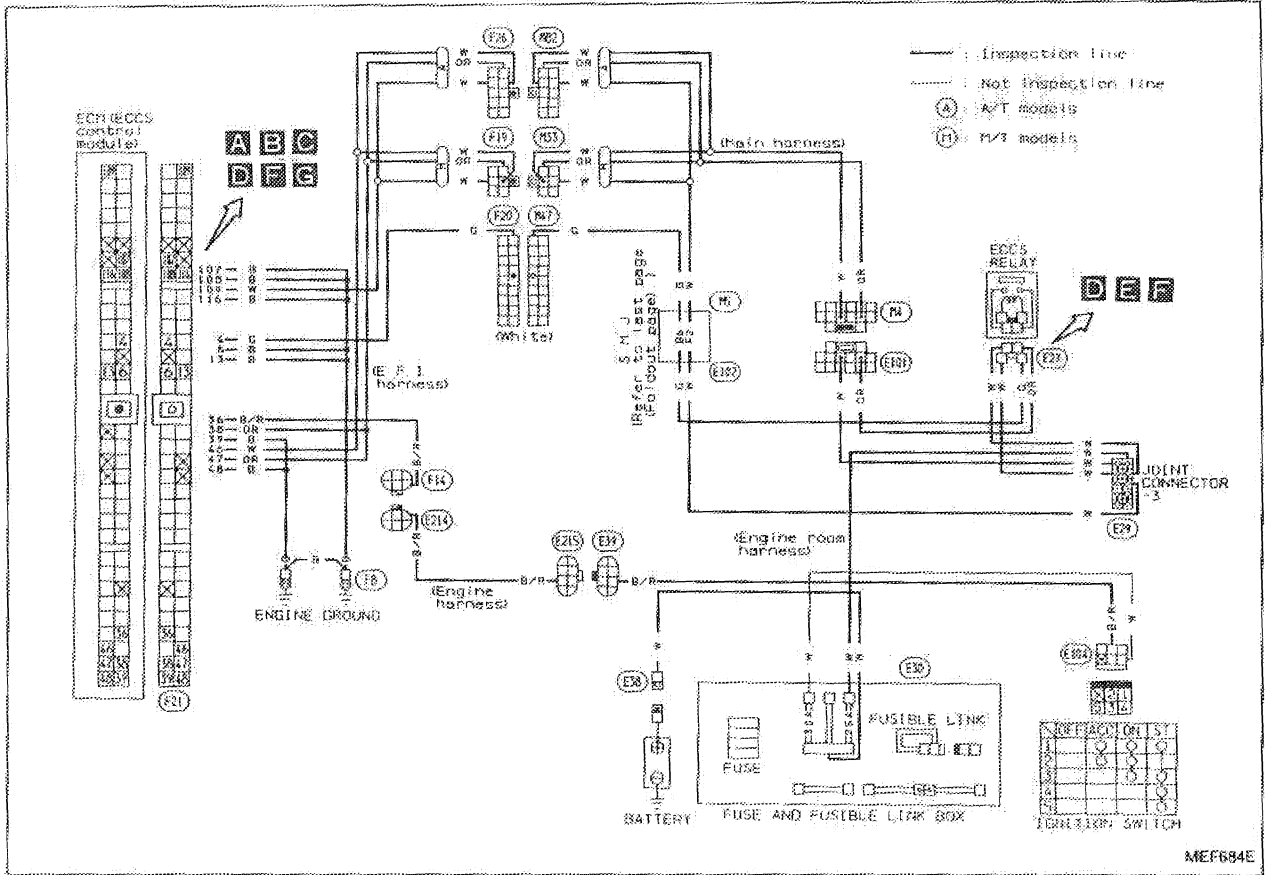
How to Execute On-board Diagnostic System in Diagnostic Test Mode II

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	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> ☆ MONITOR ☆ NO FAIL [X] CKPS-RPM (REF) 800rpm MAS AIR/FL SE 1.55V COOLAN TEMP/S 78°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 </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;">RECORD</div> <div style="text-align: center;">  <p style="font-size: small;">RED L.E.D. Malfunction indicator lamp</p> </div> <p style="text-align: right; font-size: x-small;">MEF048D</p> <p style="text-align: right; font-size: x-small;">SEF677D</p>	<p>PERFORM DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS).</p> <p>1) Turn ignition switch "ON" or start engine.</p> <p> 2) Select "DATA MONITOR" mode with CONSULT. ☆ NO FAIL</p> <p style="text-align: center;">OR</p> <p> 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.</p>

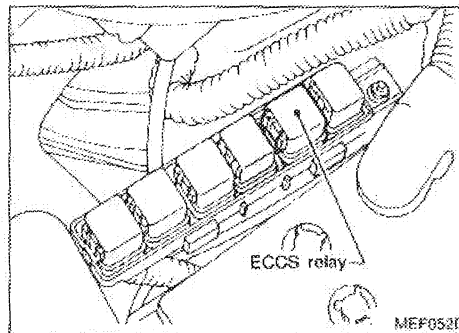
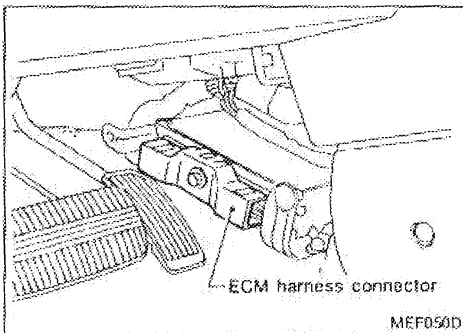
TROUBLE DIAGNOSES

Diagnostic Procedure 1

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

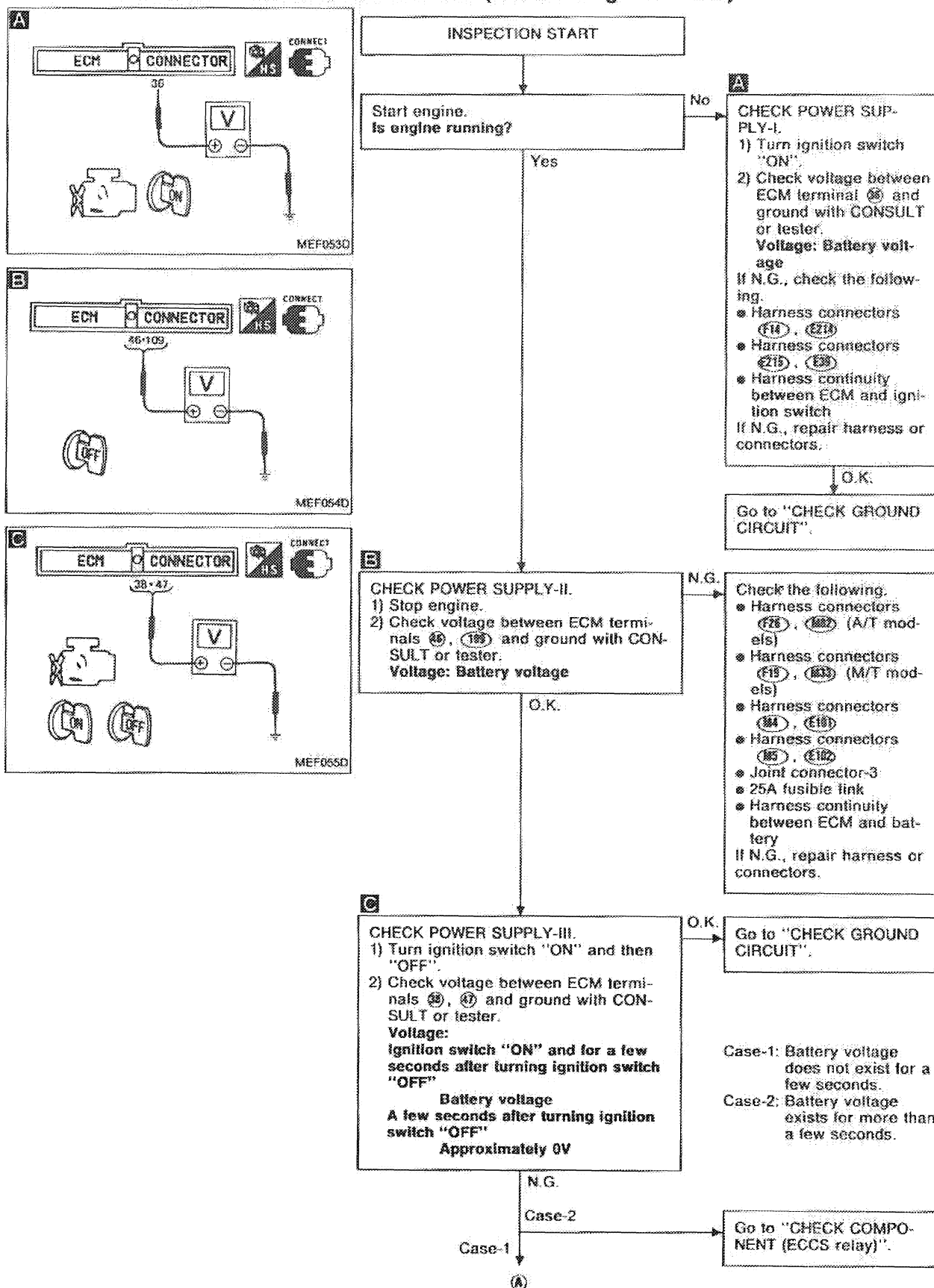


Harness layout



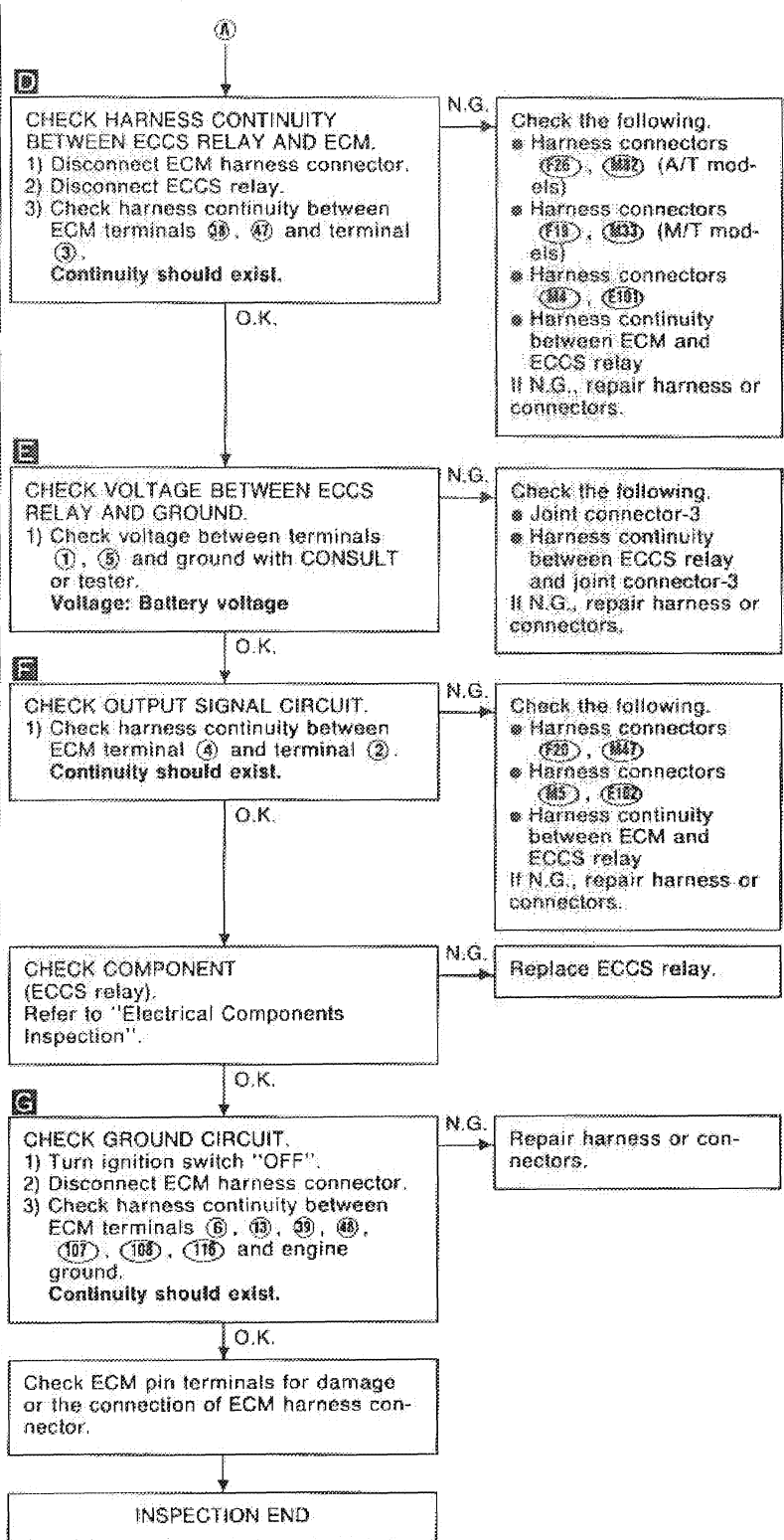
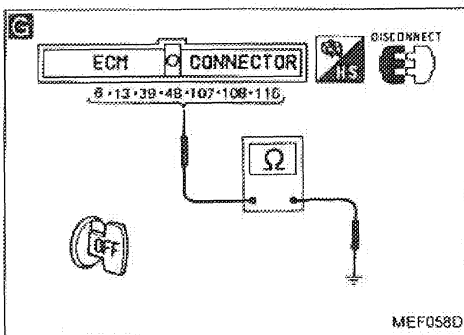
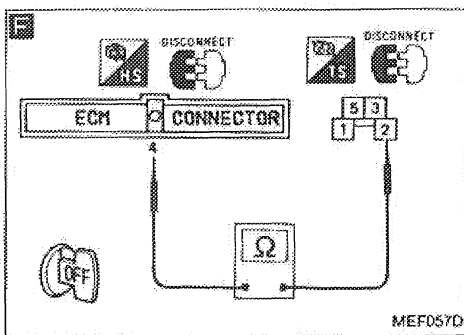
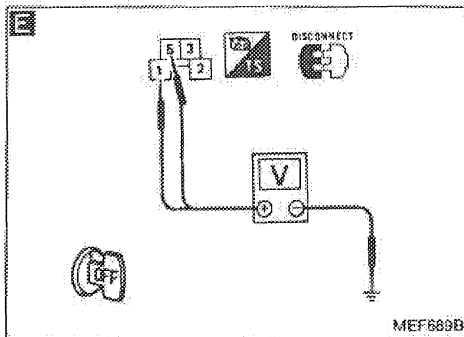
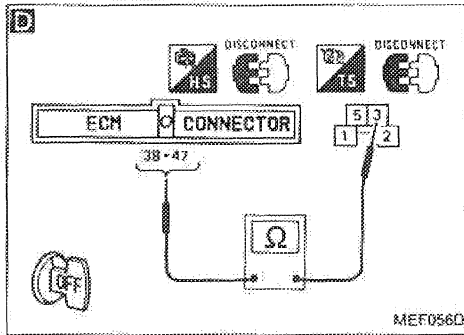
TROUBLE DIAGNOSES

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



TROUBLE DIAGNOSES

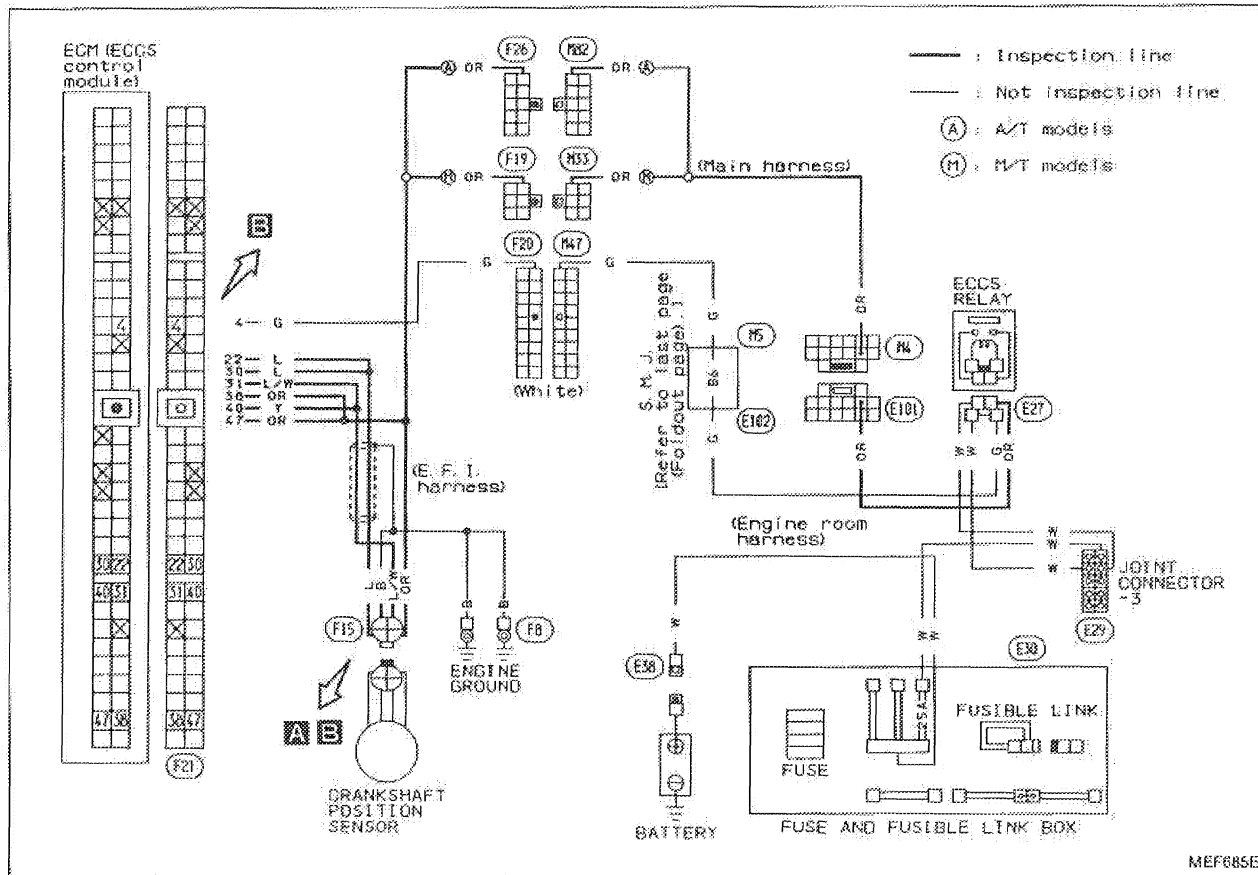
MAIN POWER SUPPLY AND GROUND CIRCUIT (Not self-diagnostic item)



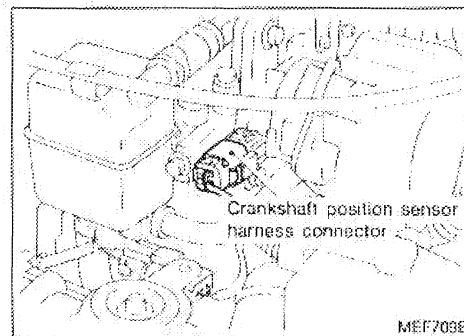
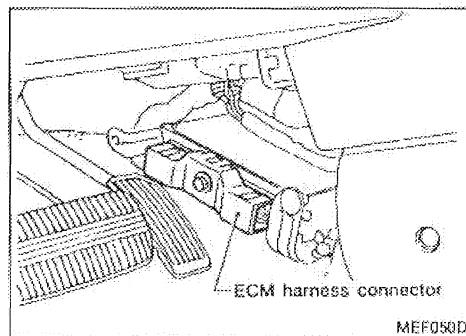
TROUBLE DIAGNOSES

Diagnostic Procedure 2

CRANKSHAFT POSITION SENSOR (Diagnostic trouble code No. 11)




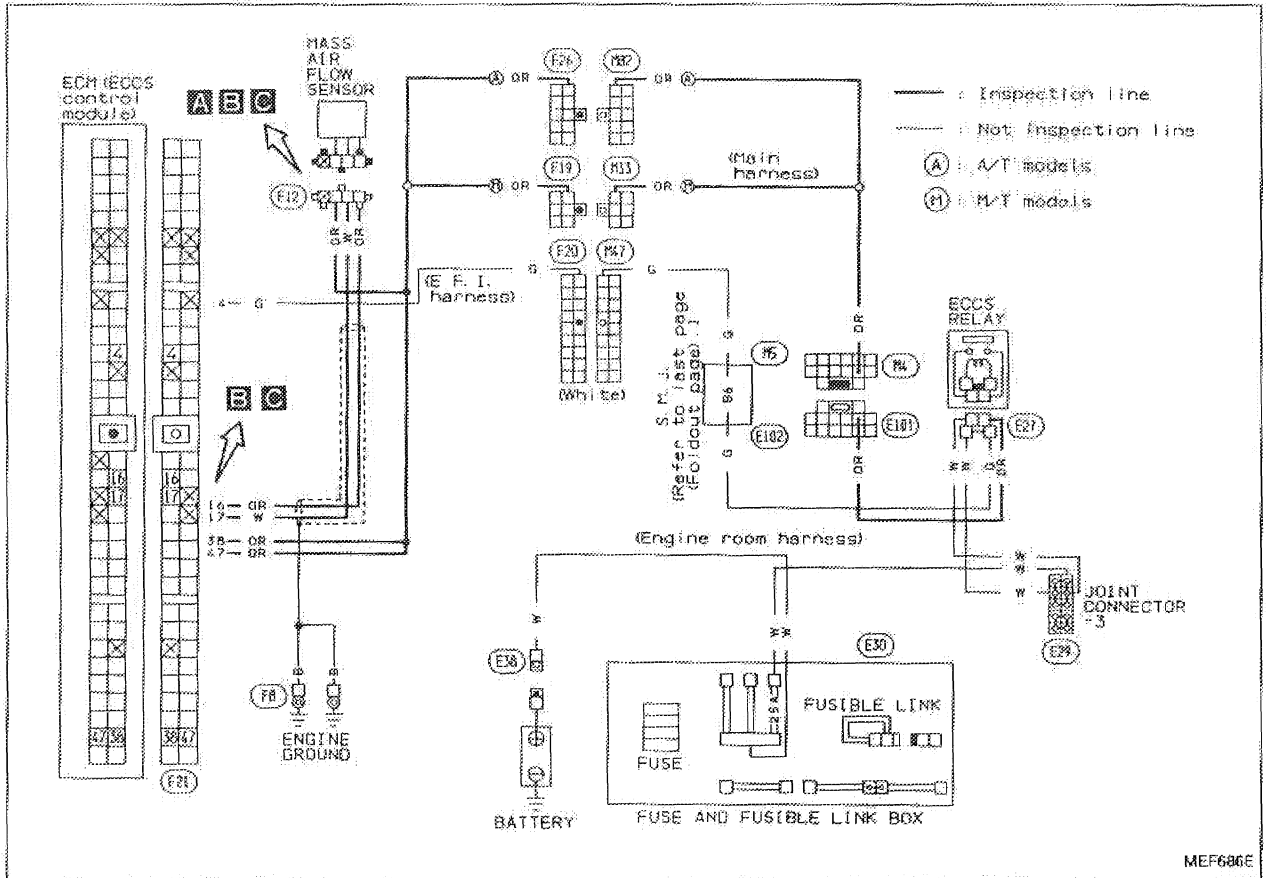
Harness layout



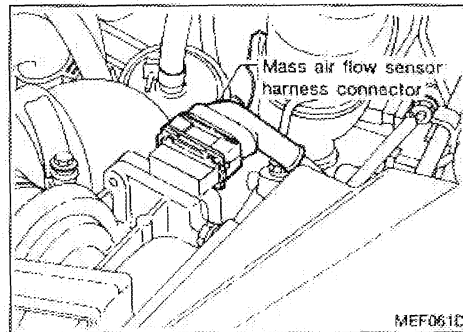
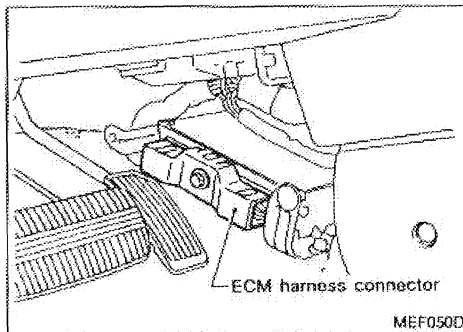
TROUBLE DIAGNOSES

Diagnostic Procedure 3

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



Harness layout

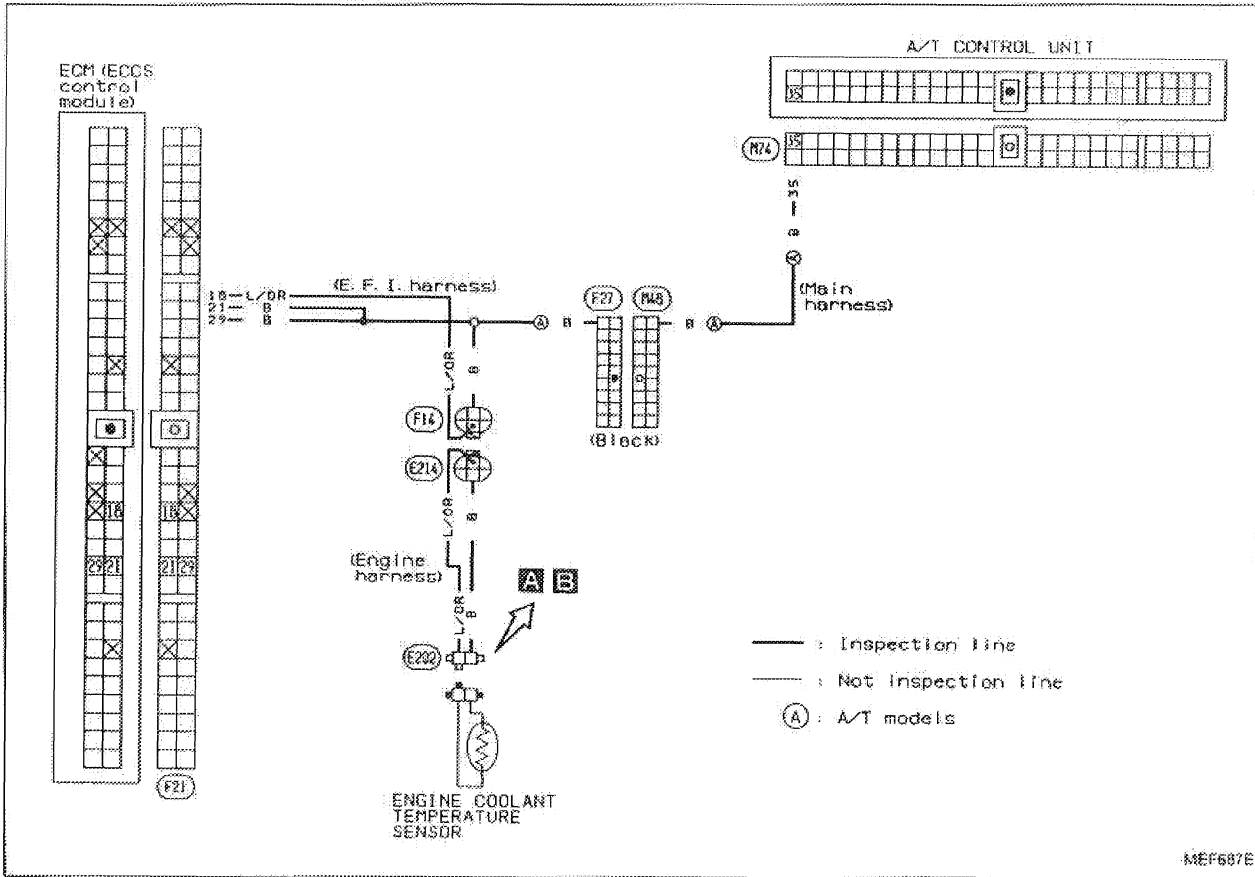


TROUBLE DIAGNOSES

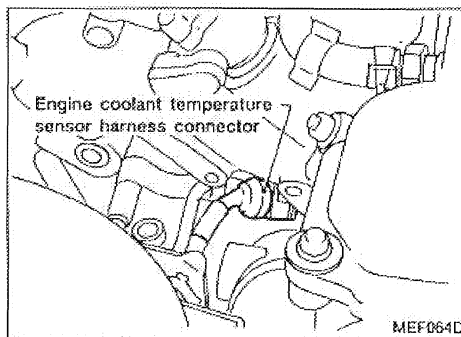
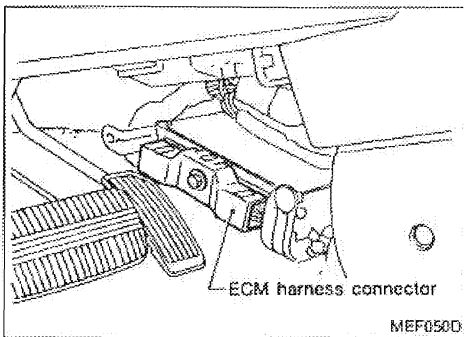
Diagnostic Procedure 4

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

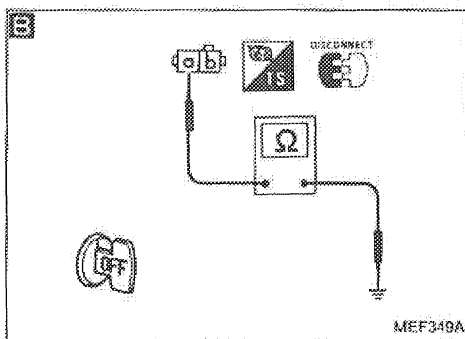
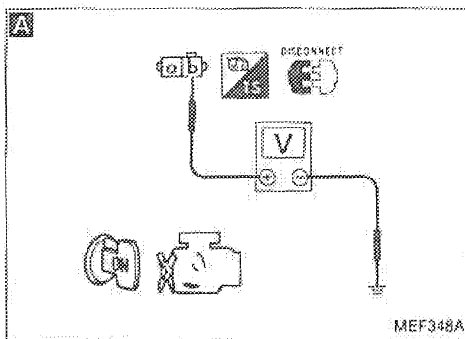
HCHECK (Malfunction indicator lamp item: California models)



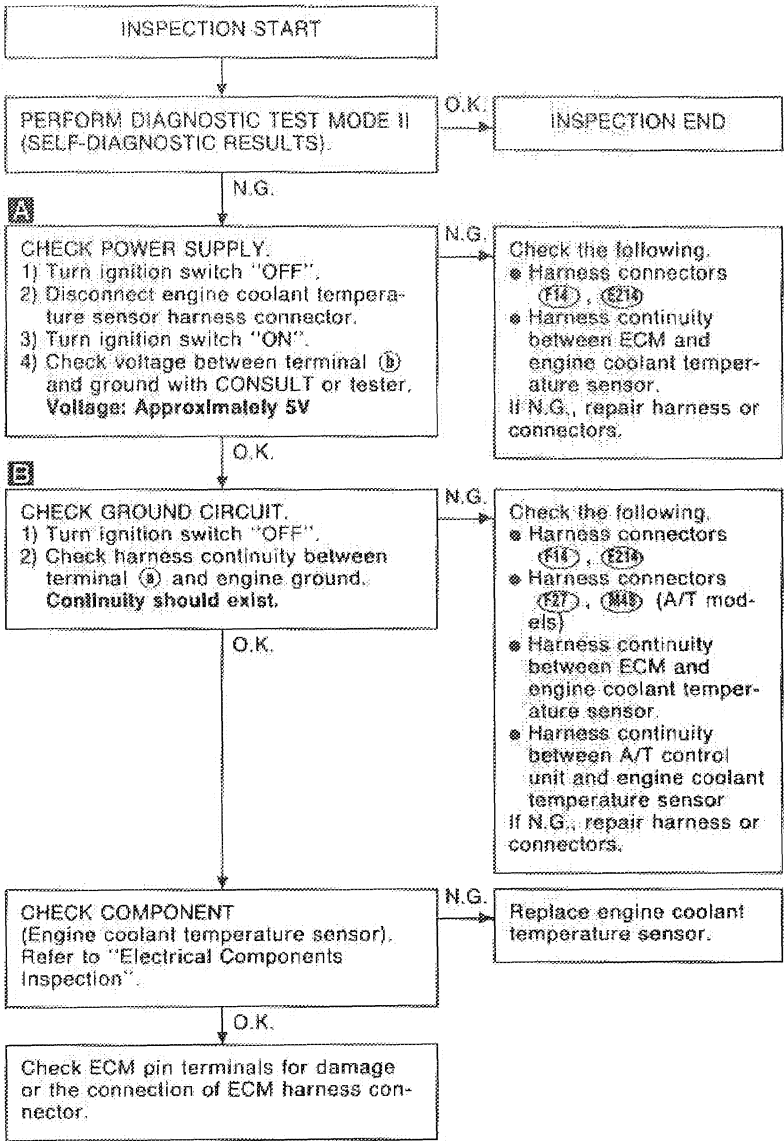
Harness layout



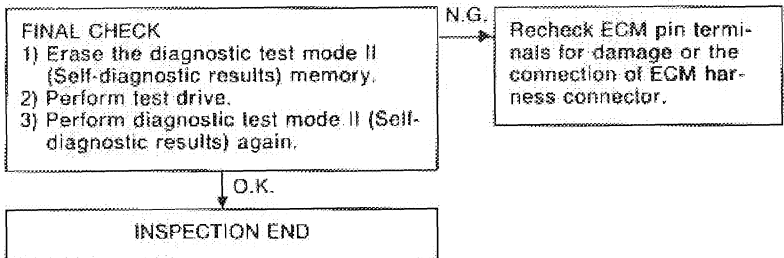
TROUBLE DIAGNOSES



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




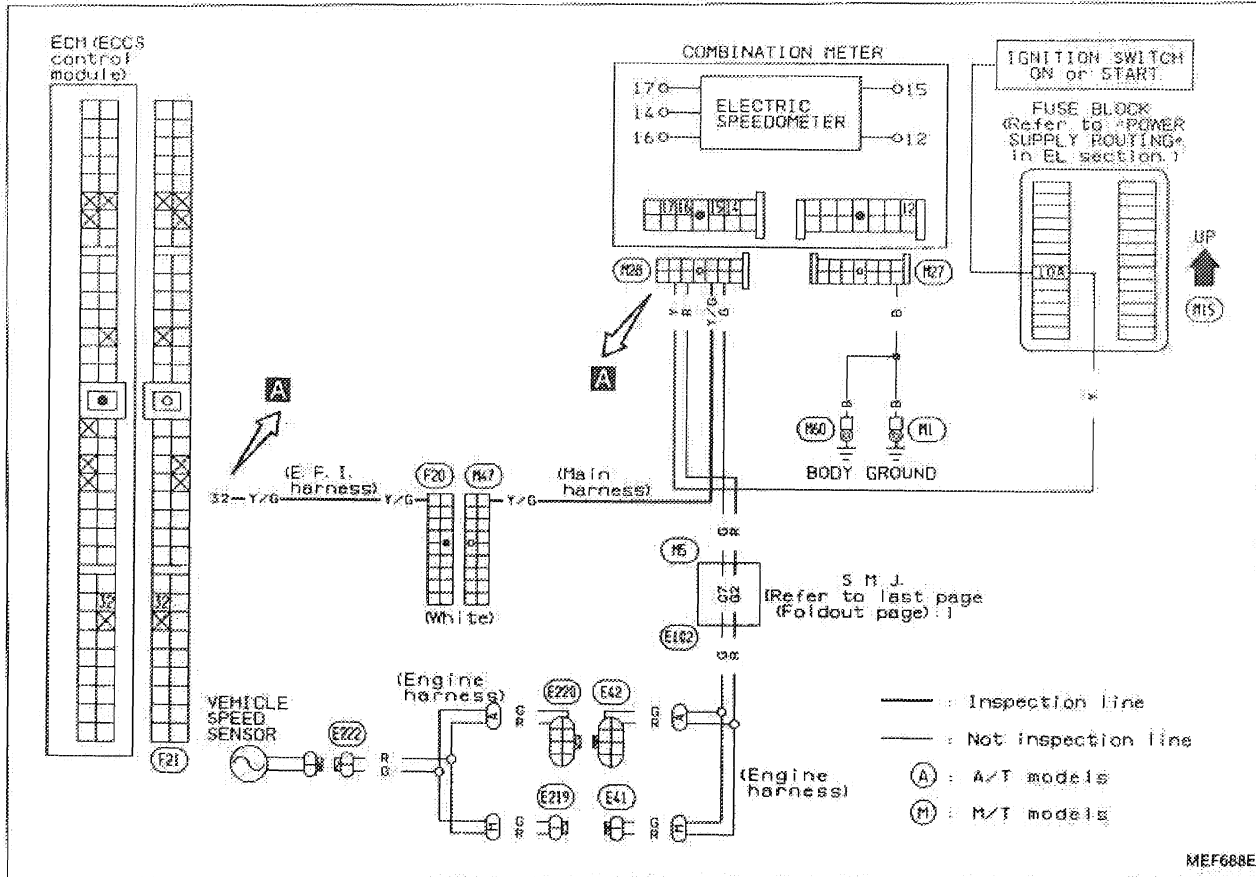
Perform **FINAL CHECK** by the following procedure after repair is completed.



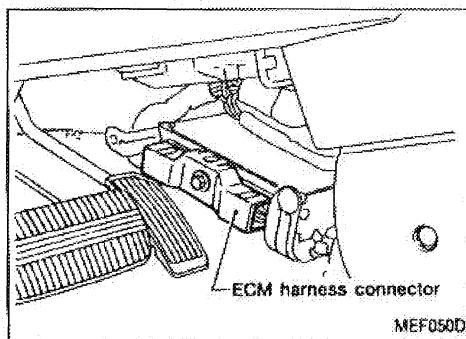
TROUBLE DIAGNOSES

Diagnostic Procedure 5

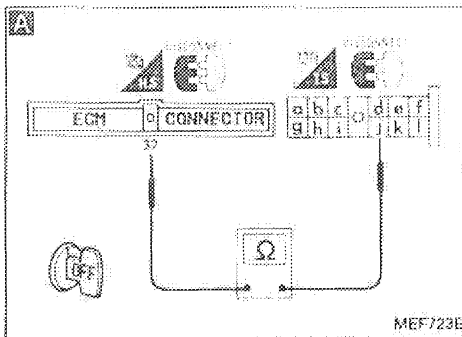
VEHICLE SPEED SENSOR (Diagnostic trouble code No. 14)  (Malfunction indicator lamp item: California models)



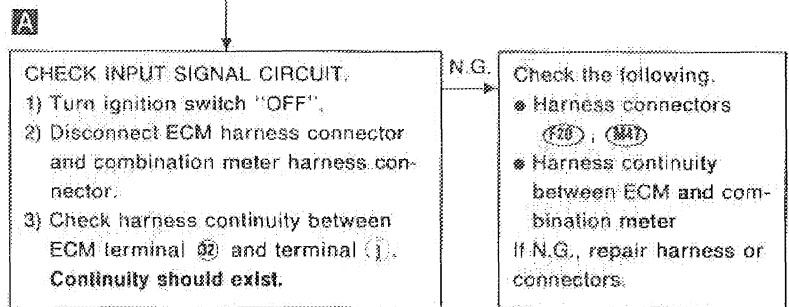
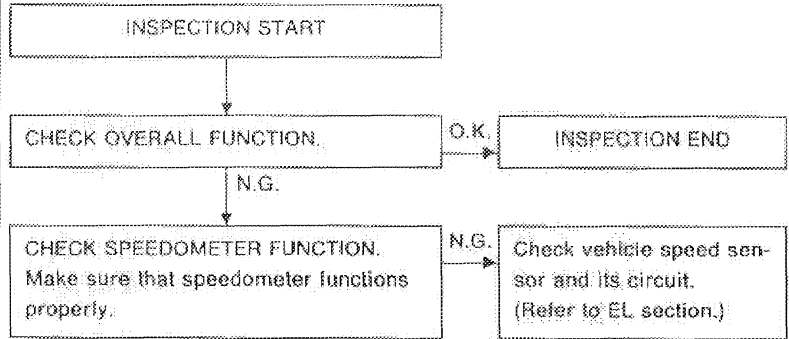
Harness layout



TROUBLE DIAGNOSES

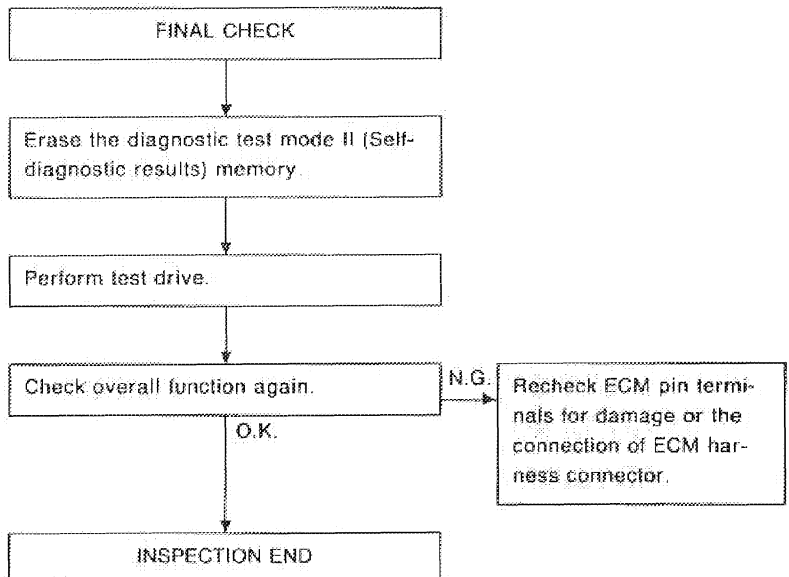


VEHICLE SPEED SENSOR (Diagnostic trouble code No.14) ^(check) (Malfunction indicator lamp item: California models)



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

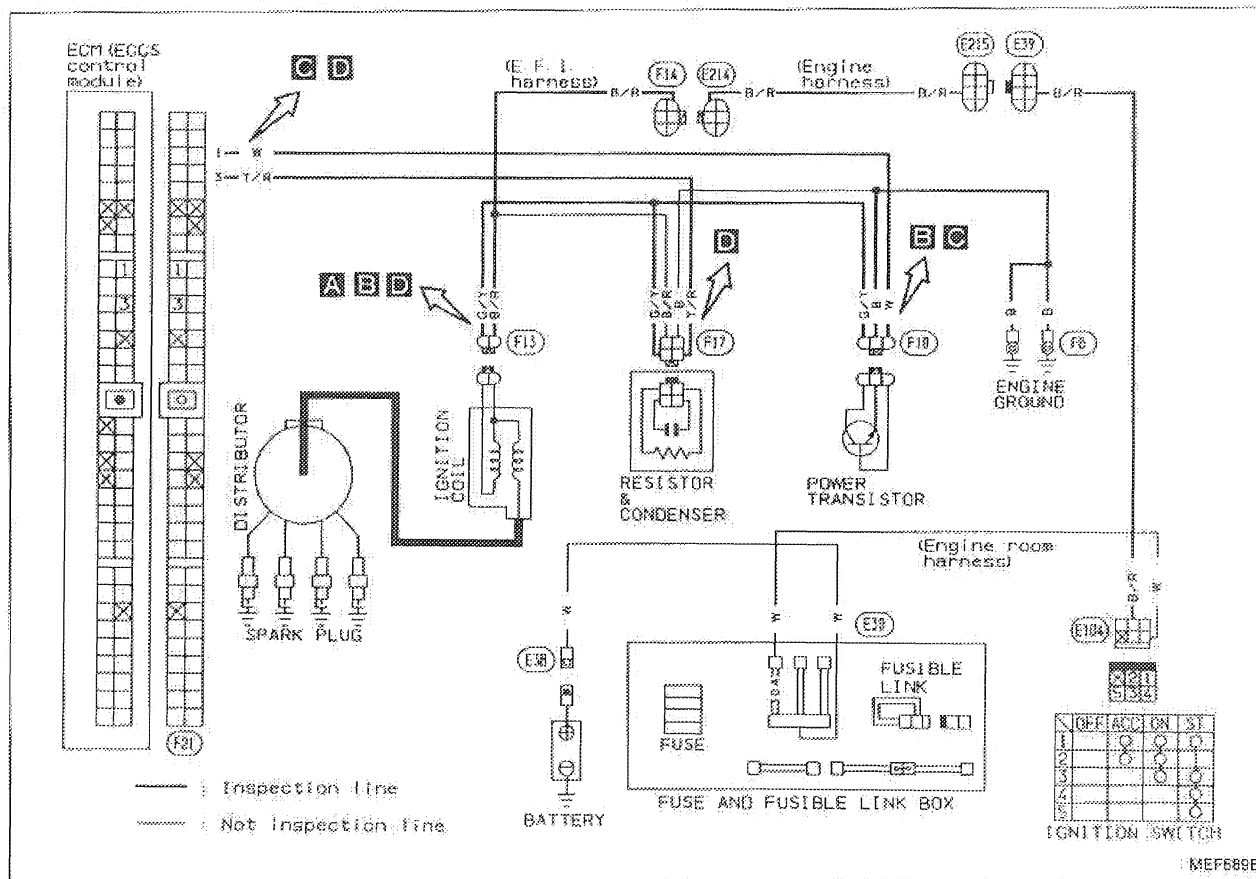
Perform FINAL CHECK by the following procedure after repair is completed.



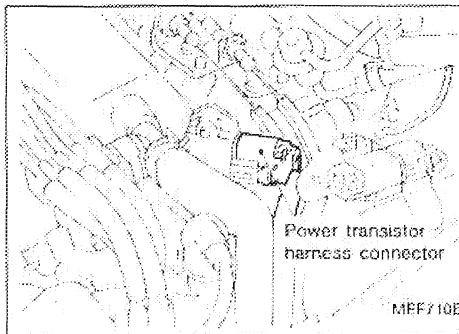
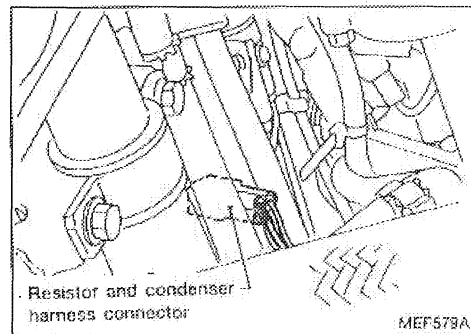
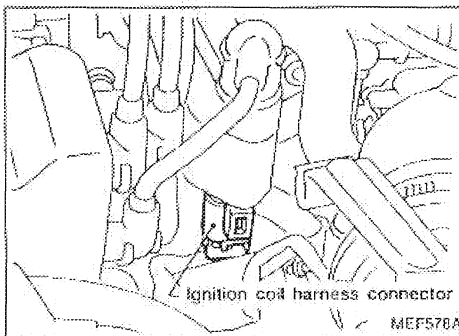
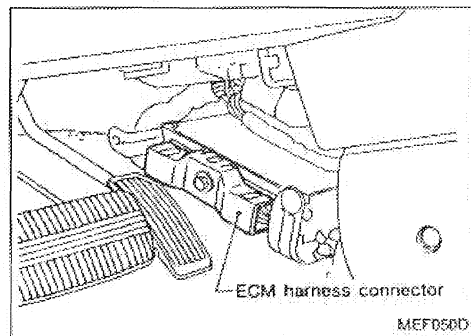
TROUBLE DIAGNOSES

Diagnostic Procedure 6

IGNITION SIGNAL (Diagnostic trouble code No. 21)

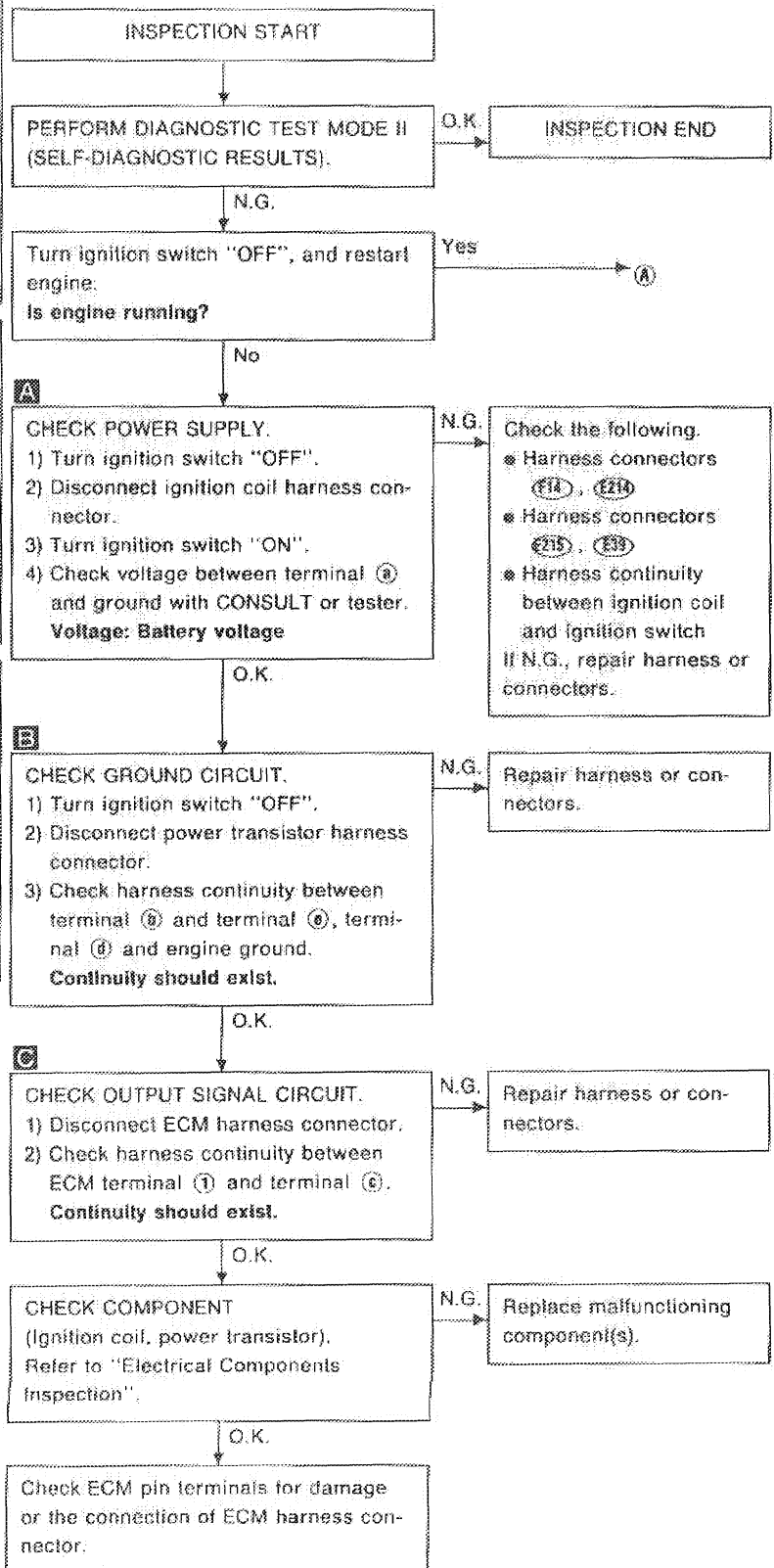
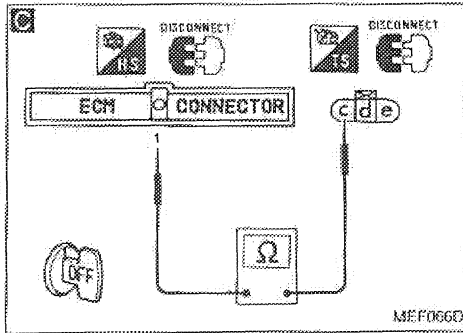
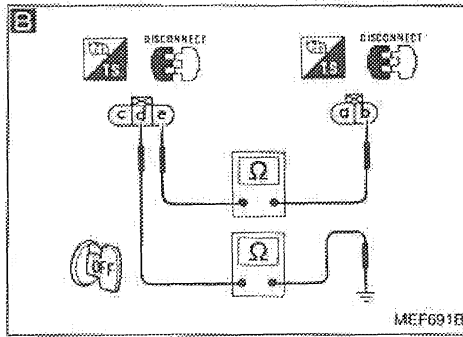
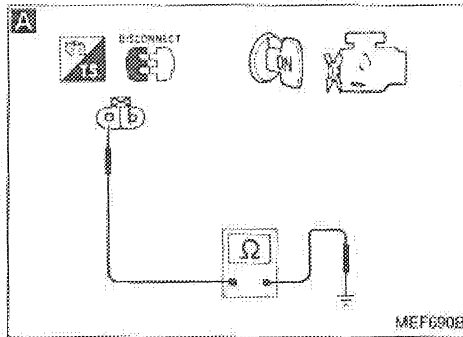


Harness layout



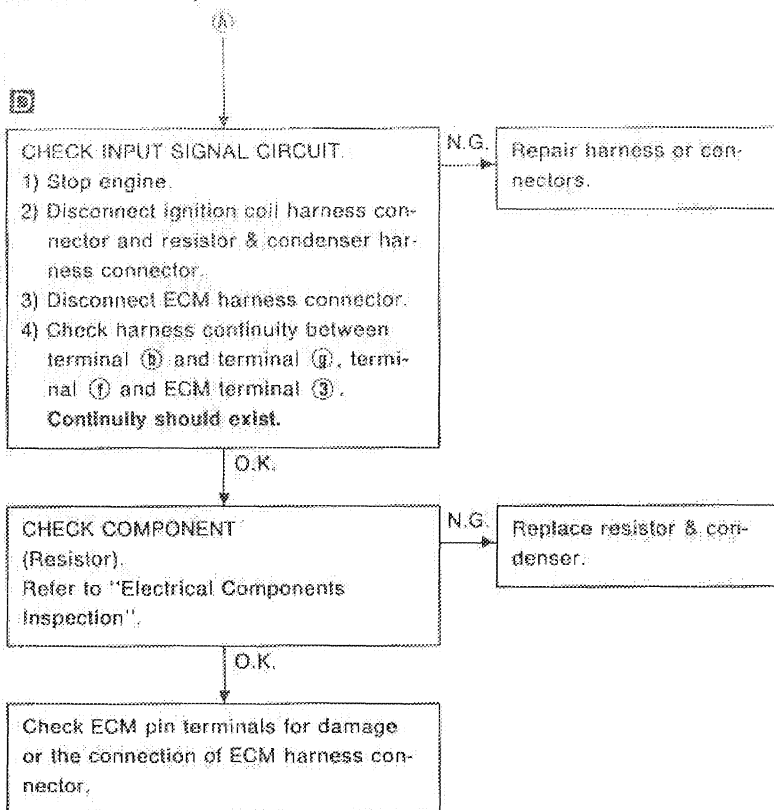
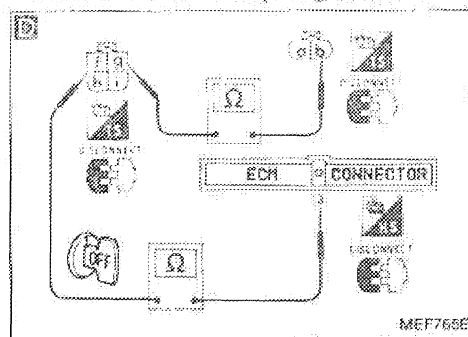
TROUBLE DIAGNOSES

IGNITION SIGNAL (Diagnostic trouble code No.21)

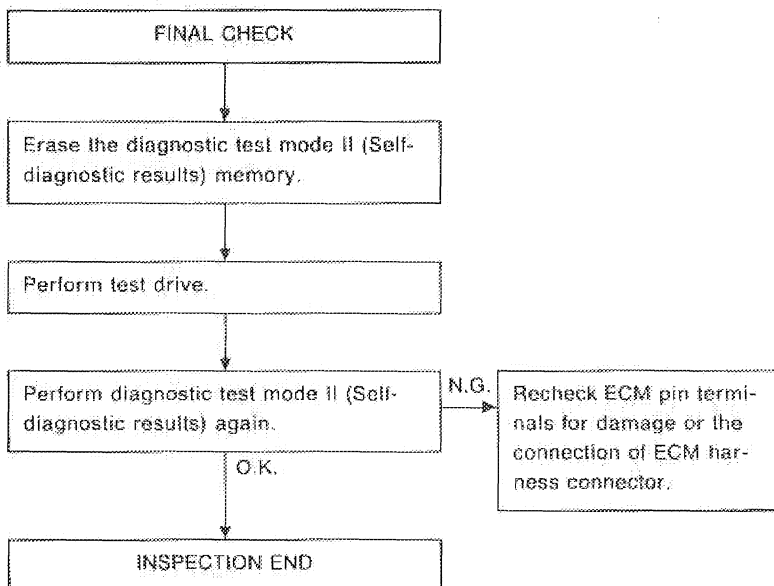


TROUBLE DIAGNOSES

IGNITION SIGNAL (Diagnostic trouble code No.21)




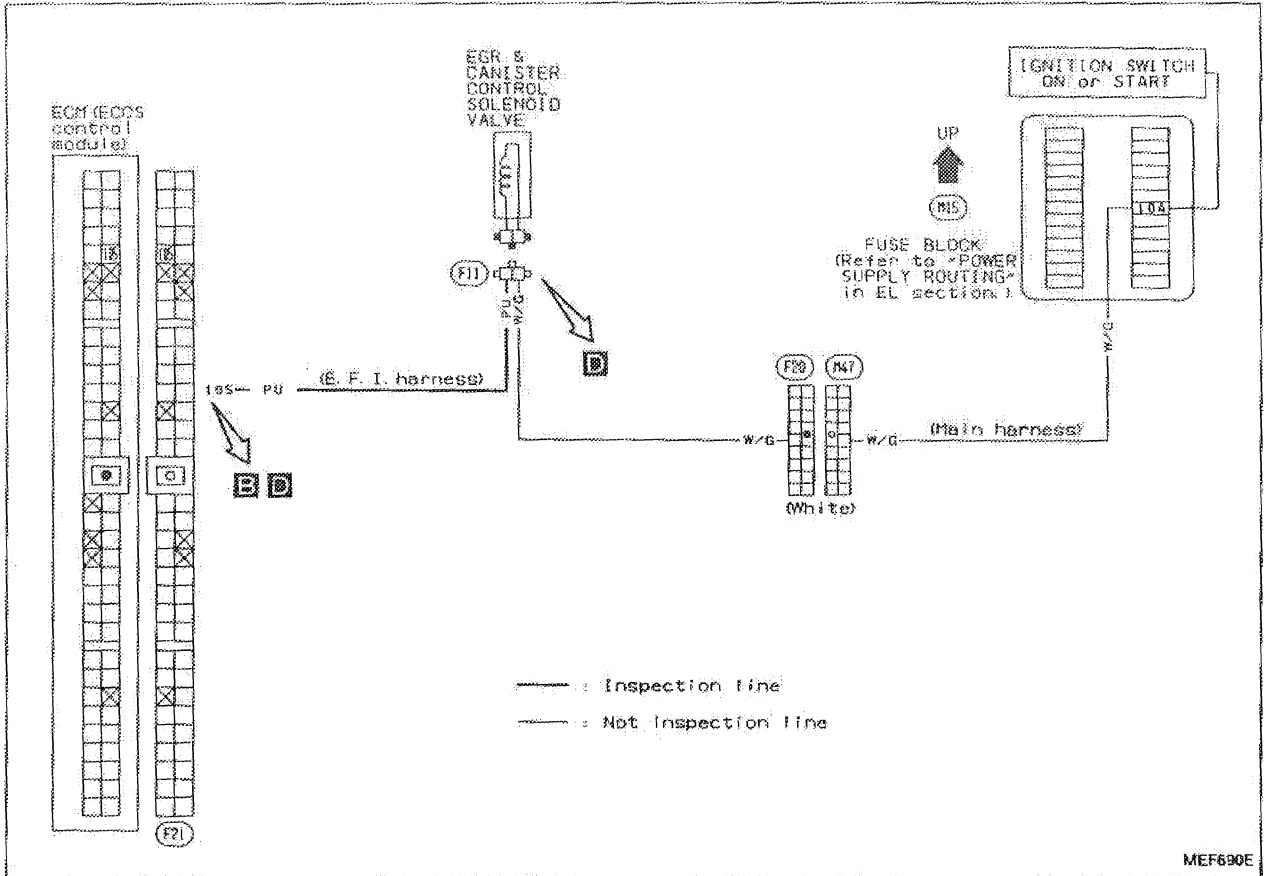
Perform FINAL CHECK by the following procedure after repair is completed.



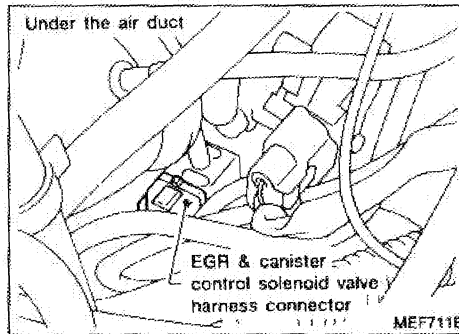
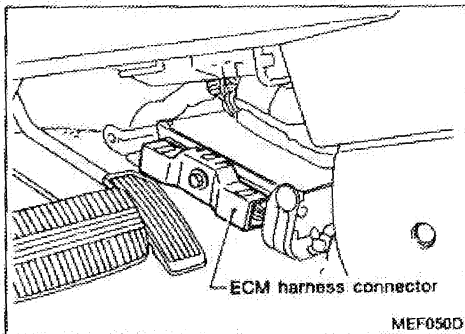
TROUBLE DIAGNOSES

Diagnostic Procedure 7

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




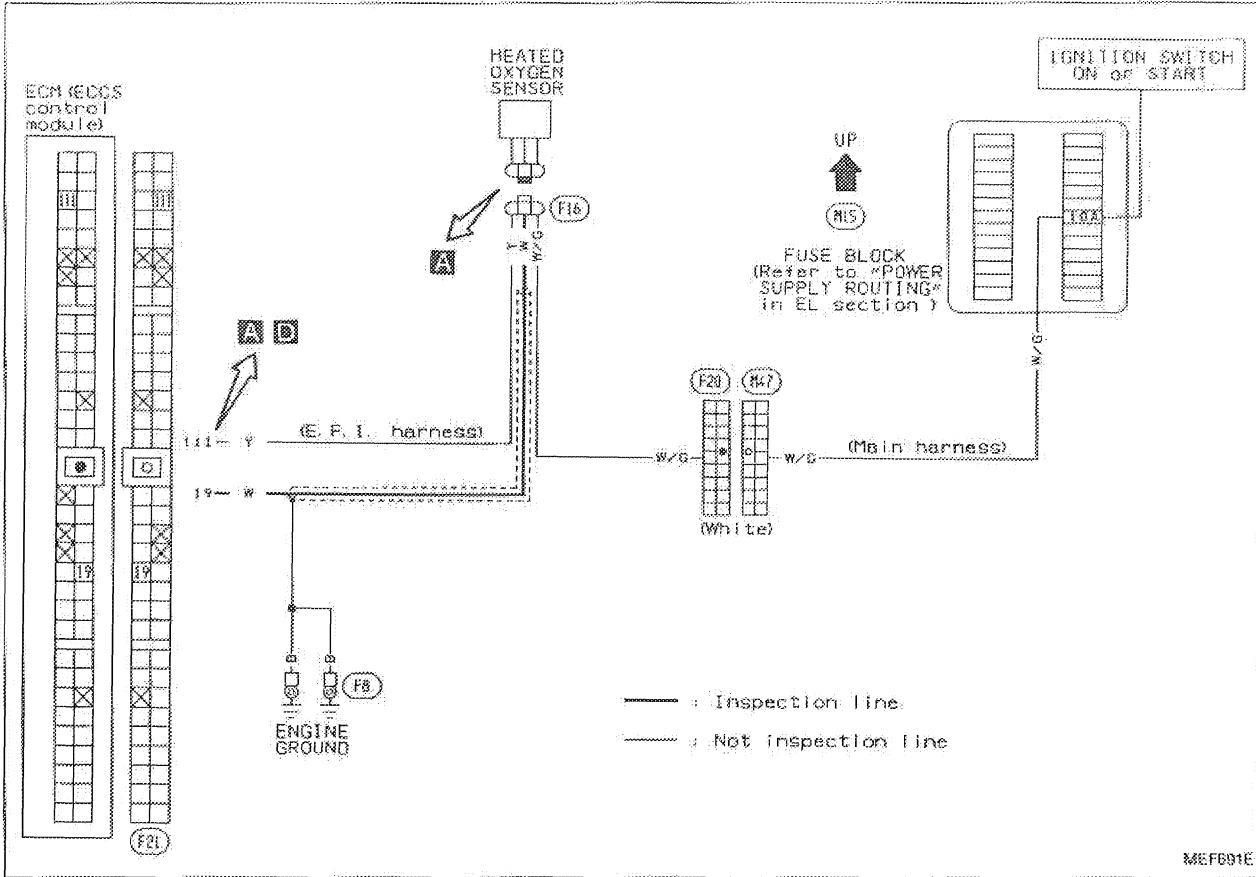
Harness layout



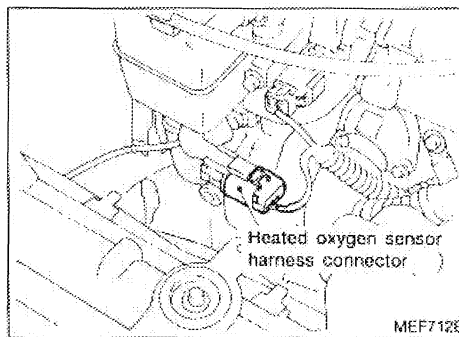
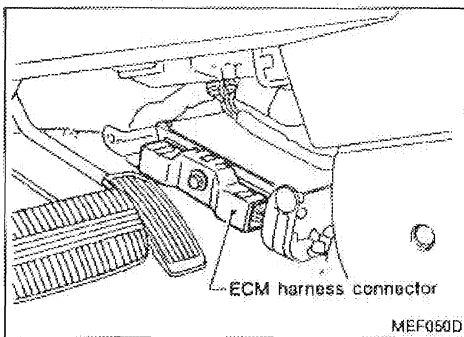
TROUBLE DIAGNOSES

Diagnostic Procedure 8

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

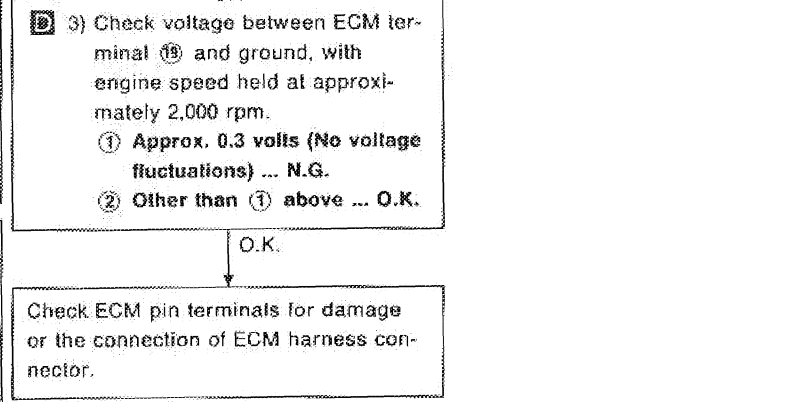
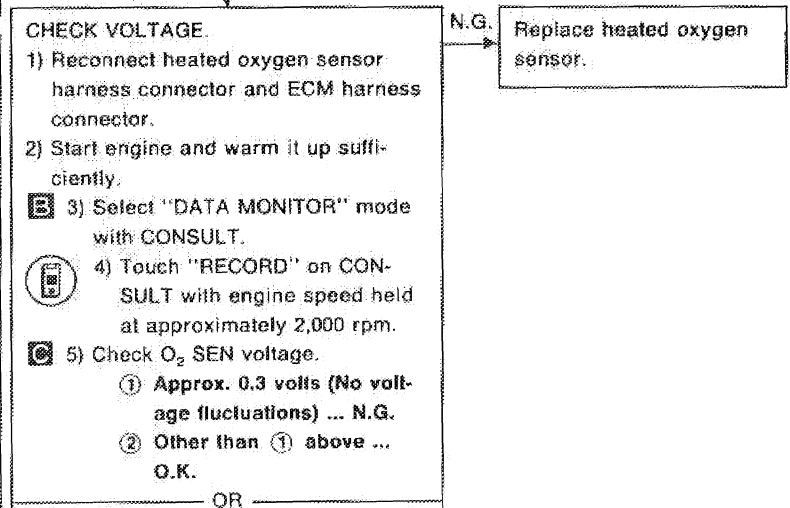
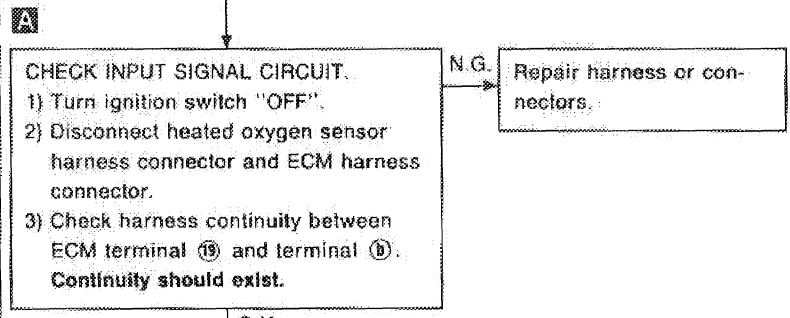
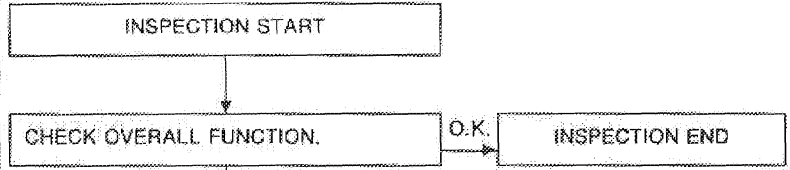
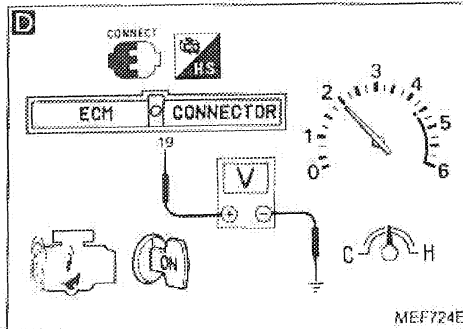
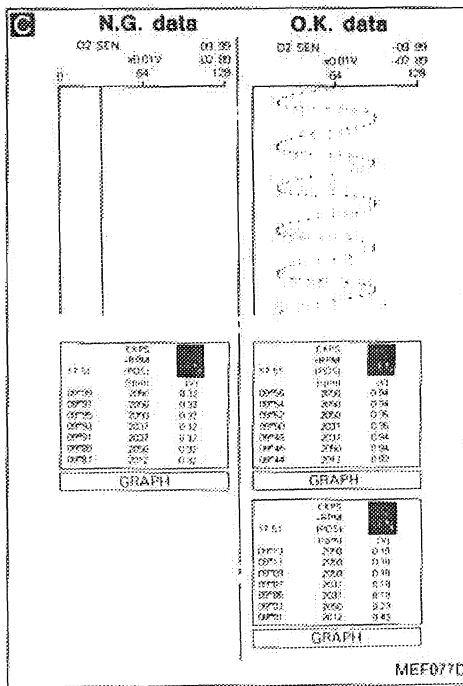
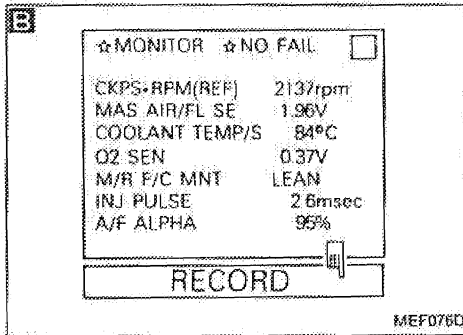
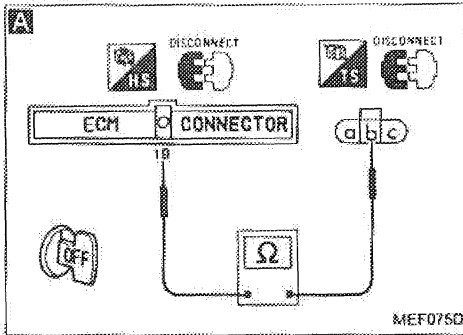


Harness layout




TROUBLE DIAGNOSES

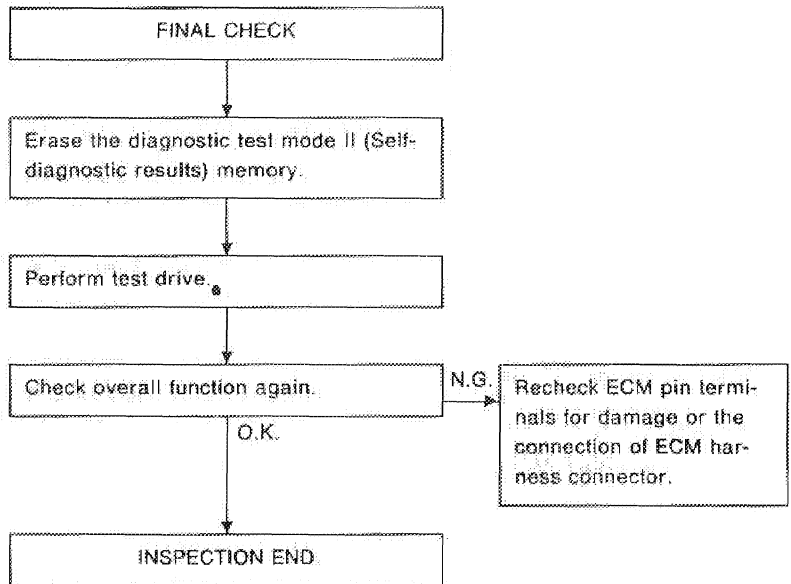
HEATED OXYGEN SENSOR (Diagnostic trouble code No.33) (Malfunction indicator lamp item: California models)



TROUBLE DIAGNOSES

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

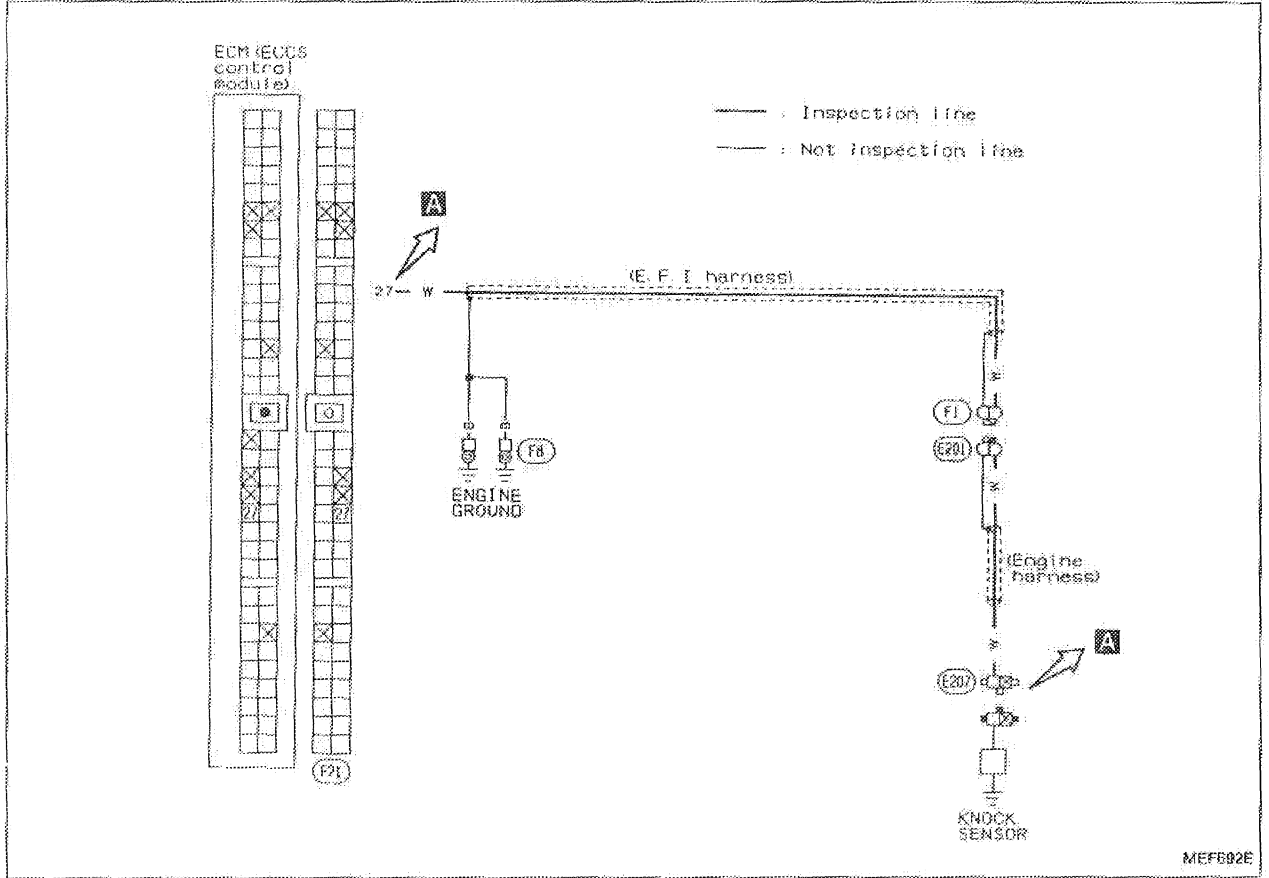
Perform FINAL CHECK by the following procedure after repair is completed.



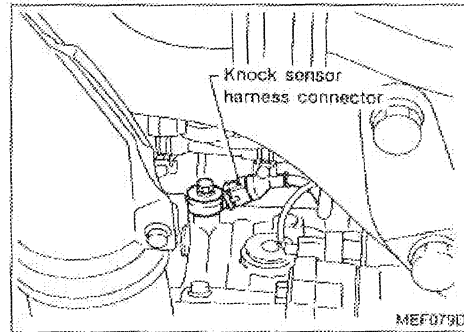
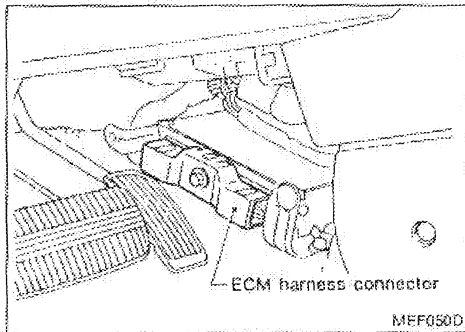
TROUBLE DIAGNOSES

Diagnostic Procedure 9

KNOCK SENSOR (Diagnostic trouble code No. 34)




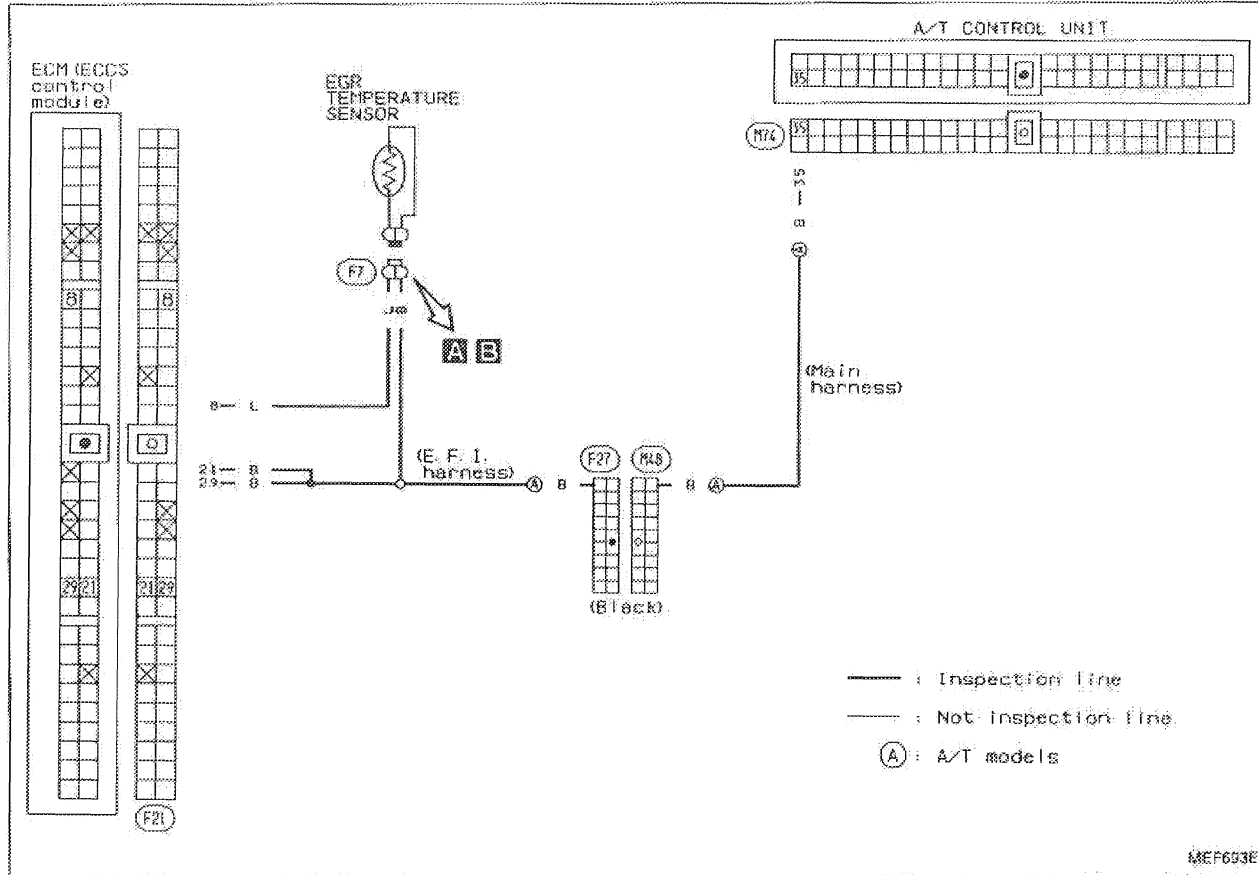
Harness layout



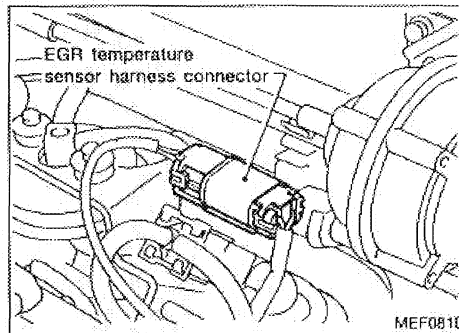
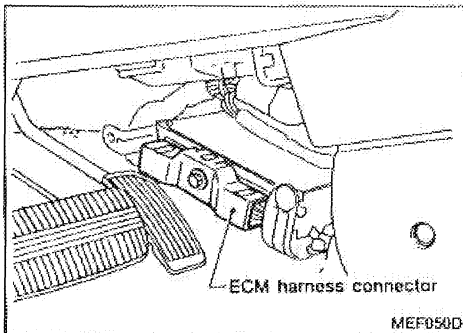
TROUBLE DIAGNOSES

Diagnostic Procedure 10

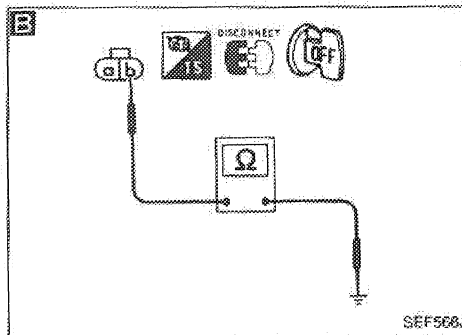
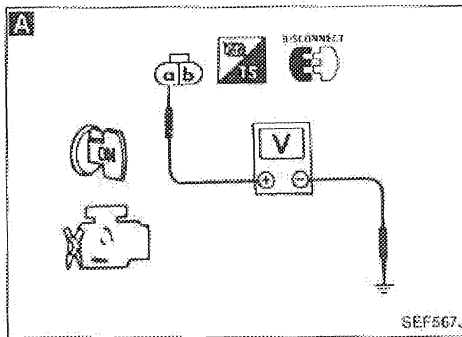
EGR TEMPERATURE SENSOR (Diagnostic trouble code No. 35)  (Malfunction indicator lamp item): California models



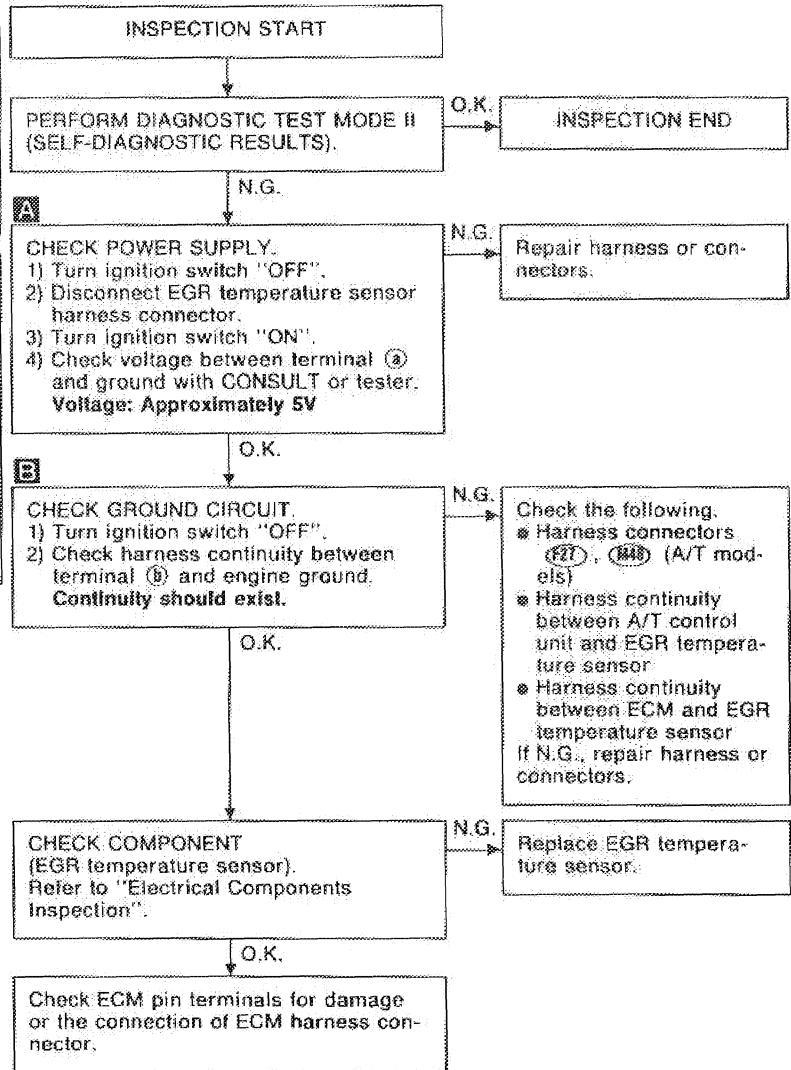
Harness layout



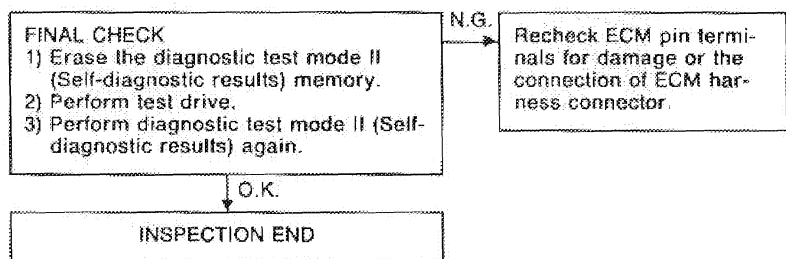
TROUBLE DIAGNOSES



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



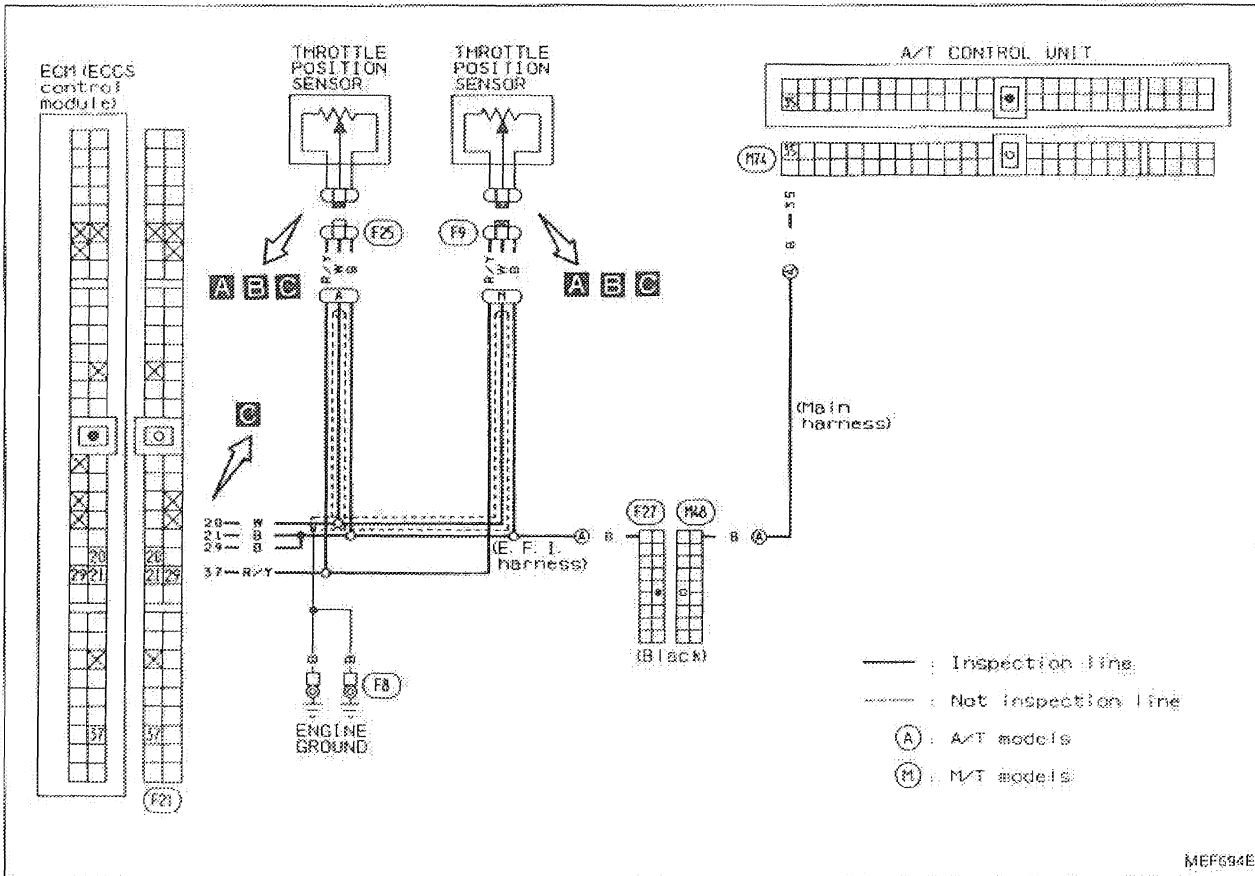
Perform FINAL CHECK by the following procedure after repair is completed.



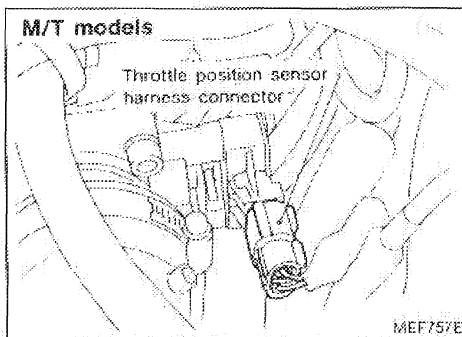
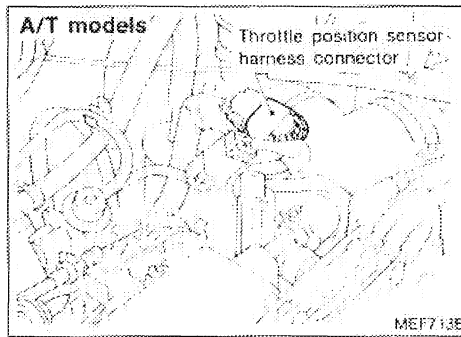
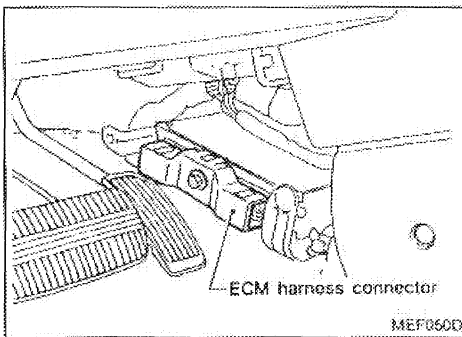
TROUBLE DIAGNOSES

Diagnostic Procedure 11

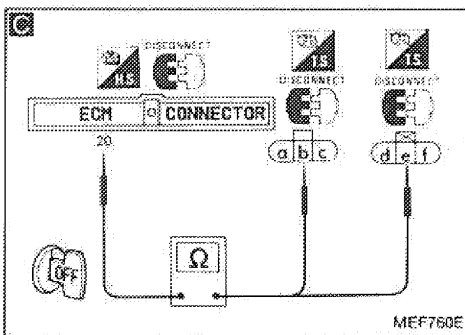
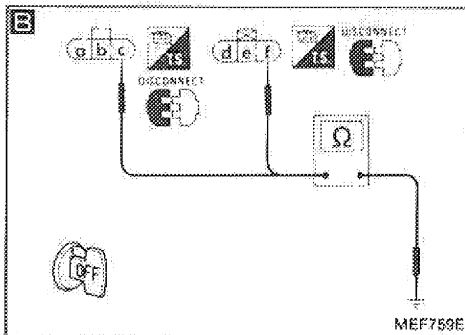
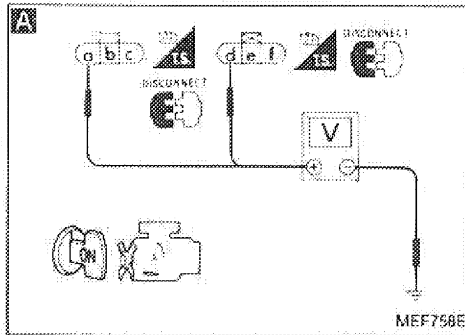
THROTTLE POSITION SENSOR (Diagnostic trouble code No. 43) (CHECK (Malfunction indicator lamp item: California models))



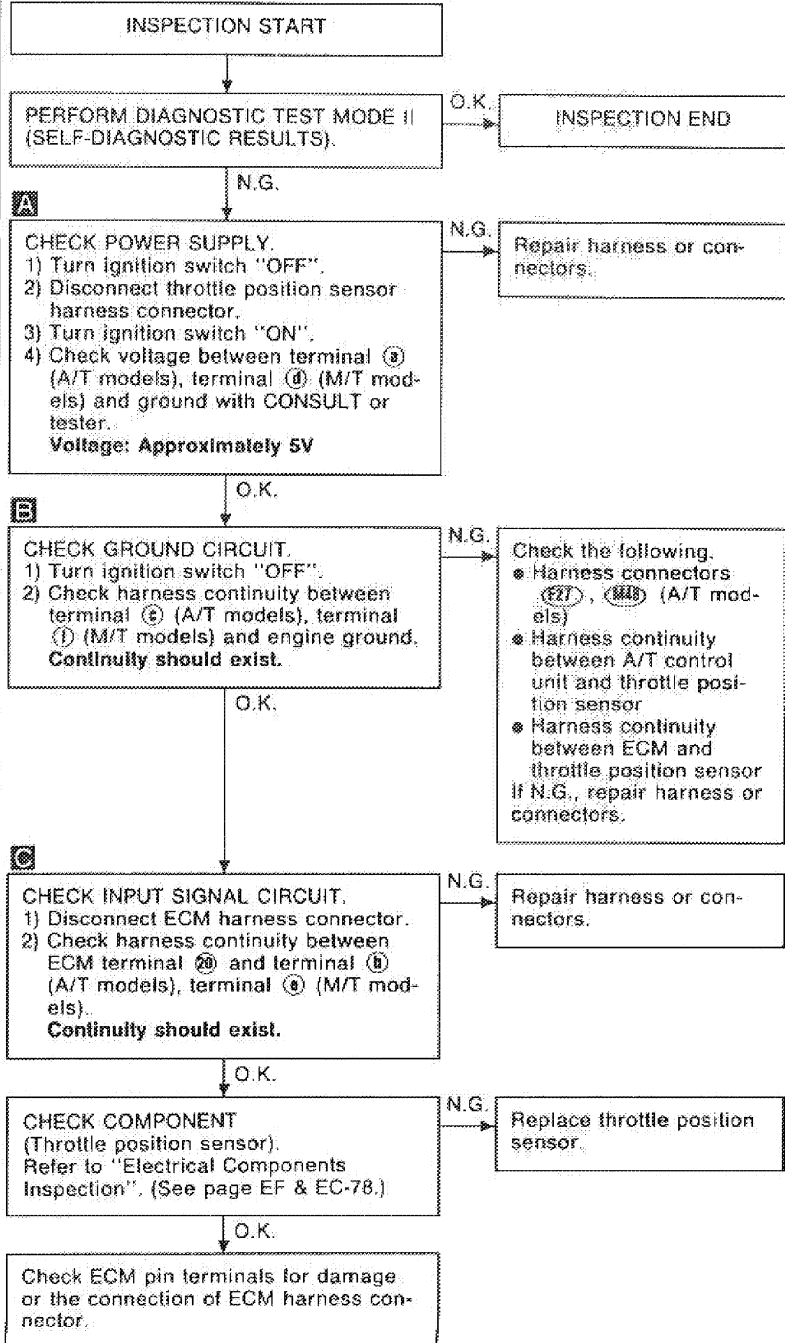
Harness layout




TROUBLE DIAGNOSES



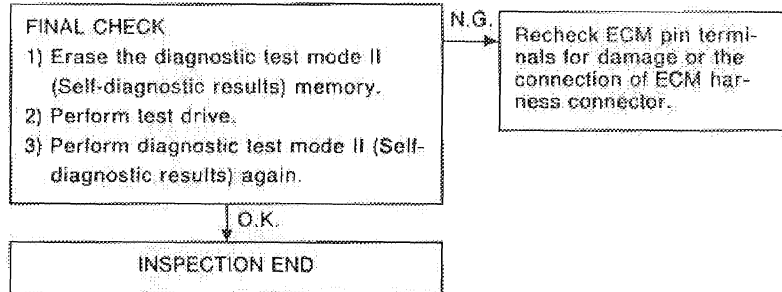
THROTTLE POSITION SENSOR (Diagnostic trouble code No.43) (Malfunction indicator lamp item: California models)



TROUBLE DIAGNOSES

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

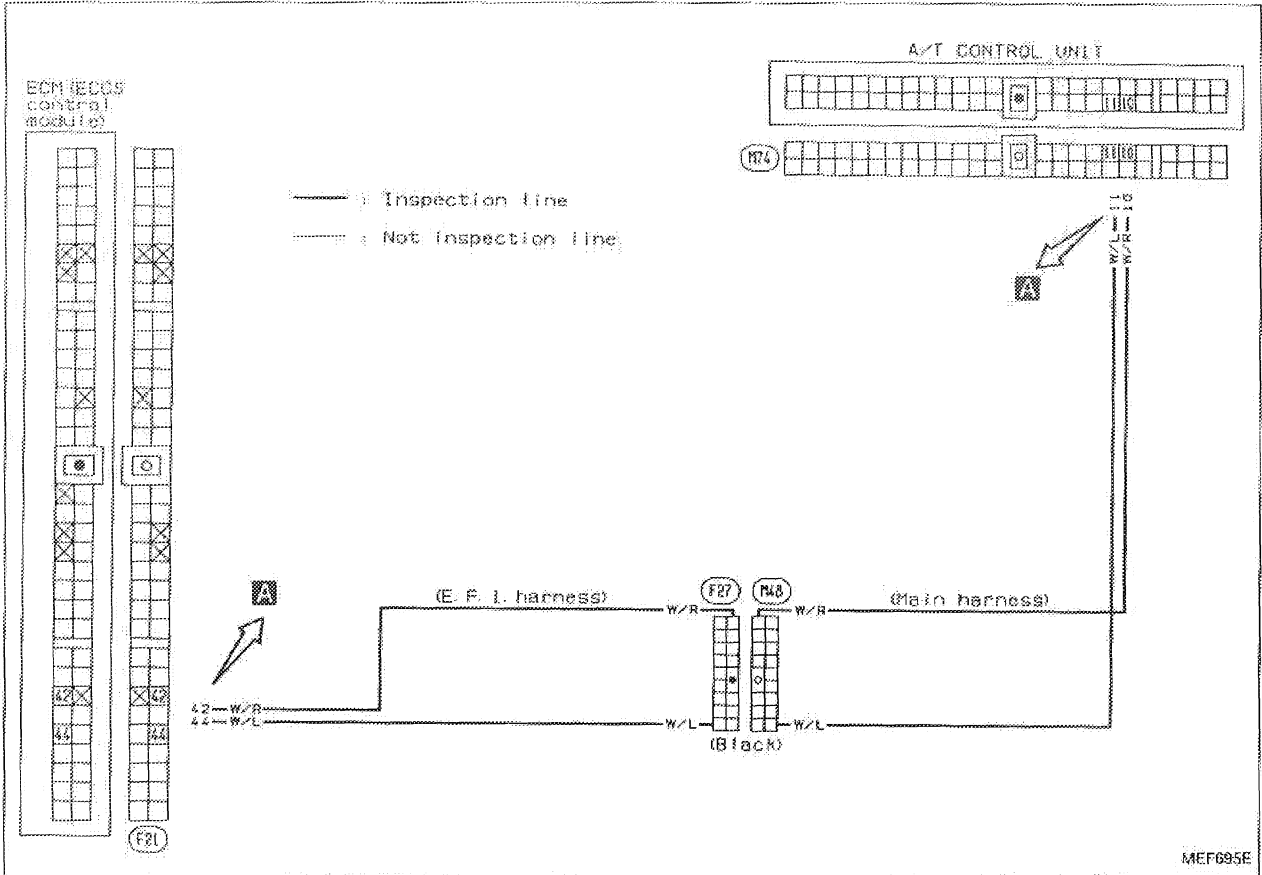
Perform FINAL CHECK by the following procedure after repair is completed.



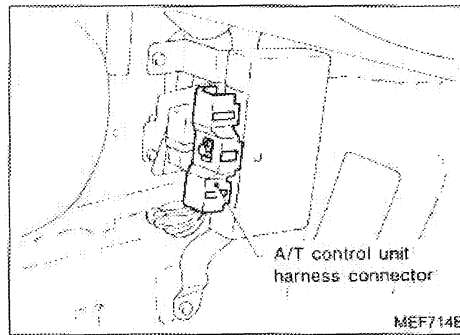
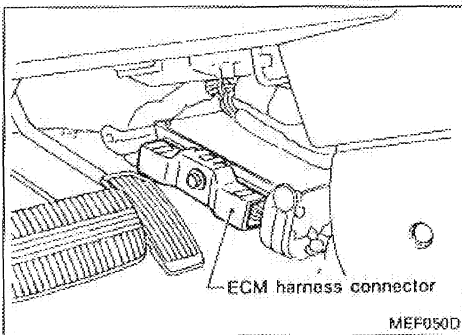
TROUBLE DIAGNOSES

Diagnostic Procedure 12

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

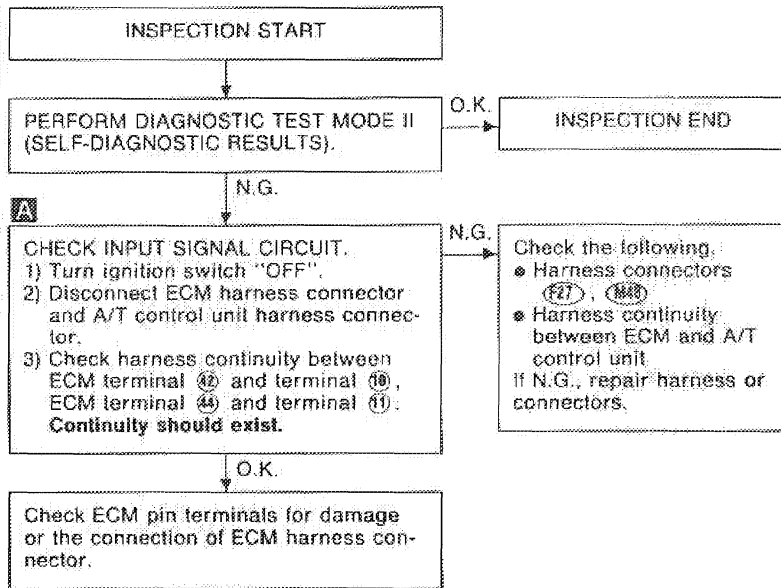
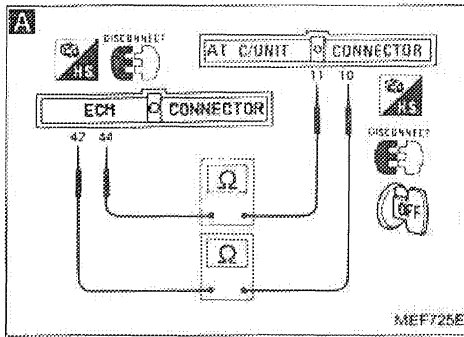


Harness layout

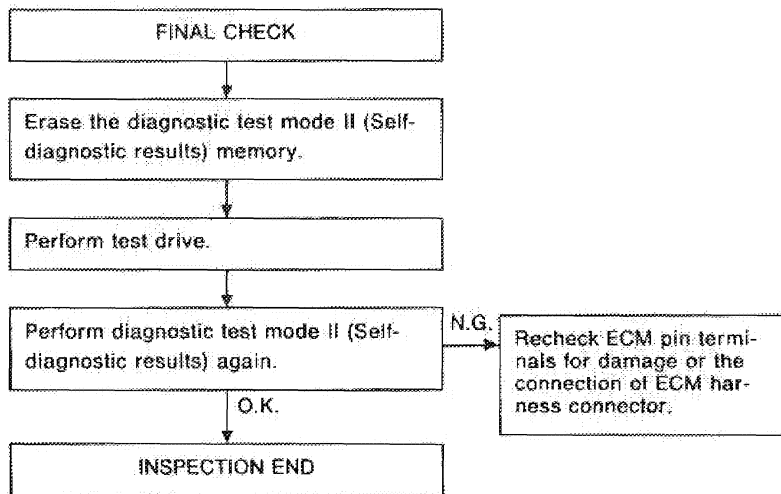


TROUBLE DIAGNOSES

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



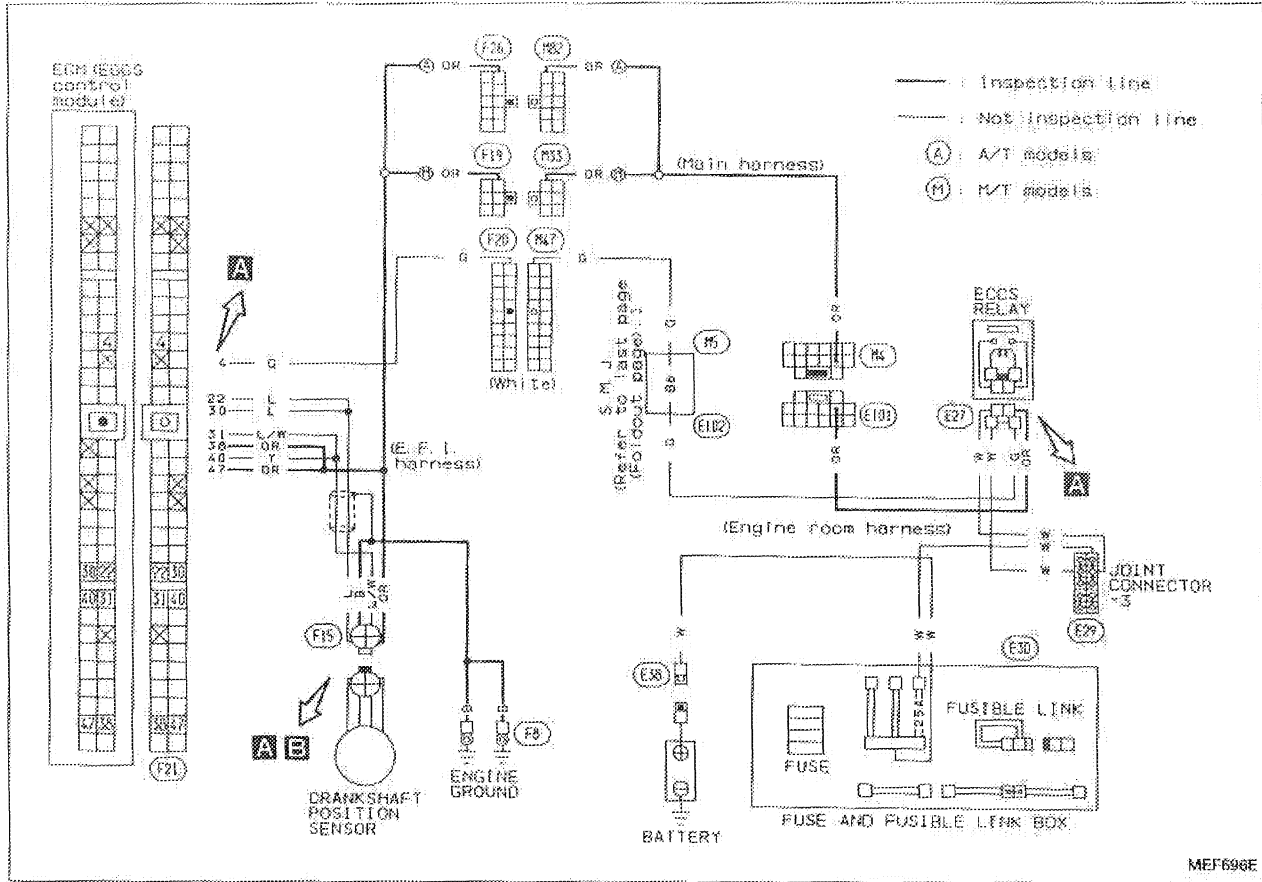
Perform FINAL CHECK by the following procedure after repair is completed.



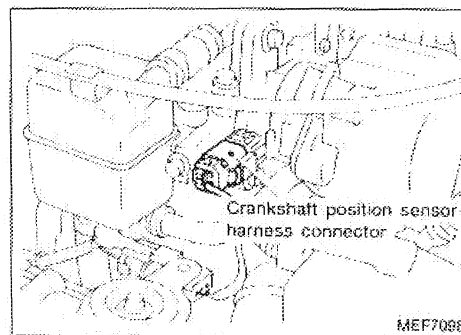
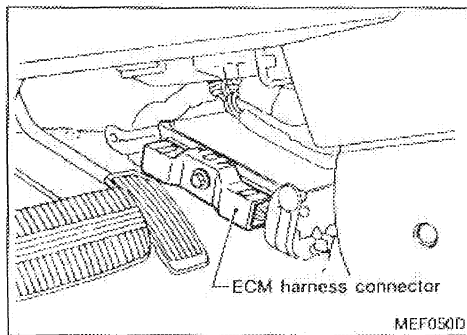
TROUBLE DIAGNOSES

Diagnostic Procedure 13

CRANKSHAFT POSITION SENSOR (Not self-diagnostic item)

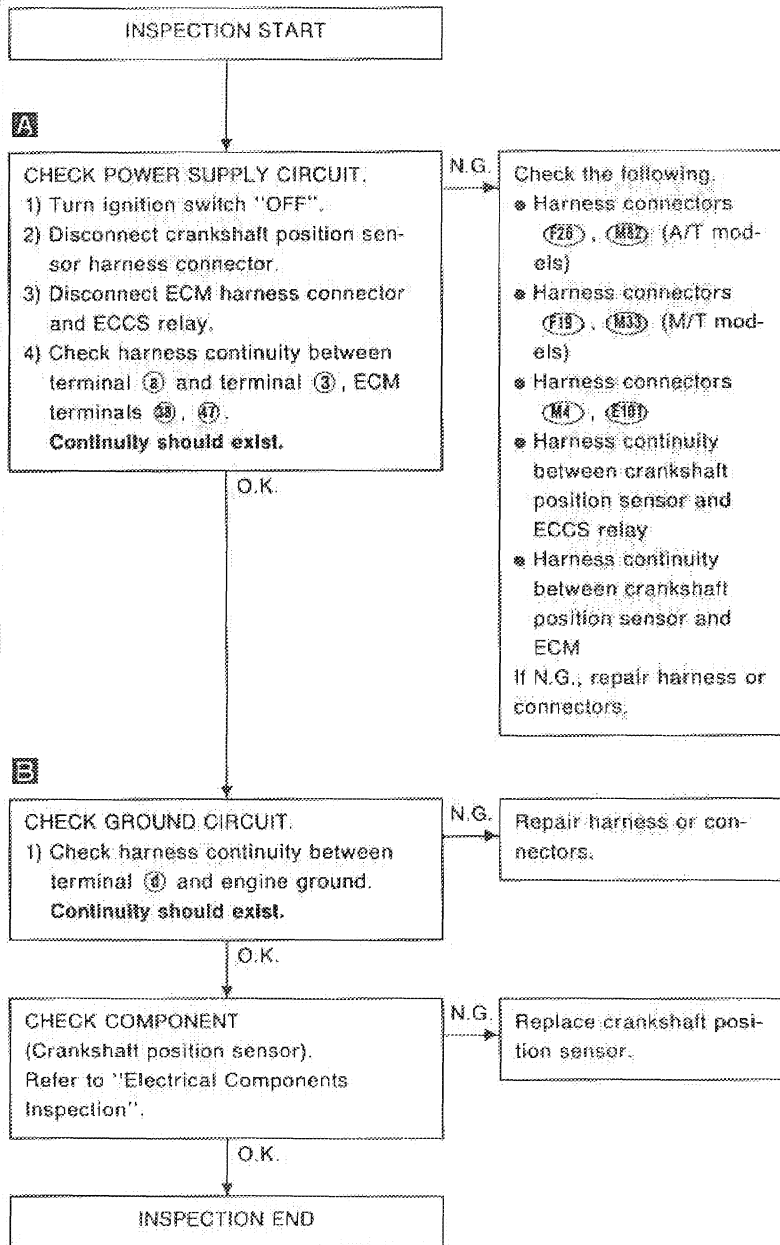
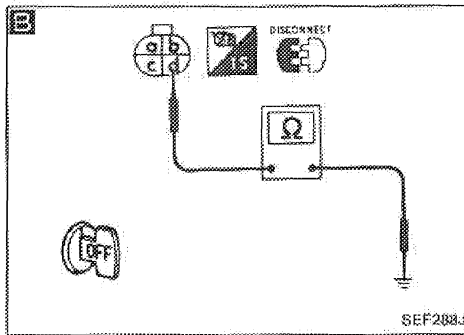
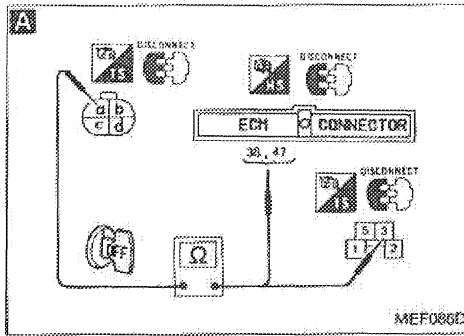


Harness layout



TROUBLE DIAGNOSES

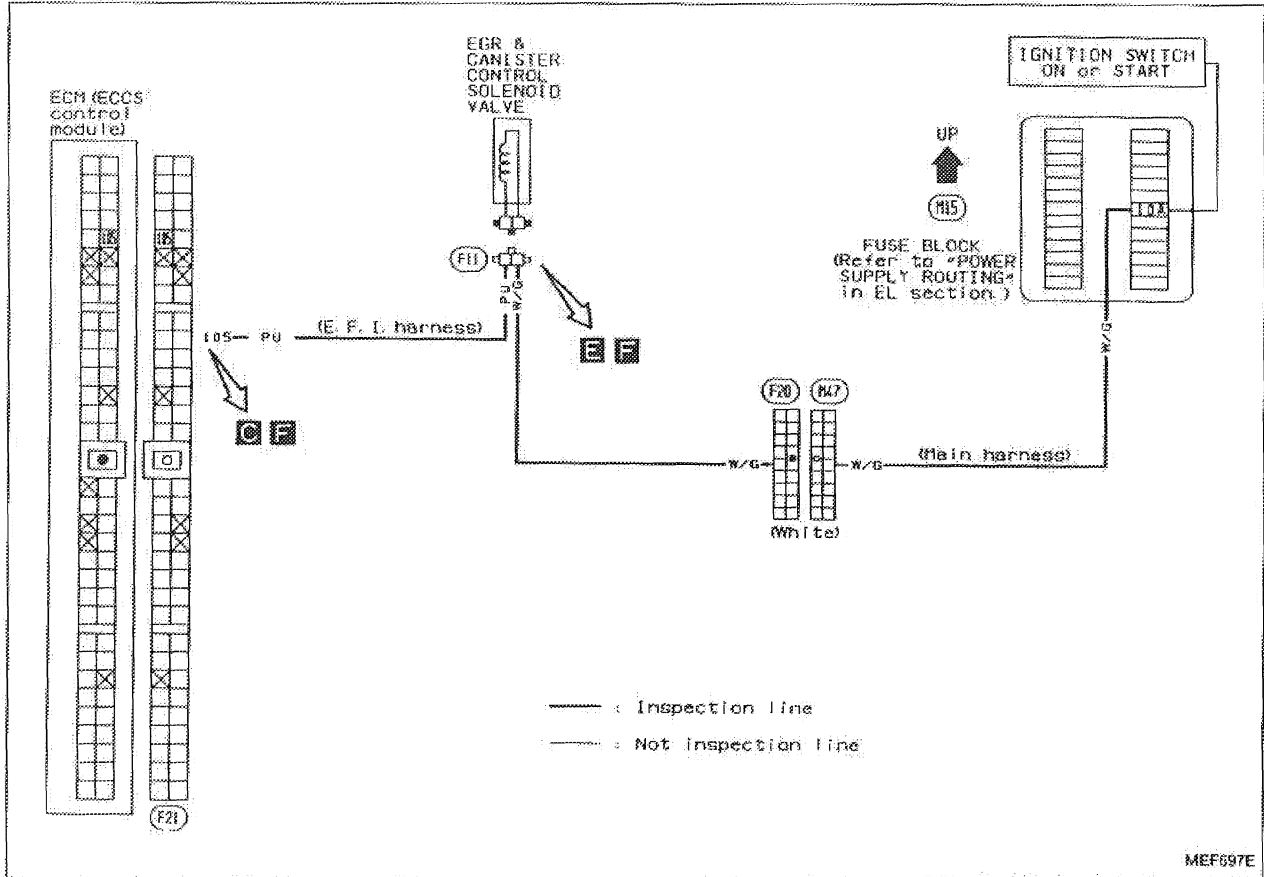
CRANKSHAFT POSITION SENSOR (Not self-diagnostic item)



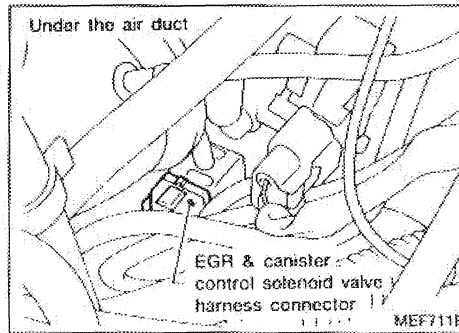
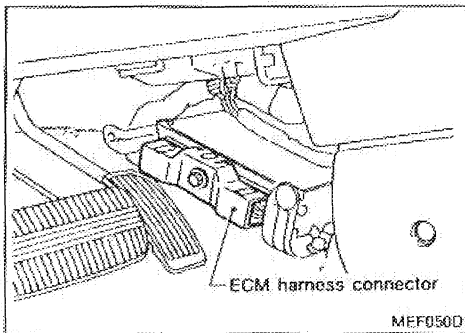
TROUBLE DIAGNOSES

Diagnostic Procedure 14

EGR CONTROL (Not self-diagnostic item)



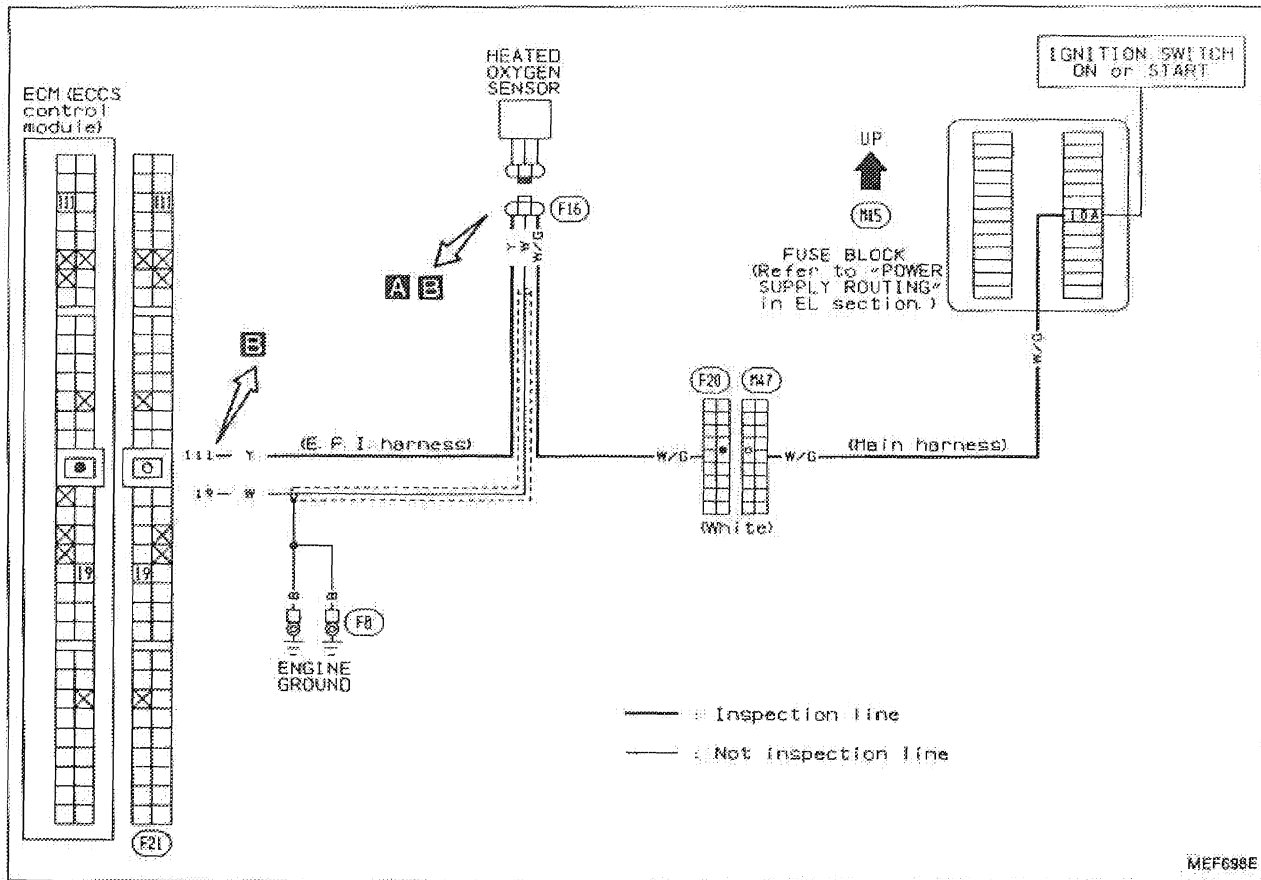
Harness layout



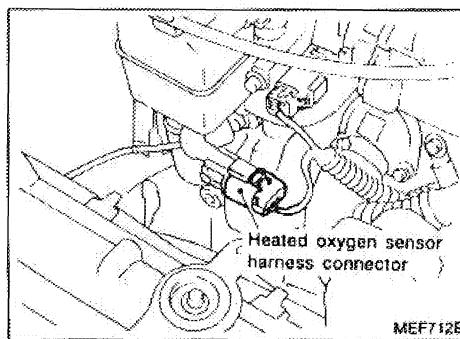
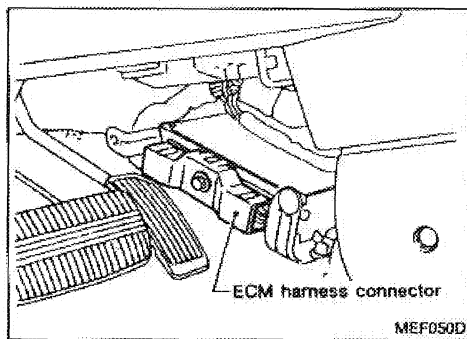
TROUBLE DIAGNOSES

Diagnostic Procedure 15

HEATED OXYGEN SENSOR HEATER (Not self-diagnostic item)



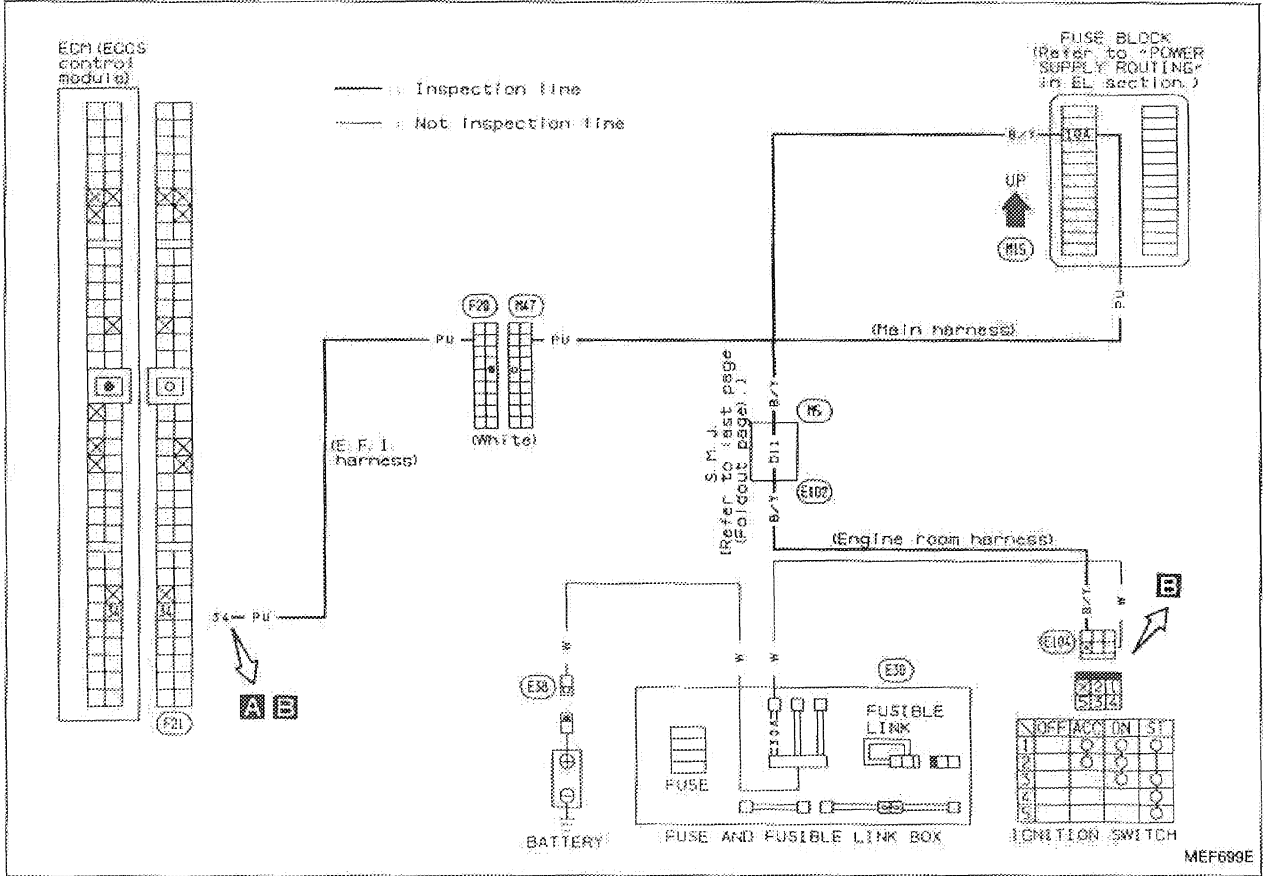
Harness layout



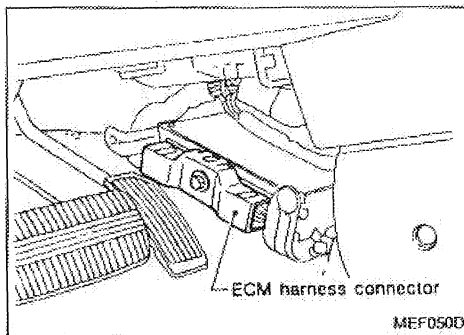
TROUBLE DIAGNOSES

Diagnostic Procedure 16

START SIGNAL (Not self-diagnostic item)



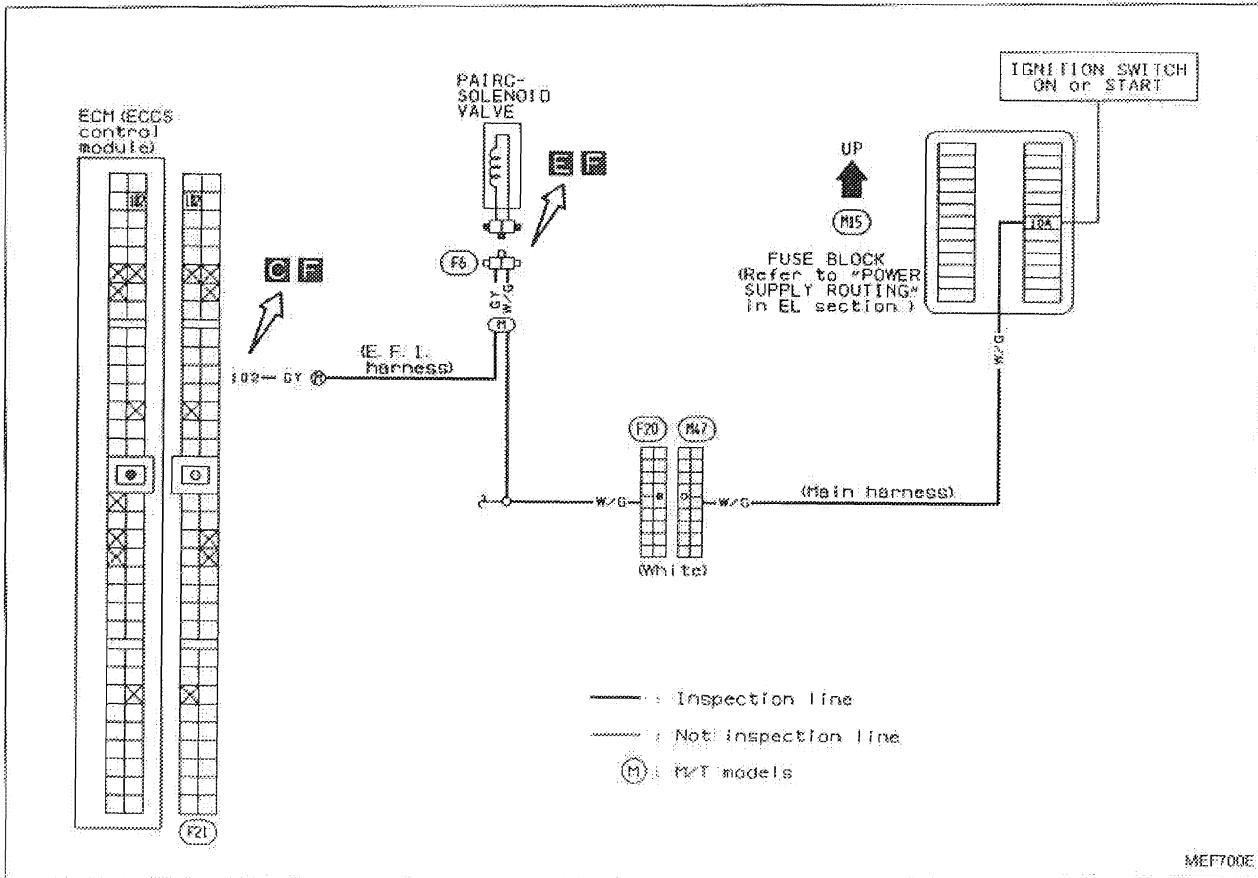
Harness layout



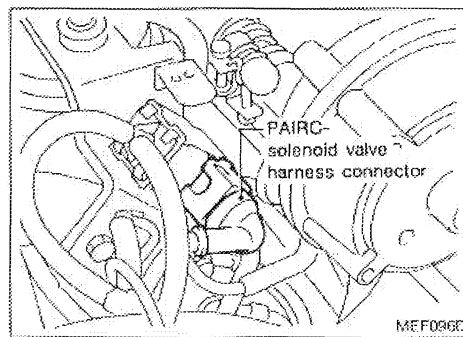
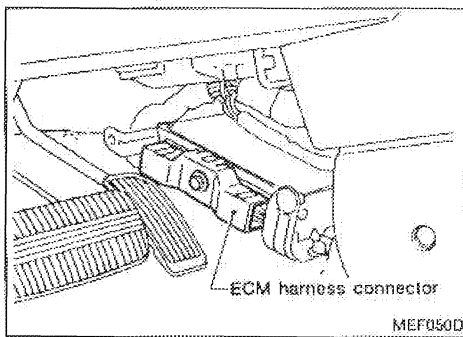
TROUBLE DIAGNOSES

Diagnostic Procedure 17

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



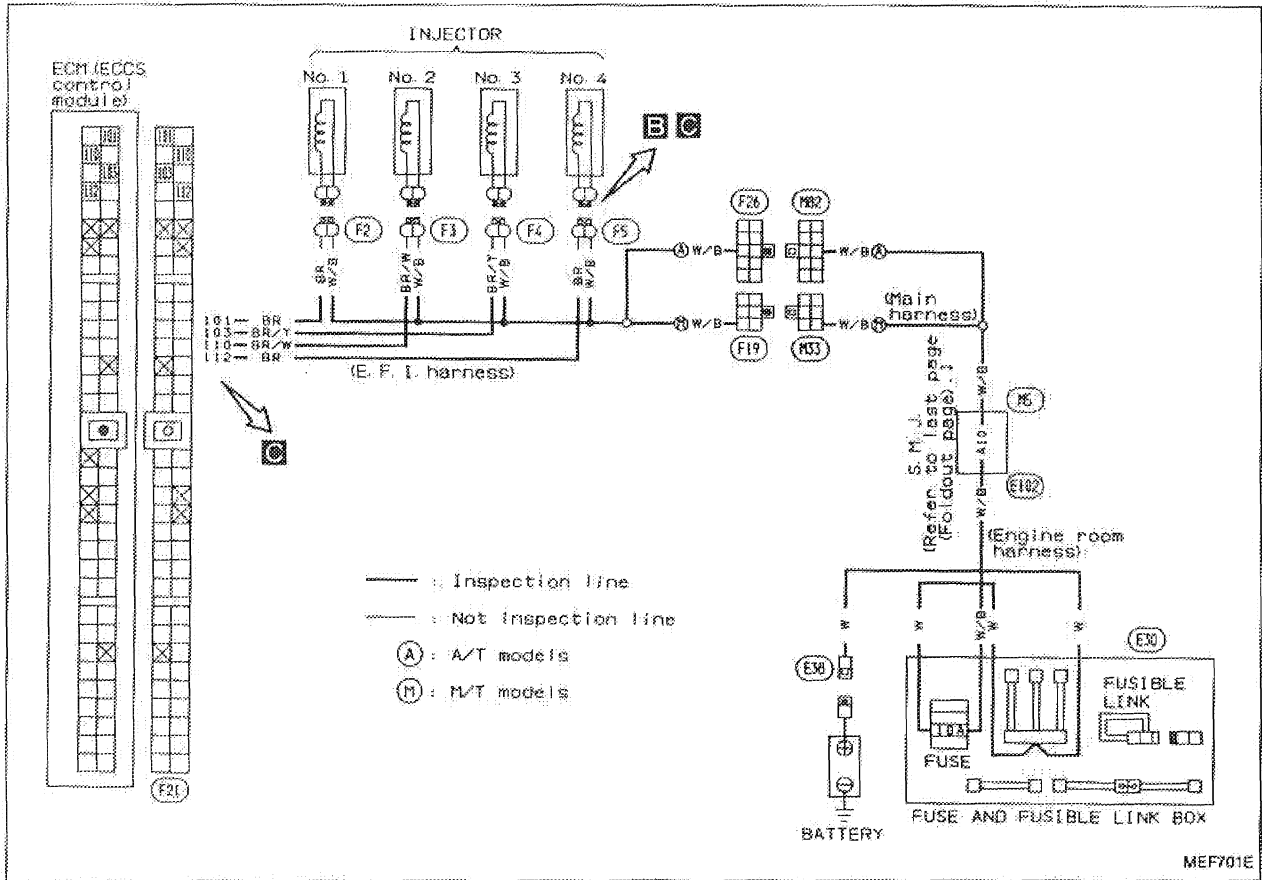
Harness layout



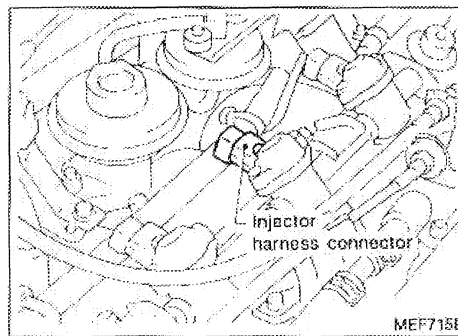
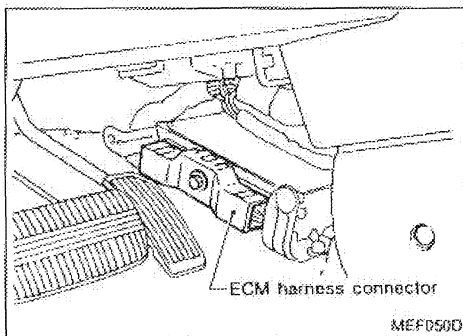
TROUBLE DIAGNOSES

Diagnostic Procedure 18

INJECTOR (Not self-diagnostic item)

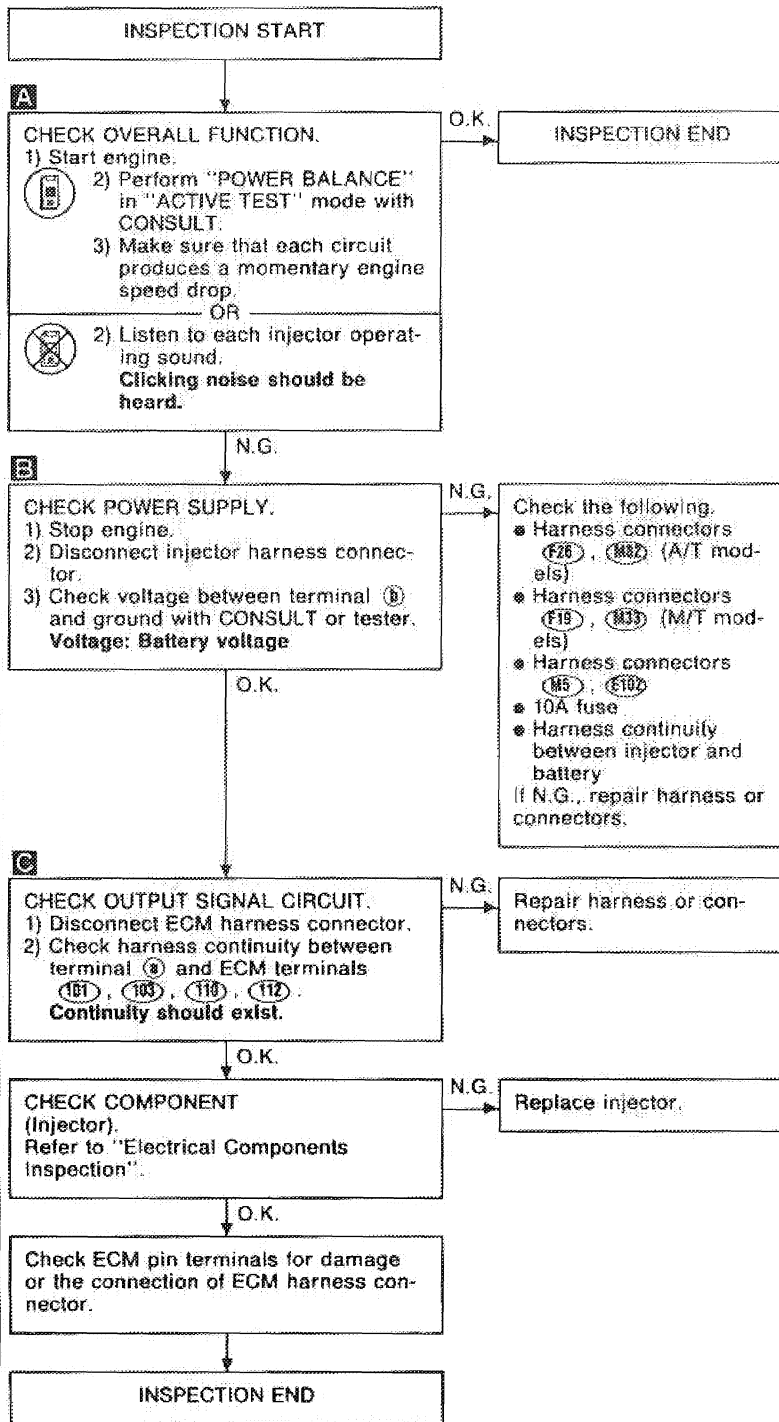
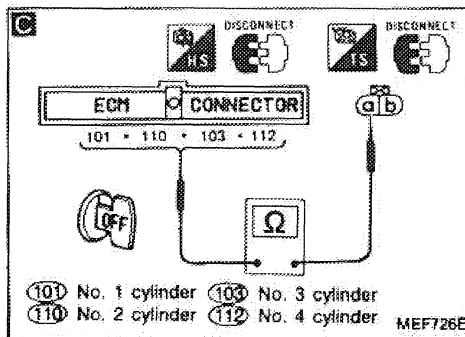
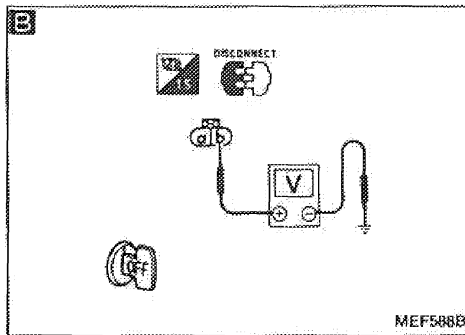
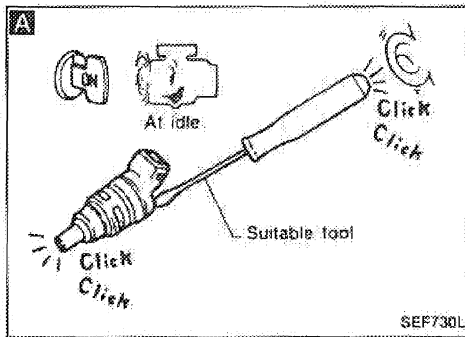
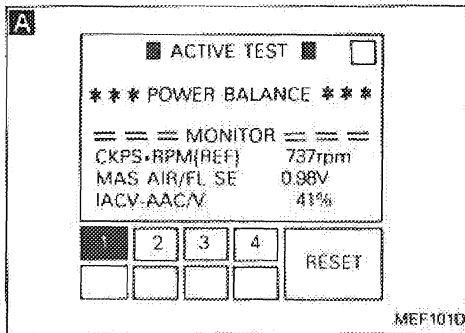


Harness layout



TROUBLE DIAGNOSES

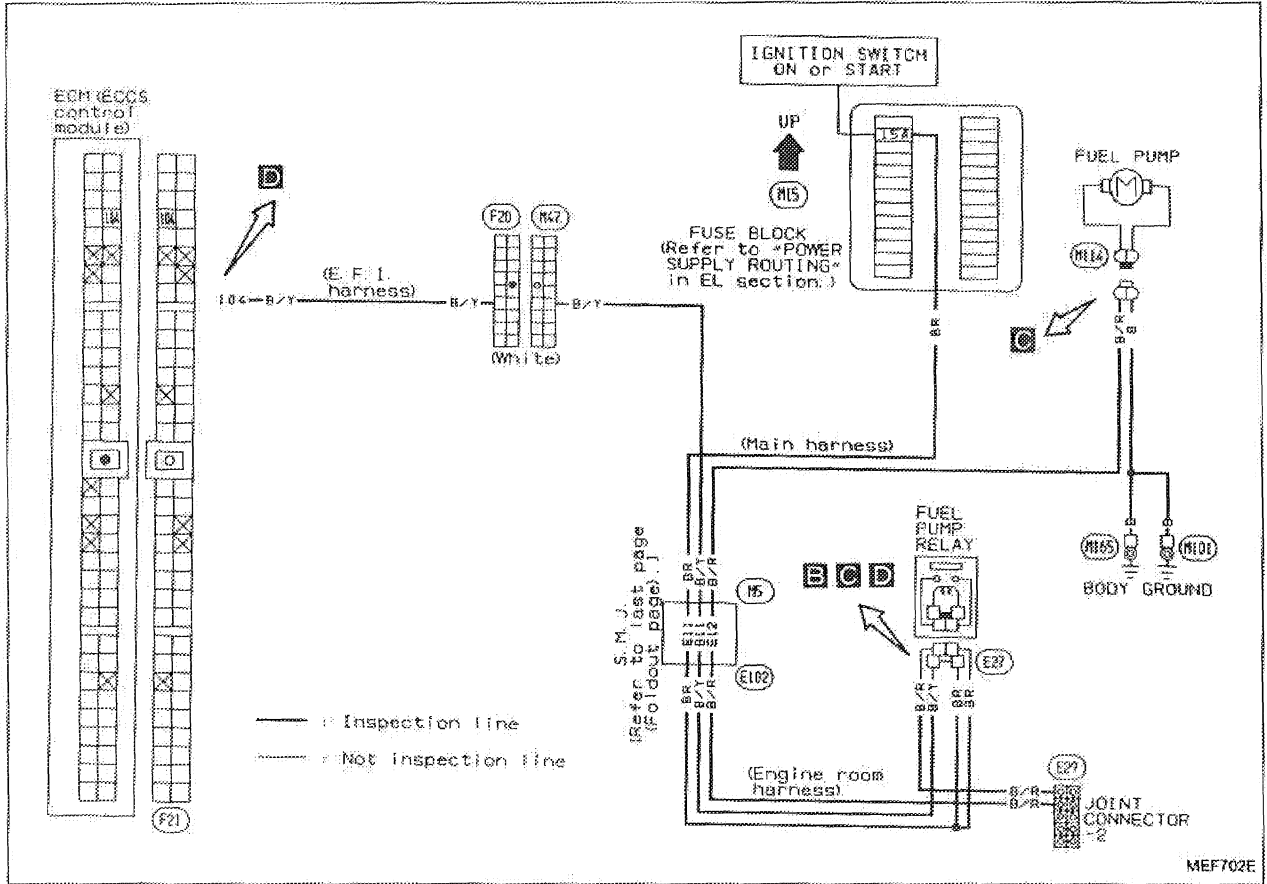
INJECTOR (Not self-diagnostic item)



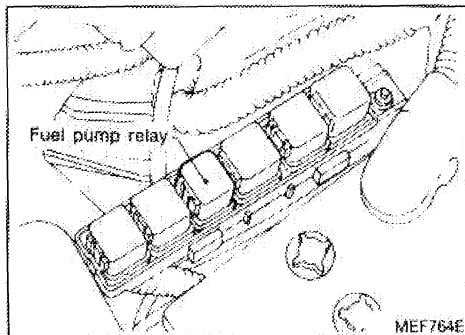
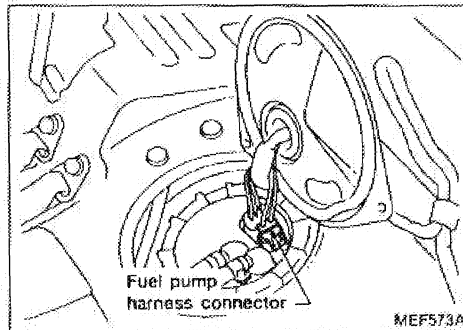
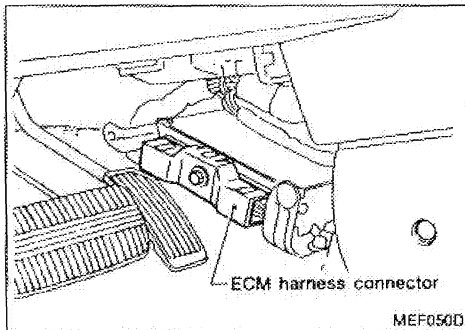
TROUBLE DIAGNOSES

Diagnostic Procedure 19

FUEL PUMP (Not self-diagnostic item)



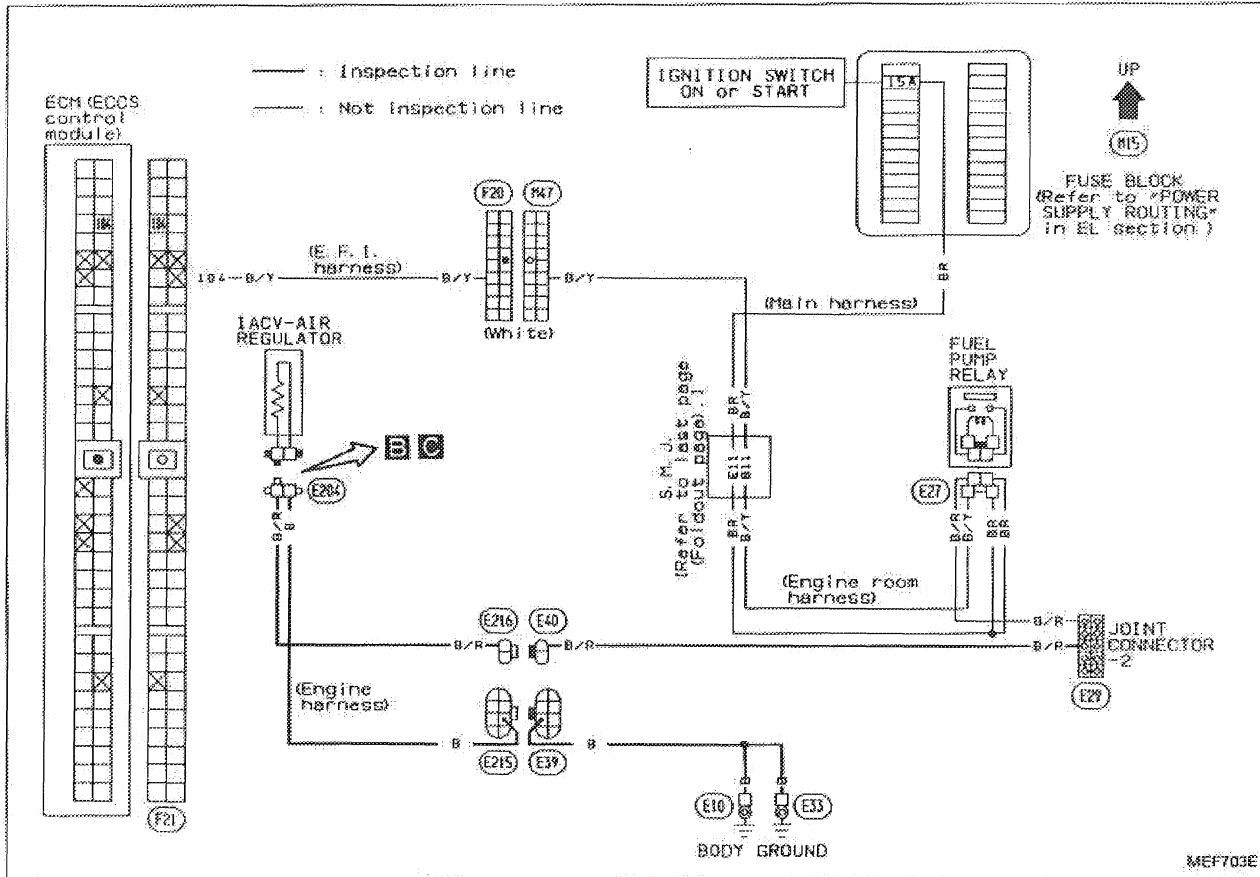
Harness layout



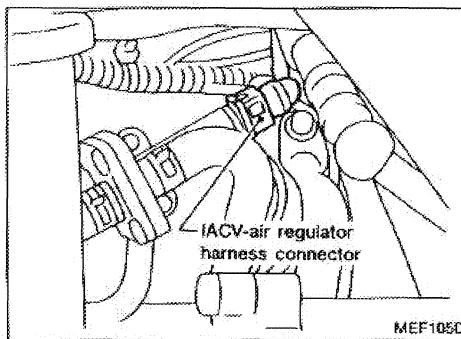
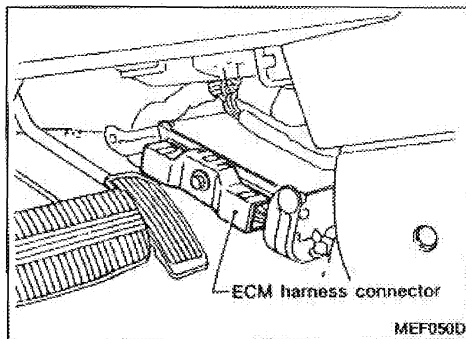
TROUBLE DIAGNOSES

Diagnostic Procedure 20

IACV-AIR REGULATOR (Not self-diagnostic item)



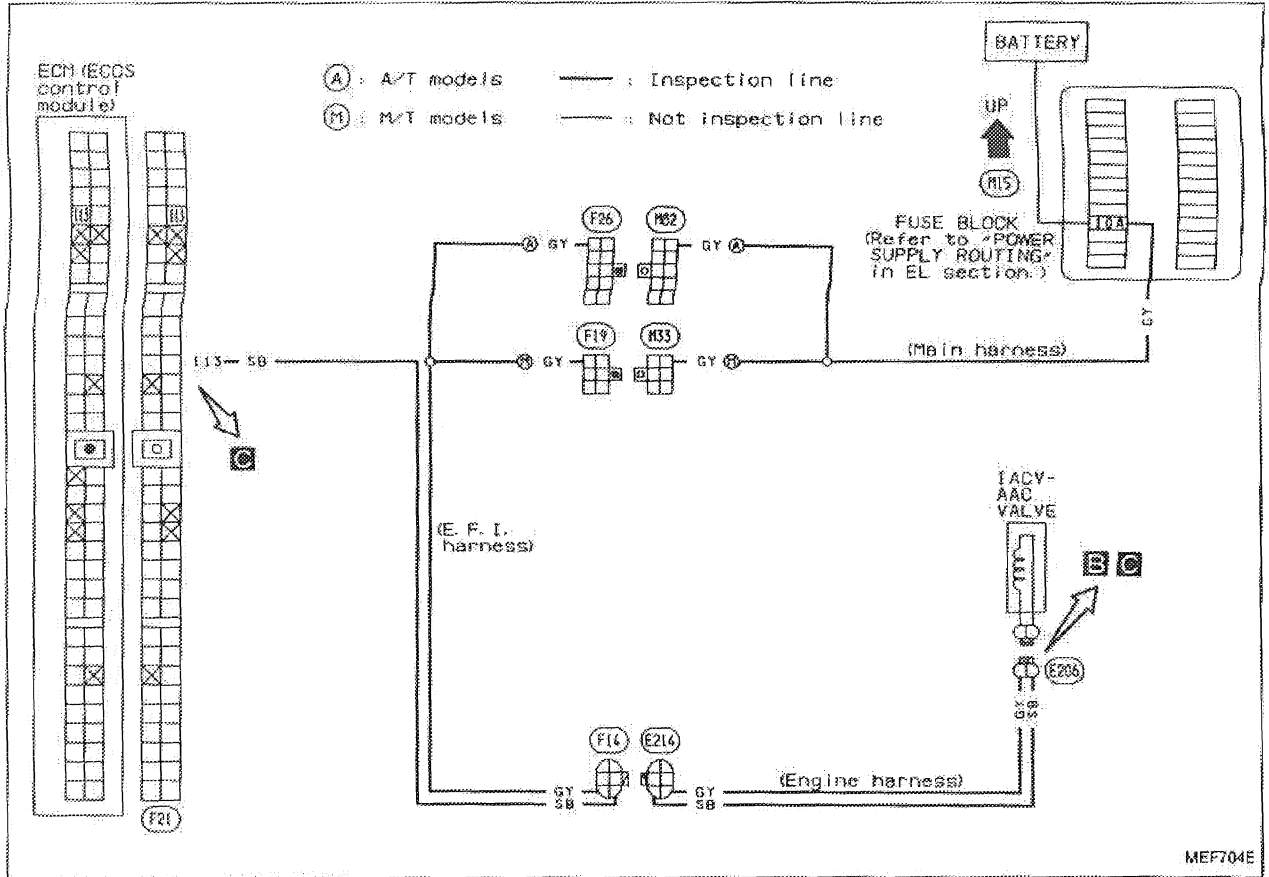
Harness layout



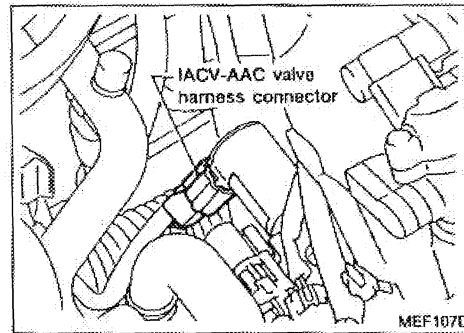
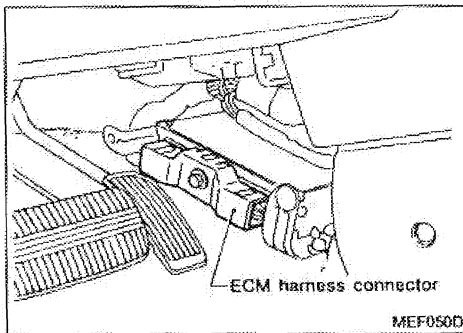
TROUBLE DIAGNOSES

Diagnostic Procedure 21

IACV-AAC VALVE (Not self-diagnostic item)



Harness layout



TROUBLE DIAGNOSES

IACV-AAC VALVE (Not self-diagnostic item)

A

■ IACV-AAC/V SYSTEM ■

LET ENGINE IDLE
THEN
TOUCH START
(A/C SW, LIGHT SW OFF)

NEXT START

MEF108D

A

■ ACTIVE TEST ■

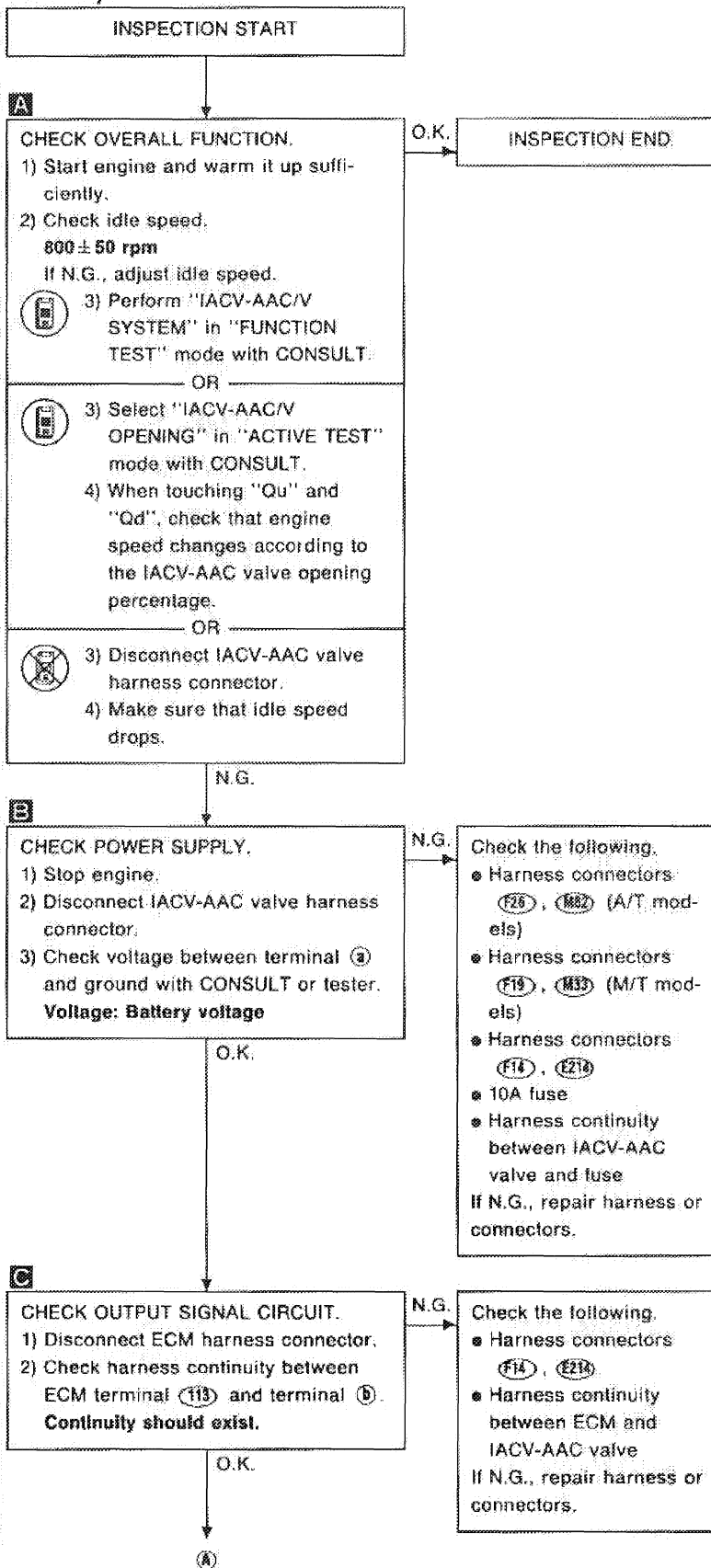
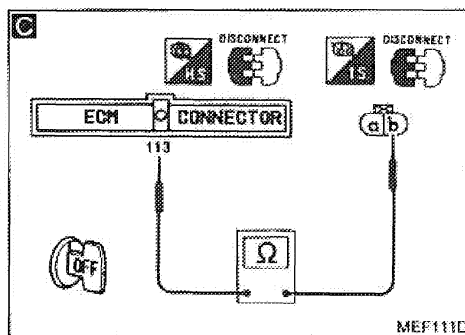
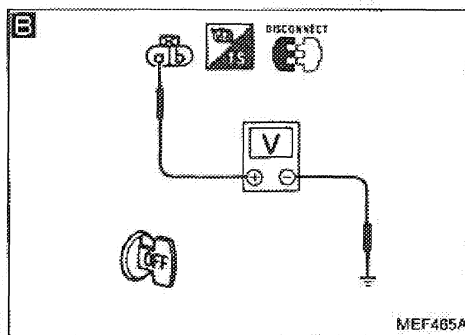
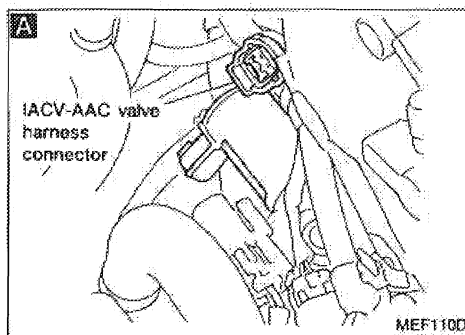
IACV-AAC/V OPENING 26%

=== MONITOR ===

CKPS-RPM (REF) 800rpm
MAS AIR/FL SE 1.49V
COOLAN TEMP/S 92°C

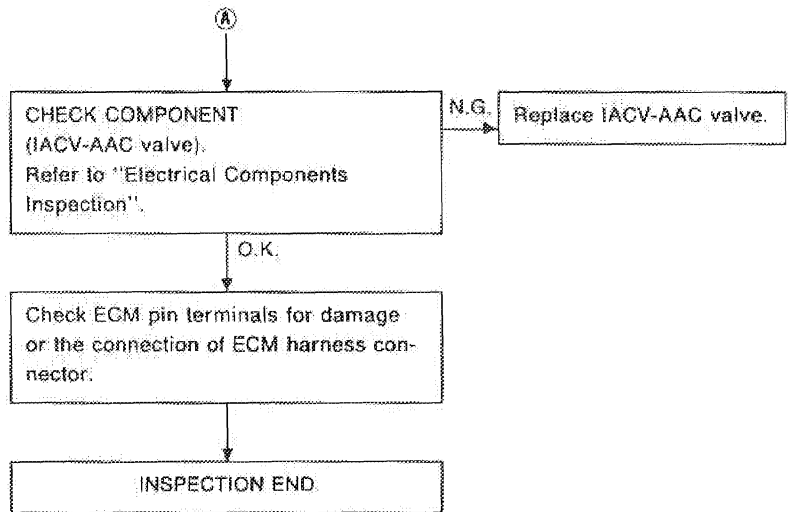
Qu UP DWN Qd

MEF109D



TROUBLE DIAGNOSES

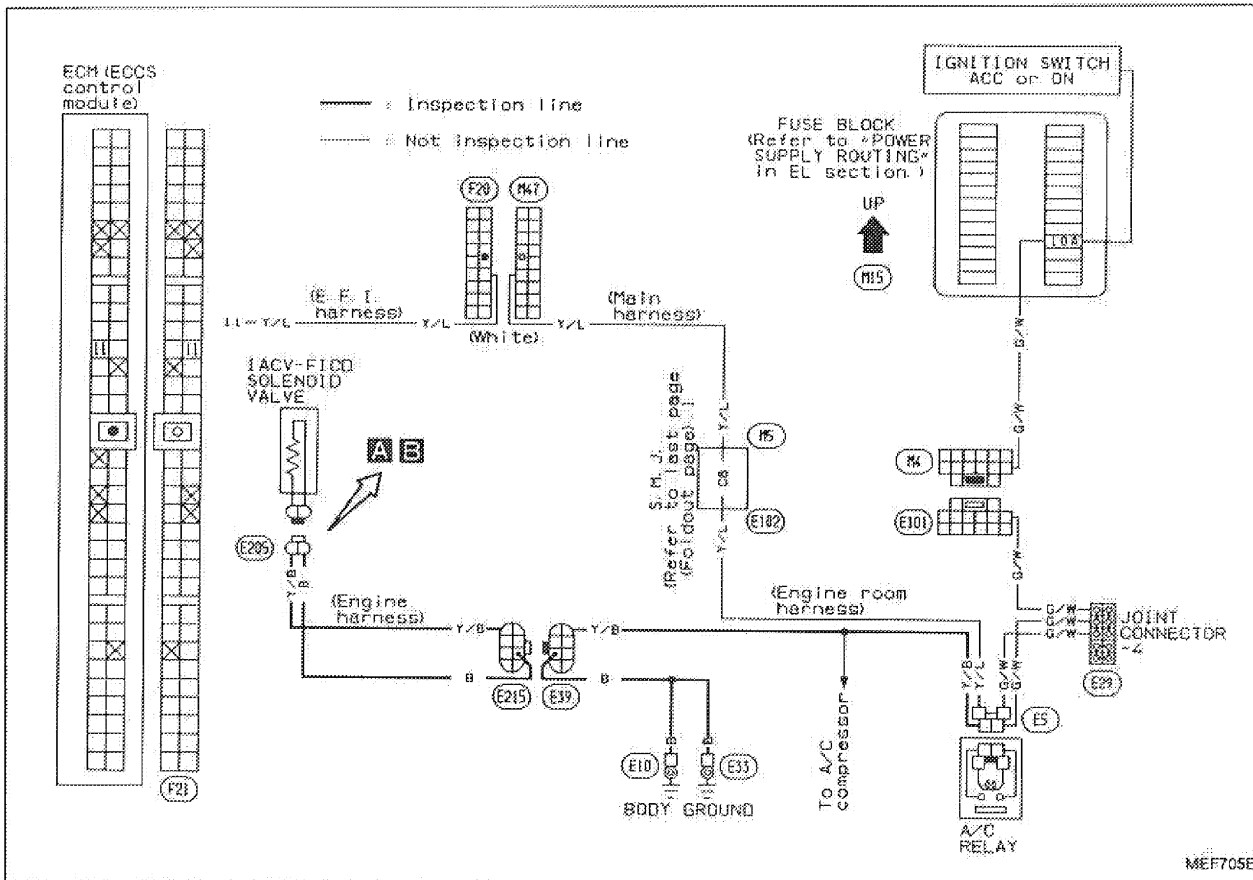
IACV-AAC VALVE (Not self-diagnostic item)



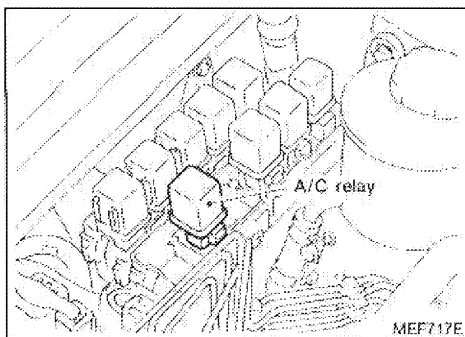
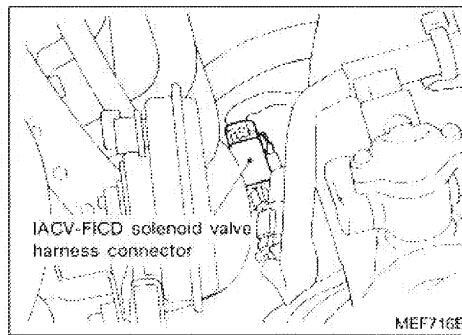
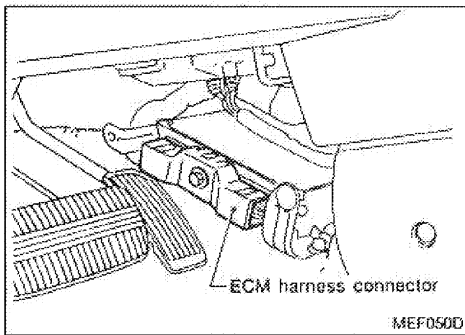
TROUBLE DIAGNOSES

Diagnostic Procedure 22

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

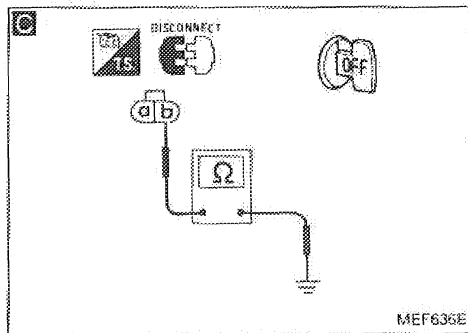
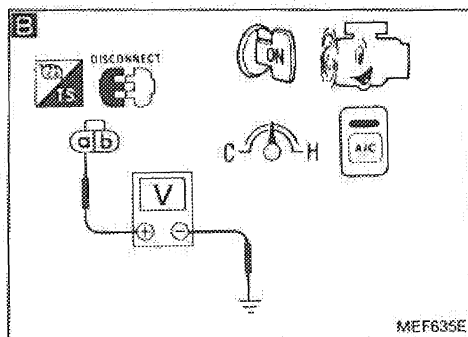
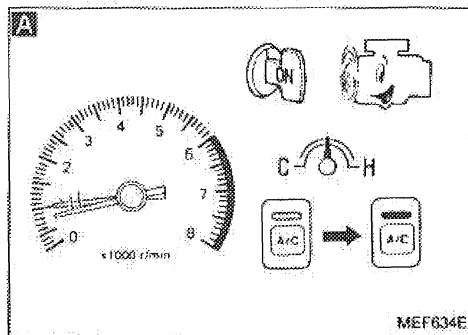


Harness layout



TROUBLE DIAGNOSES

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 (E18), (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.

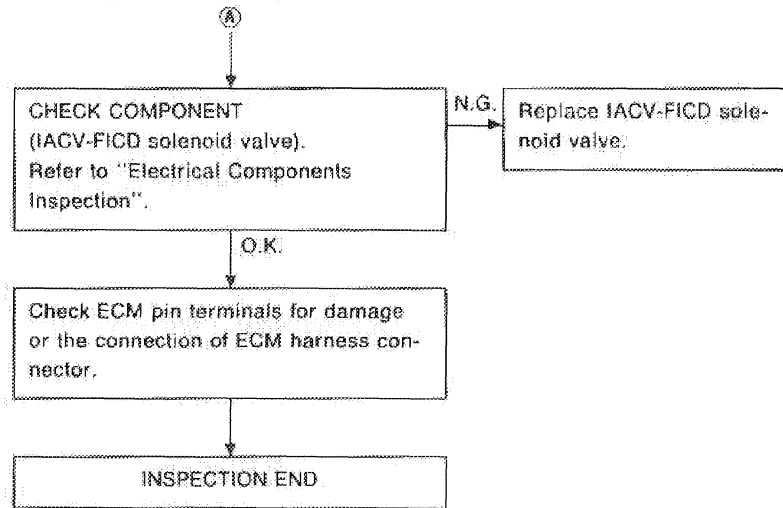
- Harness connectors (E18), (E39)
- Harness continuity between IACV-FICD solenoid valve and body ground

If N.G., repair harness or connectors.

(A)

TROUBLE DIAGNOSES

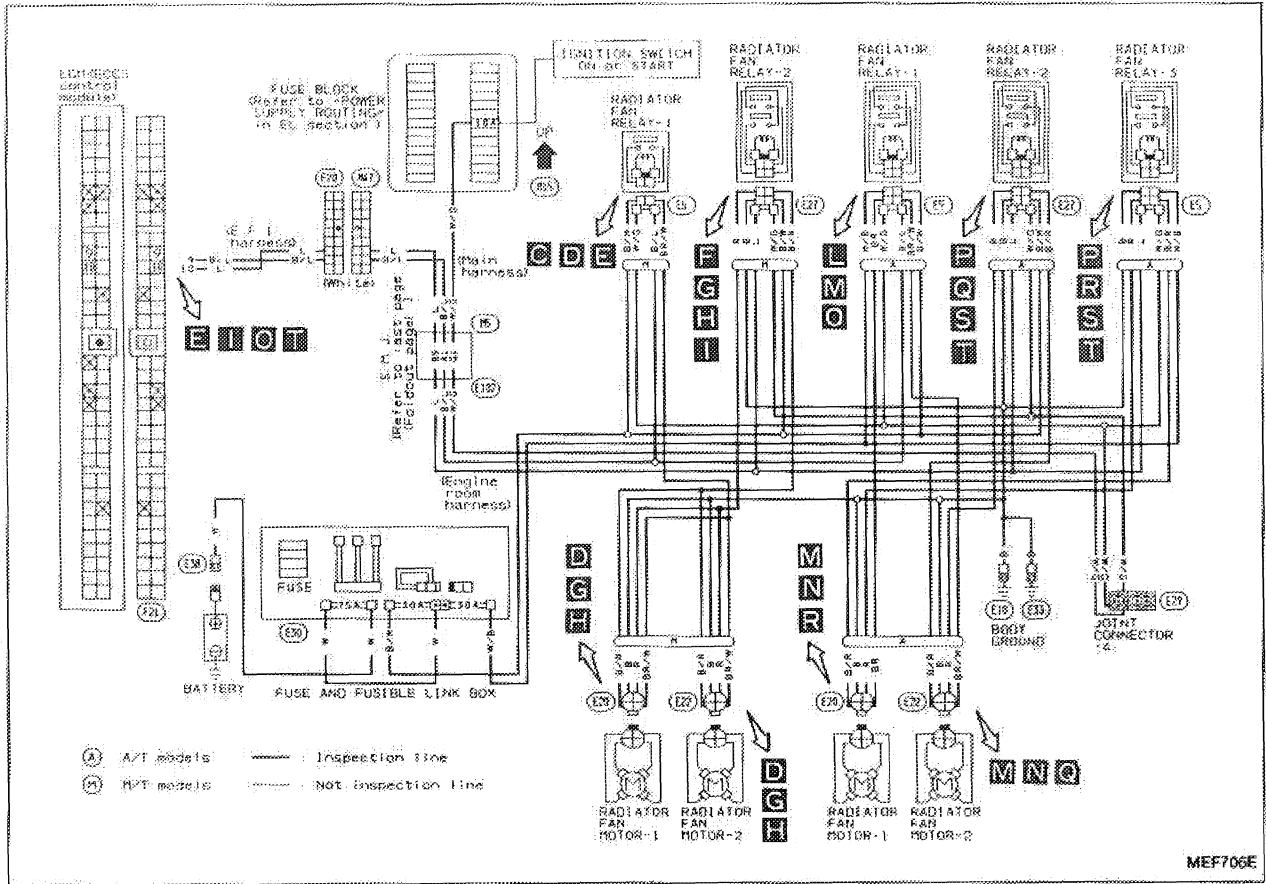
IACV-FICD SOLENOID VALVE (Not self-diagnostic item)



TROUBLE DIAGNOSES

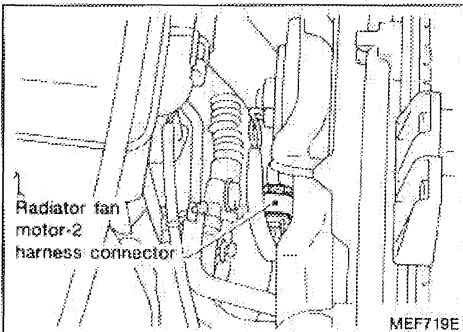
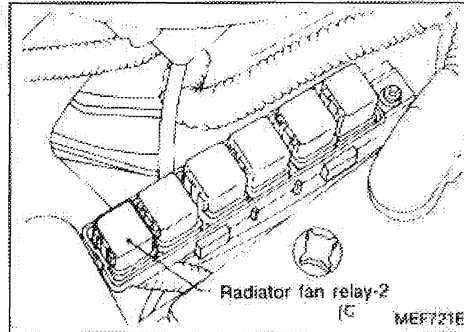
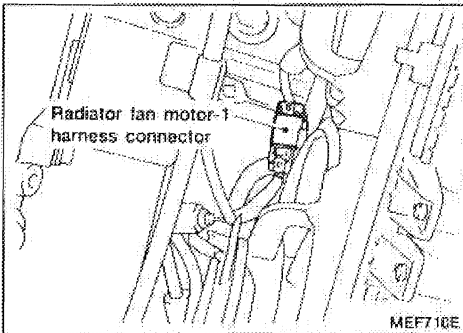
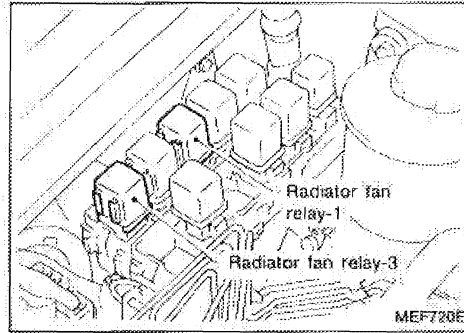
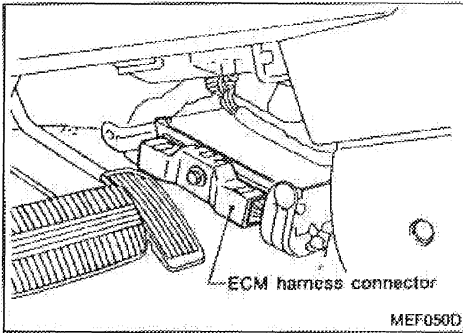
Diagnostic Procedure 23

RADIATOR FAN CONTROL (Not self-diagnostic item)



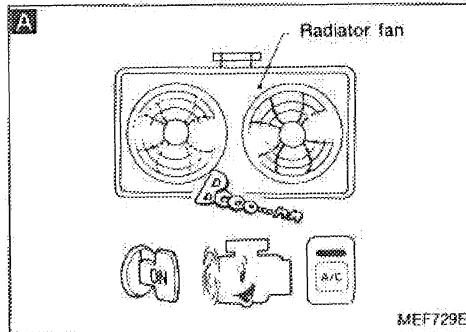
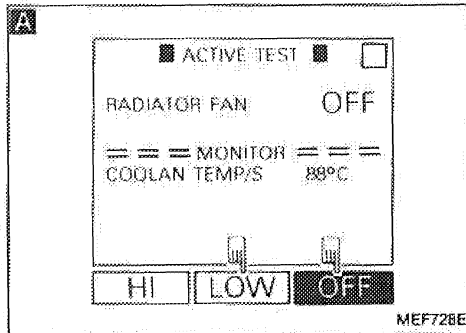
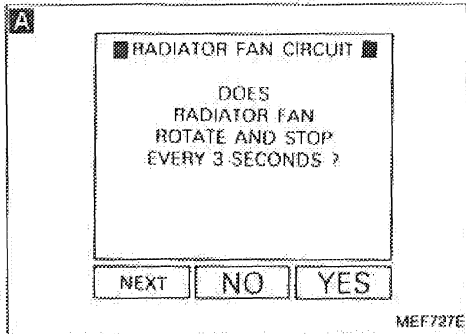
TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)



TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)



M/T models

INSPECTION START

A

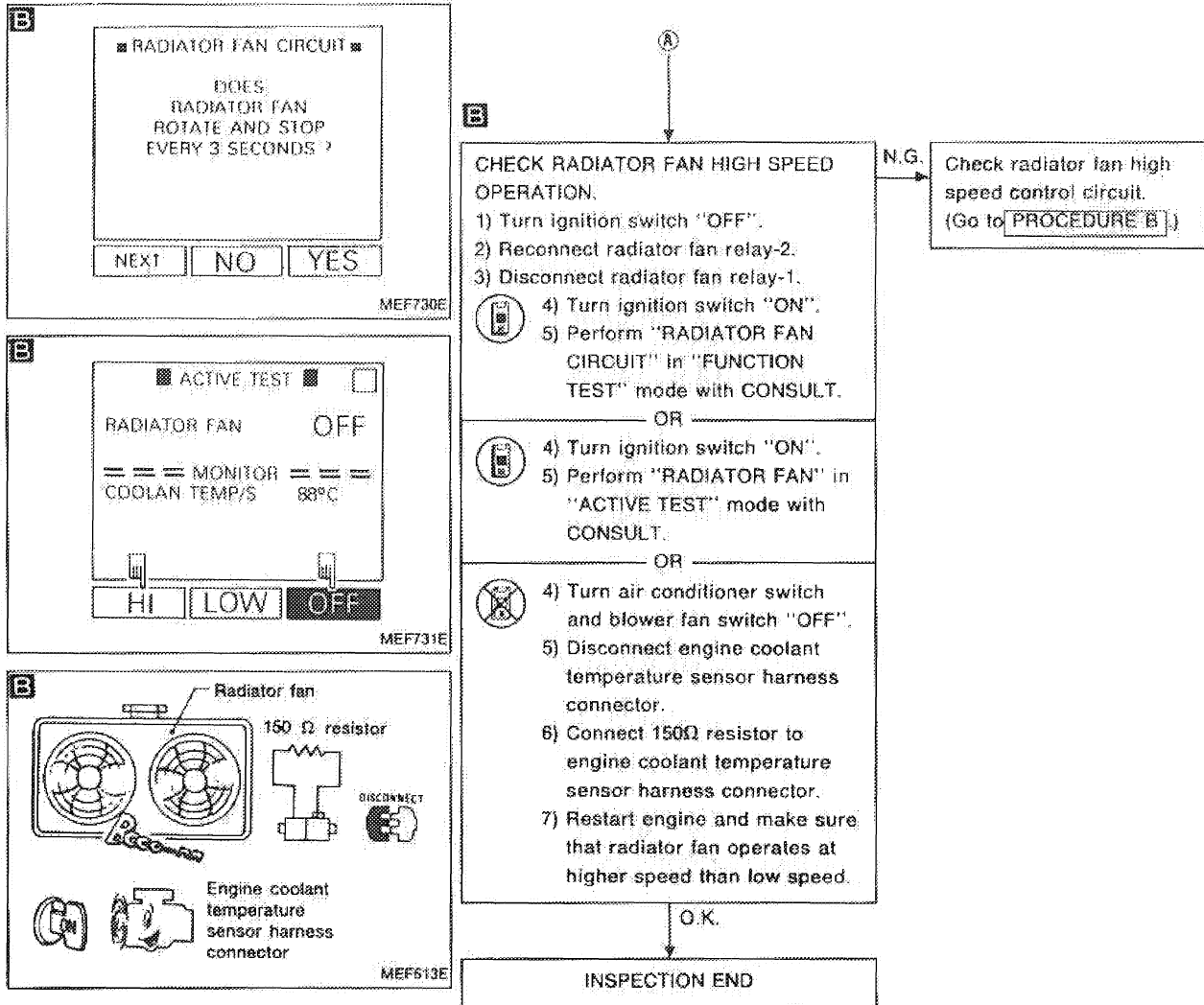
- CHECK RADIATOR FAN LOW SPEED OPERATION.**
- 1) Disconnect radiator fan relay-2.
 - 2) Turn ignition switch "ON".
 - 3) Perform "RADIATOR FAN CIRCUIT" in "FUNCTION TEST" mode with CONSULT.
- OR
- 2) Turn ignition switch "ON".
 - 3) Perform "RADIATOR FAN" in "ACTIVE TEST" mode with CONSULT.
- OR
- 2) 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.
A

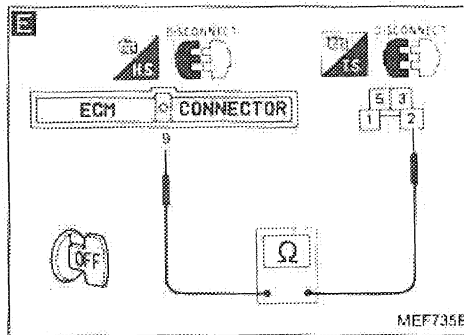
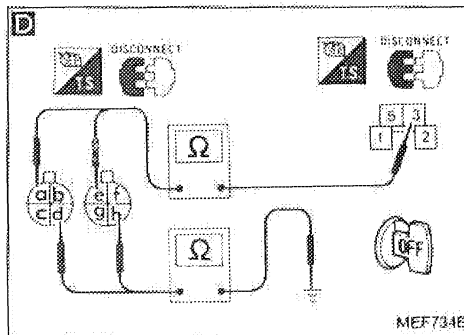
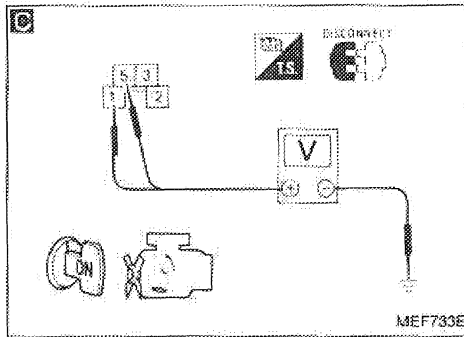
TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)



TROUBLE DIAGNOSES

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
 ● 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 ③, ⑧ and terminal ③, terminals ③, ⑧ 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
 ● ②③, ④④⑦
 ● Harness connectors
 ● ④⑤, ⑤⑧②
 ● Harness continuity between radiator fan relay-1 and ECM
 If N.G., repair harness or connectors.

O.K. ↓

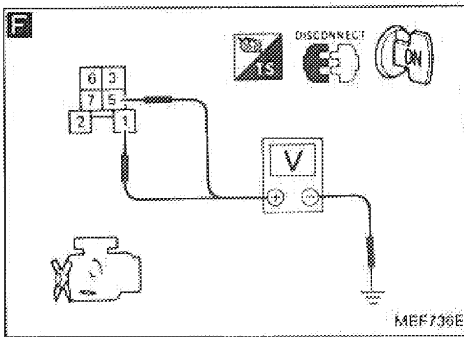
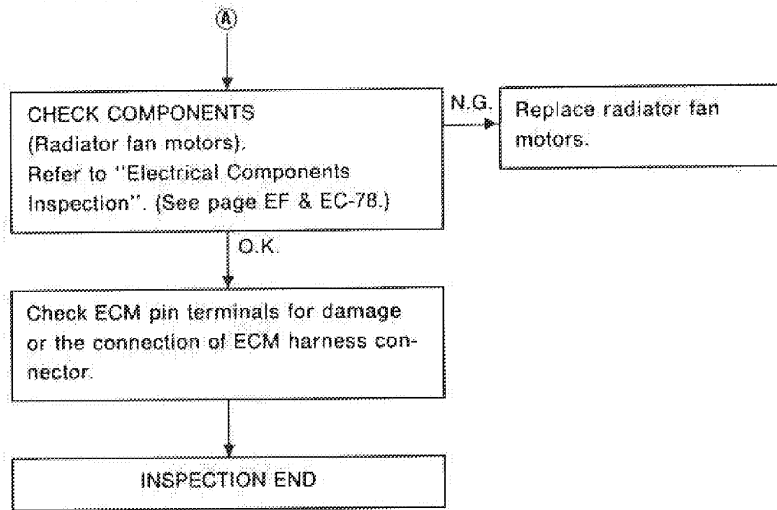
CHECK COMPONENT
 (Radiator fan relay-1).
 Refer to "Electrical Components Inspection".

N.G. → Replace radiator fan relay.

O.K. ↓
 Ⓐ

TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)

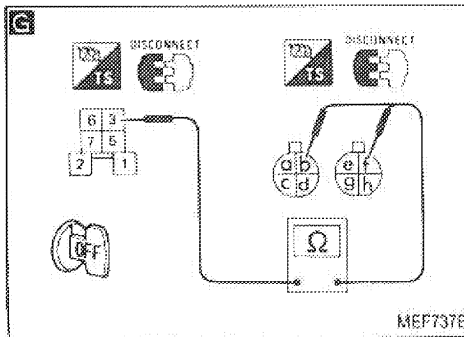


PROCEDURE B

INSPECTION START

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

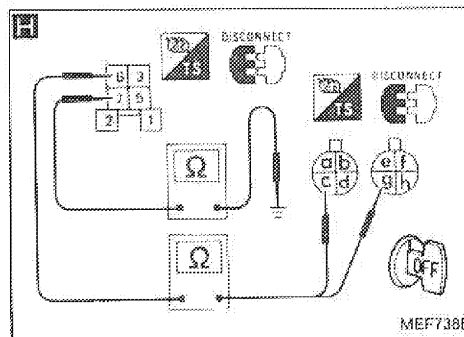
N.G. → Check the following.
 ● Harness connectors
 ● 10A fuse
 ● 30A fusible link
 ● 75A fusible link
 ● Joint connector-4
 ● Harness continuity between radiator fan relay-2 and fuse
 ● Harness continuity between radiator fan relay-2 and battery
 If N.G., repair harness or connectors.



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.
 3) Check harness continuity between terminal ③ and terminals ⑥, ⑦.
Continuity should exist.
 4) Check harness continuity between terminal ⑥ and terminals ⑧, ⑨, terminal ⑦ and body ground.
Continuity should exist.

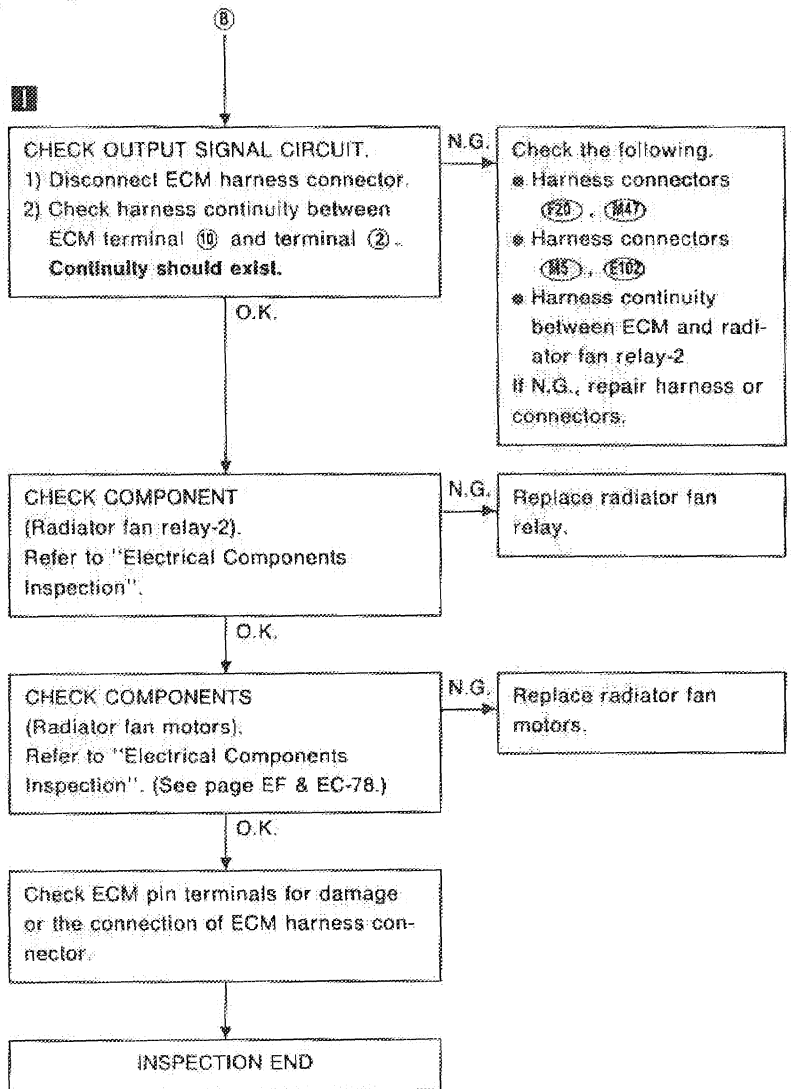
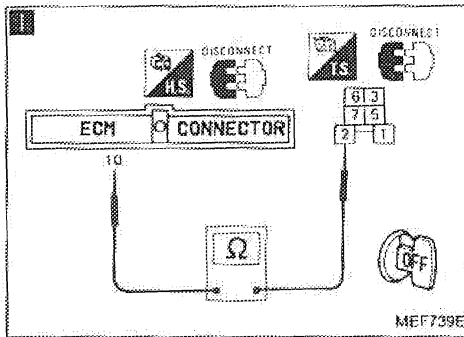
N.G. → Repair harness or connectors.



O.K. →
 (B)

TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)



TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)

U

■ RADIATOR FAN CIRCUIT ■

DOES
RADIATOR FAN
ROTATE AND STOP
EVERY 3 SECONDS ?

NEXT NO YES

MEF740E

U

■ ACTIVE TEST ■

RADIATOR FAN OFF

== MONITOR ==

COOLAN TEMP/S 88°C

HI LOW OFF

MEF741E

U

Radiator fan

MEF742E

A/T models

INSPECTION START

U

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.
Ⓐ

TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)

■ RADIATOR FAN CIRCUIT ■

DOES
RADIATOR FAN
ROTATE AND STOP
EVERY 3 SECONDS.?

MEF743E

■ ACTIVE TEST ■

RADIATOR FAN OFF

== == MONITOR == ==

COOLANT TEMP/S 88°C

MEF744E

Radiator fan

150 Ω resistor

DISCONNECT

Engine coolant temperature sensor harness connector

MEF613E

A

K

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.

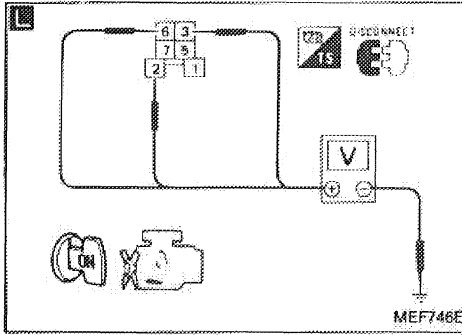
N.G. → Check radiator fan high speed control circuit. (Go to [PROCEDURE D].)

O.K.

INSPECTION END

TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)

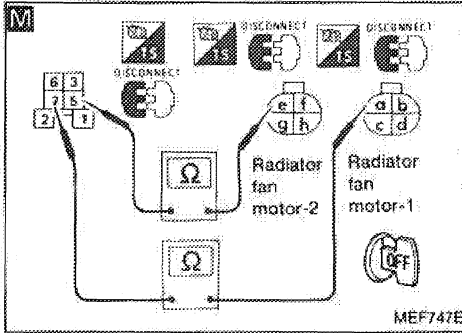


PROCEDURE C

INSPECTION START

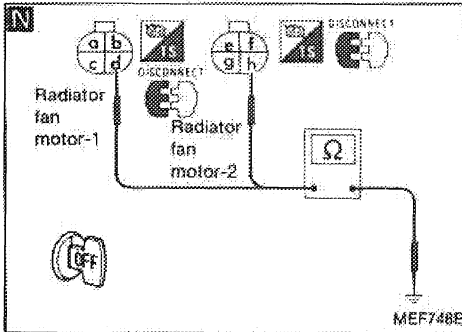
CHECK POWER SUPPLY.
 1) Stop engine.
 2) Disconnect radiator fan relay-1.
 3) Turn ignition switch "ON".
 4) Check voltage between terminals ②, ③, ⑥ and ground with CONSULT or tester.
Voltage: Battery voltage

N.G. → Check the following.
 ● Harness connectors (M3, 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.



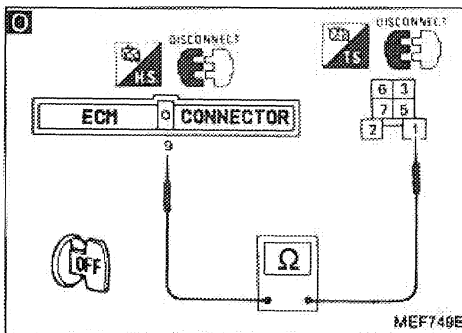
CHECK GROUND CIRCUIT.
 1) Turn ignition switch "OFF".
 2) Disconnect radiator fan motor-1 harness connector and radiator fan motor-2 harness connector.
 3) Check harness continuity between terminal ⑦ and terminal ⑧, terminal ⑤ and terminal ⑥.
Continuity should exist.
 4) Check harness continuity between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

N.G. → Repair harness or connectors.



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, M47)
 ● Harness connectors (M3, E102)
 ● Harness continuity between radiator fan relay-1 and ECM
 If N.G., repair harness or connectors.



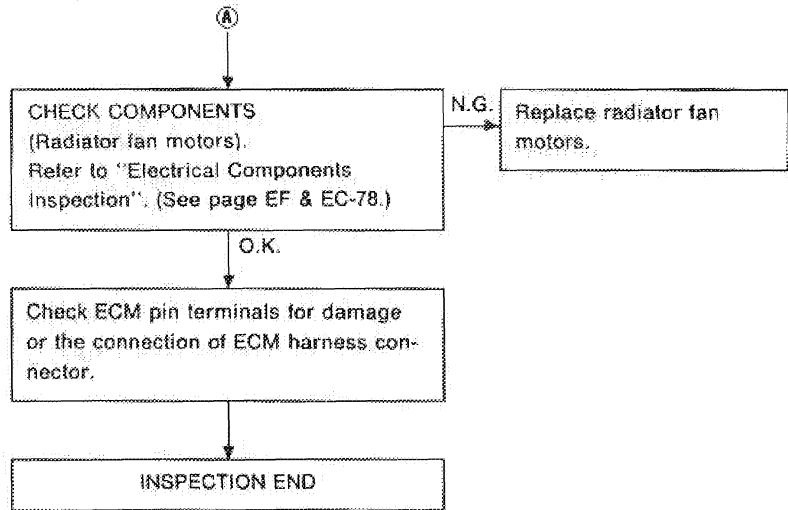
CHECK COMPONENT (Radiator fan relay-1).
 Refer to "Electrical Components Inspection".

N.G. → Replace radiator fan relay.

O.K.
 (A)

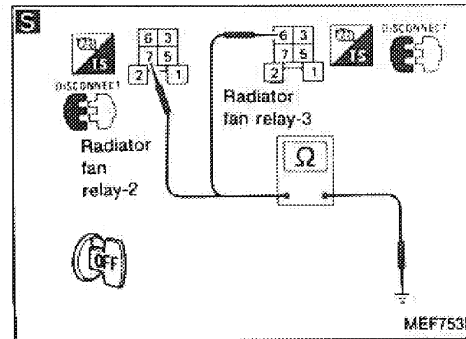
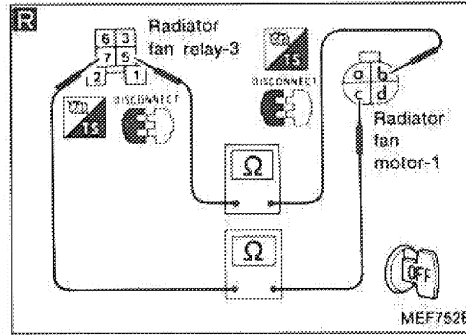
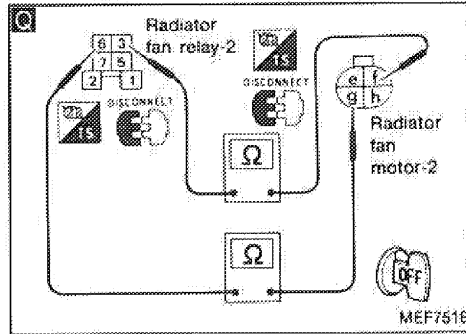
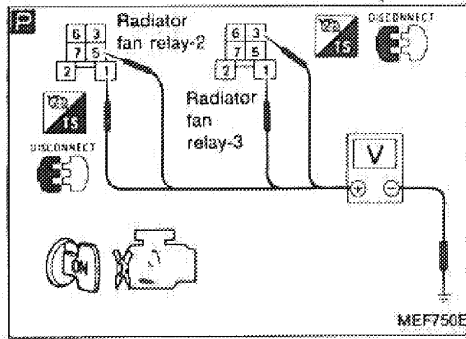
TROUBLE DIAGNOSES

RADIATOR FAN CONTROL (Not self-diagnostic item)



TROUBLE DIAGNOSES

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), (E18)
- 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. ↓

R 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 ① (Radiator fan motor-2), terminal ⑥ (Radiator fan relay-2) and terminal ② (Radiator fan motor-2).
Continuity should exist.
- R** 4) Check harness continuity between terminal ⑤ (Radiator fan relay-3) and terminal ④ (Radiator fan motor-1), terminal ⑦ (Radiator fan relay-3) and terminal ③ (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.

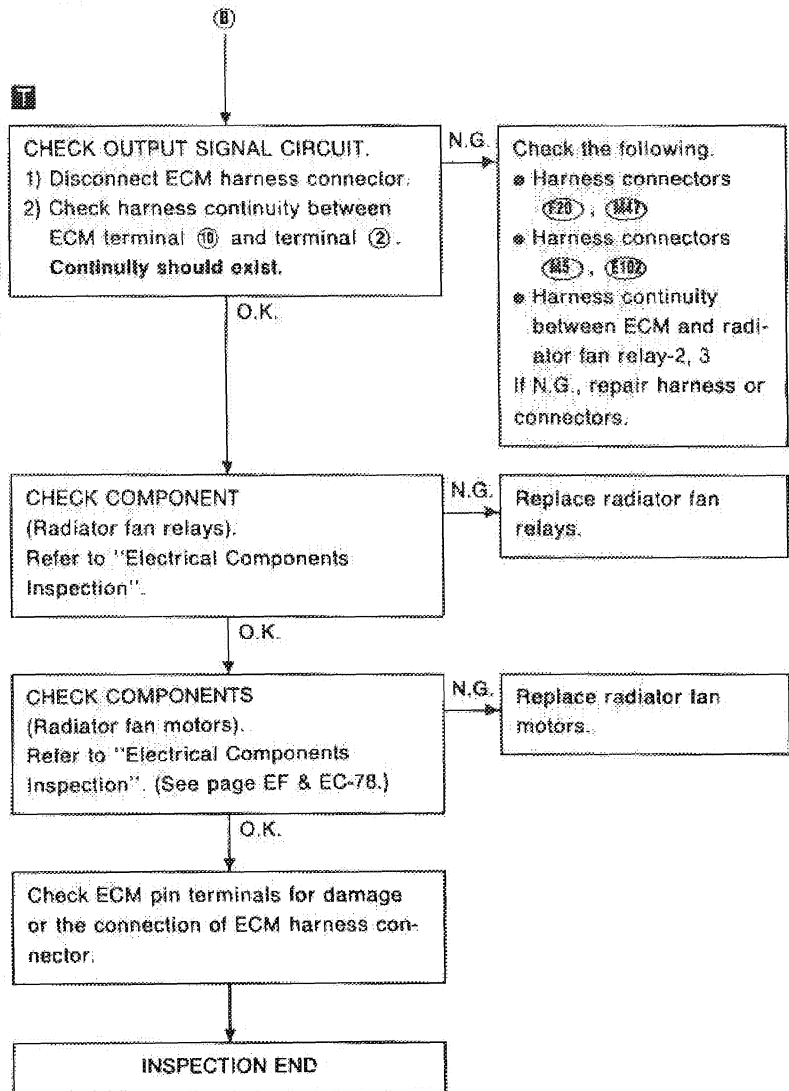
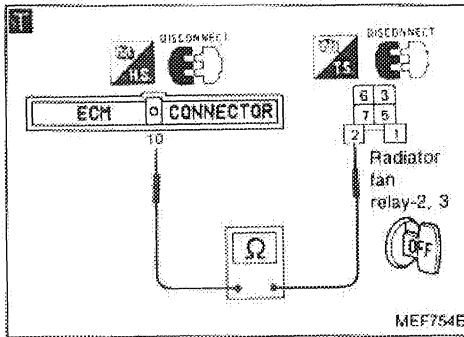
N.G. → Repair harness or connectors.

O.K. ↓

⑧

TROUBLE DIAGNOSES

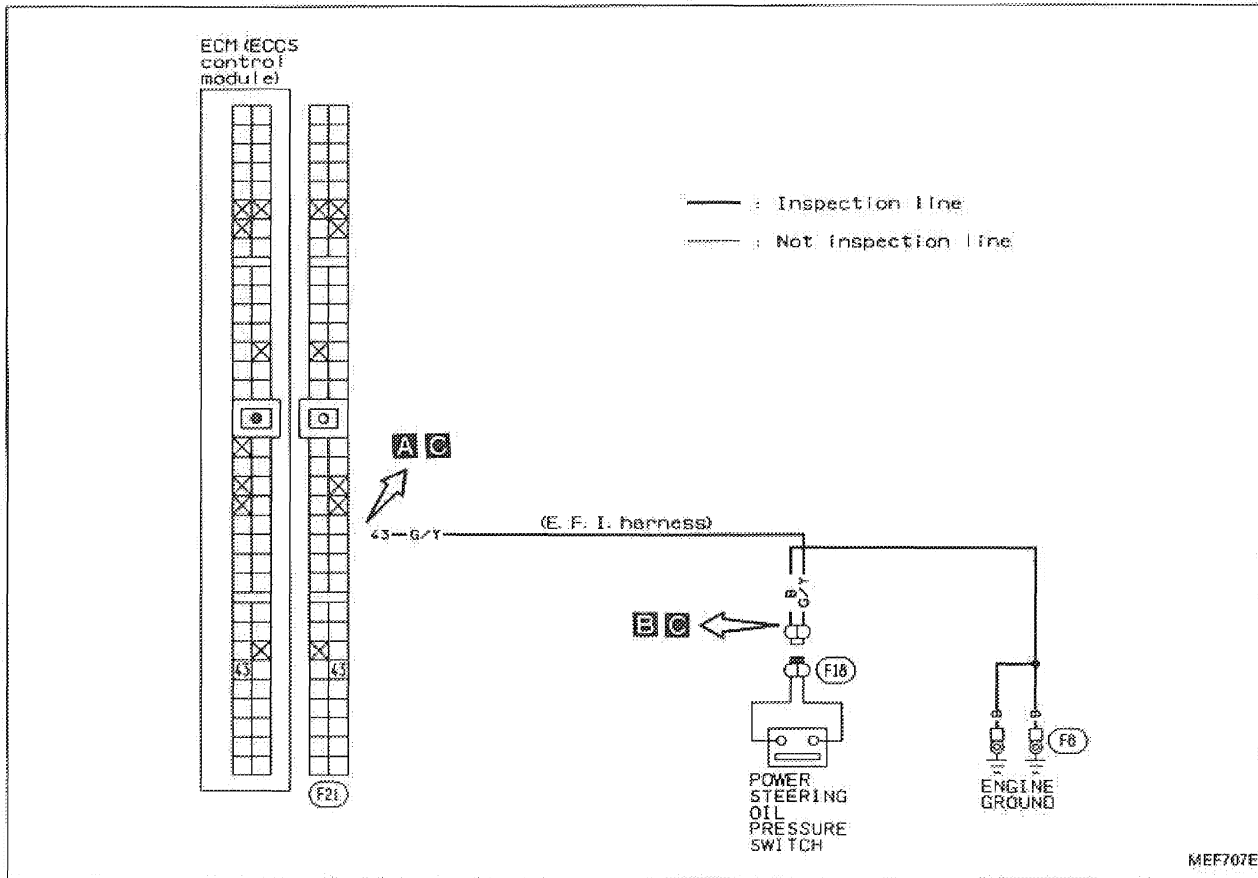
RADIATOR FAN CONTROL (Not self-diagnostic item)



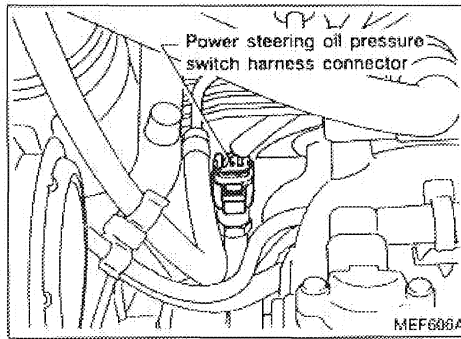
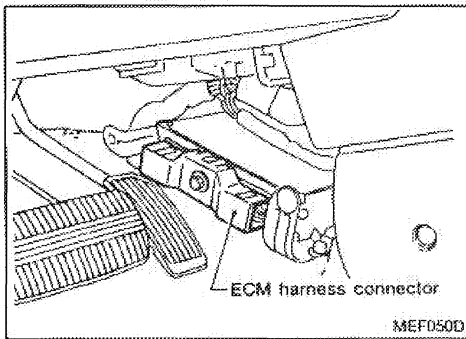
TROUBLE DIAGNOSES

Diagnostic Procedure 24

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



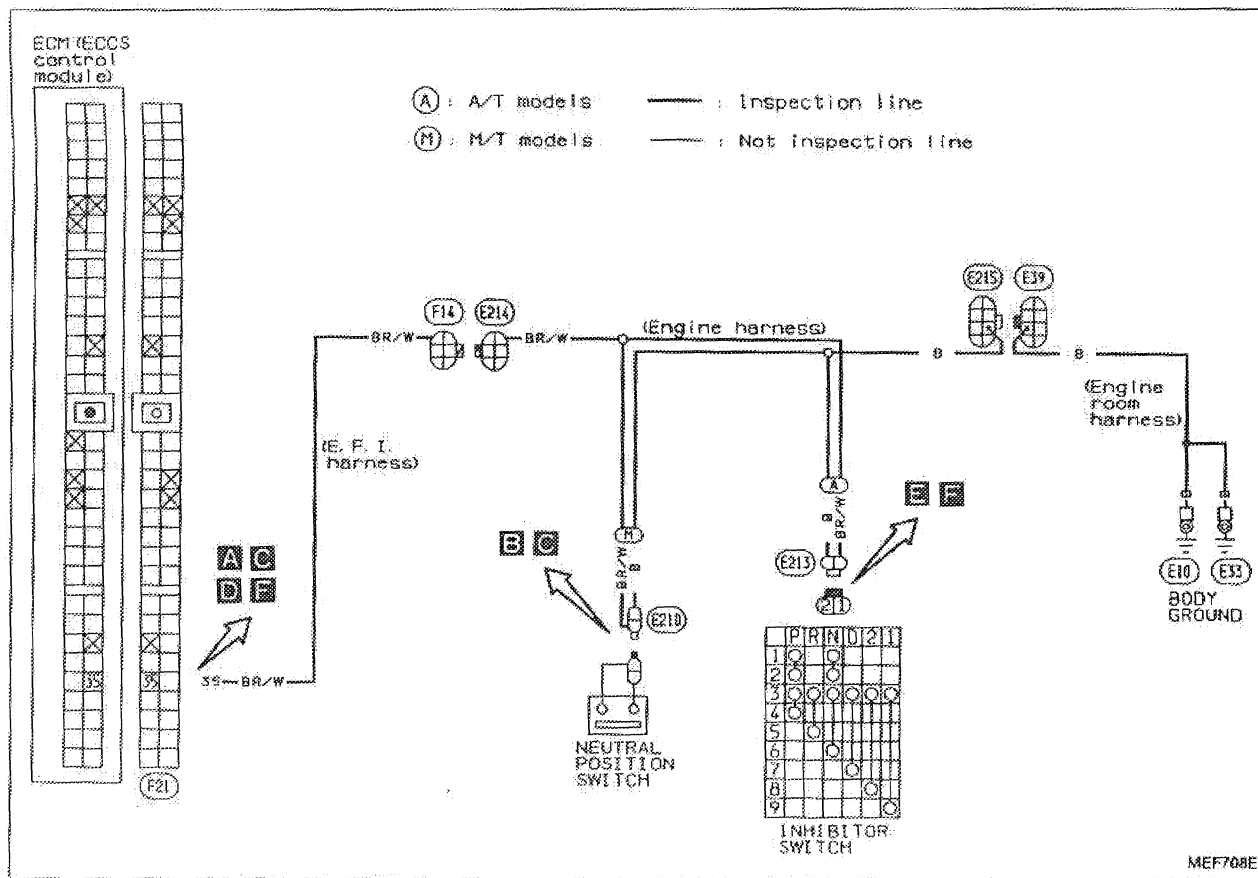
Harness layout



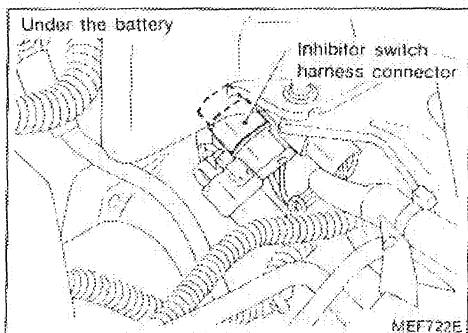
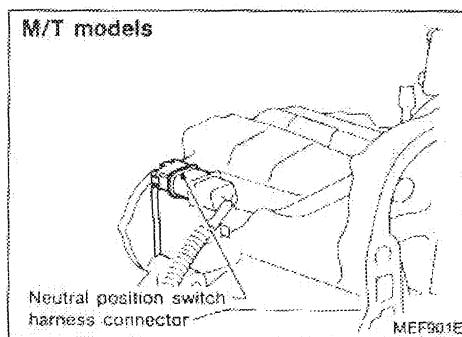
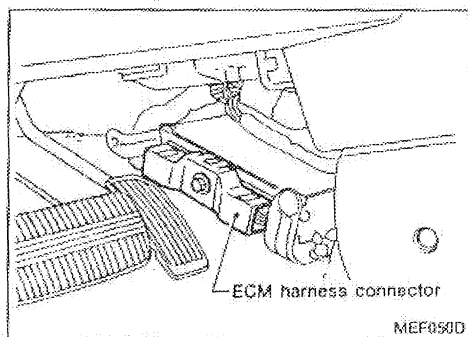
TROUBLE DIAGNOSES

Diagnostic Procedure 25

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

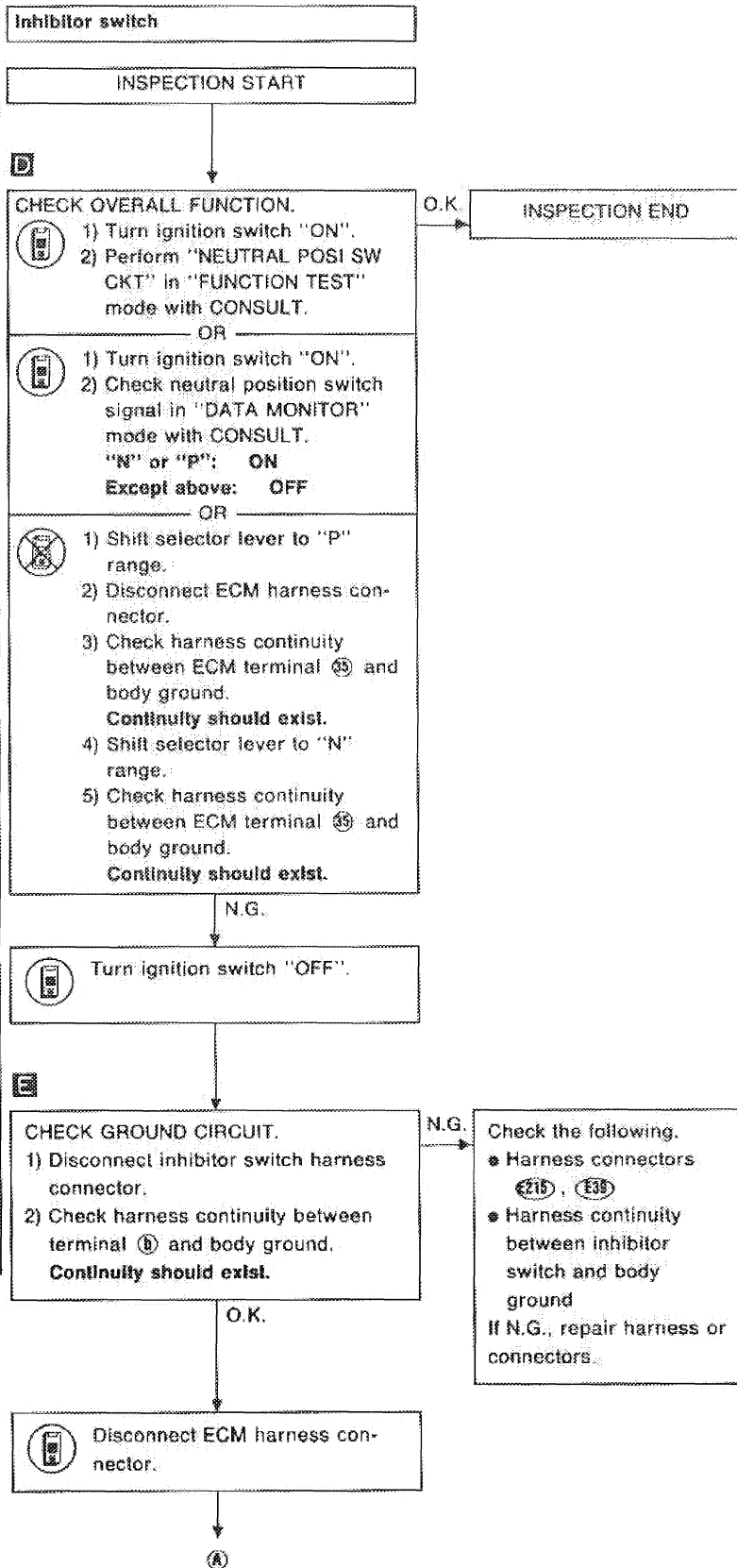
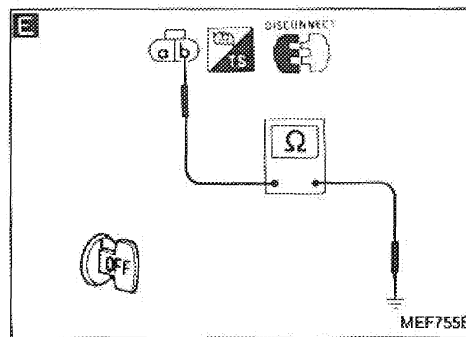
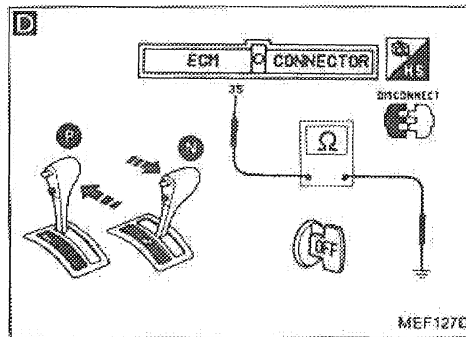
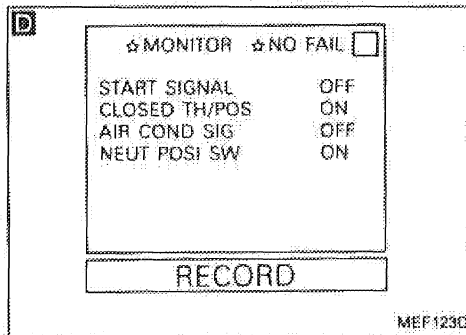
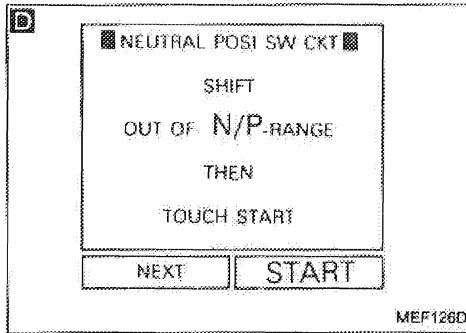


Harness layout



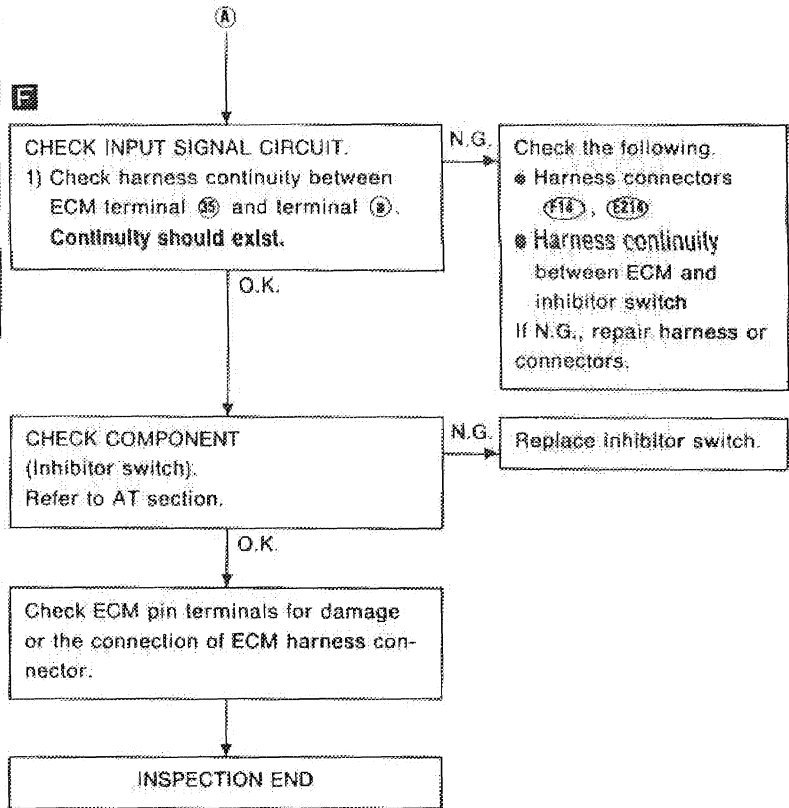
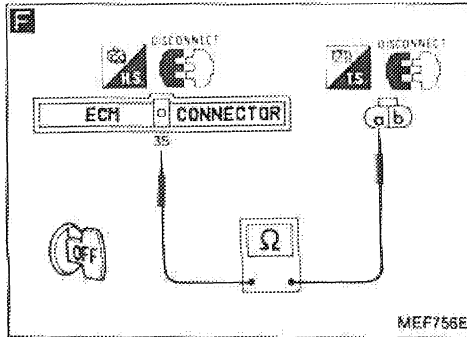
TROUBLE DIAGNOSES

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

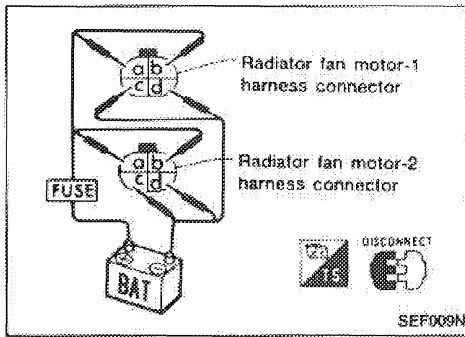


TROUBLE DIAGNOSES

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



TROUBLE DIAGNOSES



Electrical Components Inspection

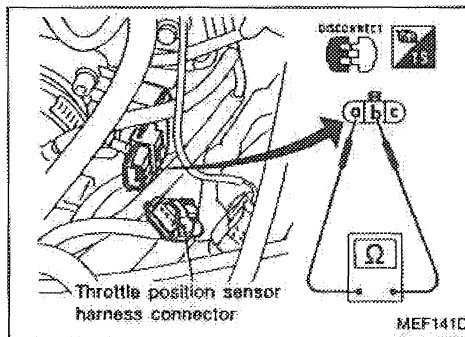
RADIATOR FAN MOTORS-1 AND -2

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	(b)	(c)
	High	(a, b)	(c, d)
Radiator fan motor-2	Low	(b)	(c)
	High	(a, b)	(c, d)

Radiator fan motor should operate.

If N.G., replace radiator fan motor.

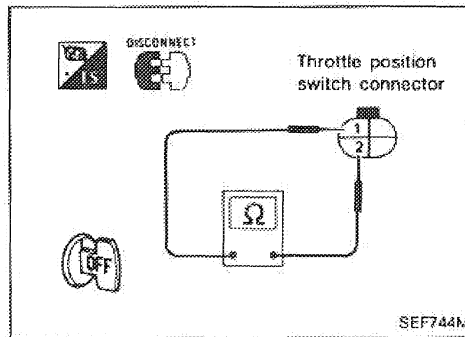


THROTTLE POSITION SENSOR

1. Disconnect throttle position sensor harness connector.
2. Make sure that resistance between terminals (a) and (b) 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

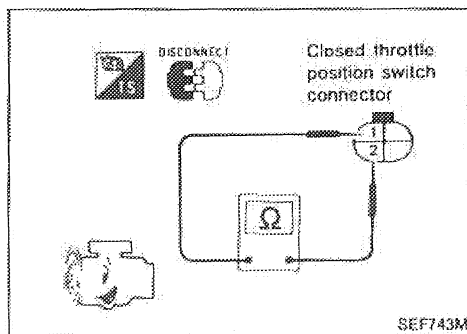
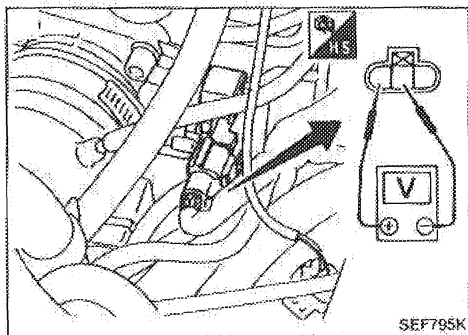
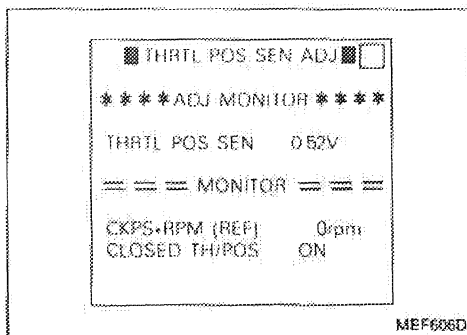
If N.G., replace closed throttle position switch.

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:

TROUBLE DIAGNOSES

Electrical Components Inspection (Cont'd)



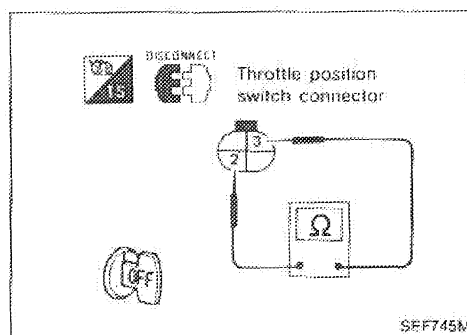
MT model;

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 continually 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.

CLUTCH

SECTION **CL**

MODIFICATION NOTICE:

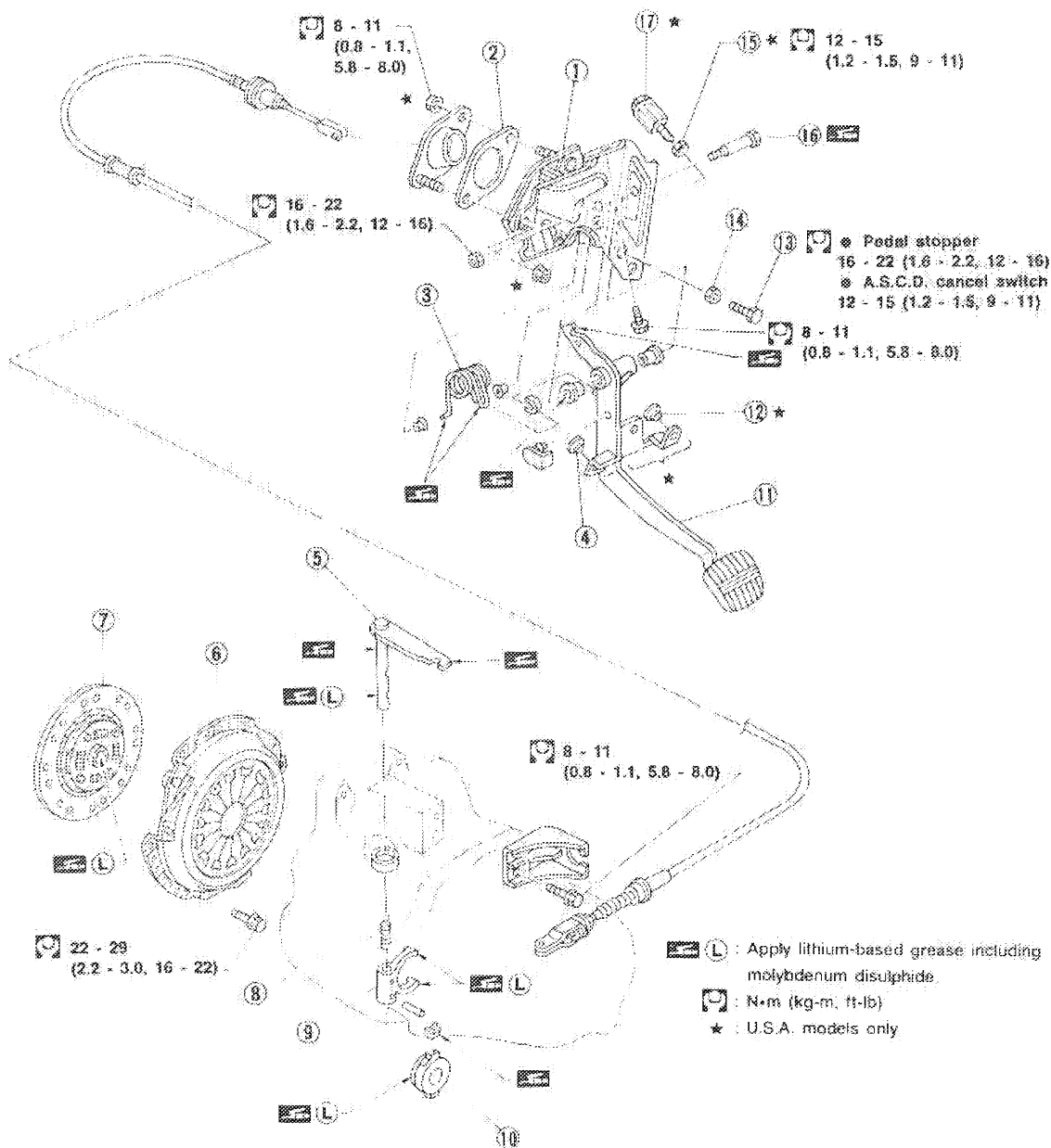
The clutch cover has been changed.

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CLUTCH SYSTEM	2	SERVICE DATA AND SPECIFICATIONS (S.D.S.)	5
CLUTCH DISC AND CLUTCH COVER	3	General Specifications.....	5
Clutch Disc	3	Inspection and Adjustment.....	5
Clutch Cover and Flywheel	4		



CLUTCH SYSTEM



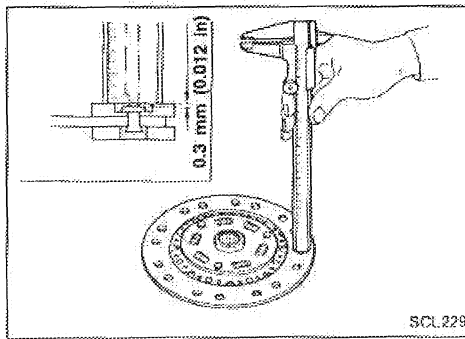
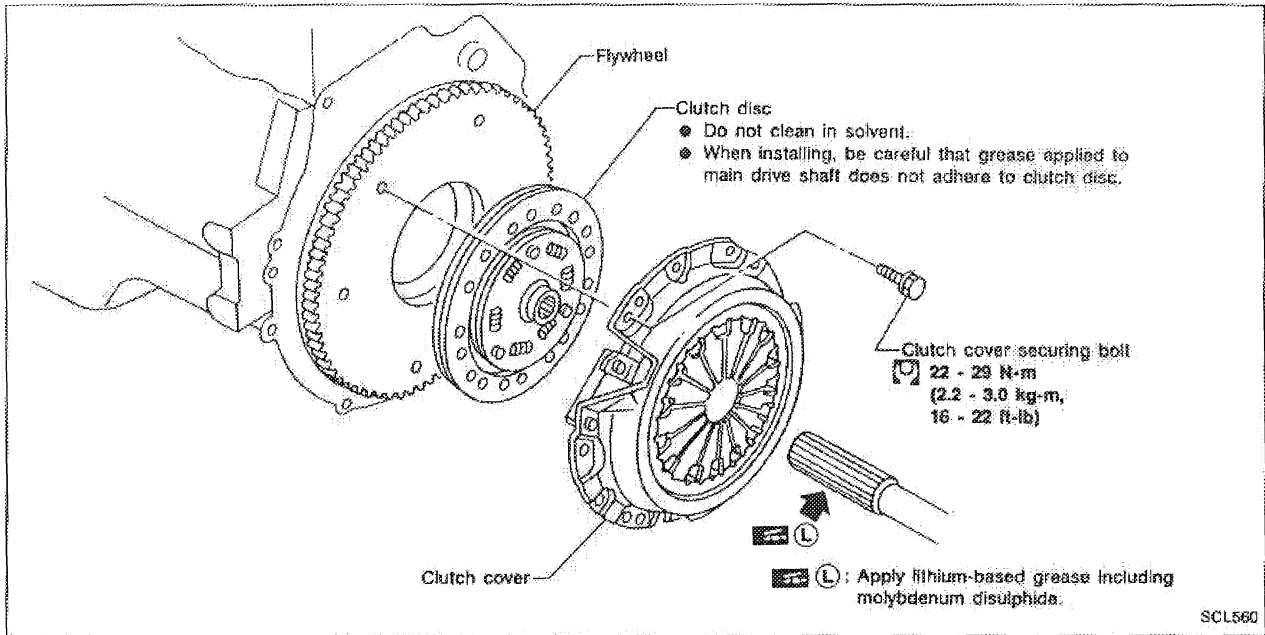
SCL569

- 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 AND CLUTCH COVER

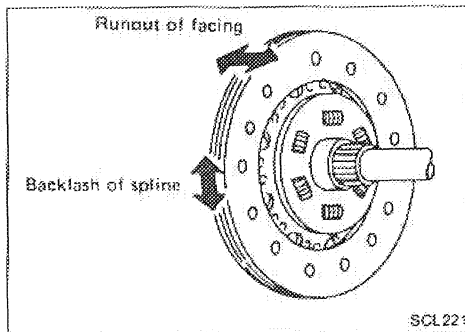


Clutch Disc

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 DISC AND CLUTCH COVER

Clutch Cover and Flywheel

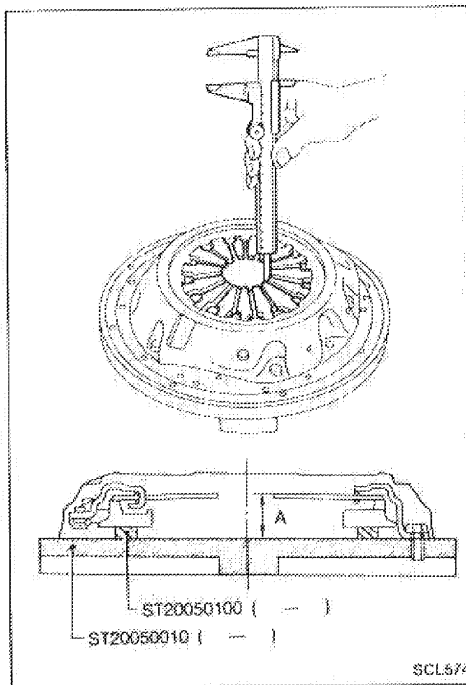
INSPECTION AND ADJUSTMENT

- 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)

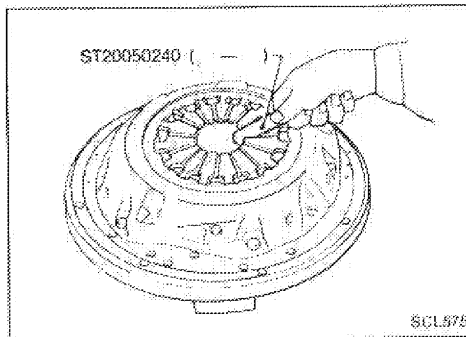
- Check thrust rings for wear or damage by shaking cover assembly and listening for chattering noise, or lightly hammering on rivets for a slightly cracked noise. Replace clutch cover assembly if necessary.
- Check pressure plate and clutch disc contact surface for slight burns or discoloration. Repair 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)



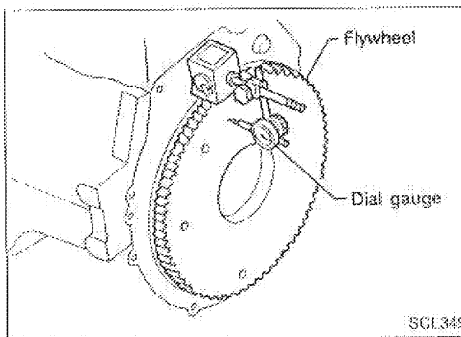
FLYWHEEL INSPECTION

- Check contact surface of flywheel for slight burns or discoloration. Repair flywheel with emery paper.
- Check flywheel runout.

Runout (Total indicator reading):

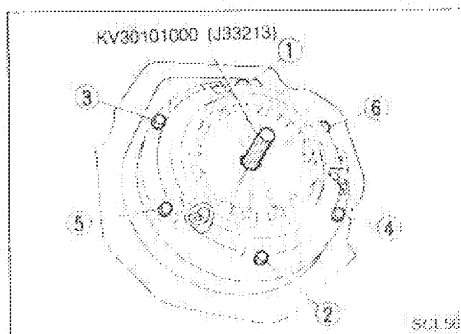
Flywheel

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.



SERVICE DATA AND SPECIFICATIONS (S.D.S.)

General Specifications

CLUTCH DISC

Unit: mm (in)

Engine	SR20DE
Model	215
Facing size (Outer dia. x inner dia. x thick- ness)	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.

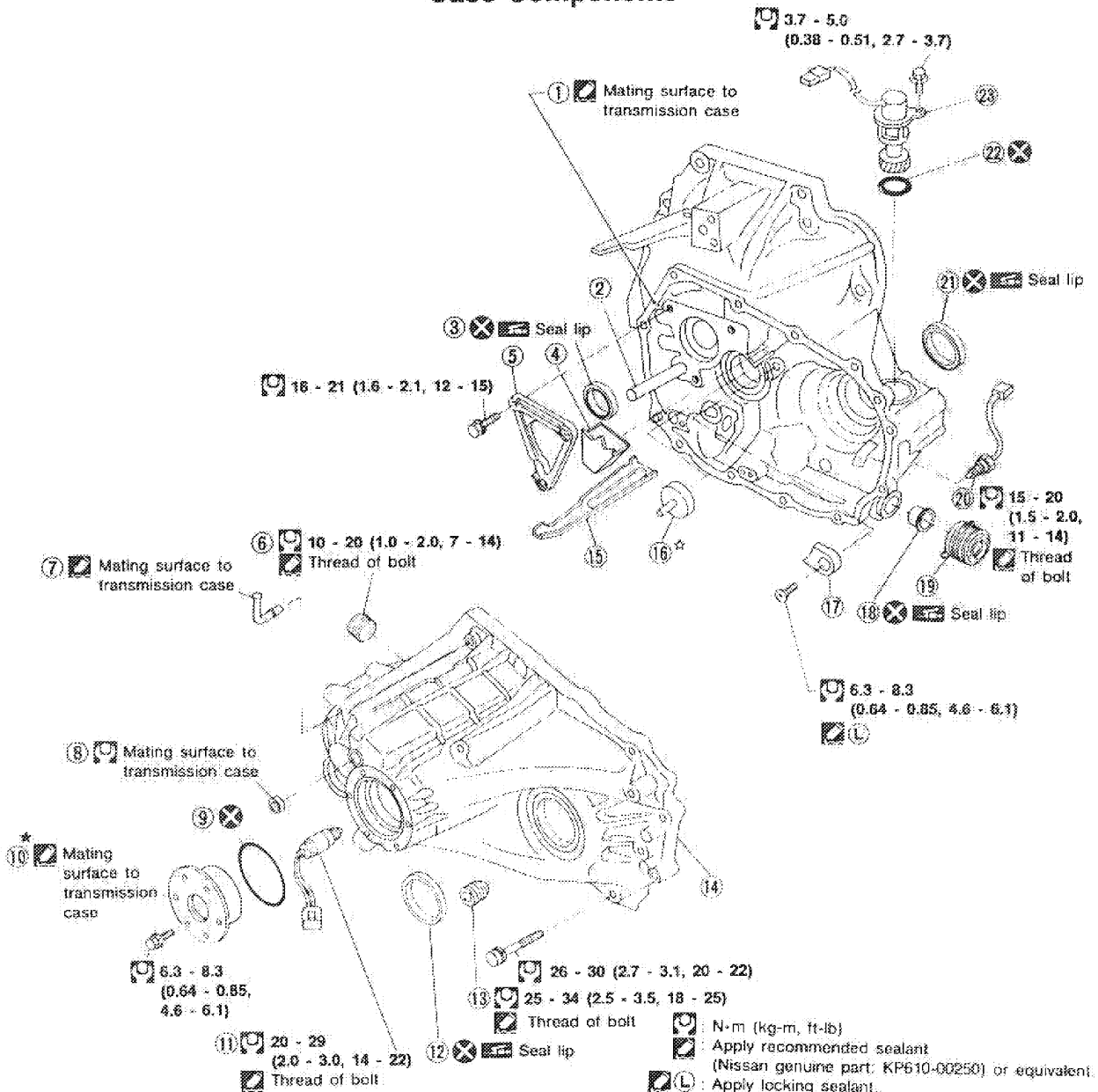
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MAJOR OVERHAUL

Case Components

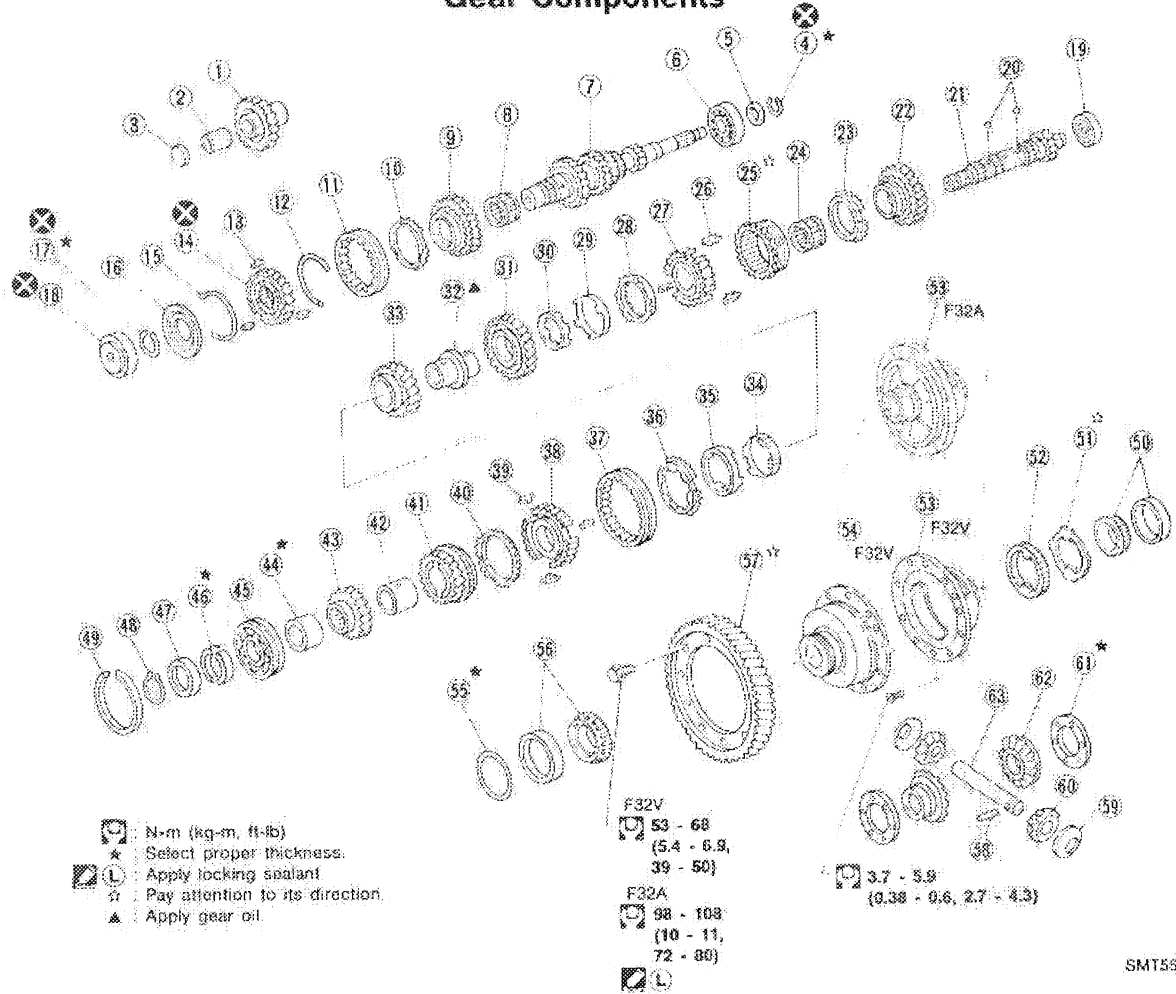


SMT556C

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

MAJOR OVERHAUL

Gear Components



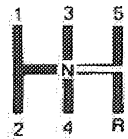
SMT557C

- | | | |
|-----------------------------|---|--|
| ① Reverse idler gear | ③③ Baulk ring | ④④ Spacer |
| ② Reverse idler bushing | ③④ 1st gear needle bearing | ④⑤ Mainshaft rear bearing |
| ③ Reverse idler spacer | ③⑤ Reverse main gear
(Coupling sleeve) | ④⑥ C-ring |
| ④ Snap ring | ③⑥ Insert spring | ④⑦ C-ring holder |
| ⑤ Spacer | ③⑦ 1st & 2nd synchronizer hub | ④⑧ Snap ring |
| ⑥ Input shaft front bearing | ③⑧ 2nd outer baulk ring | ④⑨ Snap ring |
| ⑦ Input shaft | ③⑨ 2nd gear synchronizer cone | ④⑩ Differential side bearing |
| ⑧ 5th gear needle bearing | ③⑩ 2nd inner baulk ring | ④⑪ Speedometer stopper |
| ⑨ 5th input gear | ③⑪ 2nd main gear | ④⑫ Speedometer drive gear |
| ⑩ Baulk ring | ③⑫ 2nd & 3rd bushing | ④⑬ Differential case |
| ⑪ Coupling sleeve | ③⑬ 3rd main gear | ④⑭ Viscous coupling |
| ⑫ Spread ring | ③⑭ 3rd inner baulk ring | ④⑮ Differential side bearing
adjusting shim |
| ⑬ Insert spring | ③⑮ 3rd gear synchronizer cone | ④⑯ Differential side bearing |
| ⑭ 5th gear synchronizer hub | ③⑯ 3rd outer baulk ring | ④⑰ Final gear |
| ⑮ Spread ring | ③⑰ Coupling sleeve | ④⑱ Retaining pin |
| ⑯ 5th stopper | ③⑱ 3rd & 4th synchronizer hub | ④⑲ Thrust washer |
| ⑰ Snap ring | ③⑲ Insert spring | ④⑳ Pinion mate gear |
| ⑱ Input shaft bearing | ③⑳ Baulk ring | ④㉑ Thrust washer |
| ⑳ Mainshaft front bearing | ④① 4th main gear | ④㉒ Side gear |
| ㉑ Steel ball | ④② 4th gear bushing | ④㉓ Pinion mate shaft |
| ㉒ Mainshaft | ④③ 5th main gear | |
| ㉓ 1st main gear | | |

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

General Specifications

TRANSAXLE

Engine	SR20DE		
Transaxle model	RS5F32A & RS5F32V		
Number of speeds	5		
Synchronmesh 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

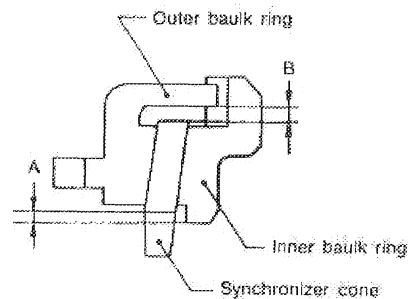
1st, 4th, 5th baulk ring

Unit: mm (in)

Standard		Wear limit
1st	0.95 - 1.45 (0.0374 - 0.0571)	
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)



SMT644B

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**

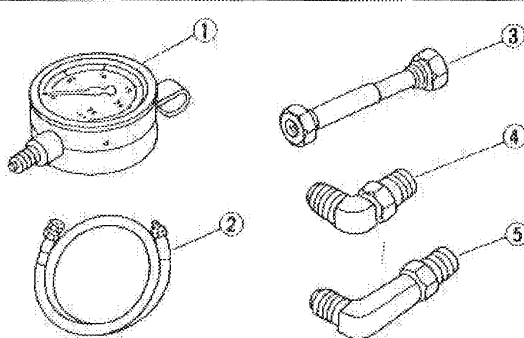
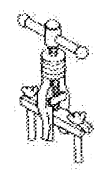
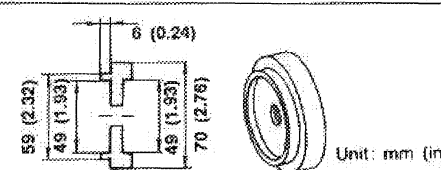
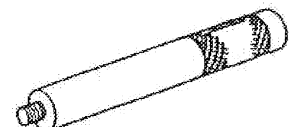
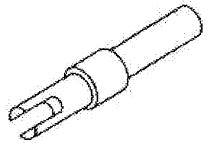
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AT

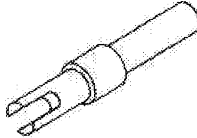
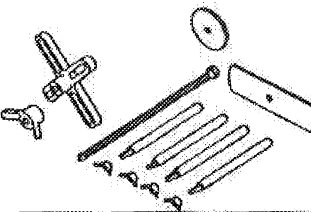


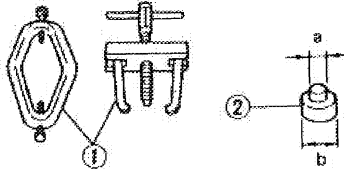

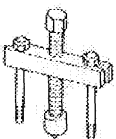
PREPARATION AND PRECAUTIONS

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 (J25610-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

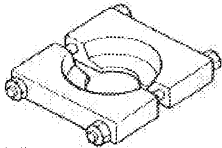
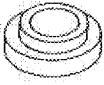
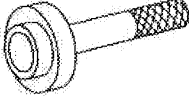


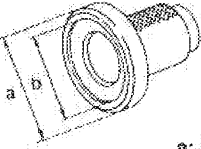
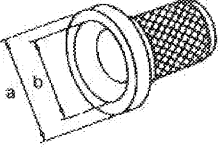
PREPARATION AND PRECAUTIONS

Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description
KV38107700 (—) Preload adapter	 <ul style="list-style-type: none"> — 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	 <p>Removing and installing clutch return spring</p>
ST23540000 (—) Pin punch	 <p>Removing and installing parking rod plate, manual plate and differential pinion mate shaft retaining pins</p>
KV32101000 (J25689-A) Pin punch	 <p>Installing throttle lever and manual shaft retaining pins Removing pinion mate shaft retaining pin</p>
ST3306S001 (—) Differential side bearing puller set ① ST33051001 (—) Puller ② ST33061000 (J8107-2) Adapter	 <p>a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.</p> <p>Removing differential side bearing inner race</p>
KV381054S0 (—) Puller	 <ul style="list-style-type: none"> ● Removing idler gear bearing outer race ● Removing differential side bearing outer race ● Removing needle bearing from bearing retainer
ST27180001 (—) Puller	 <p>Removing idler gear</p>

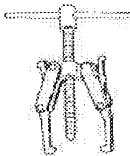


PREPARATION AND PRECAUTIONS

Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description
ST30031000 (—) Puller	 <p>Removing reduction gear bearing inner race</p>
ST35272000 (—) Drift	 <ul style="list-style-type: none"> ● Installing reduction gear bearing inner race ● Installing idler gear bearing inner race
ST37830000 (—) Drift	 <p>Installing idler gear bearing outer race</p>
ST35321000 (—) Drift	 <p>Installing output shaft bearing</p>
ST30633000 (—) Drift	 <p>Installing differential side bearing outer race</p>
ST35271000 (—) Drift	 <p>Installing idler gear</p> <p>a: 76 mm (2.99 in) dia. b: 67 mm (2.64 in) dia.</p>
ST33400001 (J26082) Drift	 <p>Installing oil pump housing oil seal</p> <p>a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.</p>

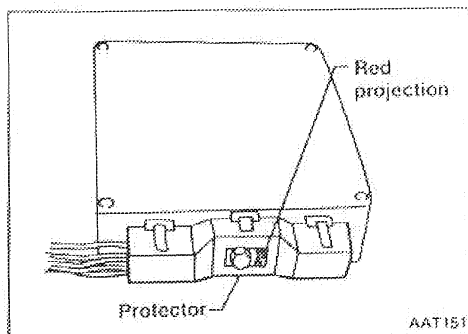
PREPARATION AND PRECAUTIONS

Commercial Service Tools

Tool name	Description
Puller	 <ul style="list-style-type: none"> ● Removing idler gear bearing inner race ● Removing and installing band servo piston snap ring
Drift	 <p style="text-align: center;">a: 34 mm (1.34 in) dia.</p>
Drift	 <p style="text-align: center;">a: 36 mm (1.42 in) dia.</p>

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.
- 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.



- It is very important to perform functional tests whenever they are indicated.

PREPARATION AND PRECAUTIONS

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

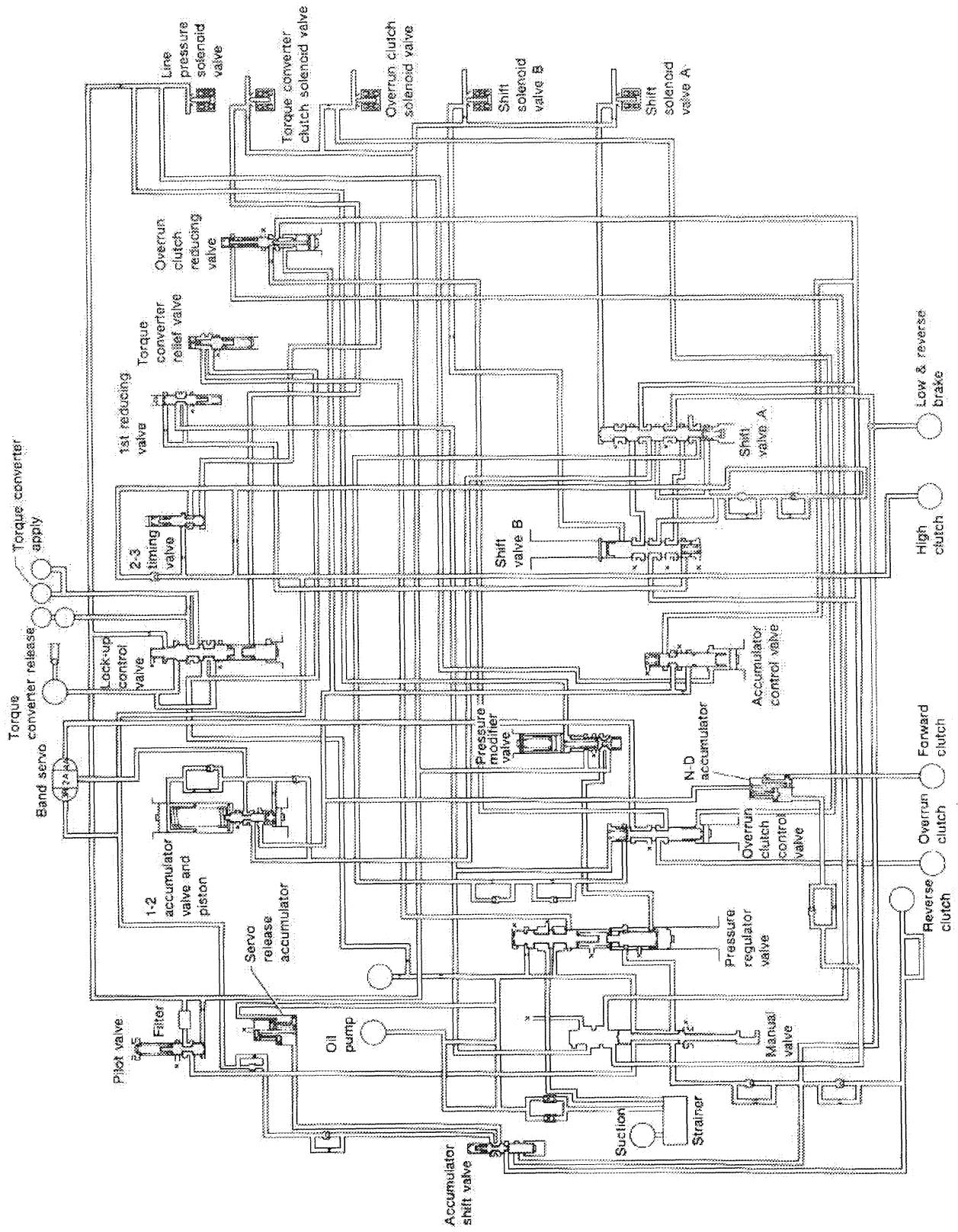
The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner" help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel 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.

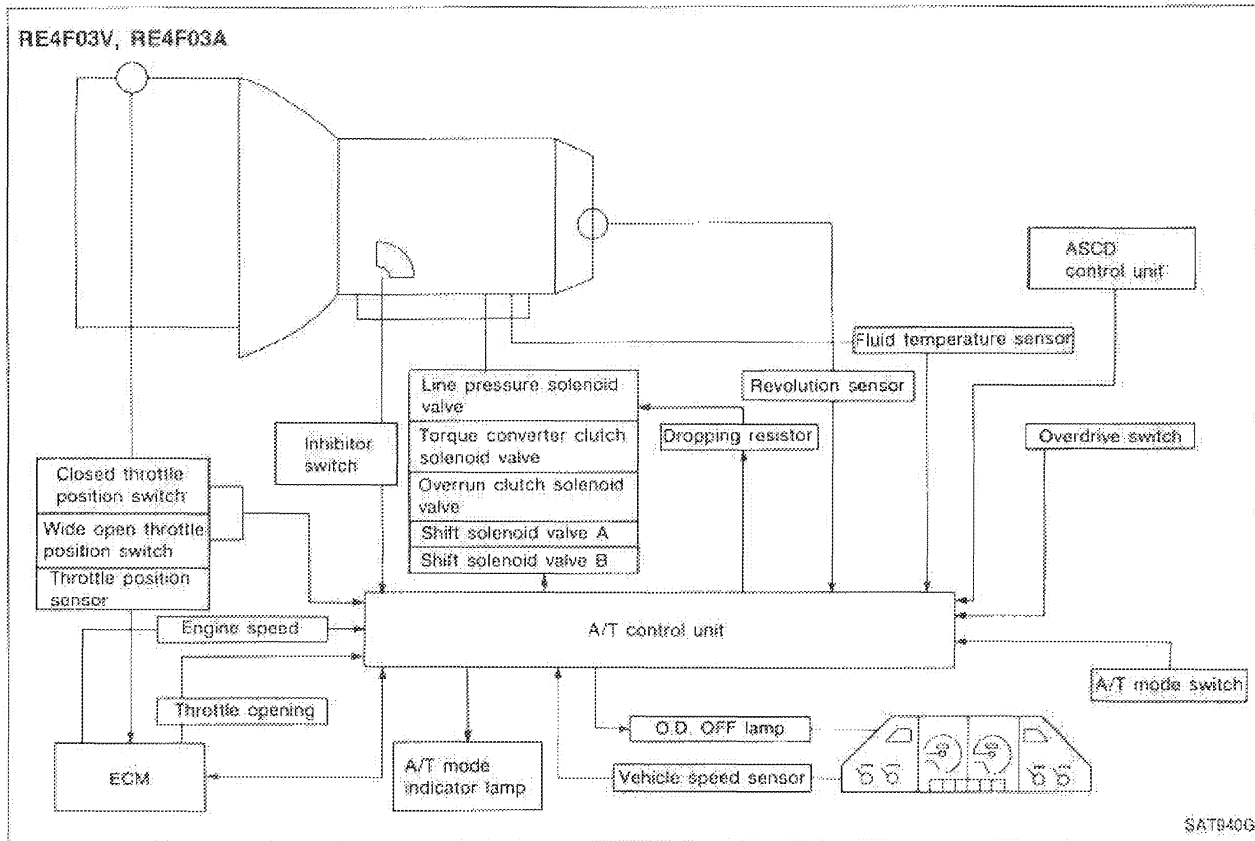
A/T CONTROL DIAGRAM

Hydraulic Control Circuit



A/T CONTROL DIAGRAM

Electrical Control Chart



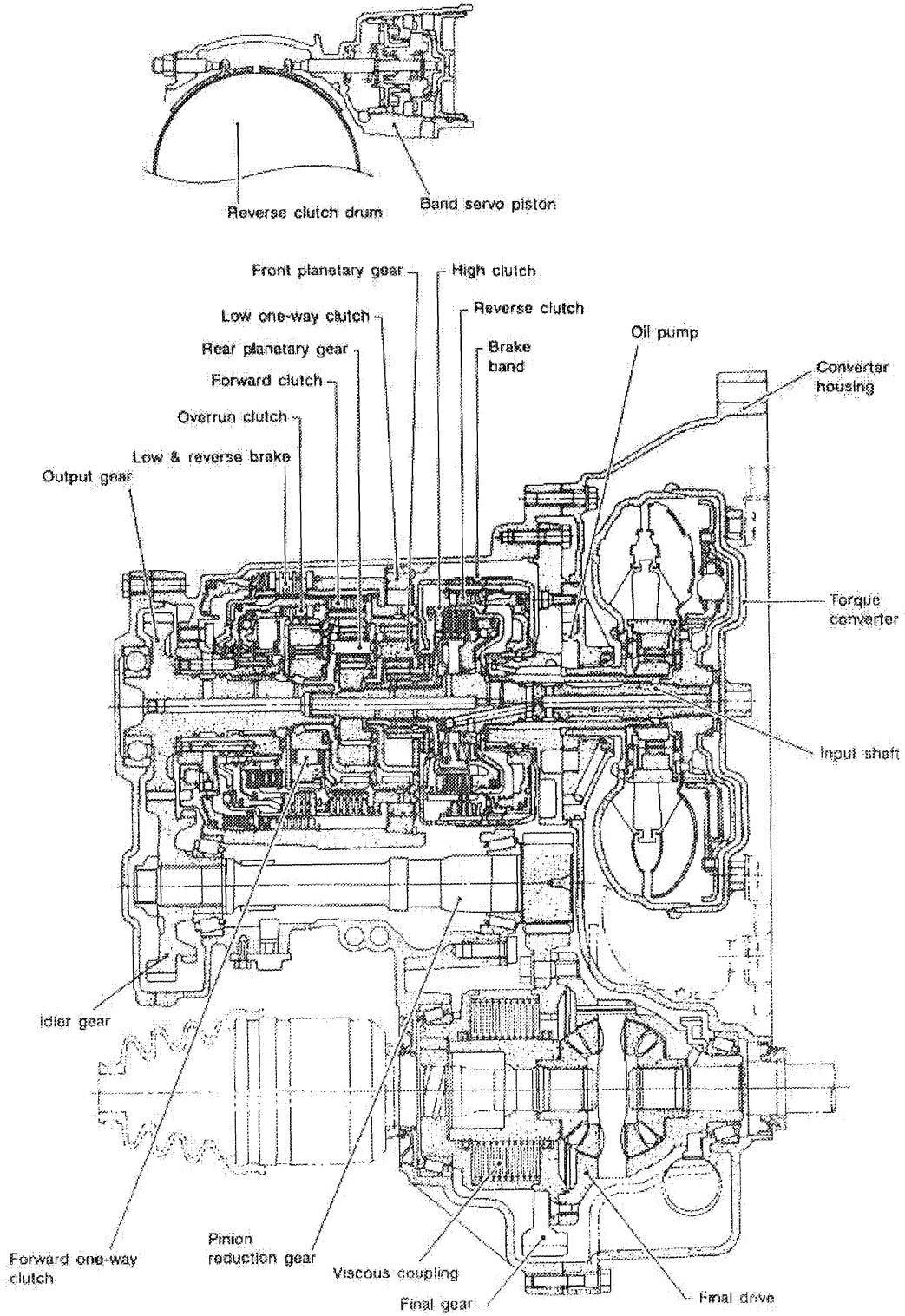
Mechanical Operation

Shift position	Reverse clutch	High clutch	Forward clutch	Overrun clutch	Band servo			Forward one-way clutch	Low one-way clutch	Low & reverse brake	Lock-up	Remarks
					2nd apply	3rd release	4th apply					
P												PARK POSITION
R	○									○		REVERSE POSITION
N												NEUTRAL POSITION
D *4	1st		○	*1 ○				●	●			Automatic shift 1 ↔ 2 ↔ 3 ↔ 4
	2nd		○		○			●				
	3rd		○		○	*2 ○	○		●		*3 ○	
	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
- (with dot) : Operates when throttle opening is less than 1/16.
- : Operates during "progressive" acceleration.
- ⊗ : Operates but does not affect power transmission.

A/T CONTROL DIAGRAM

Cross-sectional View — RE4F03V



TROUBLE DIAGNOSES

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TROUBLE DIAGNOSES

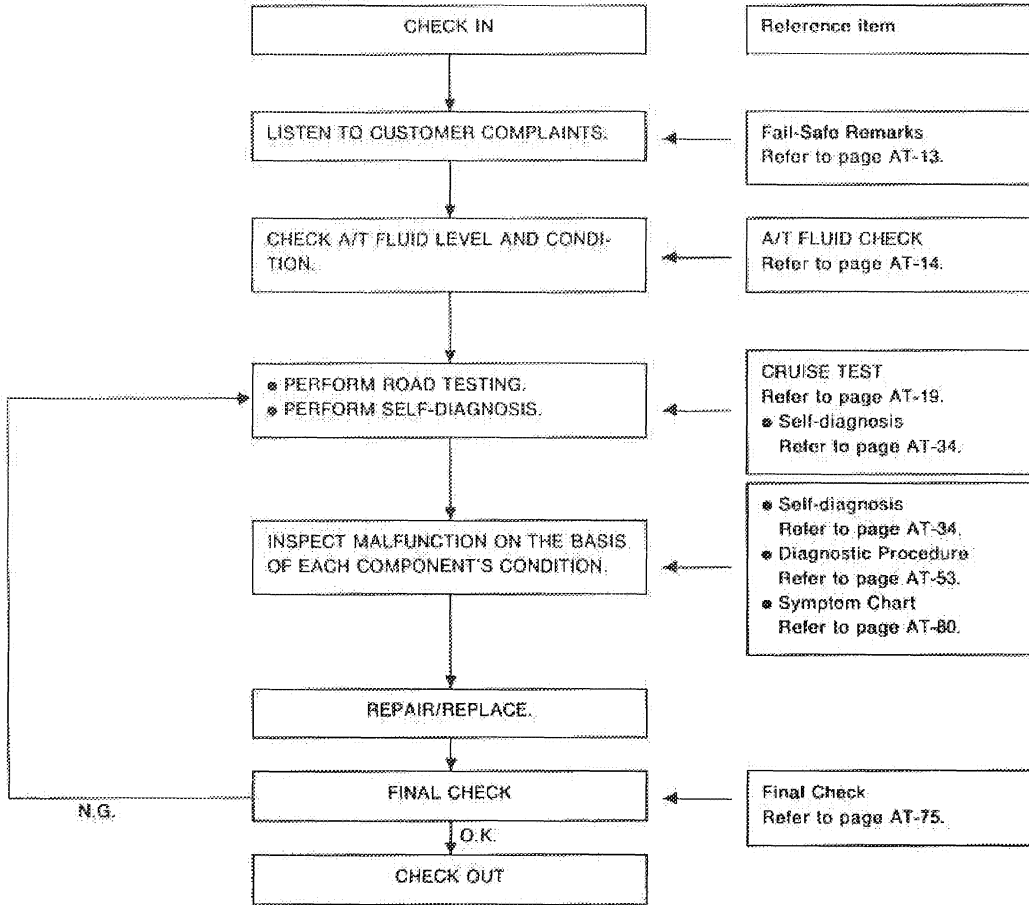
Contents (Cont'd)

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TROUBLE DIAGNOSES

How to Perform Trouble Diagnoses for Quick and Accurate Repair

WORK FLOW



TROUBLE DIAGNOSES

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.

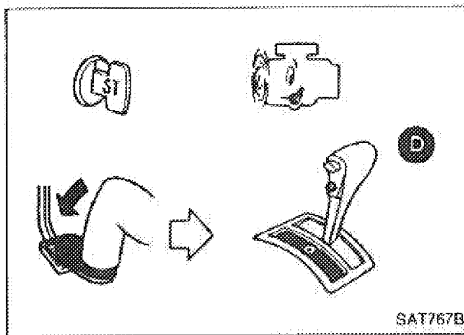
Always follow the "WORK FLOW" (see the previous page).

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.

TROUBLE DIAGNOSES

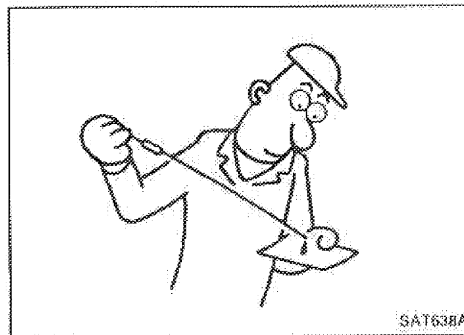
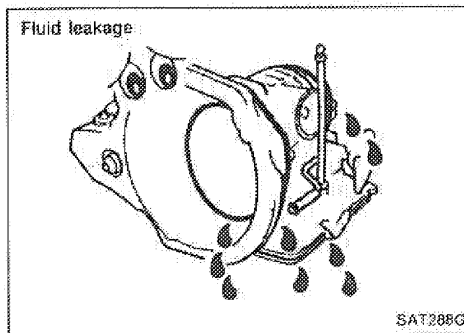


Preliminary Check

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 TEST PROCEDURE

1. Check before engine is started.



2. Check at idle.



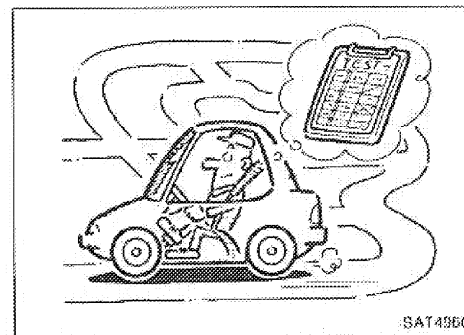
3. Cruise test.

SAT786A

ROAD TESTING

Description

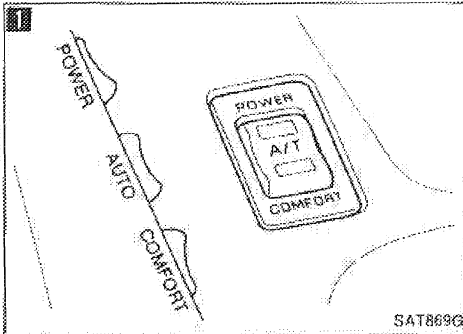
- The purpose of this road test is to determine overall performance of automatic transaxle and analyze causes of problems.
- The road test consists of the following three parts:
 1. Check before engine is started
 2. Check at idle
 3. Cruise test
- Before road test, familiarize yourself with all test 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".



TROUBLE DIAGNOSES

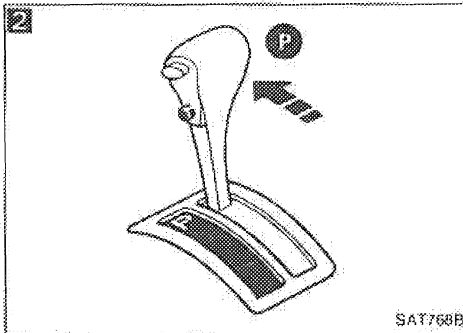
Preliminary Check (Cont'd)

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.



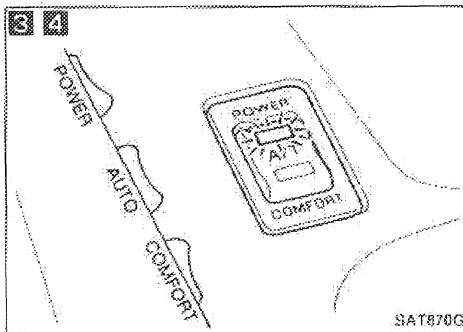
2. Move selector lever to "P" position.
2. Turn ignition switch to "ON" position. (Do not start engine.)

3. Does power indicator lamp come on for about 2 seconds?

No
Go to Diagnostic Procedure 1.

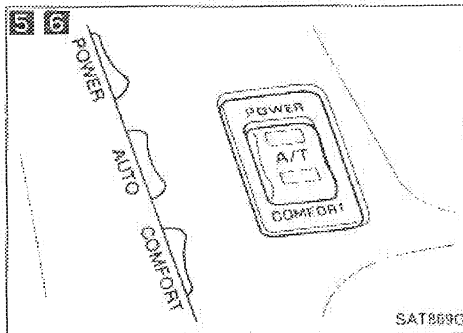
4. Does power indicator lamp flicker for about 8 seconds?

Yes
Perform self-diagnosis. — Refer to SELF-DIAGNOSIS PROCEDURE.



5. Set A/T mode switch to "POWER" position.
2. Does power indicator lamp come on?

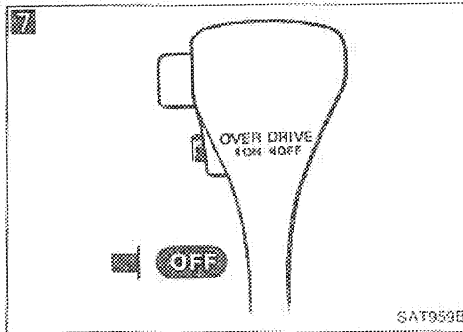
No
Go to Diagnostic Procedure 2.



6. Set A/T mode switch to "COMFORT" position.
2. Does comfort indicator lamp come on?

No
Go to Diagnostic Procedure 2.

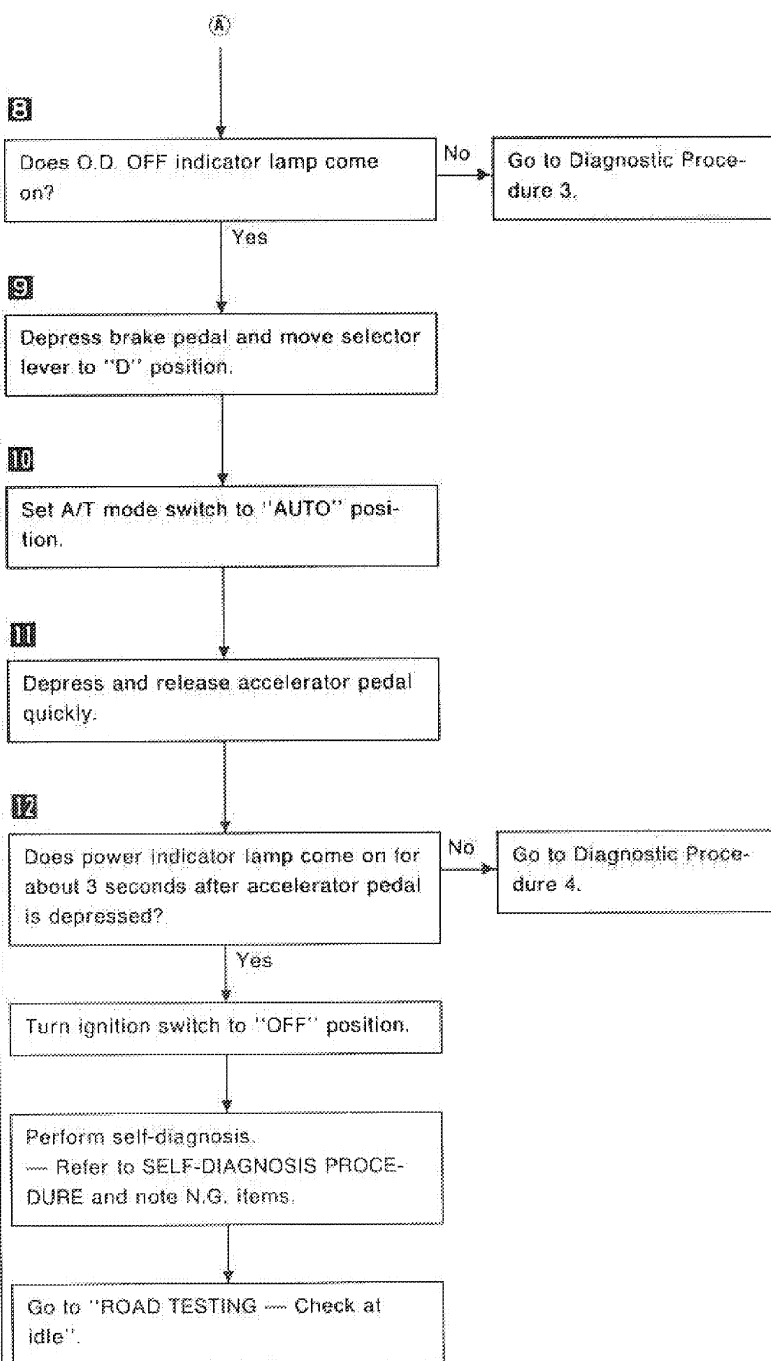
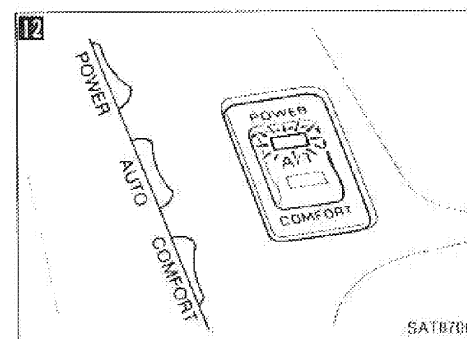
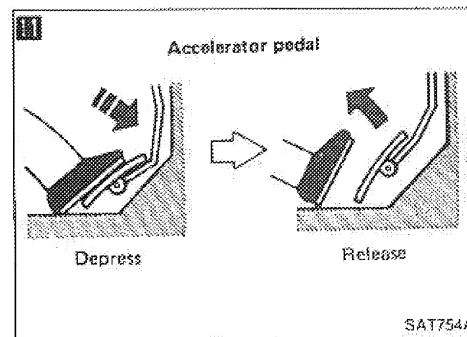
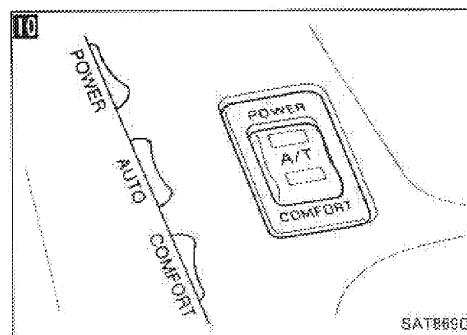
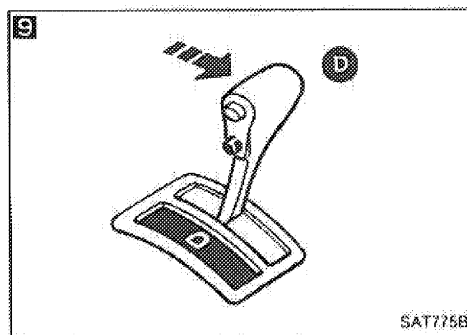
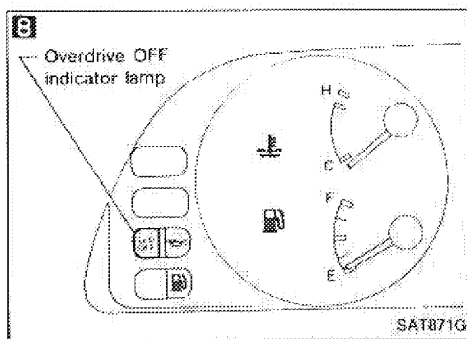
7. Set overdrive switch to "OFF" position.



(A)

TROUBLE DIAGNOSES

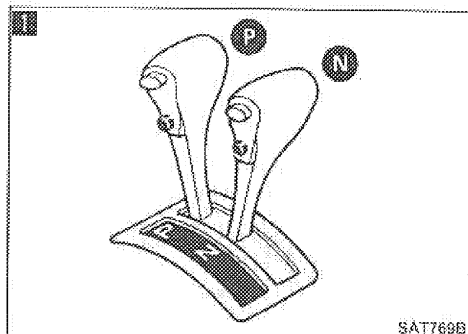
Preliminary Check (Cont'd)



TROUBLE DIAGNOSES

Preliminary Check (Cont'd)

2. Check at idle



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.

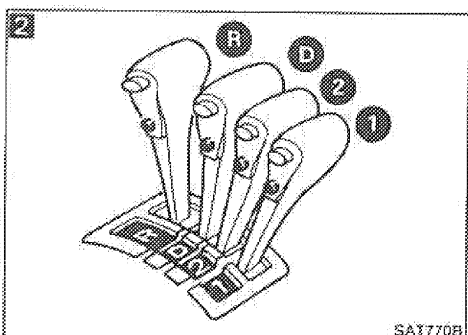
Does engine start?

No

Go to Diagnostic Procedure 5.

Yes

Turn ignition switch to "ACC" position.



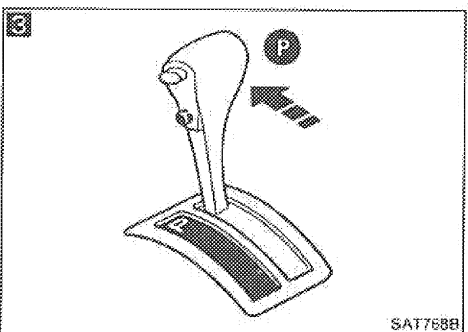
1. Move selector lever to "D", "1", "2" or "R" position.
2. Turn ignition switch to "START" position.

Does engine start?

Yes

Go to Diagnostic Procedure 5.

No



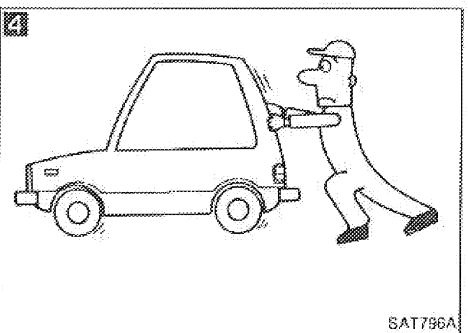
1. Move selector lever to "P" position.
2. Turn ignition switch to "OFF" position.
3. Release parking brake.

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



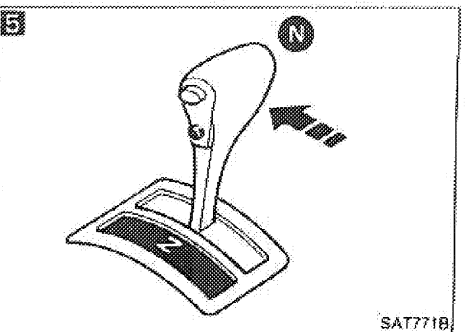
1. Move selector lever to "N" position.
2. Start engine.
3. Release parking brake.
4. Does vehicle move forward or backward?

Yes

Go to Diagnostic Procedure 7.

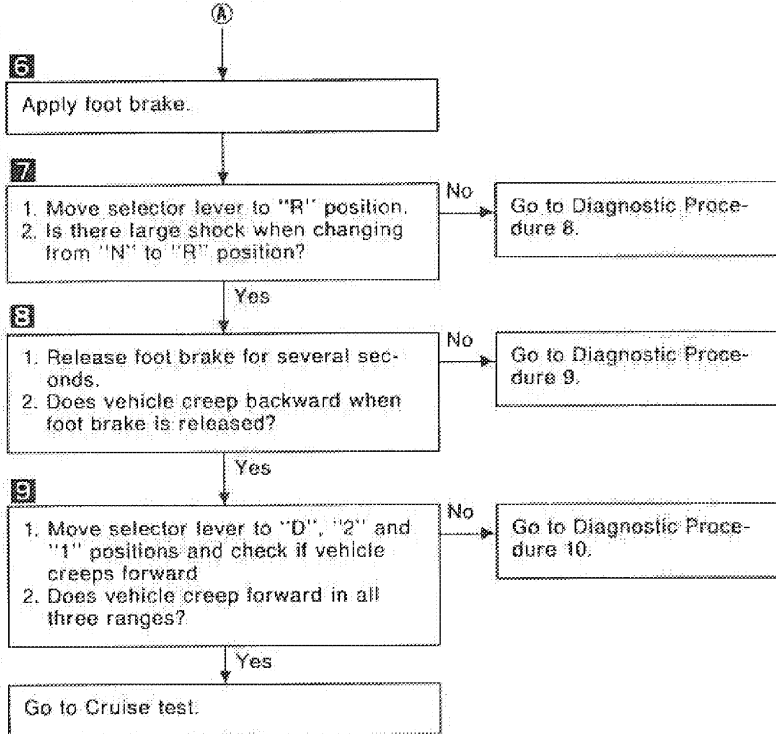
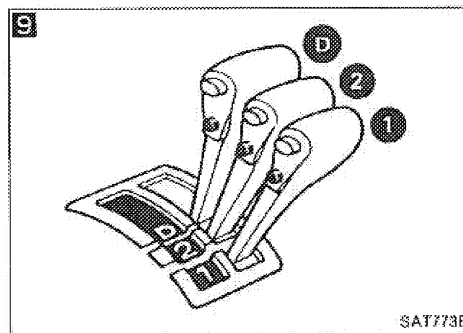
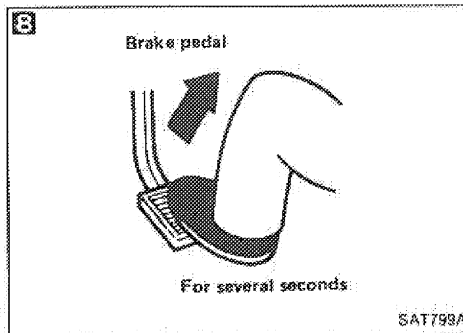
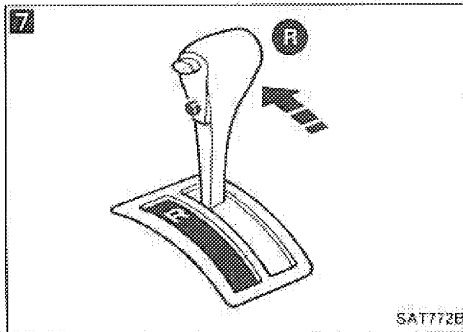
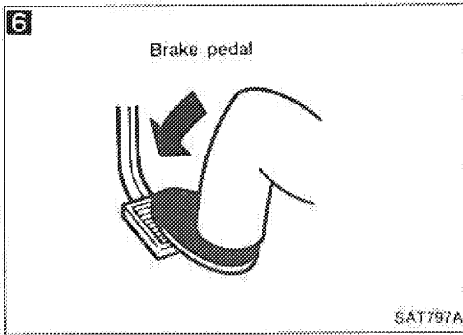
No

(A)

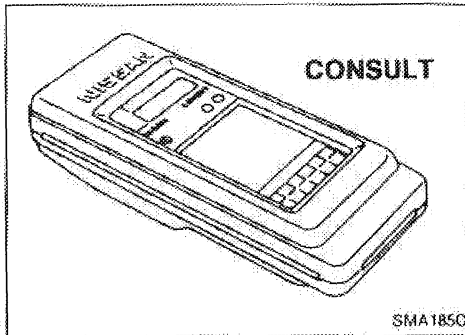


TROUBLE DIAGNOSES

Preliminary Check (Cont'd)



TROUBLE DIAGNOSES



Preliminary Check (Cont'd)

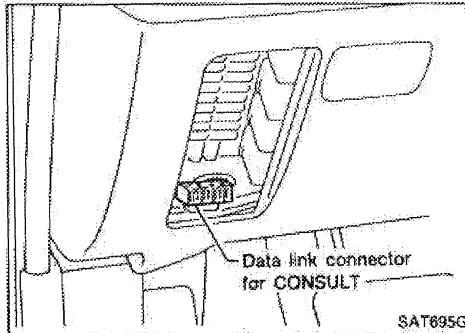
3. Cruise test

- Check all items listed in Parts 1 through 3.



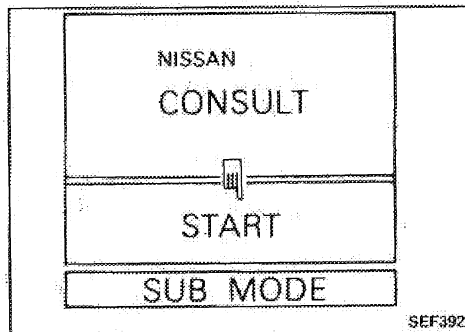
With CONSULT

- 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".

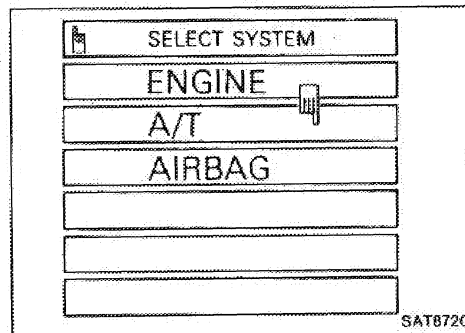


CONSULT setting procedure

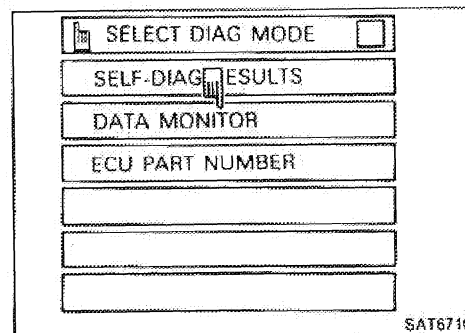
1. Turn off ignition switch.
2. Connect "CONSULT" to Data link connector for CONSULT.



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



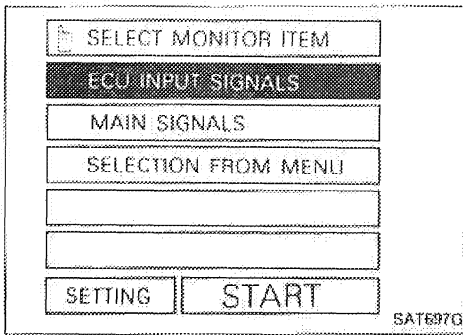
5. Touch "A/T".



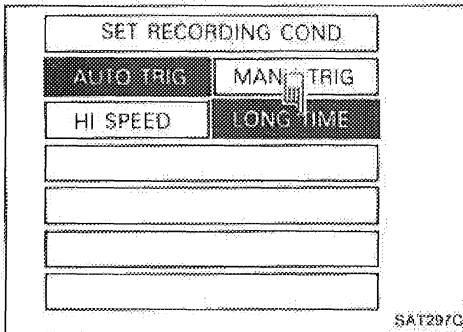
6. Touch "DATA MONITOR".

TROUBLE DIAGNOSES

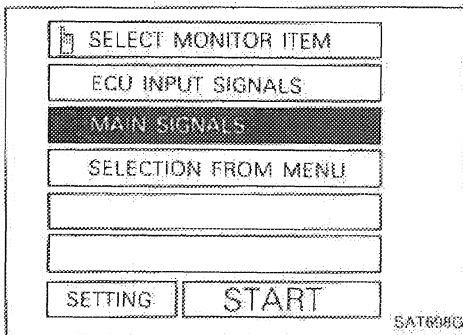
Preliminary Check (Cont'd)



7. Touch "SETTING" to set recording condition.

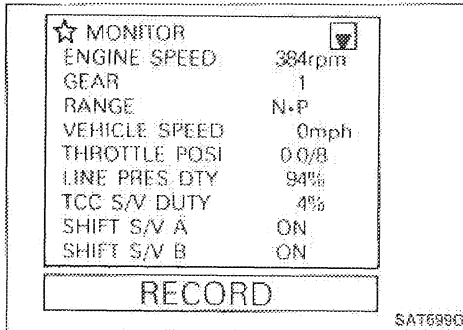


8. Touch "LONG TIME" and "ENTER" key.

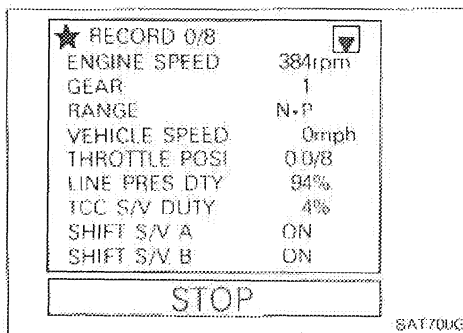


9. Go back to SELECT MONITOR ITEM and touch "MAIN SIGNALS".

10. Touch "START".



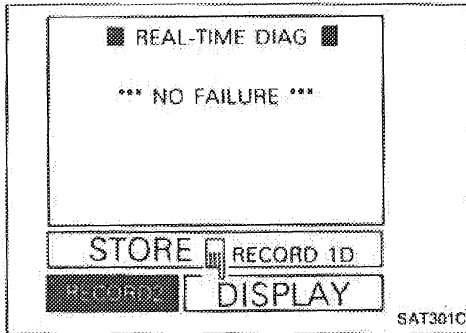
11. When performing cruise test, touch "RECORD".



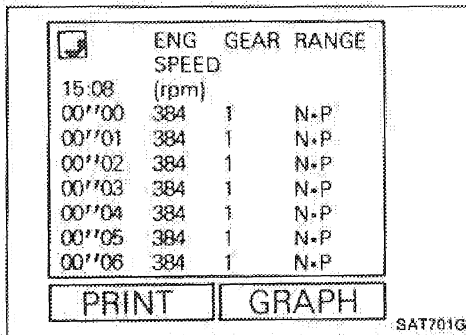
12. After finishing cruise test part 1, touch "STOP".

TROUBLE DIAGNOSES

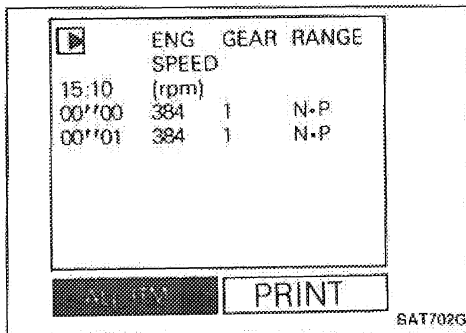
Preliminary Check (Cont'd)



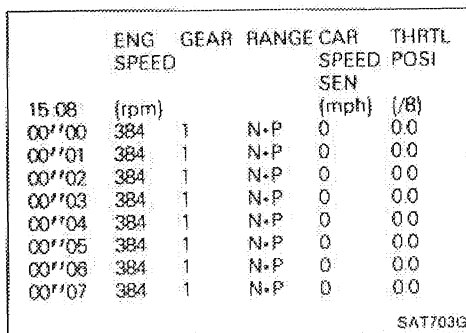
13. Touch "DISPLAY".



14. Touch "PRINT".



15. Touch "PRINT" again.

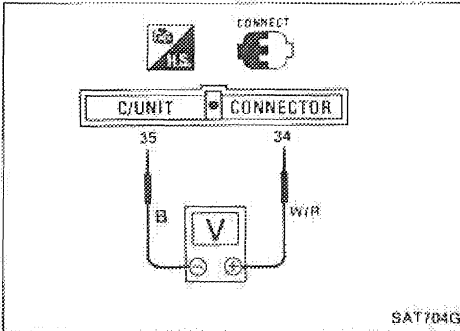


16. Check the monitor data printed out.

17. Continue cruise test part 2 and 3.

TROUBLE DIAGNOSES

Preliminary Check (Cont'd)



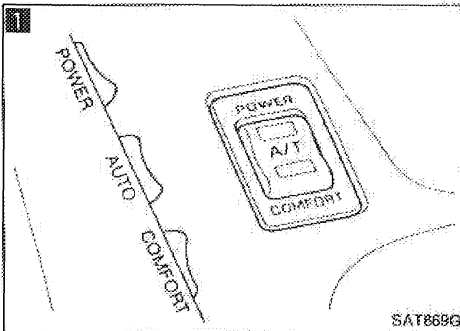
Without CONSULT

- Throttle position can be controlled by voltage across terminals ④ and ⑤ of A/T control unit.

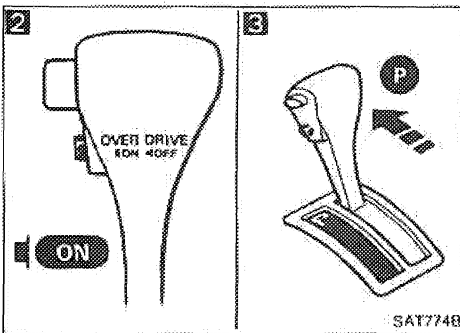
Cruise test — Part 1

1. Warm up engine until engine oil and A.T.F. reach operating temperature after vehicle has been driven approx. 10 minutes.

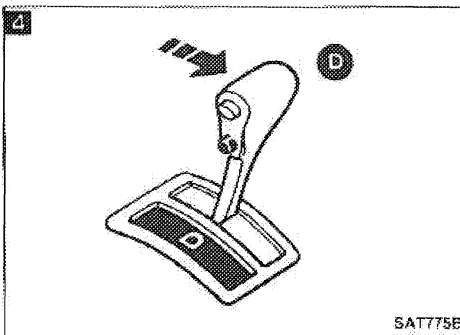
A.T.F. operating temperature:
50 - 80°C (122 - 176°F)



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



2. Set overdrive switch to "ON" position.



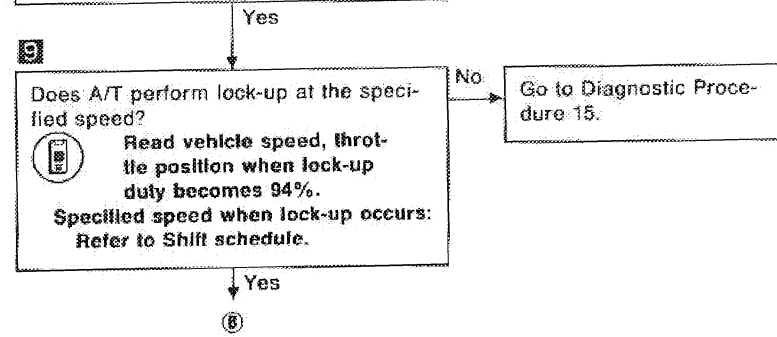
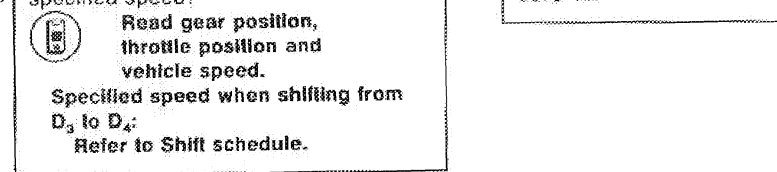
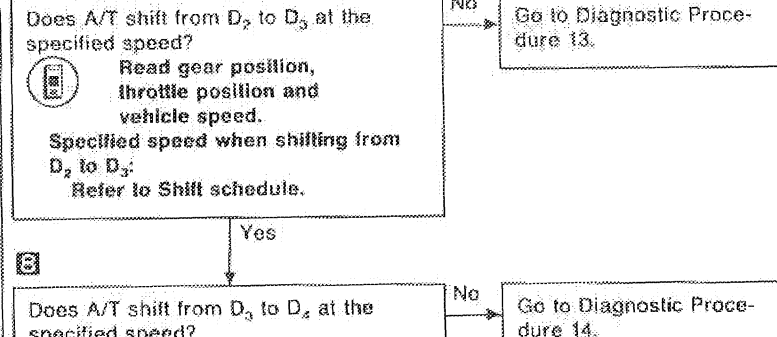
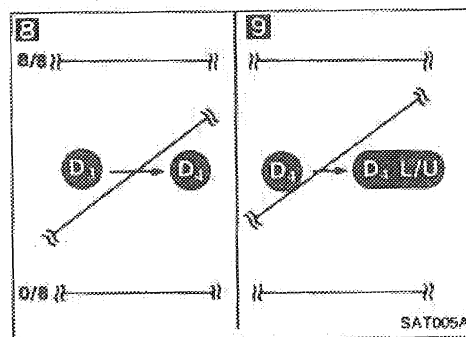
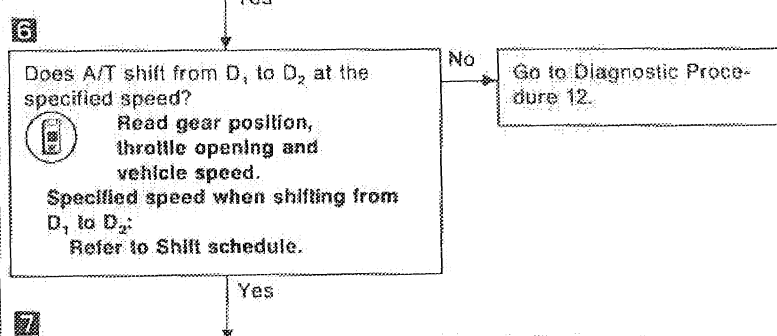
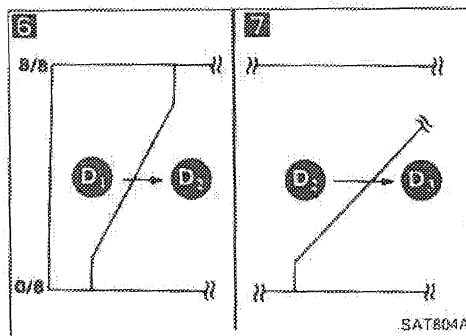
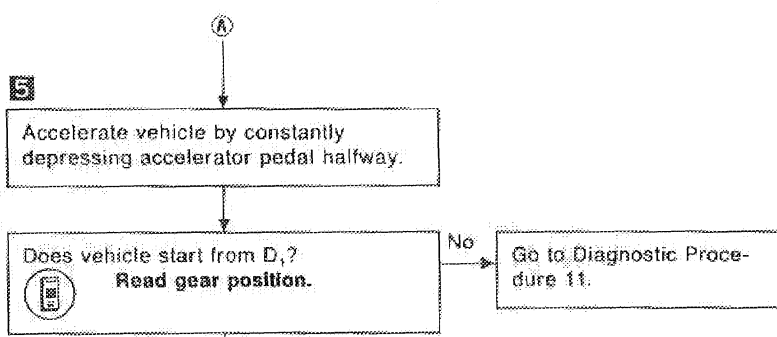
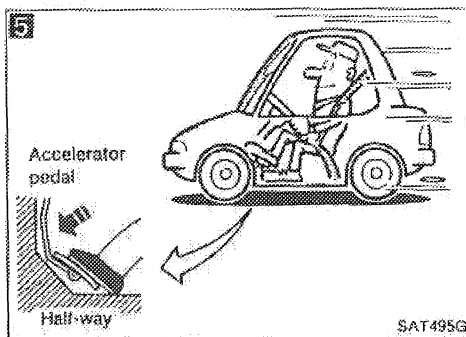
3. 1. Move selector lever to "P" position.
2. Start engine.

4. Move selector lever to "D" position.

①

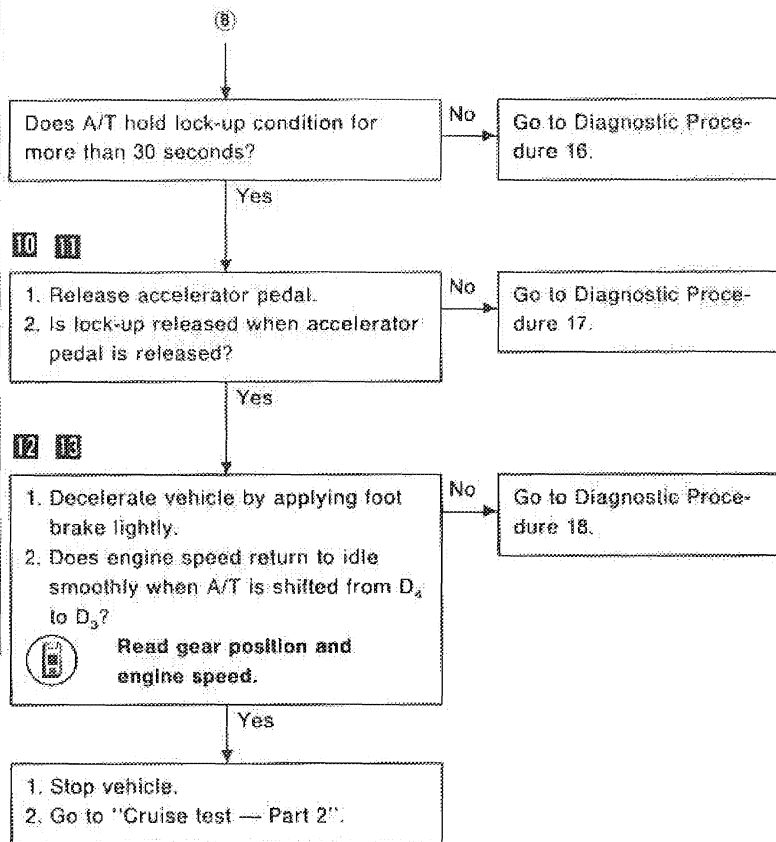
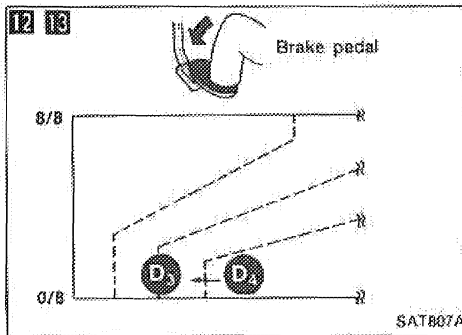
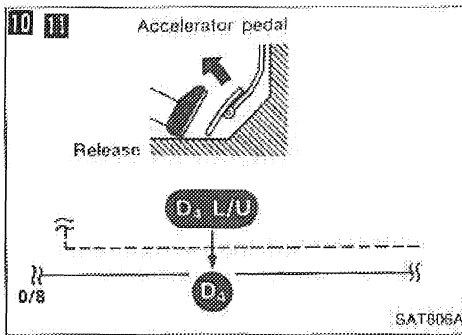
TROUBLE DIAGNOSES

Preliminary Check (Cont'd)



TROUBLE DIAGNOSES

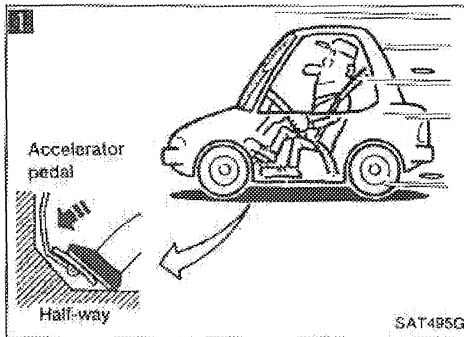
Preliminary Check (Cont'd)



TROUBLE DIAGNOSES

Preliminary Check (Cont'd)

Cruise test — Part 2

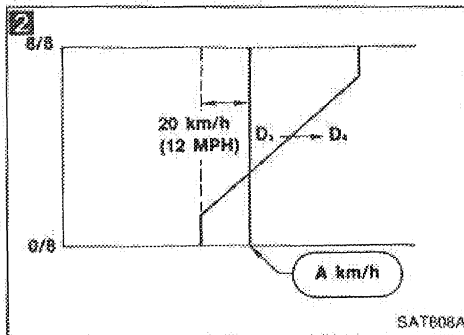


1. Confirm A/T mode switch is in "Auto" position and overdrive switch is in "ON" position.
2. Confirm selector lever is in "D" position.

1

1. Accelerate vehicle by half throttle again.
2. Does vehicle start from D₁?
Read gear position.

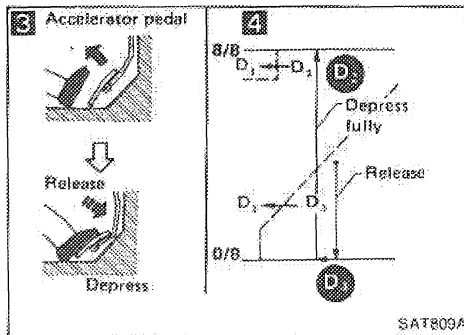
No → Go to Diagnostic Procedure 19.



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 D₁ to D₂ as soon as accelerator pedal is depressed fully?
Read gear position and throttle position.

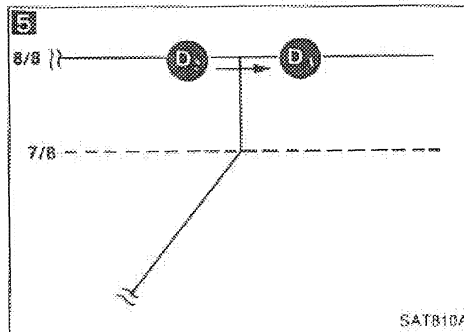
No → Go to Diagnostic Procedure 12.



5

1. Does A/T shift from D₂ to D₃ at the specified speed?
Read gear position, throttle position and vehicle speed.
**Specified speed when shifting from D₂ to D₃:
Refer to Shift schedule.**

No → Go to Diagnostic Procedure 13.



6

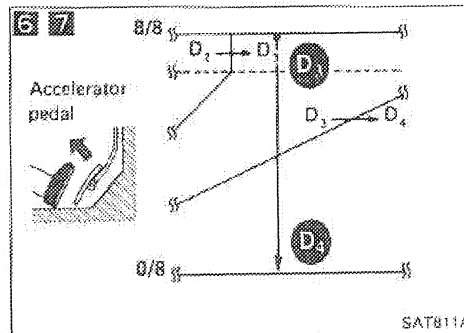
1. Release accelerator pedal after shifting from D₂ to D₃.

7

1. Does A/T shift from D₃ to D₄ and does vehicle decelerate by engine brake?
Read gear position, throttle position and vehicle speed.

No → Go to Diagnostic Procedure 14.

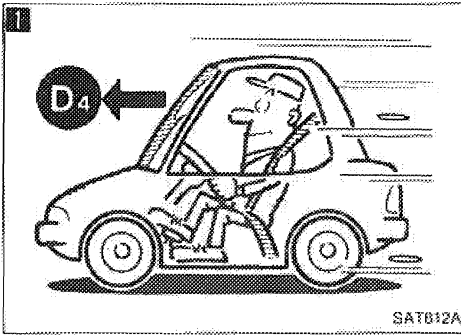
1. Stop vehicle.
2. Go to "Cruise test — Part 3".



TROUBLE DIAGNOSES

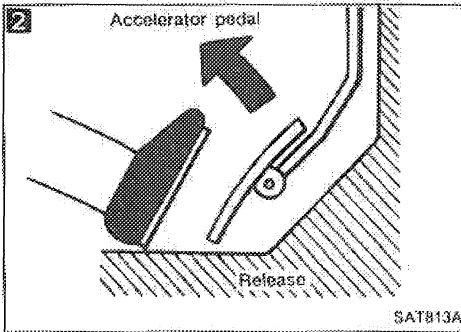
Preliminary Check (Cont'd)

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_x .



2
Release accelerator pedal.

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

4
Does A/T shift from D_4 to D_3 ?
Read gear position and vehicle speed.

No → Go to Diagnostic Procedure 20.

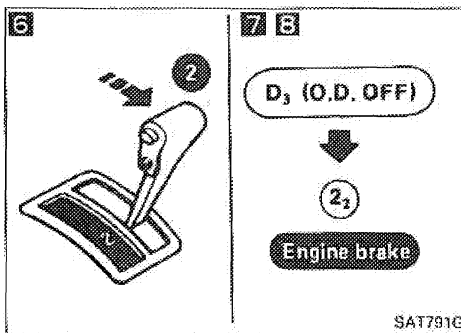
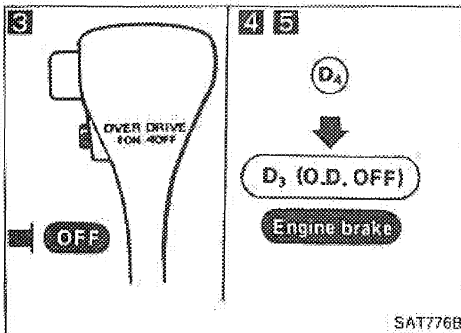
5
Does vehicle decelerate by engine brake?

No → Go to Diagnostic Procedure 18.

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.



8
Does vehicle decelerate by engine brake?

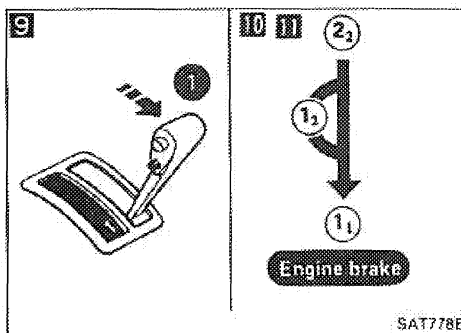
No → Go to Diagnostic Procedure 18.

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.

11
Does vehicle decelerate by engine brake?

No → Go to Diagnostic Procedure 23.



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

TROUBLE DIAGNOSES

Preliminary Check (Cont'd)

Vehicle speed when shifting gears

Throttle position	Shift pattern	Vehicle speed km/h (MPH)					
		D ₁ → D ₂	D ₂ → D ₃	D ₃ → D ₄	D ₄ → D ₅	D ₅ → D ₂	D ₂ → 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)

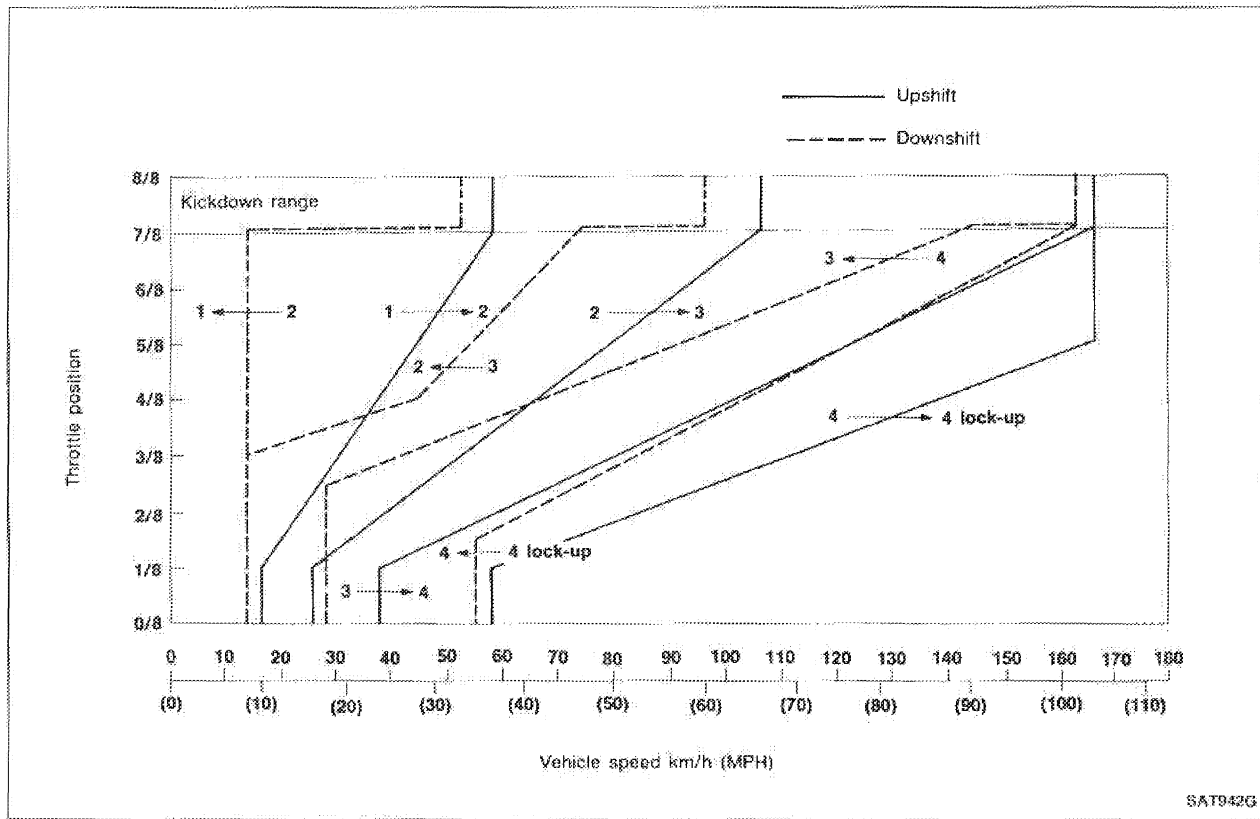
Vehicle speed when performing lock-up

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)

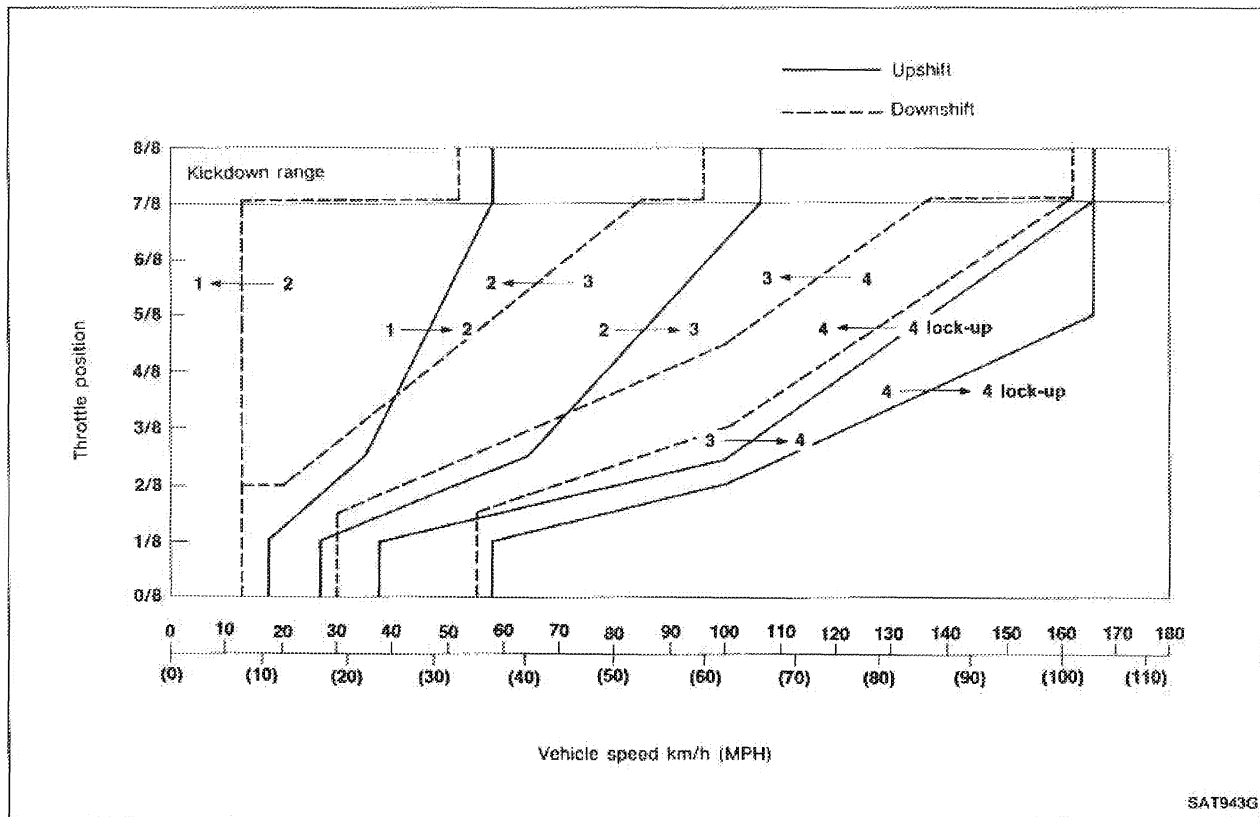
TROUBLE DIAGNOSES

Shift schedule (Comfort pattern)

Preliminary Check (Cont'd)



Shift schedule (Power pattern)



TROUBLE DIAGNOSES

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	Item	Application
Vehicle speed sensor 1 (A/T)	×	Overrun clutch solenoid valve	×
Vehicle speed sensor 2 (meter)	×	*Shift solenoid valve A (feedback)	×
Throttle position sensor	×	*Shift solenoid valve B (feedback)	×
Fluid temperature sensor	×	*Overrun clutch solenoid valve (feedback)	×
Battery voltage	×	Hold mode switch (A/T mode switch — COMFORT)	×
Engine speed	×	1 position switch	×
Selector lever switch (O.D. switch)	×	2 position switch	×
A.S.C.D. — cruise signal	×	D position switch	×
A.S.C.D. — O.D. cut signal	×	P/N position switch	×
Kickdown switch	-	R position switch	×
Power shift switch (A/T mode switch — POWER)	×	Gear position	×
Power shift lamp	×	Range position	×
Closed throttle position switch	×	Vehicle speed	×
Wide open throttle position switch	×	Throttle opening	×
Shift solenoid valve A	×	Line-pressure solenoid valve	×
Shift solenoid valve B	×	Torque converter clutch solenoid valve	×

× : Applicable - : Not applicable

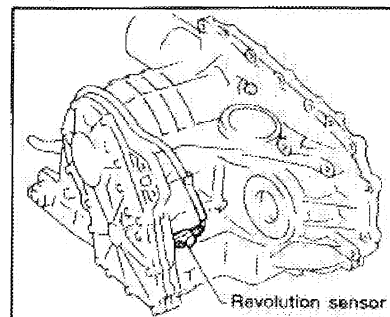
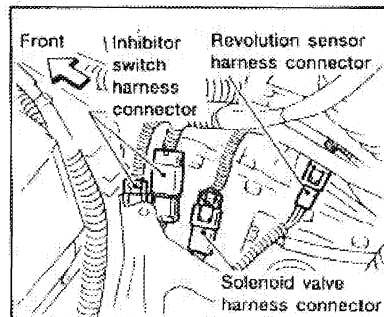
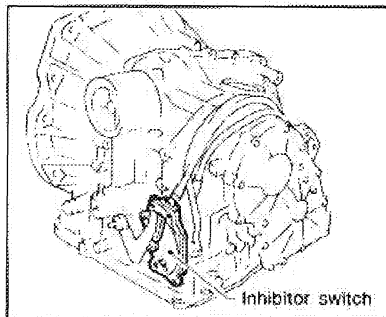
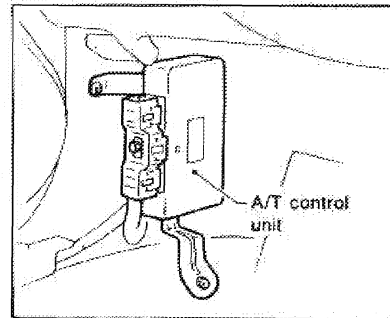
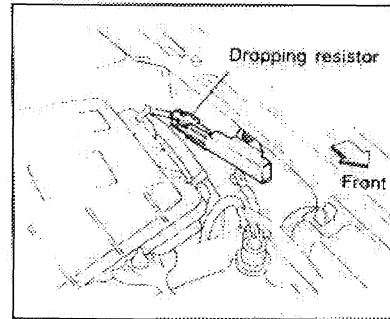
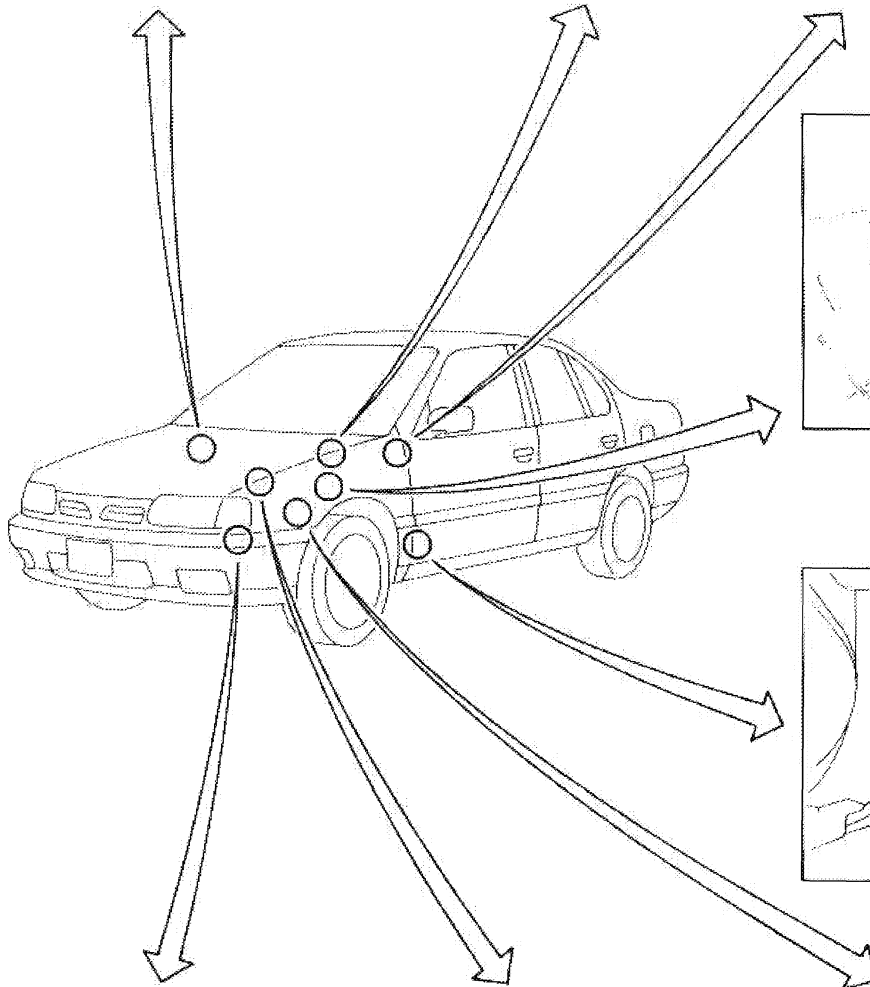
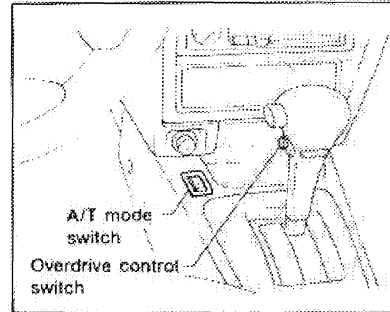
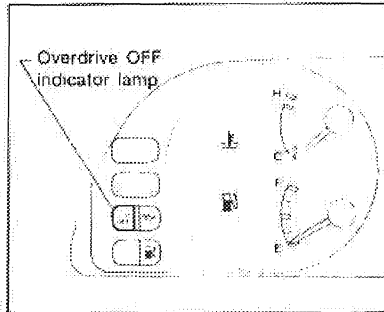
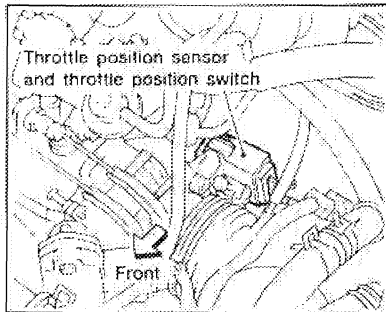
DATA ANALYSIS

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

TROUBLE DIAGNOSES

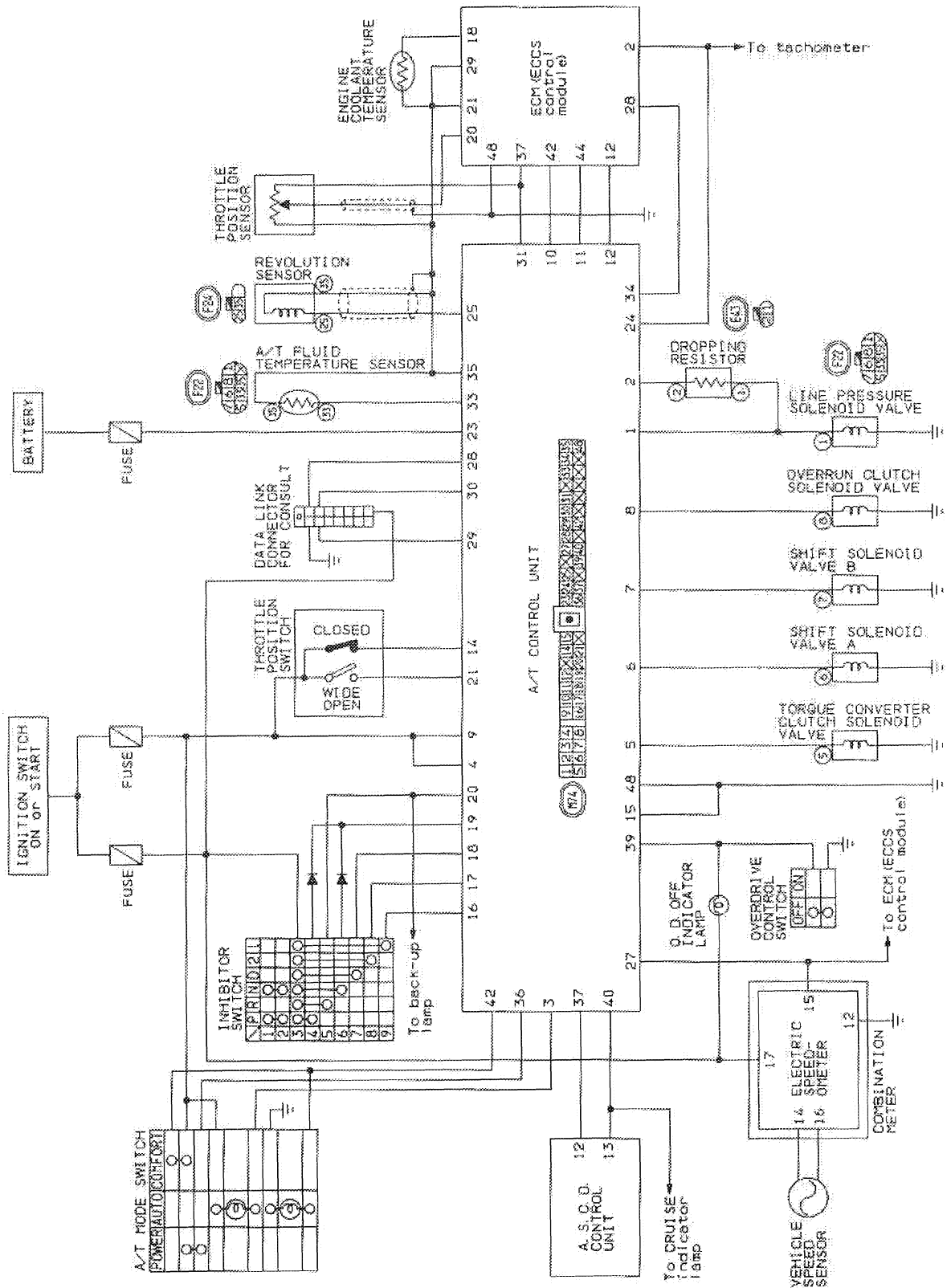
A/T Electrical Parts Location



SAT901G

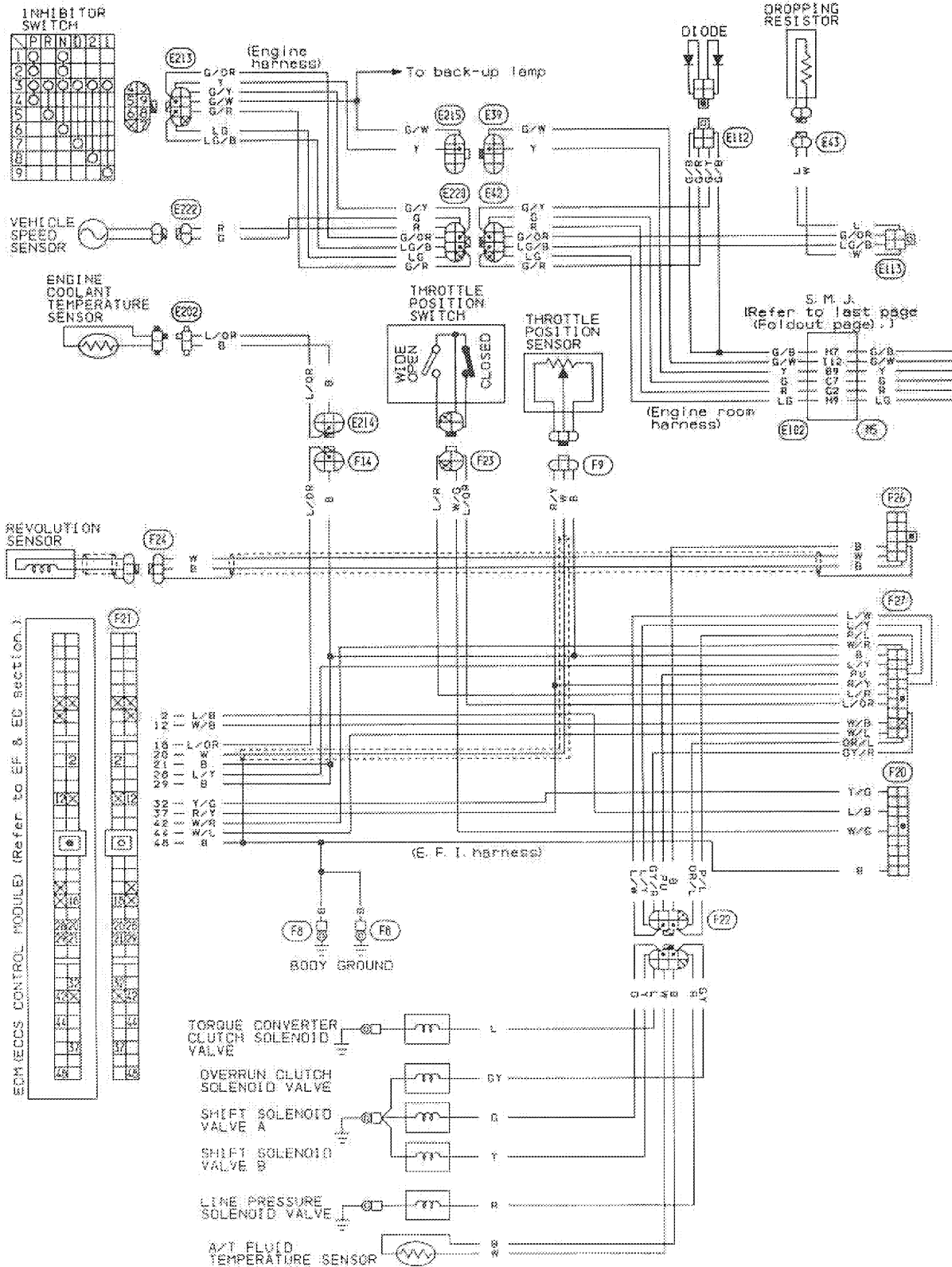
TROUBLE DIAGNOSES

Circuit Diagram for Quick Pinpoint Check



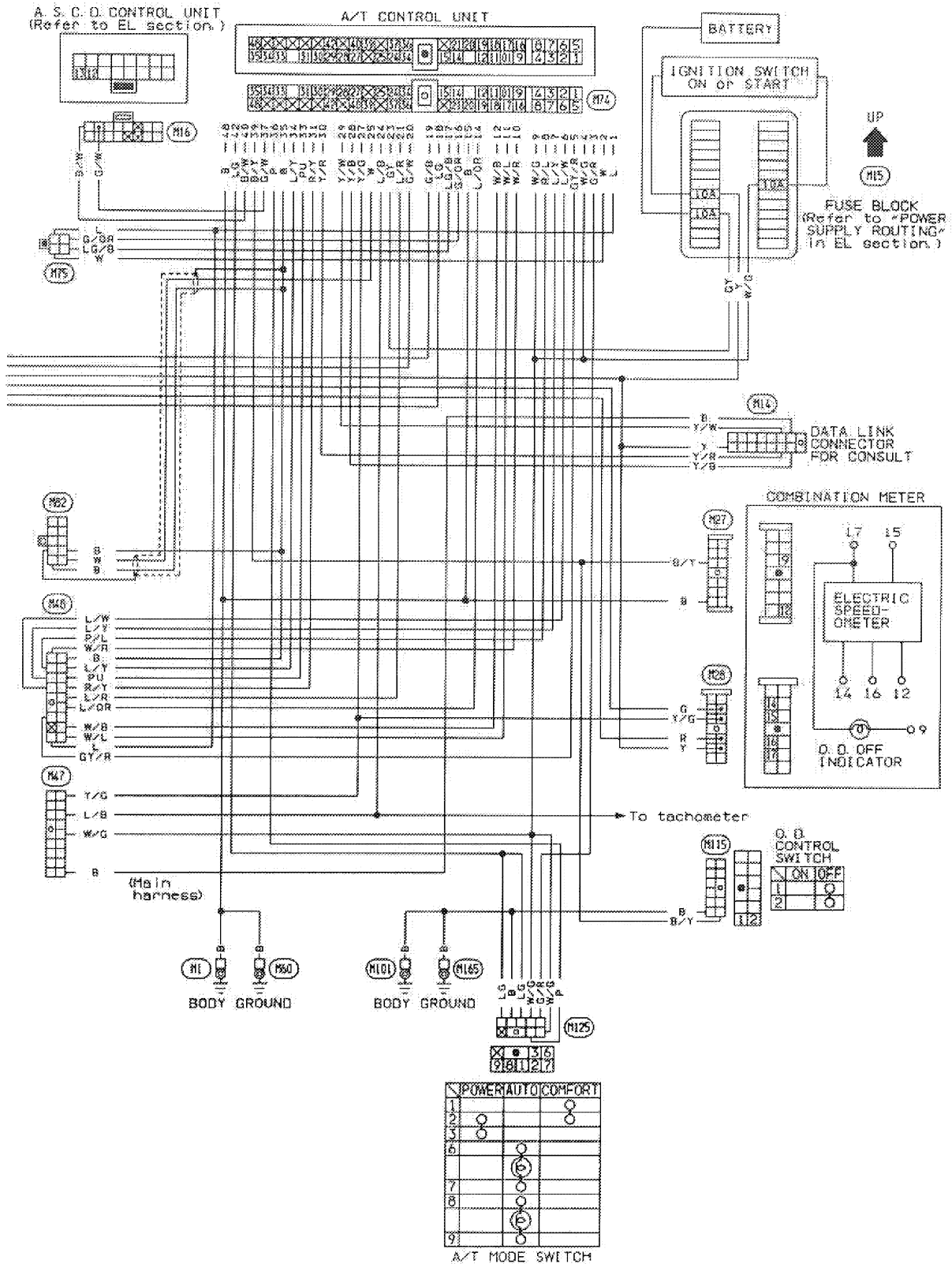
TROUBLE DIAGNOSES

Wiring Diagram

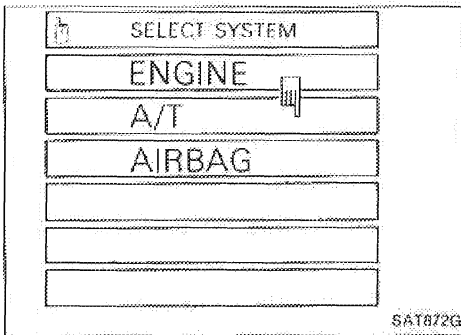


TROUBLE DIAGNOSES

Wiring Diagram (Cont'd)



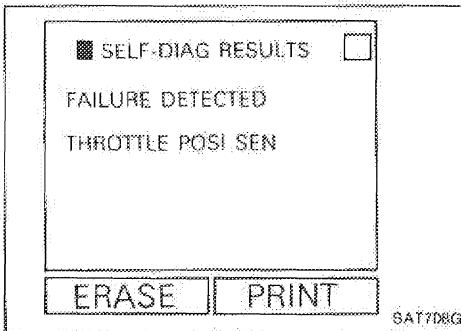
TROUBLE DIAGNOSES



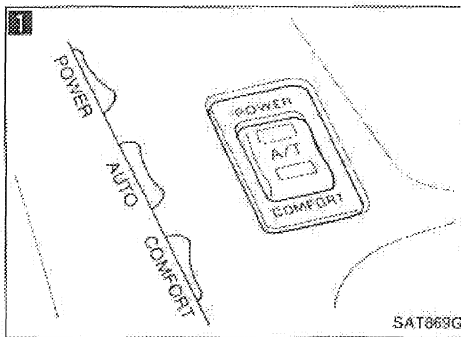
Self-diagnosis

SELF-DIAGNOSTIC PROCEDURE (With CONSULT)

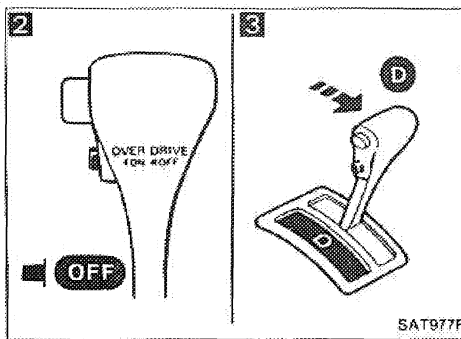
1. Turn on CONSULT.
2. Touch "A/T".



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.

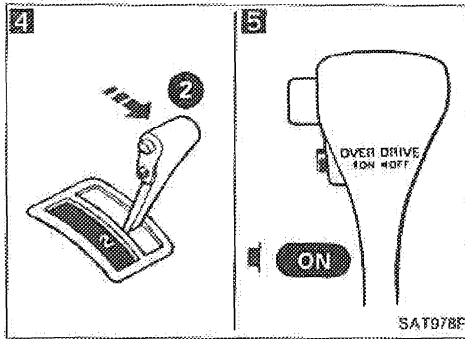
3
1. Move selector lever to "D" position.
2. Turn ignition switch to "ON" position. (Do not start engine.)
3. Does power indicator lamp come on for about 2 seconds?

No → Go to Diagnostic Procedure 1.

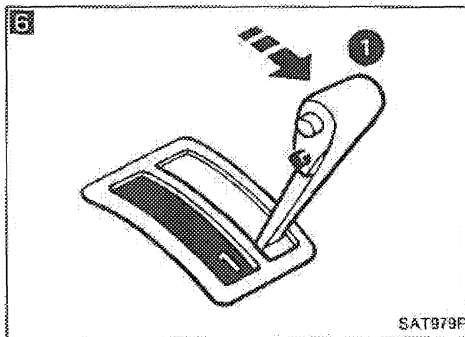
Yes
Ⓐ

TROUBLE DIAGNOSES

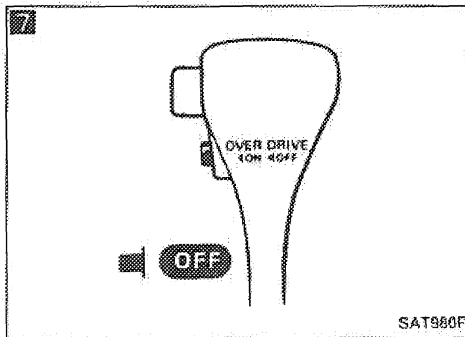
Self-diagnosis (Cont'd)



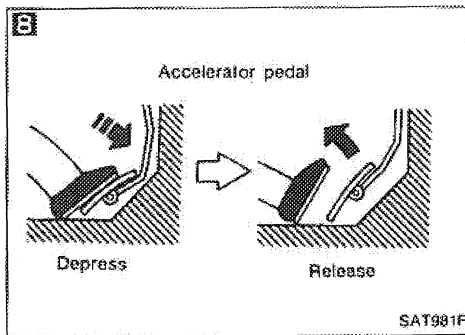
4 5
1. Move selector lever to "2" position.
2. Set overdrive switch in "ON" position.



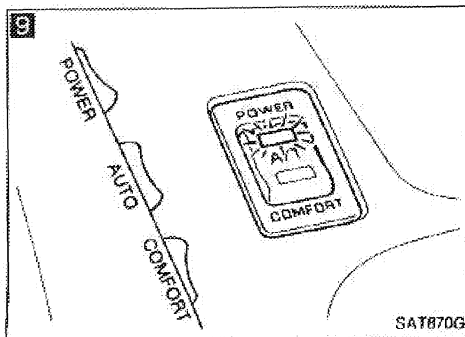
6
Move selector lever to "1" position.



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

TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

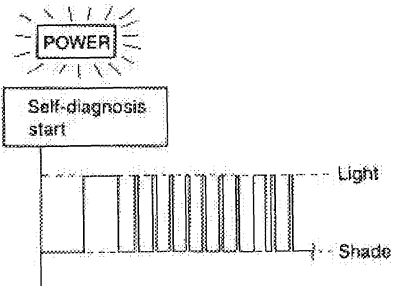
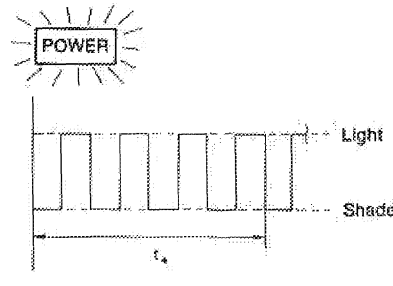
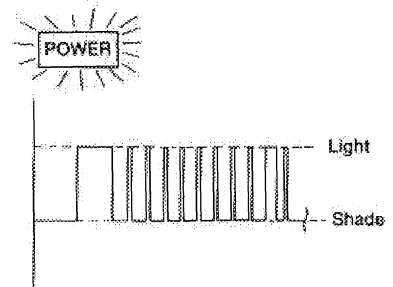
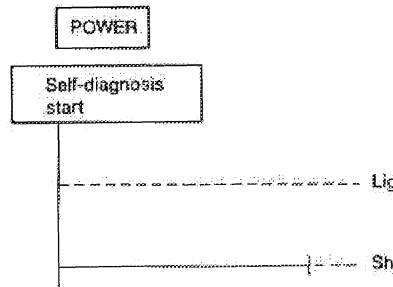
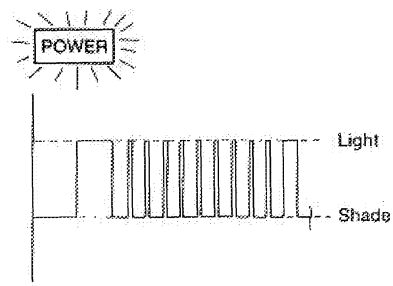
JUDGEMENT OF SELF-DIAGNOSIS CODE

Power indicator lamp:	
<p>All judgement flickers are same.</p> <p>Start signal 10 judgement flickers</p> <p>All circuits that can be confirmed by self-diagnosis are</p> <p style="text-align: right;">SAT755A</p>	<p>4th judgement flicker is longer than others.</p> <p>Shift solenoid valve A circuit is short-circuited or disconnected.</p> <p>➡ Go to SHIFT SOLENOID VALVE A CIRCUIT CHECK.</p> <p style="text-align: right;">SAT762A</p>
<p>1st judgement flicker is longer than others.</p> <p>Revolution sensor circuit is short-circuited or disconnected.</p> <p>➡ Go to REVOLUTION SENSOR CIRCUIT CHECK.</p> <p style="text-align: right;">SAT756A</p>	<p>5th judgement flicker is longer than others.</p> <p>Shift solenoid valve B circuit is short-circuited or disconnected.</p> <p>➡ Go to SHIFT SOLENOID VALVE B CIRCUIT CHECK.</p> <p style="text-align: right;">SAT763A</p>
<p>2nd judgement flicker is longer than others.</p> <p>Vehicle speed sensor circuit is short-circuited or disconnected.</p> <p>➡ Go to VEHICLE SPEED SENSOR CIRCUIT CHECK.</p> <p style="text-align: right;">SAT757A</p>	<p>6th judgement flicker is longer than others.</p> <p>Overrun clutch solenoid valve circuit is short-circuited or disconnected.</p> <p>➡ Go to OVERRUN CLUTCH SOLENOID VALVE CIRCUIT CHECK.</p> <p style="text-align: right;">SAT764A</p>
<p>3rd judgement flicker is longer than others.</p> <p>Throttle position sensor circuit is short-circuited or disconnected.</p> <p>➡ Go to THROTTLE POSITION SENSOR CIRCUIT CHECK.</p> <p style="text-align: right;">SAT758A</p>	<p>7th judgement flicker is longer than others.</p> <p>Torque converter clutch solenoid valve circuit is short-circuited or disconnected.</p> <p>➡ Go to TORQUE CONVERTER CLUTCH SOLENOID VALVE CIRCUIT CHECK.</p> <p style="text-align: right;">SAT765A</p>

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

TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

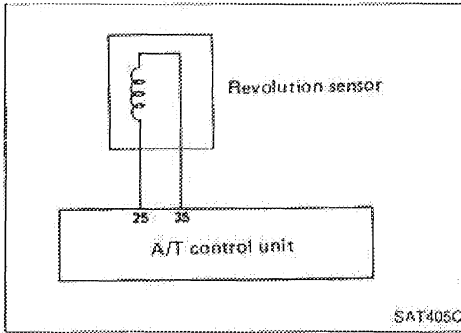
Power indicator lamp:	
<p>8th judgement flicker is longer than others.</p>  <p>Fluid temperature sensor is disconnected or A/T control unit power source circuit is damaged. ➡ Go to FLUID TEMPERATURE SENSOR AND A/T CONTROL UNIT POWER SOURCE CIRCUIT CHECKS.</p> <p style="text-align: right;">SAT770A</p>	<p>Flickers as shown below.</p>  <p>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.)</p> <p style="text-align: right;">SAT773A</p>
<p>9th judgement flicker is longer than others.</p>  <p>Engine speed signal circuit is short-circuited or disconnected. ➡ Go to ENGINE SPEED SIGNAL CIRCUIT CHECK.</p> <p style="text-align: right;">SAT771A</p>	<p>Does not come on.</p>  <p>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.</p> <p style="text-align: right;">SAT146B</p>
<p>10th judgement flicker is longer than others.</p>  <p>Line pressure solenoid valve circuit is short-circuited or disconnected. ➡ Go to LINE PRESSURE SOLENOID VALVE CIRCUIT CHECK.</p> <p style="text-align: right;">SAT772A</p>	

$t_4 = 1.0$ second

TROUBLE DIAGNOSES

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

MONITOR	
VHCL/S SE-A/T	0mph
VHCL/S SE-MTR	3mph
THRTL POS SEN	0.4V
FLUID TEMP SE	1.8V
BATTERY VOLT	11.8V
ENGINE SPEED	384rpm
SLCT LEVER SW	OFF
P/N POSI SW	O N
R POSITION SW	OFF

RECORD

SAT345G

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 ② 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.)

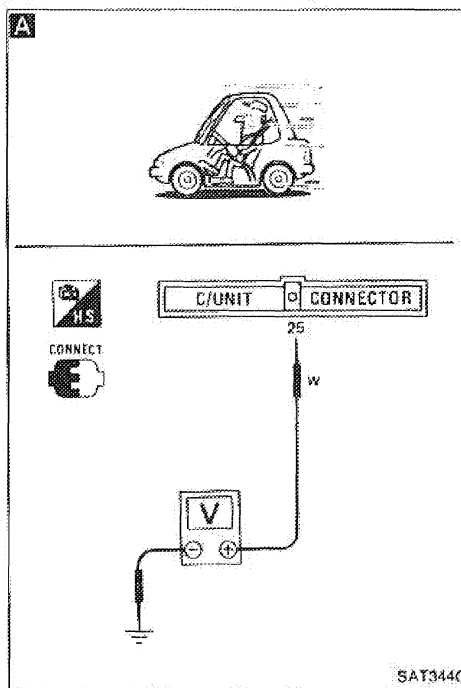
O.K.

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




TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

VEHICLE SPEED SENSOR CIRCUIT CHECK

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

A

CHECK INPUT SIGNAL.

- Turn ignition switch to "START" position and start engine.
- 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.

OR

- Check voltage between A/T control unit terminal ② 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

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)

O.K.

Perform self-diagnosis again after driving for a while.

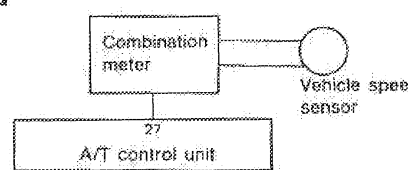
O.K.

INSPECTION END

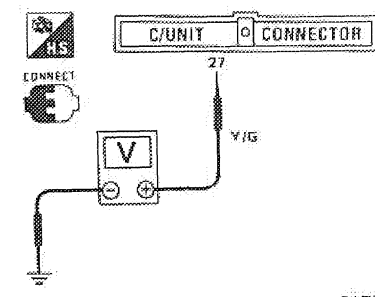
N.G.

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

A



At 2 - 3 km/h (1 - 2 MPH)

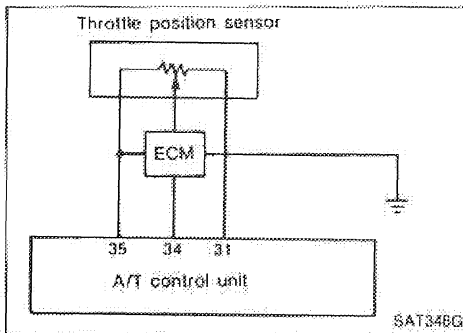


SAT347G

TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

THROTTLE POSITION SENSOR CIRCUIT CHECK



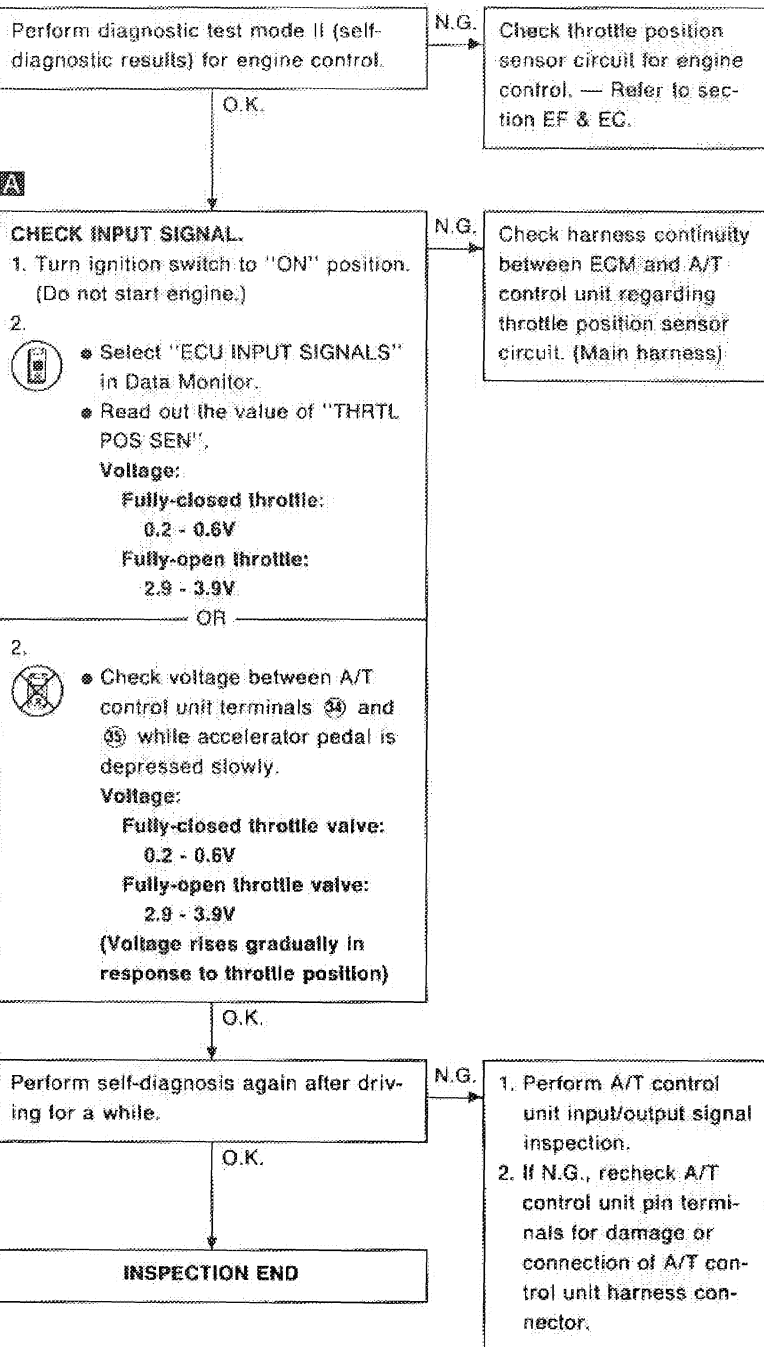
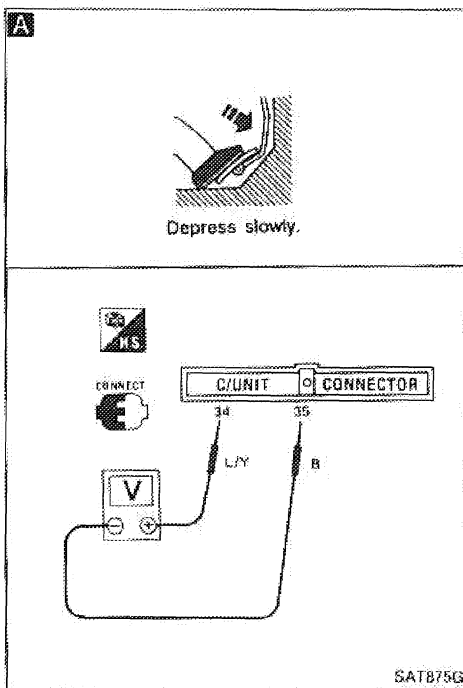
A

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	O N
R POSITION SW	OFF

RECORD

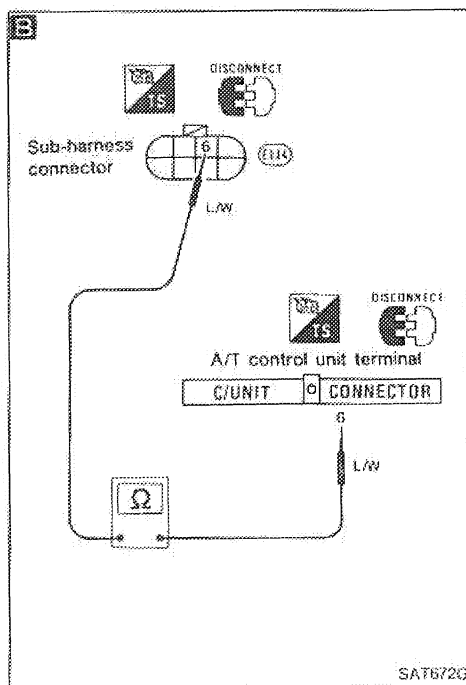
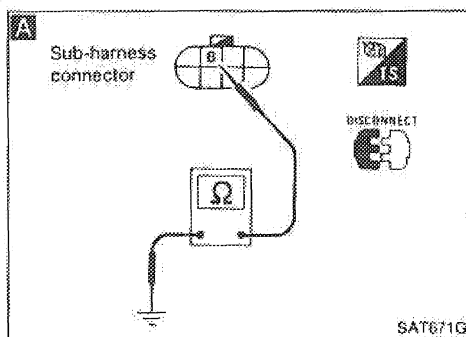
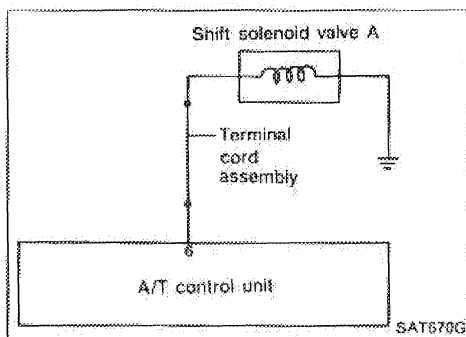
SAT349G



TROUBLE DIAGNOSES

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 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

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.

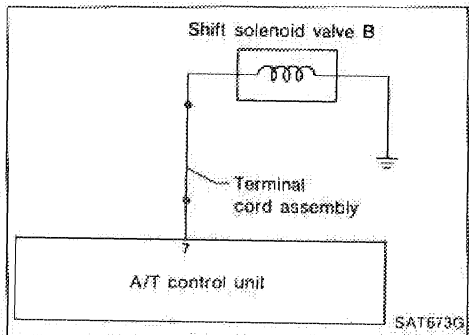
O.K.

INSPECTION END

TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

SHIFT SOLENOID VALVE B CIRCUIT CHECK



A

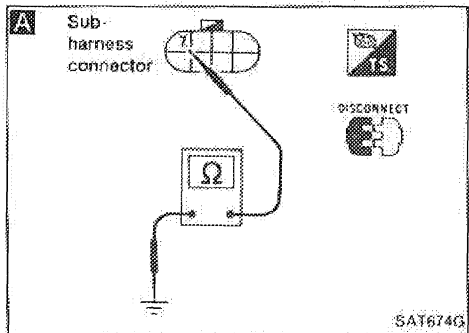
CHECK GROUND CIRCUIT.

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.

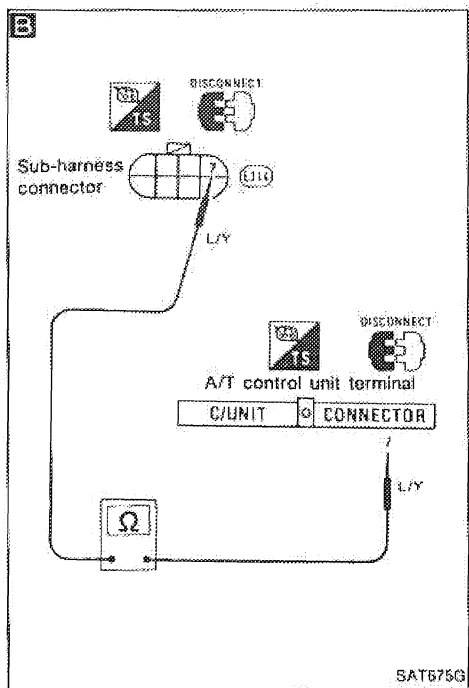
1. Turn ignition switch to "OFF" position.
2. Disconnect A/T control unit harness connector.
3. Check resistance between terminal ⑦ and A/T control unit terminal ⑦.

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.

O.K. ↓

INSPECTION END

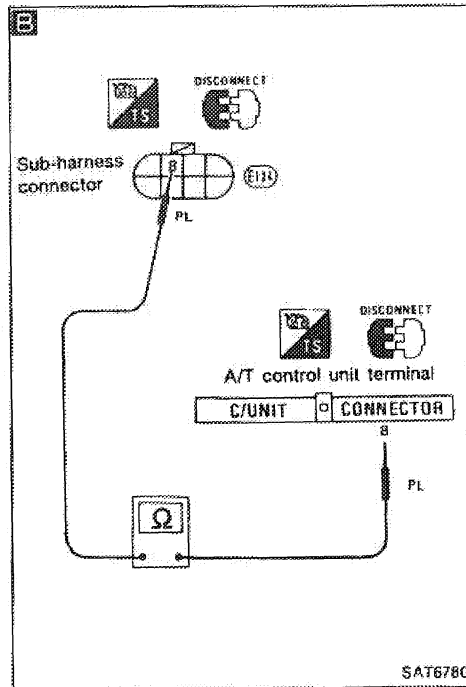
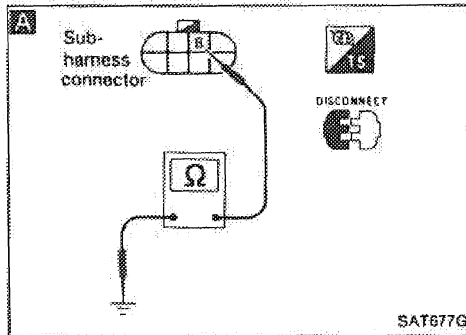
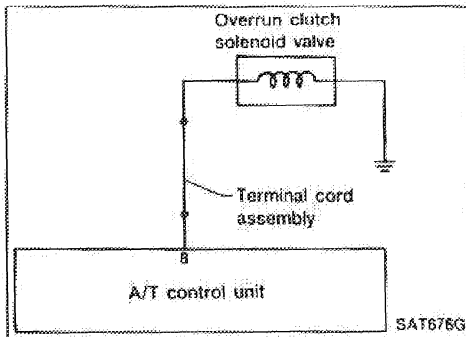
N.G. →

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.

TROUBLE DIAGNOSES

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.

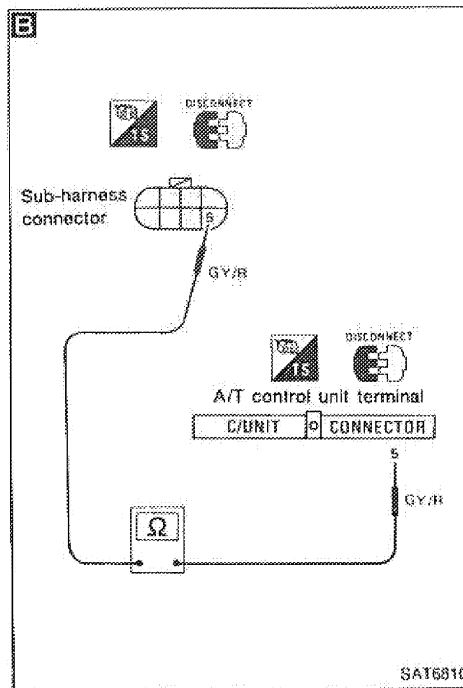
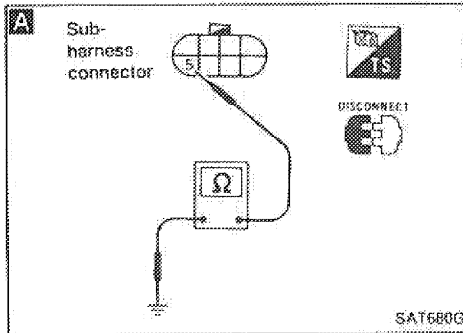
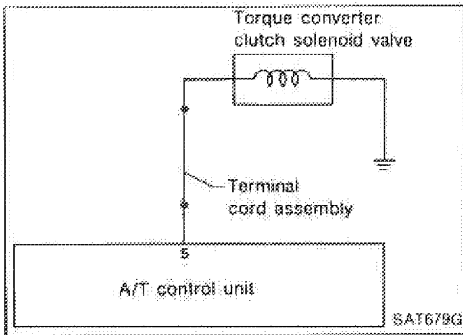
O.K.

INSPECTION END

TROUBLE DIAGNOSES

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.

1. 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.

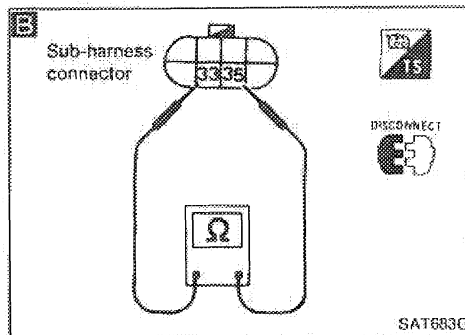
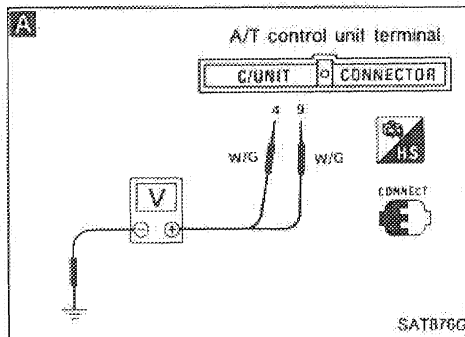
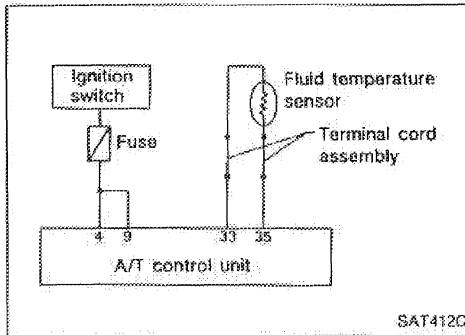
O.K.

INSPECTION END

TROUBLE DIAGNOSES

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 ③ and ⑤ when A/T is cold.

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

Resistance:

Cold [20°C (68°F)]

Approximately 2.5 kΩ

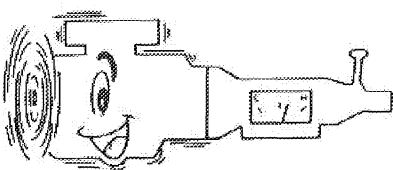
4. Reinstall any part removed.

O.K.

Ⓐ

TROUBLE DIAGNOSES

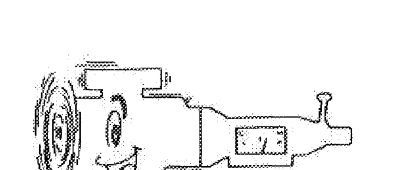
Self-diagnosis (Cont'd)



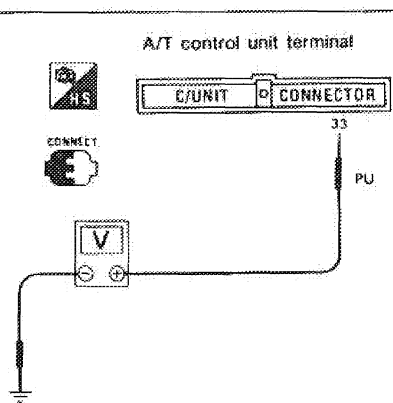
MONITOR	
VHCL/S SE-A/T	0mph
VHCL/S SE-MTR	3mph
THRTL POS SEN	0.4V
FLUID TEMP SE	1.4V
BATTERY VOLT	11.8V
ENGINE SPEED	384rpm
SLCT LEVER SW	OFF
P/N POSI SW	O N
R POSITION SW	OFF

RECORD

SAT684G



A/T control unit terminal

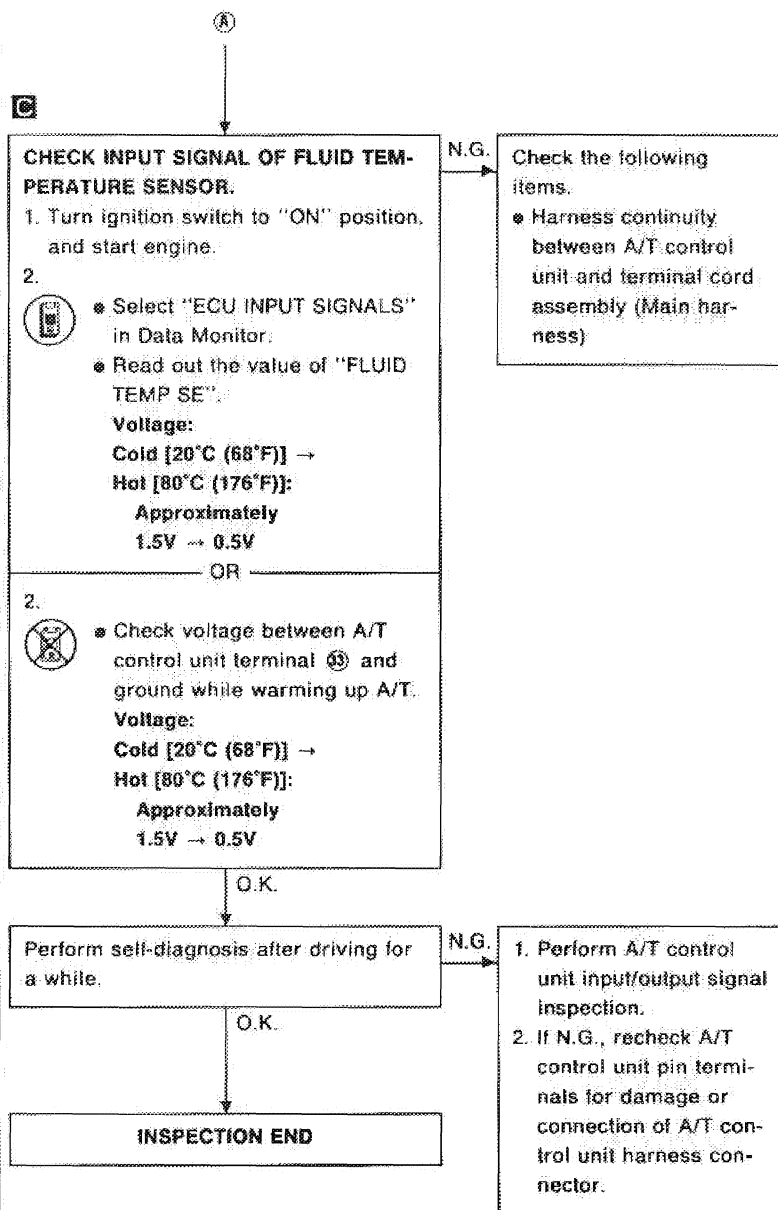


C/UNIT CONNECTOR

CONNECT

33 PU

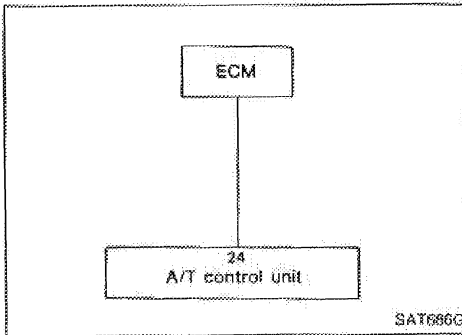
SAT685G



TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

ENGINE SPEED SIGNAL CIRCUIT CHECK

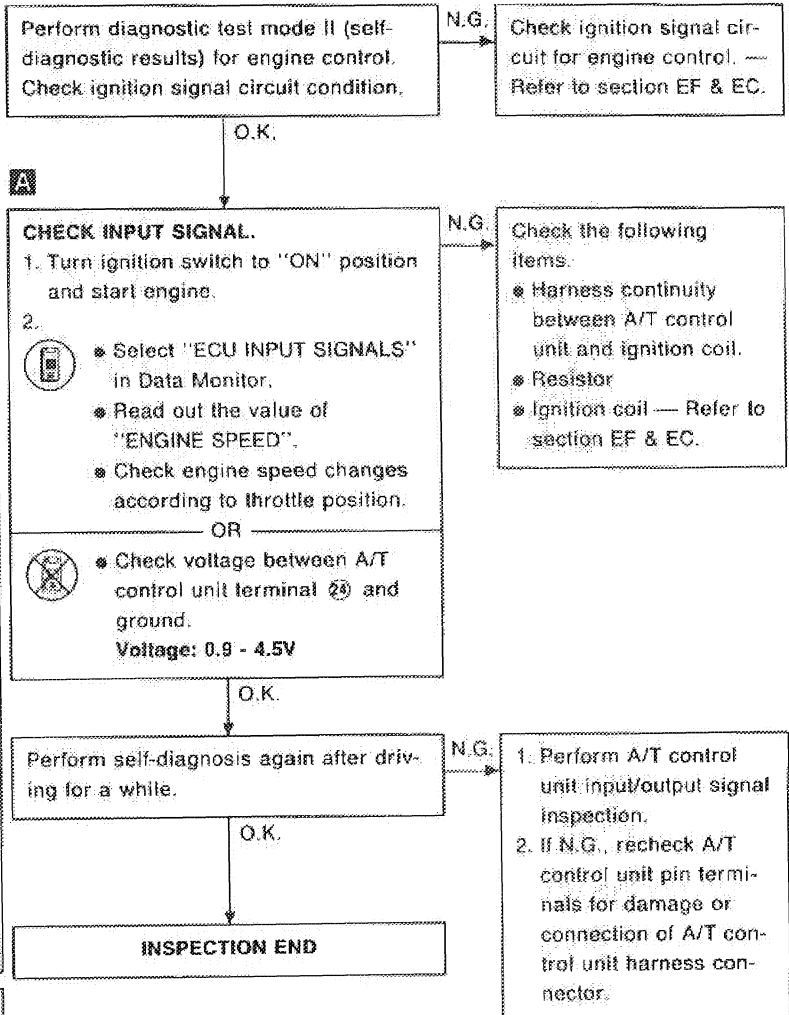
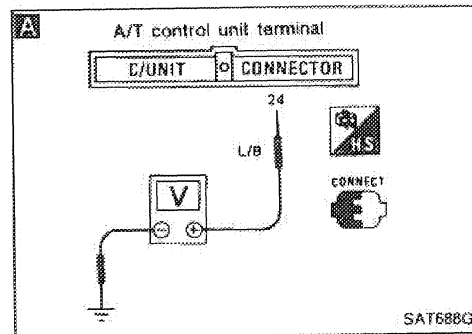


A

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

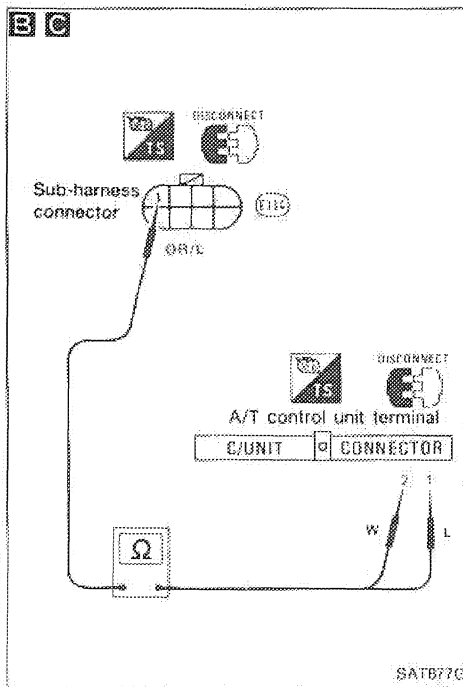
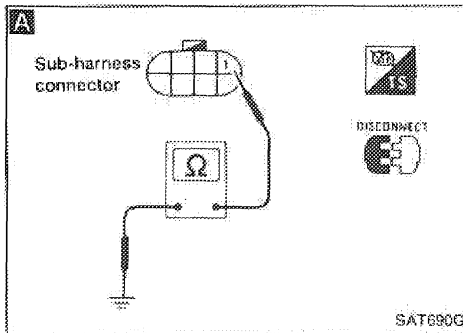
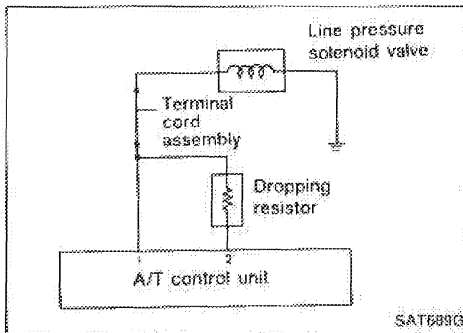
SAT687G



TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

LINE PRESSURE 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 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 6Ω**
3. Reinstall any part removed.

N.G.

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

O.K.

1. 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.

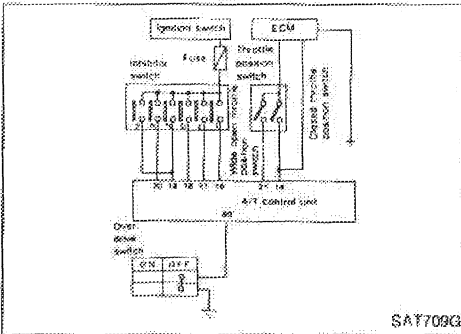
O.K.

INSPECTION END

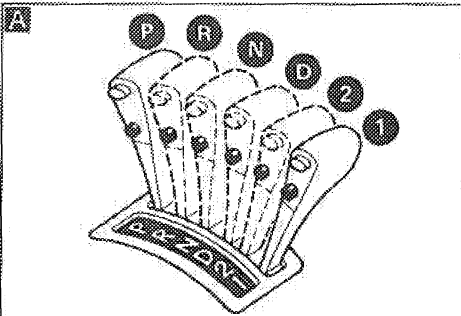
TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

INHIBITOR, OVERDRIVE AND THROTTLE POSITION SWITCH CIRCUIT CHECKS



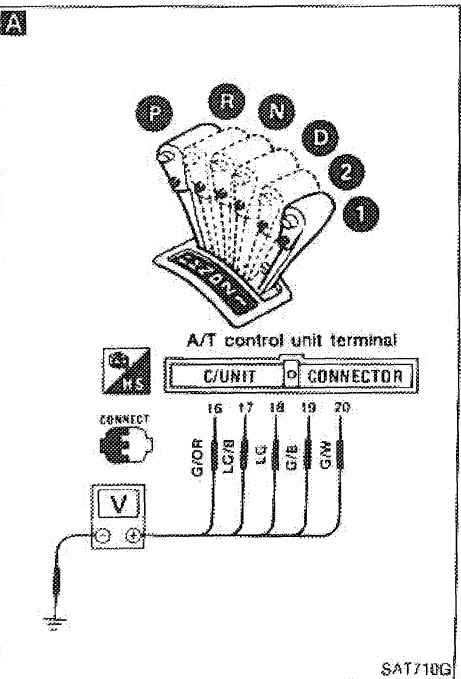
SAT709G



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

SAT711G



SAT710G

A

CHECK INHIBITOR SWITCH CIRCUIT.

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

- 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

- Check voltage between A/T control unit terminals ⑱, ⑲, ⑳, ㉑, ㉒ and ground while moving selector lever through each position.

Voltage:

- B: Battery voltage
- 0: 0V

Lever position	Terminal No.				
	⑱	⑲	⑳	㉑	㉒
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

O.K.

A

N.G.

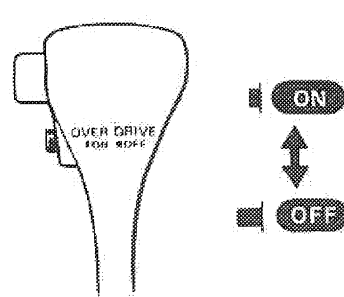
Check the following items:

- 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)

TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)

B



OVER DRIVE
OD SW

ON
OFF

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

SAT712G

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

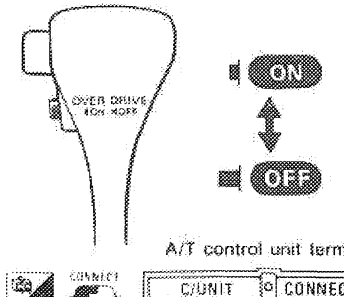
2.  Check voltage between A/T control unit terminal **40** and ground when overdrive switch is in "ON" position and in "OFF" position.

Switch position	Voltage
ON	Battery voltage
OFF	1V or less

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)

B



OVER DRIVE
OD SW

ON
OFF

A/T control unit terminal

CONNECT

C/UNIT CONNECTOR

40

B/W

V

SAT878G

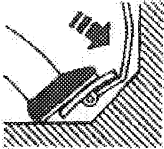
O.K.

B

TROUBLE DIAGNOSES

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	

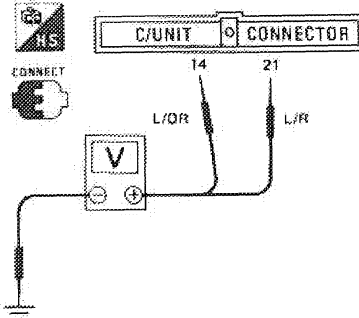
RECORD

SAT714G

C D



A/T control unit terminal



SAT879G

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.

OR

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

Voltage:

When releasing accelerator pedal:

1V or less

When depressing accelerator pedal fully:

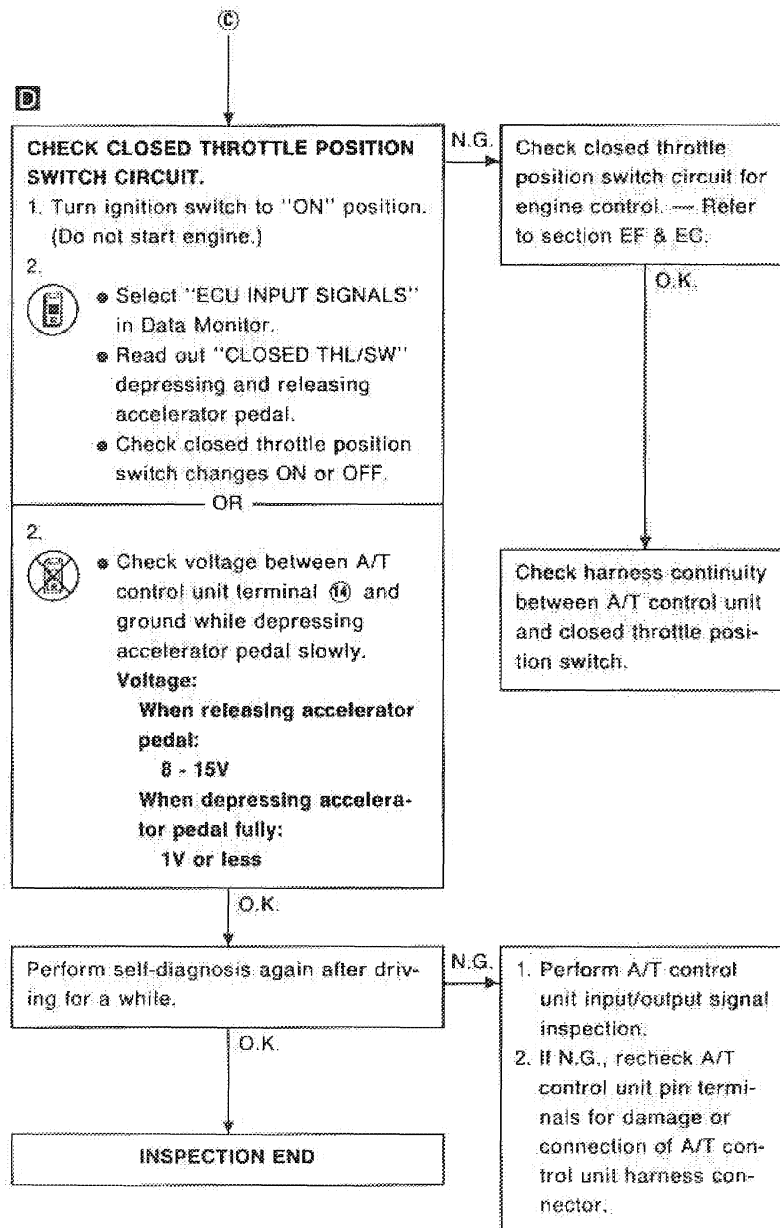
8 - 15V

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

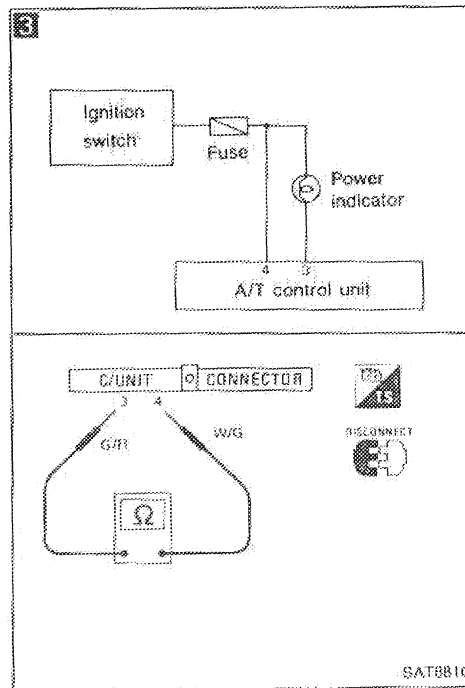
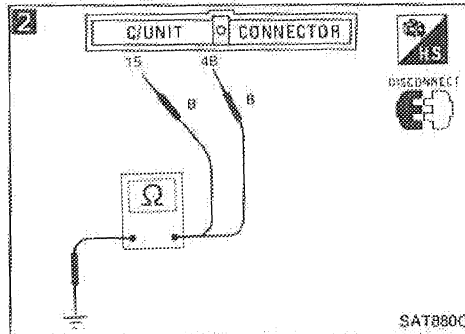
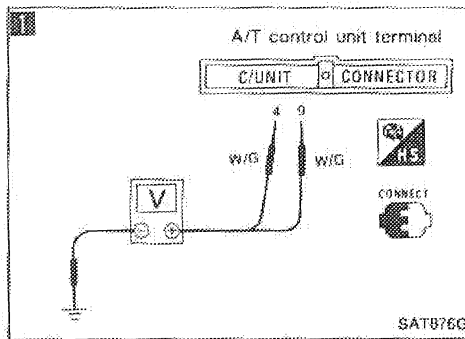
O.K. → **Ⓢ**

TROUBLE DIAGNOSES

Self-diagnosis (Cont'd)



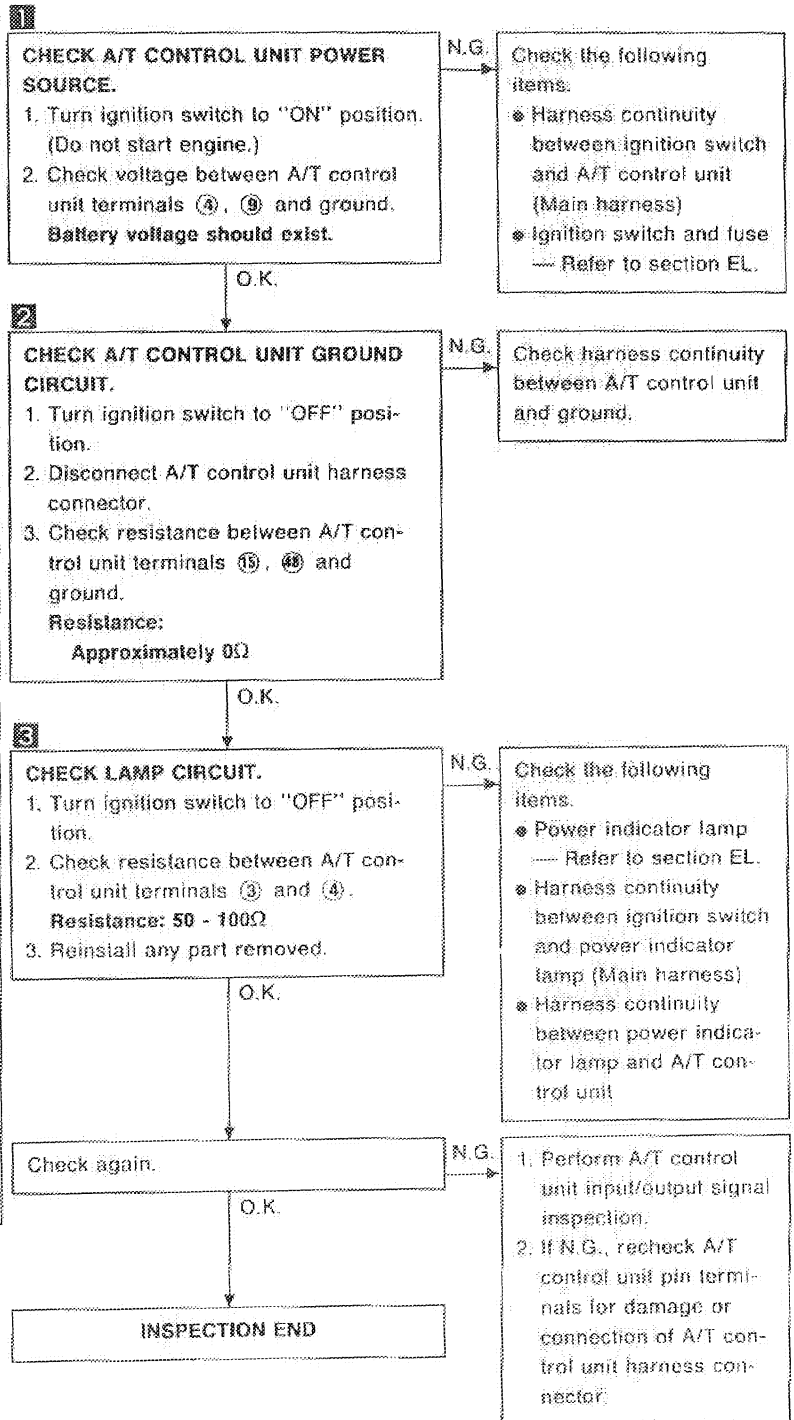
TROUBLE DIAGNOSES



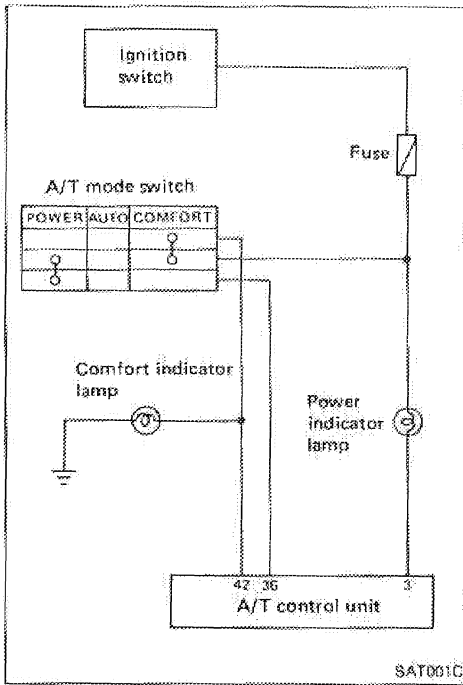
Diagnostic Procedure 1

SYMPTOM:

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



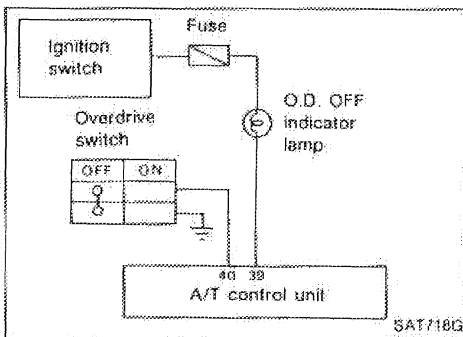
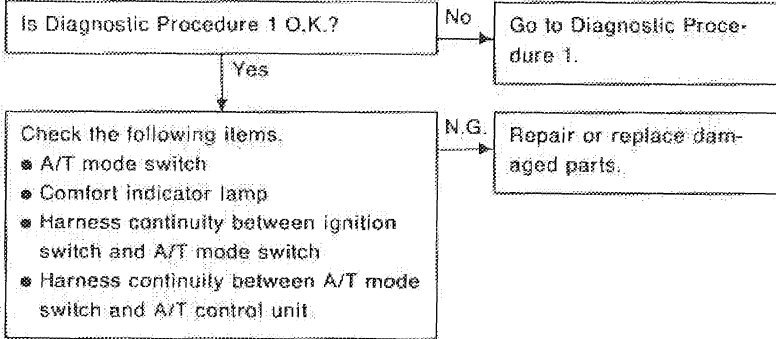
TROUBLE DIAGNOSES



Diagnostic Procedure 2

SYMPTOM:

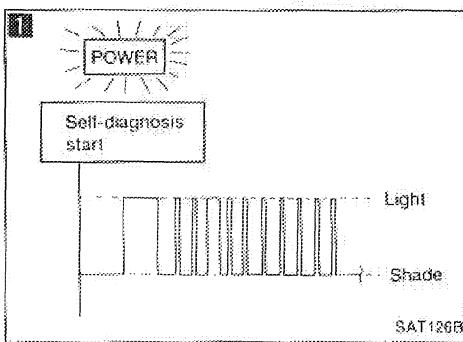
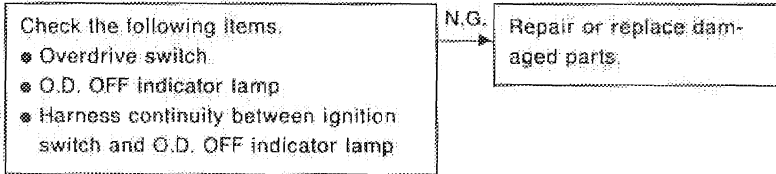
Power indicator lamp or comfort indicator lamp does not come on when turning A/T mode switch to the appropriate position.



Diagnostic Procedure 3

SYMPTOM:

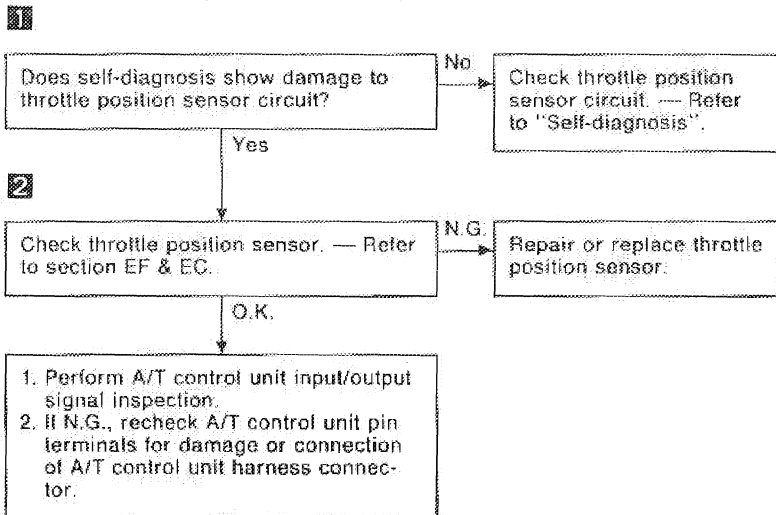
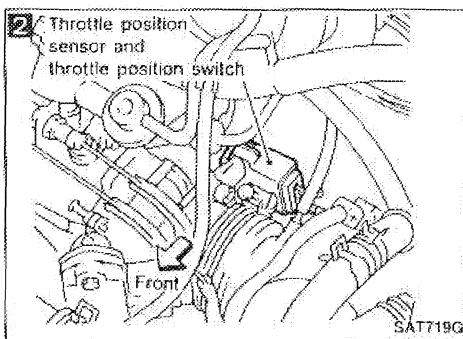
O.D. OFF indicator lamp does not come on when setting overdrive switch to "OFF" position.



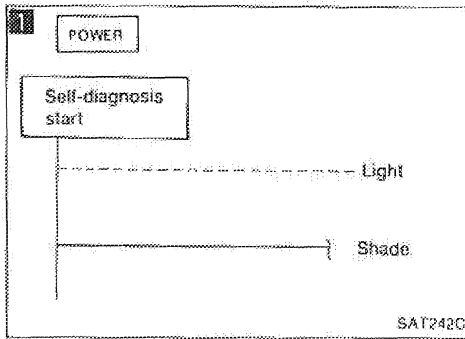
Diagnostic Procedure 4

SYMPTOM:

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



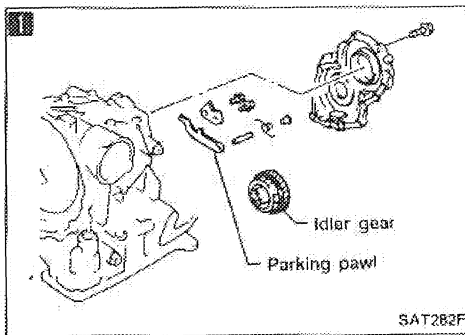
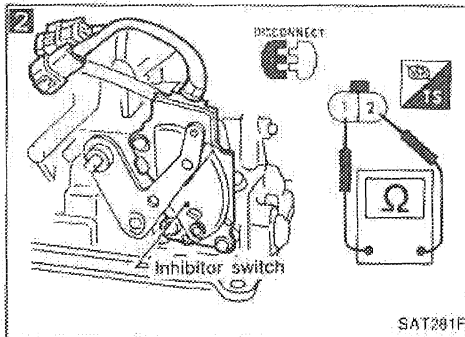
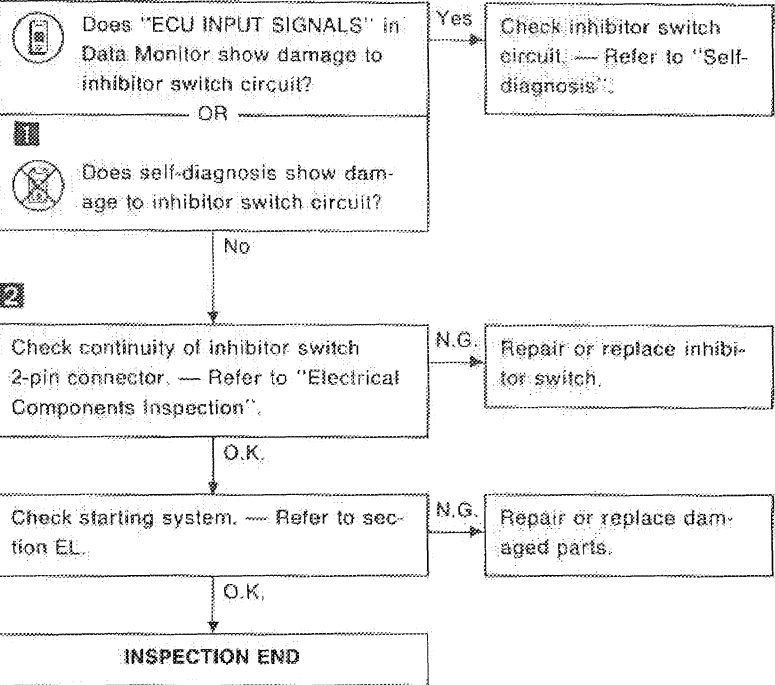
TROUBLE DIAGNOSES



Diagnostic Procedure 5

SYMPTOM:

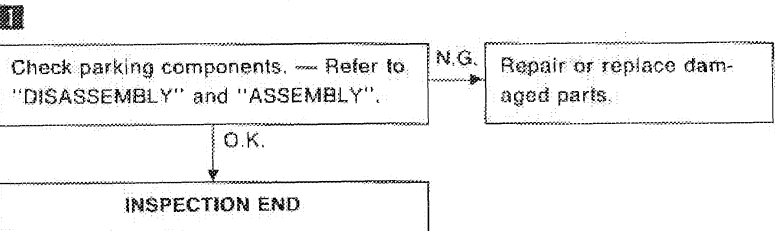
Engine cannot be started with selector lever in "P" or "N" position or engine can be started with selector lever in "D", "2", "1" or "R" position.



Diagnostic Procedure 6

SYMPTOM:

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

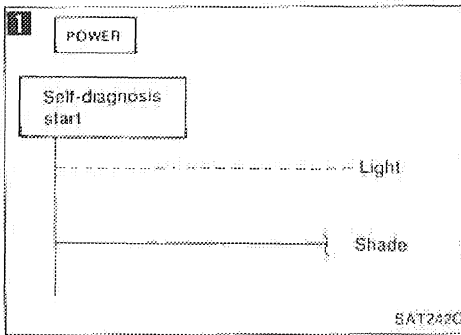


TROUBLE DIAGNOSES

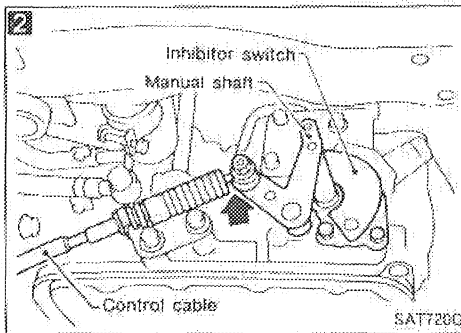
Diagnostic Procedure 7

SYMPTOM:

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



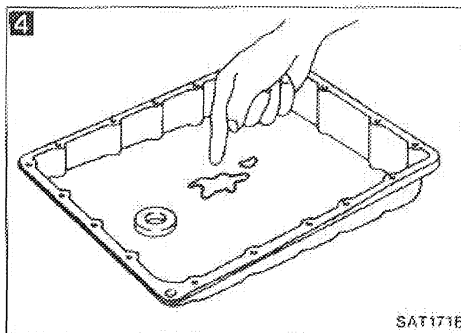
SAT242C



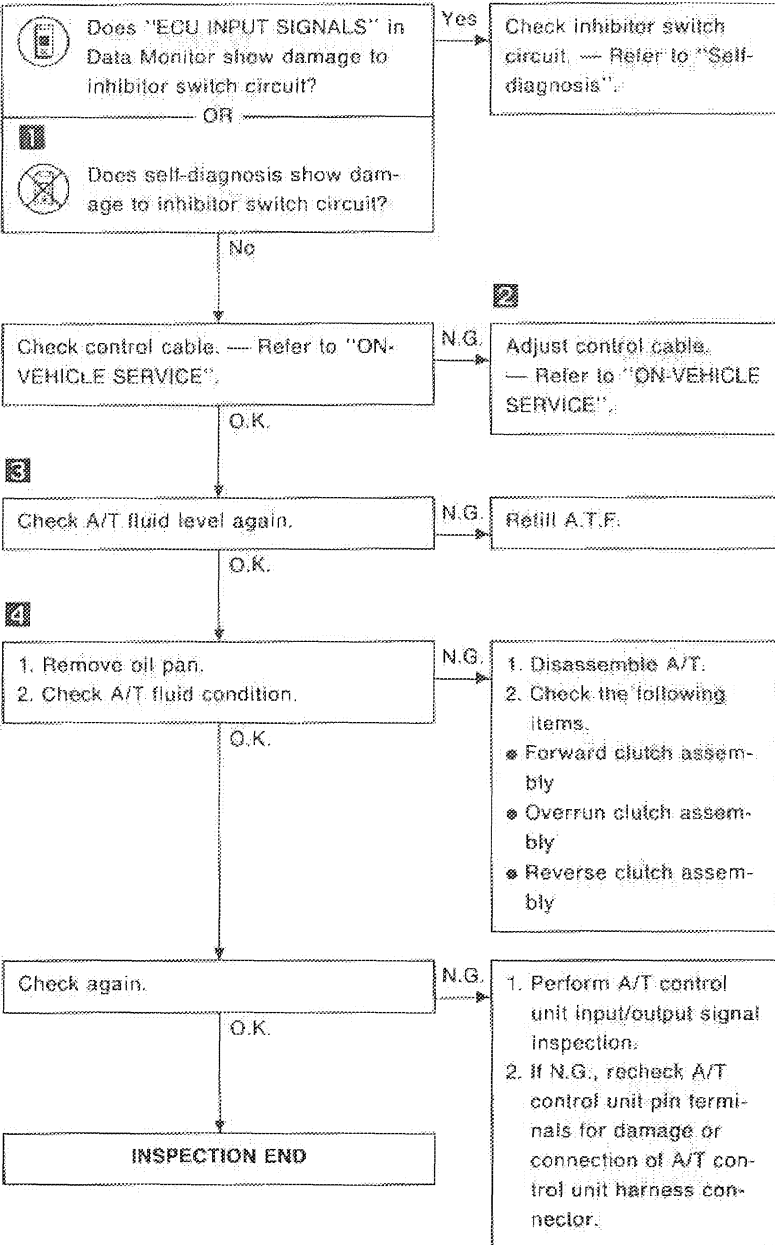
SAT726G



SAT638A



SAT171B

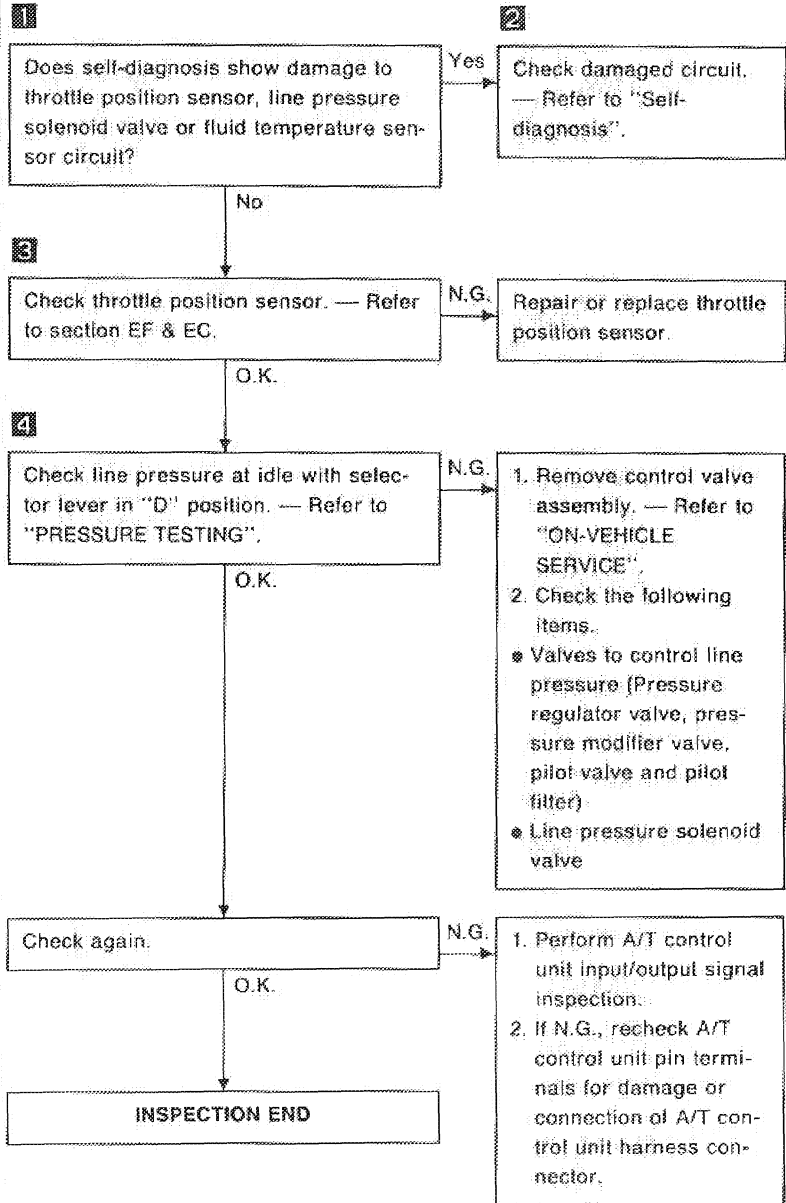
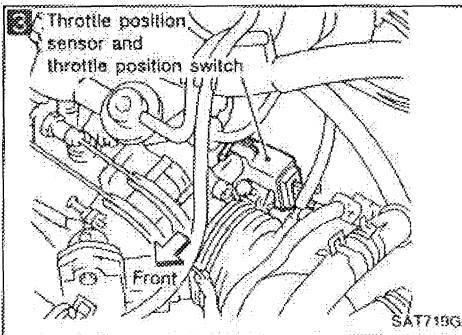
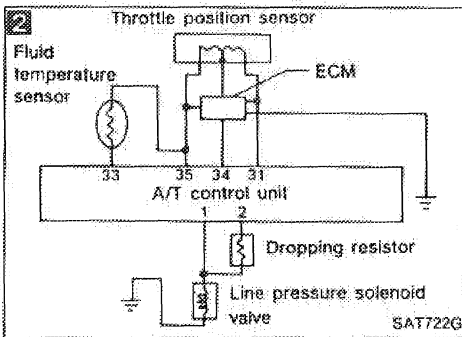
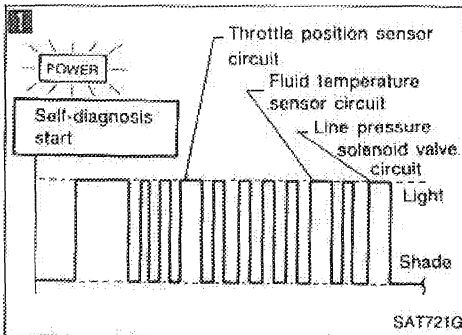


TROUBLE DIAGNOSES

Diagnostic Procedure 8

SYMPTOM:

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

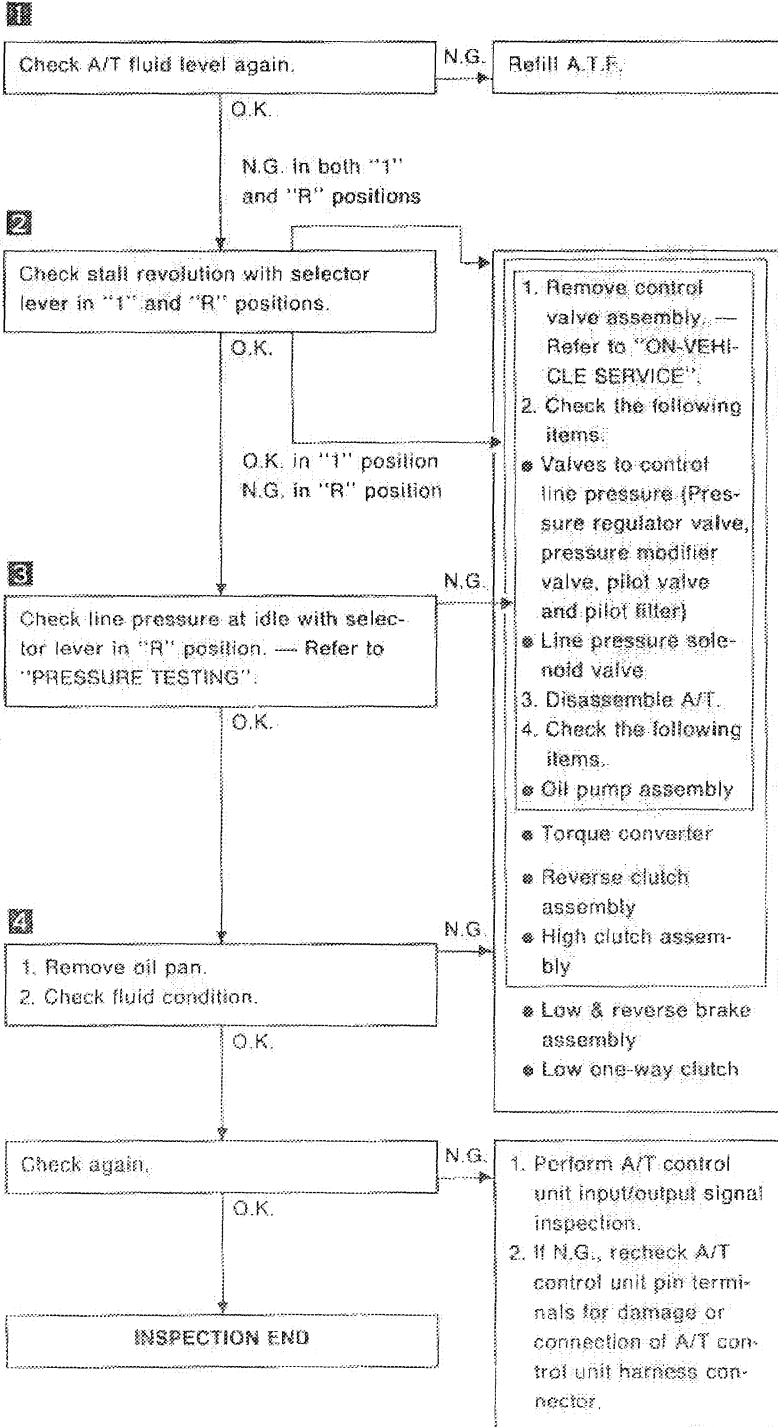
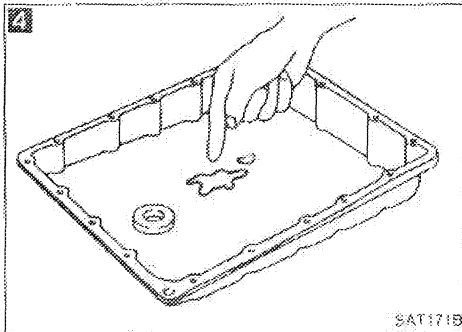
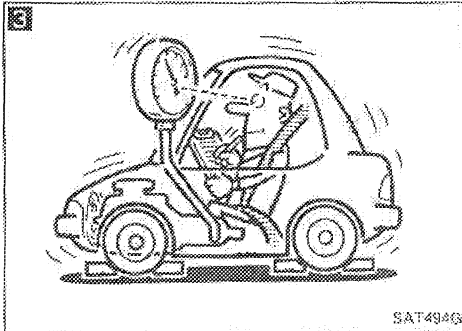
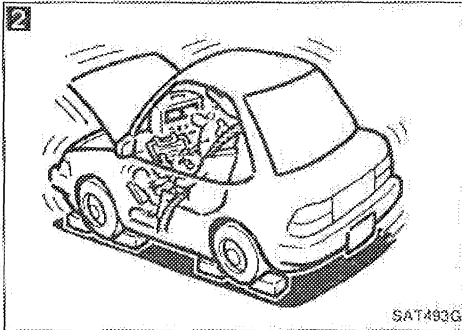
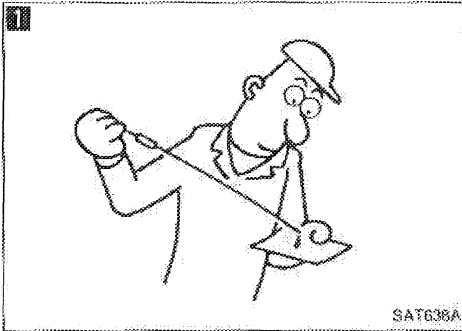


TROUBLE DIAGNOSES

Diagnostic Procedure 9

SYMPTOM:

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



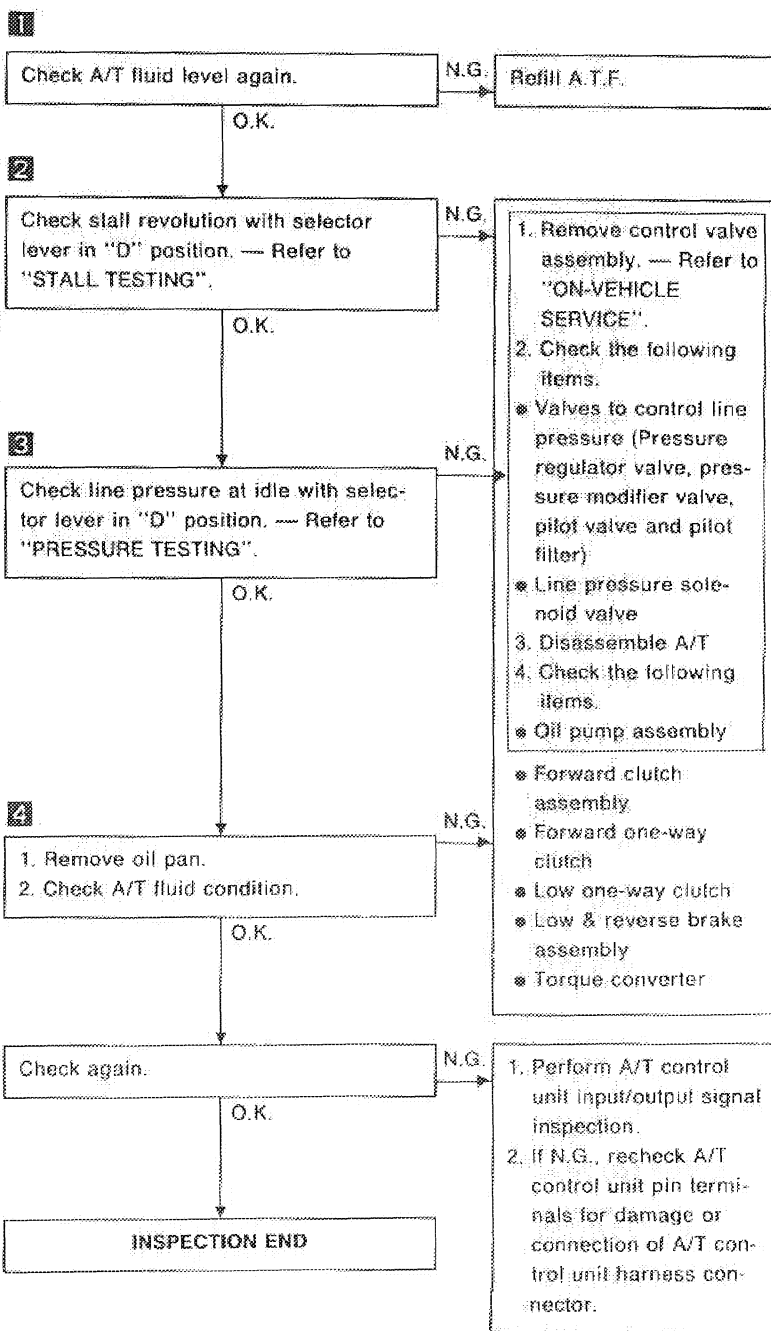
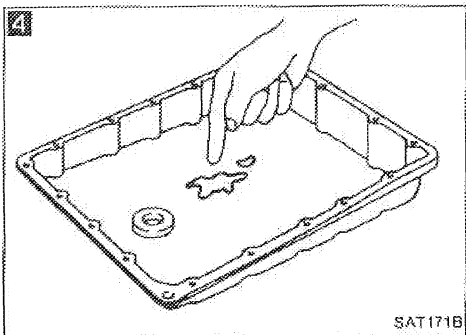
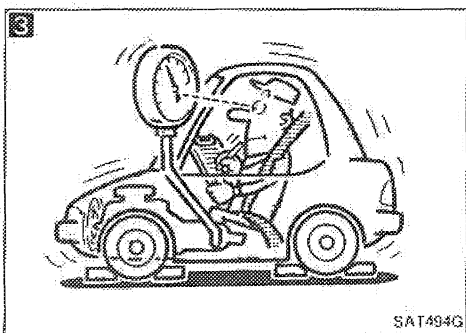
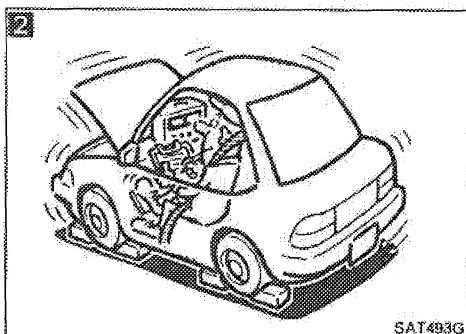
TROUBLE DIAGNOSES



Diagnostic Procedure 10

SYMPTOM:

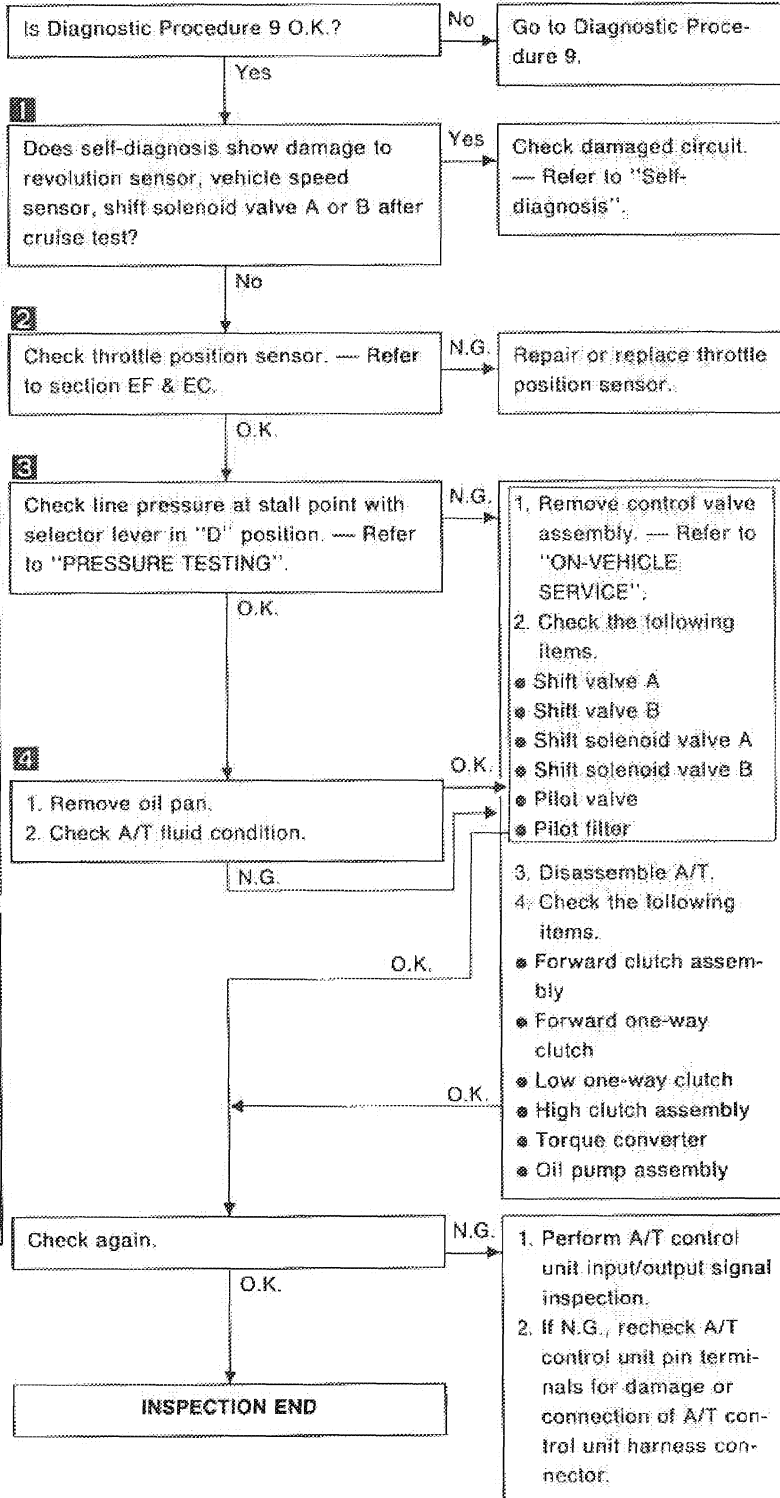
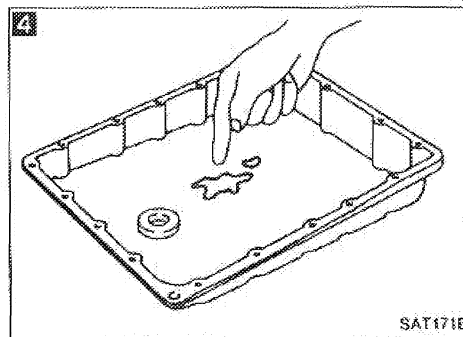
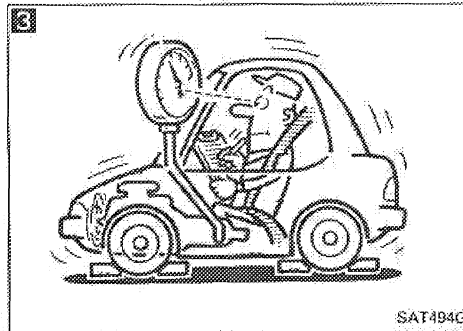
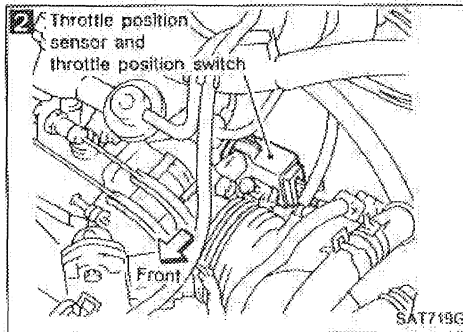
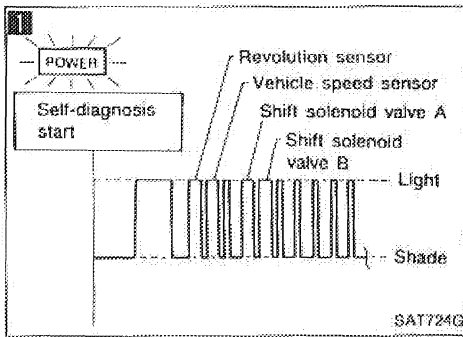
Vehicle does not creep forward when selecting "D", "2" or "1" position.



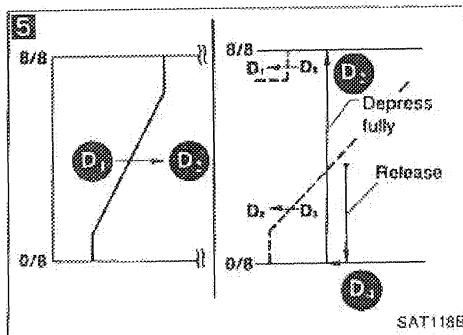
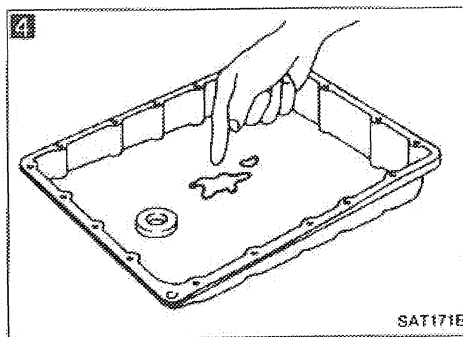
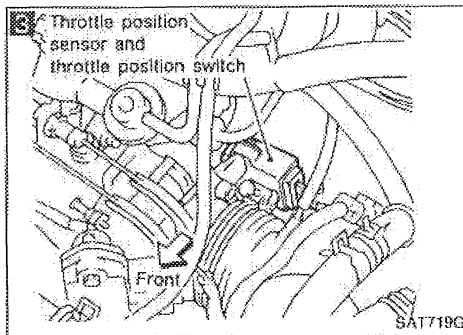
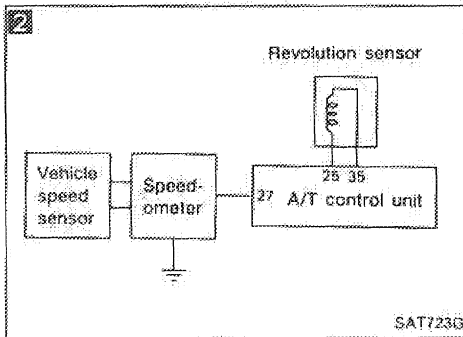
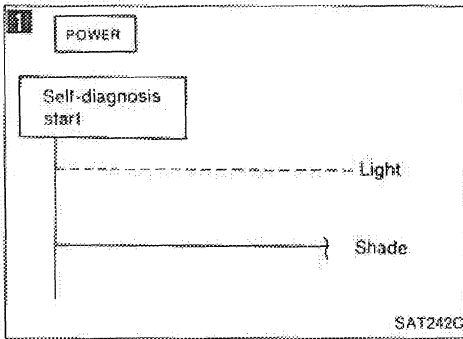
TROUBLE DIAGNOSES

Diagnostic Procedure 11

SYMPTOM:
Vehicle cannot be started from D₁ on Cruise test — Part 1.



TROUBLE DIAGNOSES

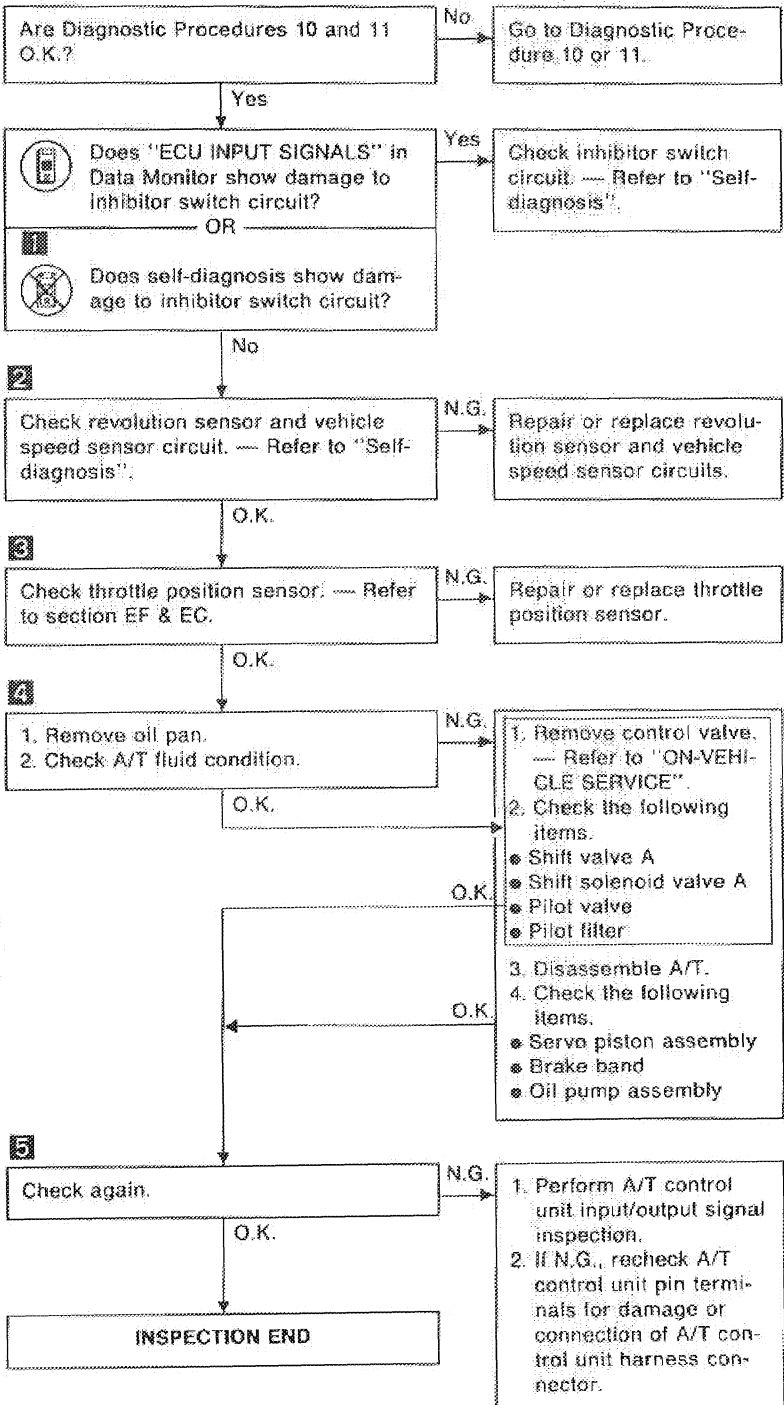


Diagnostic Procedure 12

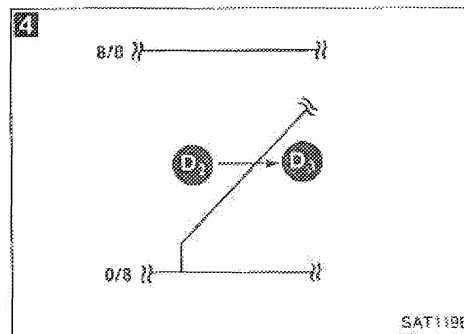
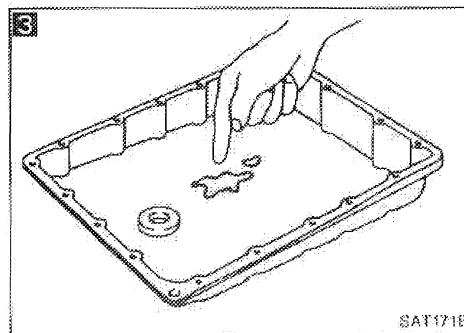
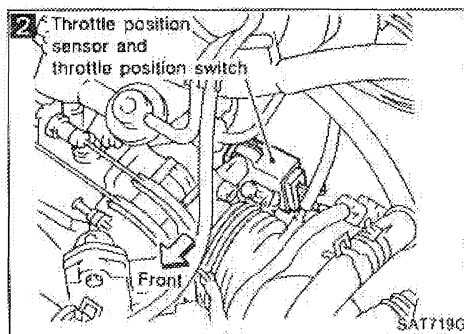
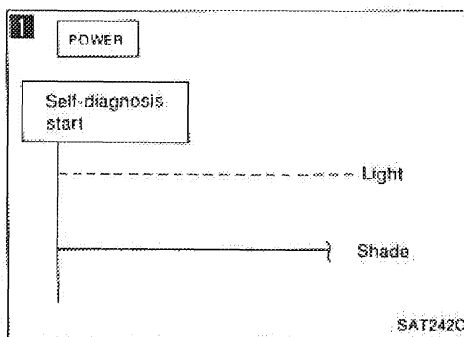
SYMPTOM:

A/T does not shift from D₁ to D₂ at the specified speed.

A/T does not shift from D₄ to D₂ when depressing accelerator pedal fully at the specified speed.



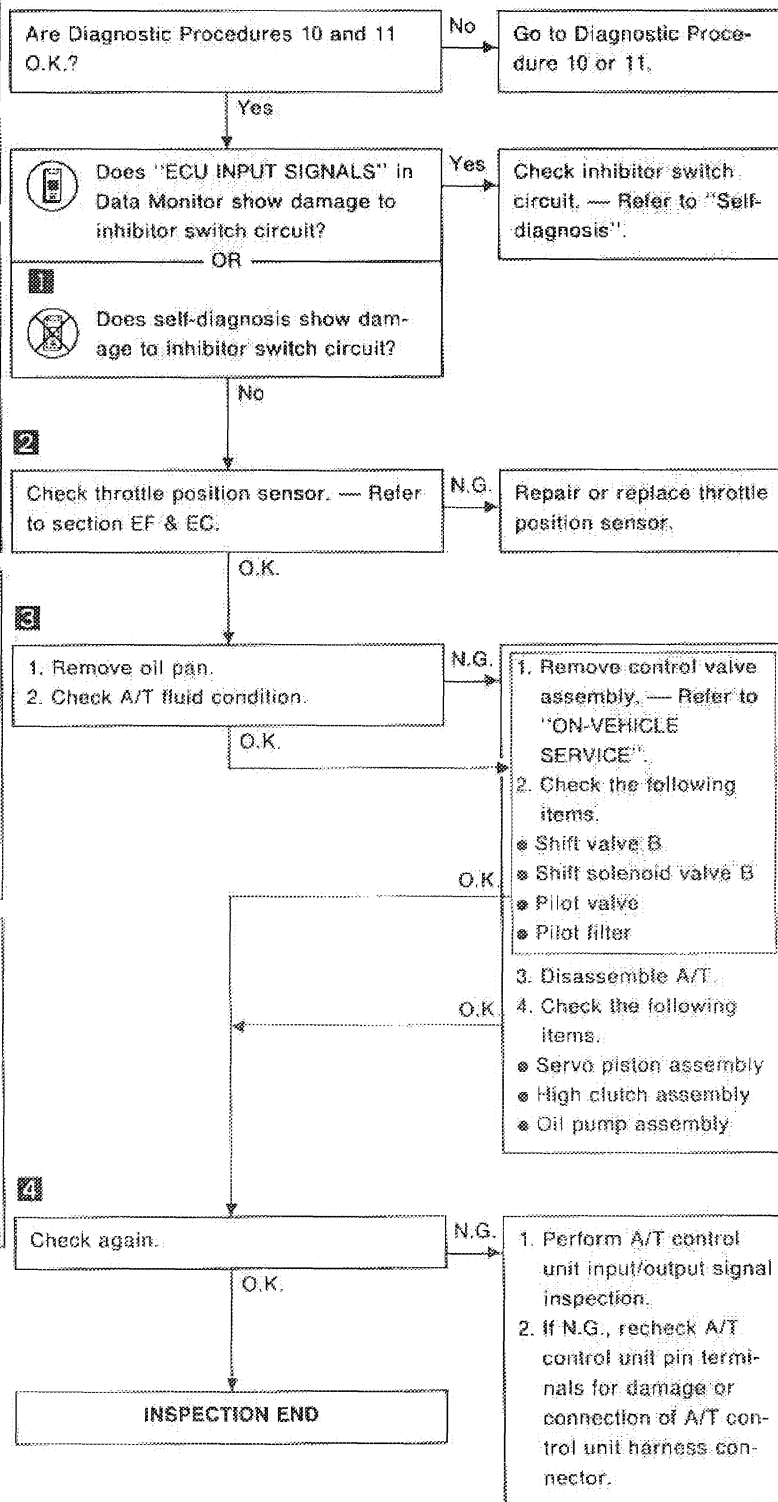
TROUBLE DIAGNOSES



Diagnostic Procedure 13

SYMPTOM:

A/T does not shift from D₂ to D₃ at the specified speed.



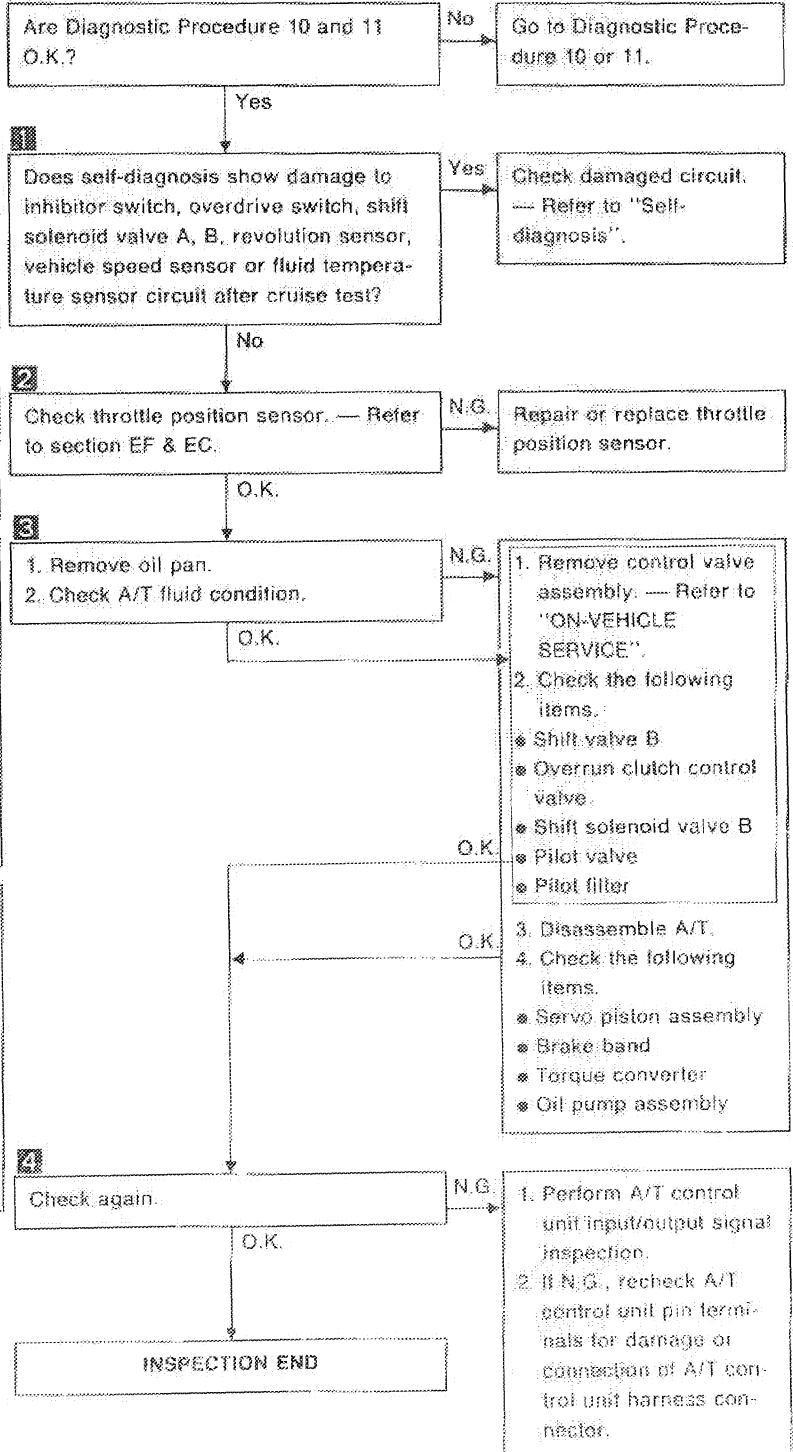
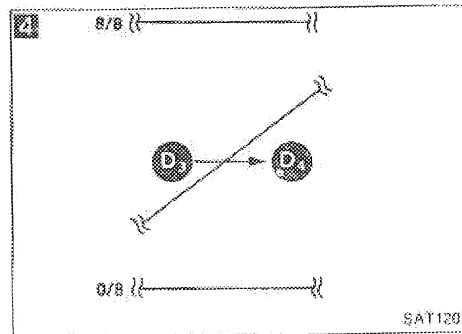
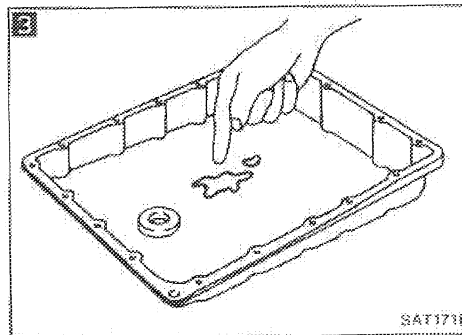
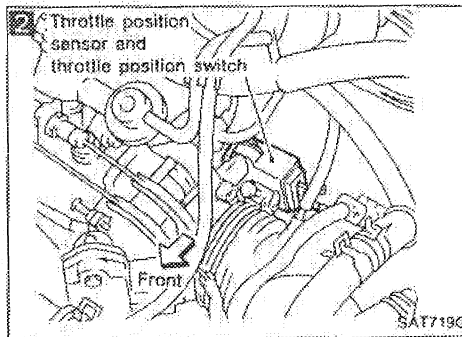
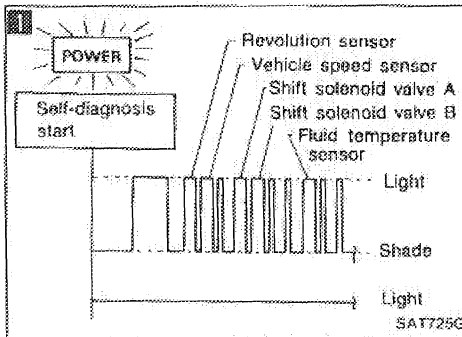
TROUBLE DIAGNOSES

Diagnostic Procedure 14

SYMPTOM:

A/T does not shift from D₃ to D₄ at the specified speed.

A/T must be warm before D₃ to D₄ shift will occur.

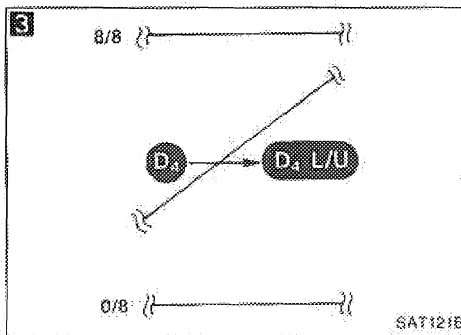
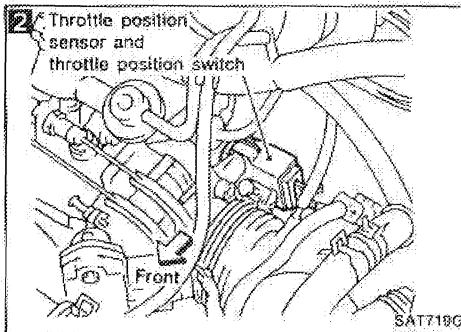
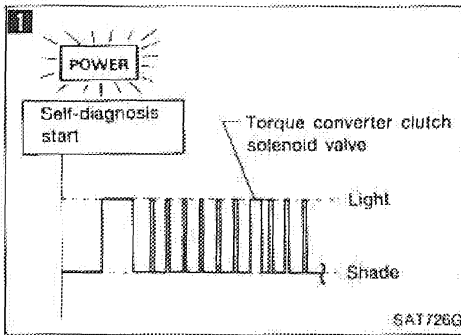


TROUBLE DIAGNOSES

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.

2

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.

3

Check again:

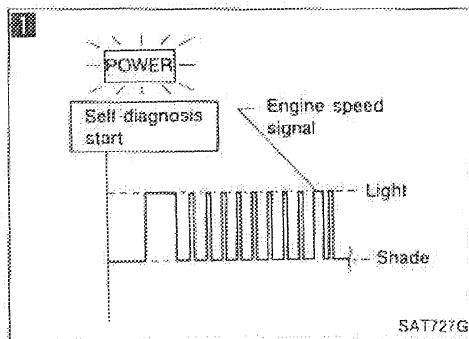
N.G.

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

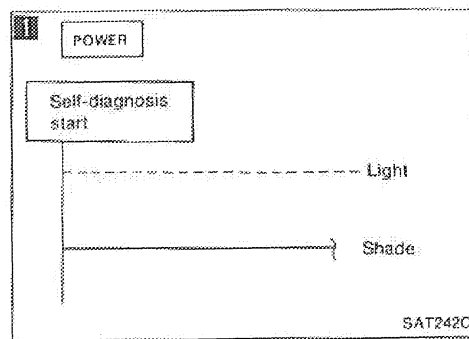
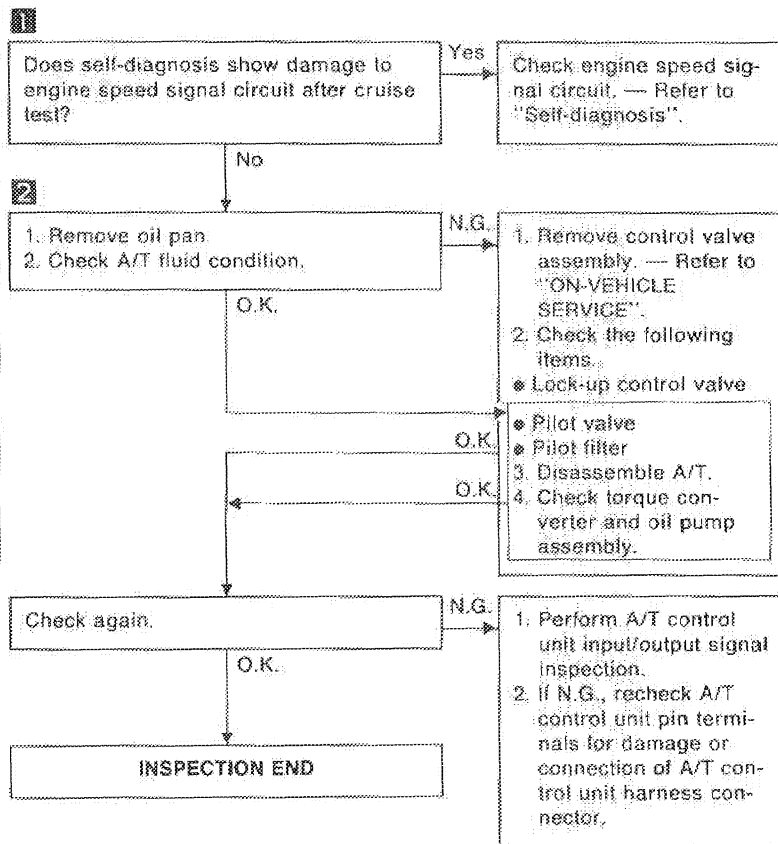
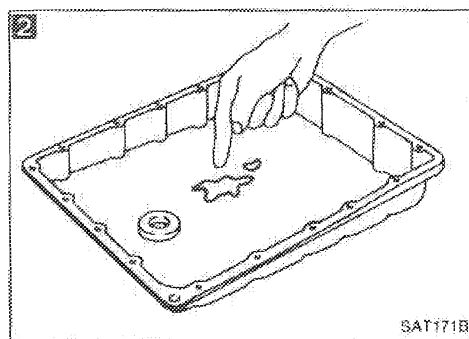
TROUBLE DIAGNOSES



Diagnostic Procedure 16

SYMPTOM:

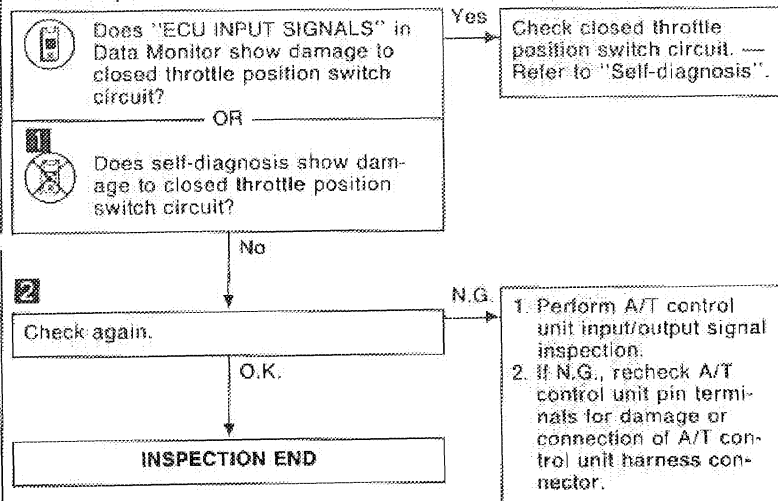
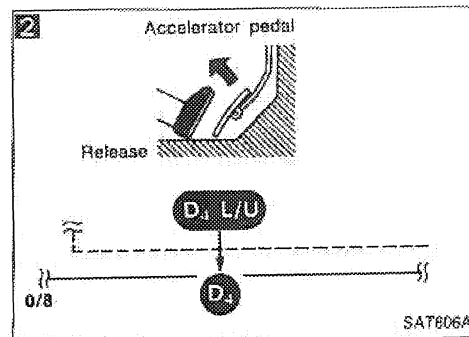
A/T does not hold lock-up condition for more than 30 seconds.



Diagnostic Procedure 17

SYMPTOM:

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



TROUBLE DIAGNOSES

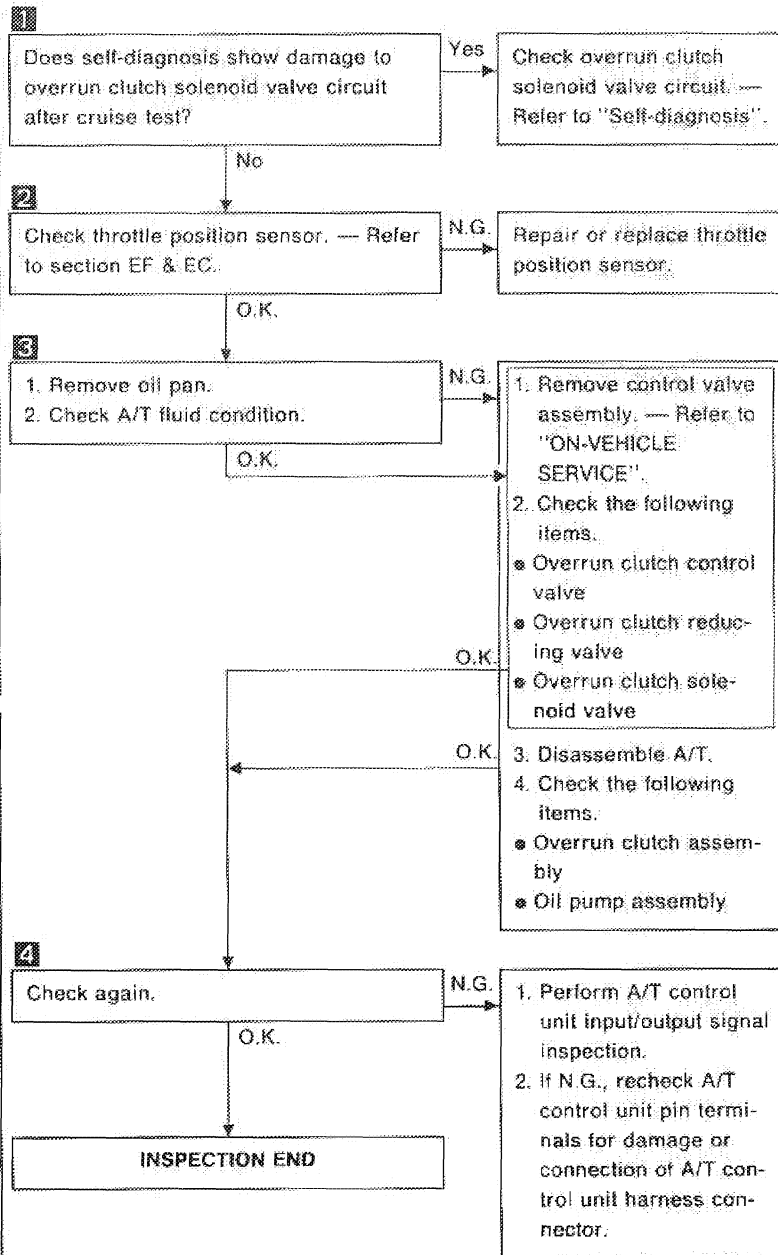
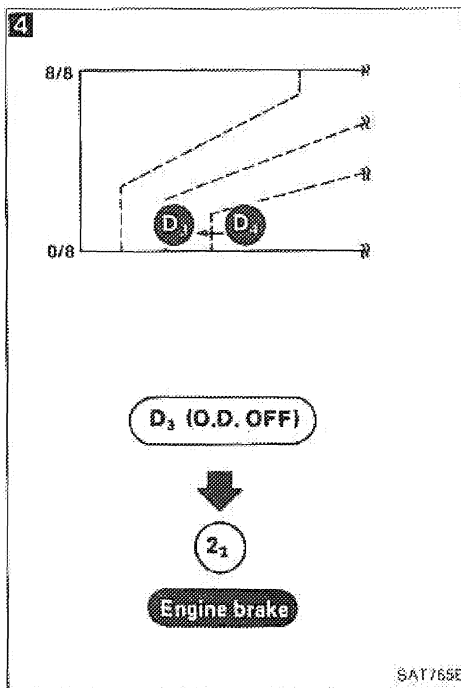
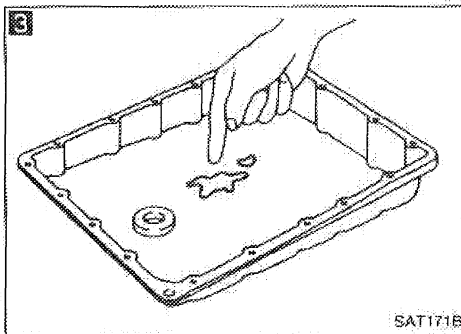
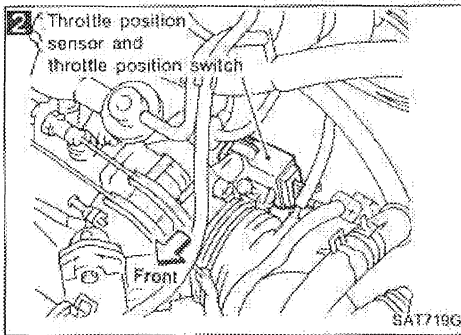
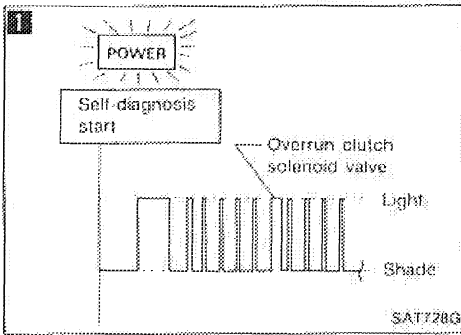
Diagnostic Procedure 18

SYMPTOM:

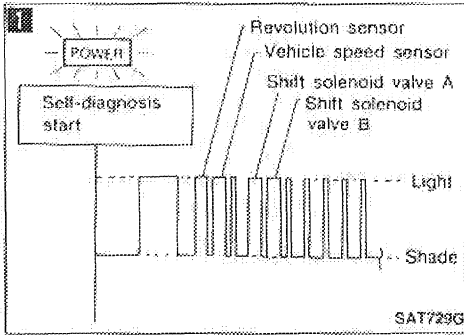
Engine speed does not return to idle smoothly when A/T is shifted from D₄ to D₃ with accelerator pedal released.

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.



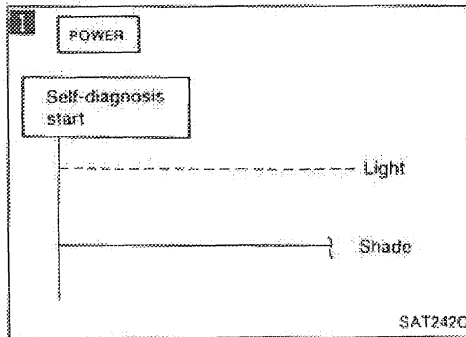
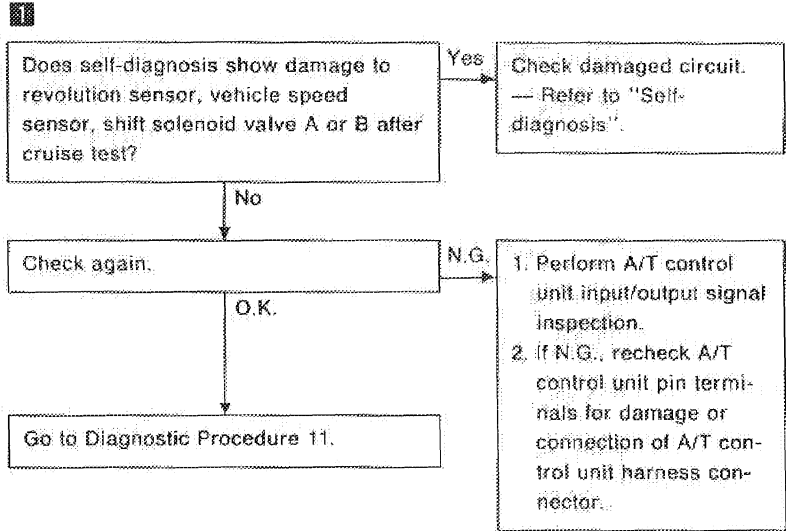
TROUBLE DIAGNOSES



Diagnostic Procedure 19

SYMPTOM:

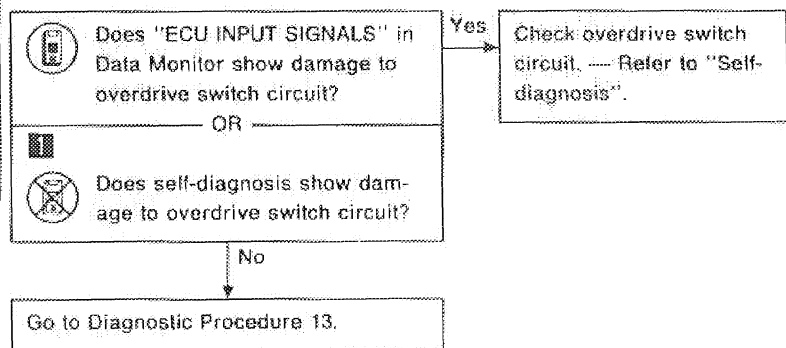
Vehicle does not start from D₁ on Cruise test — Part 2.



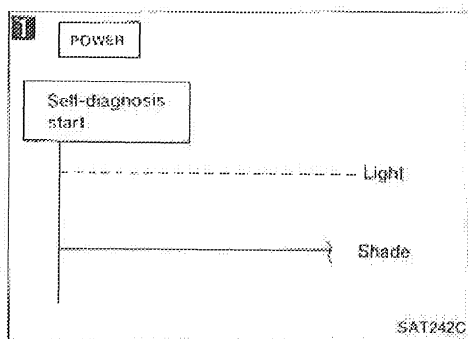
Diagnostic Procedure 20

SYMPTOM:

A/T does not shift from D₄ to D₃ when changing overdrive switch to "OFF" position.



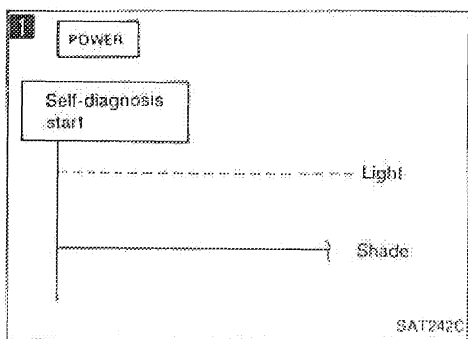
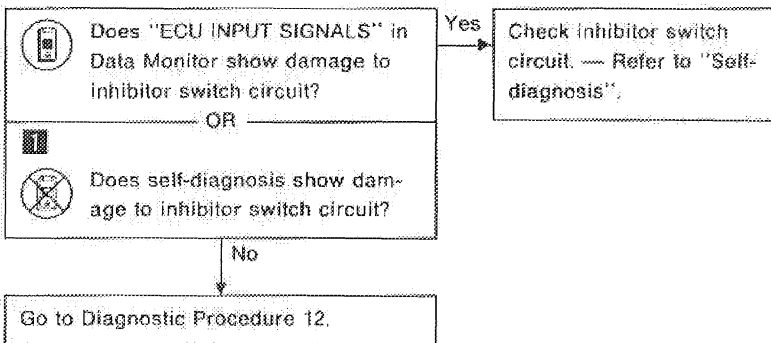
TROUBLE DIAGNOSES



Diagnostic Procedure 21

SYMPTOM:

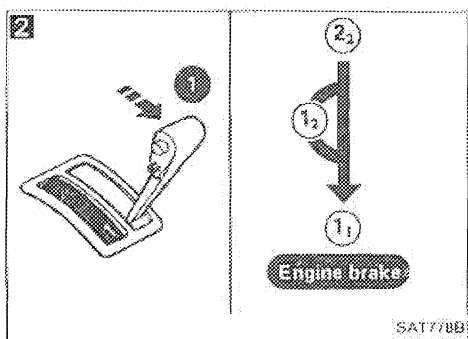
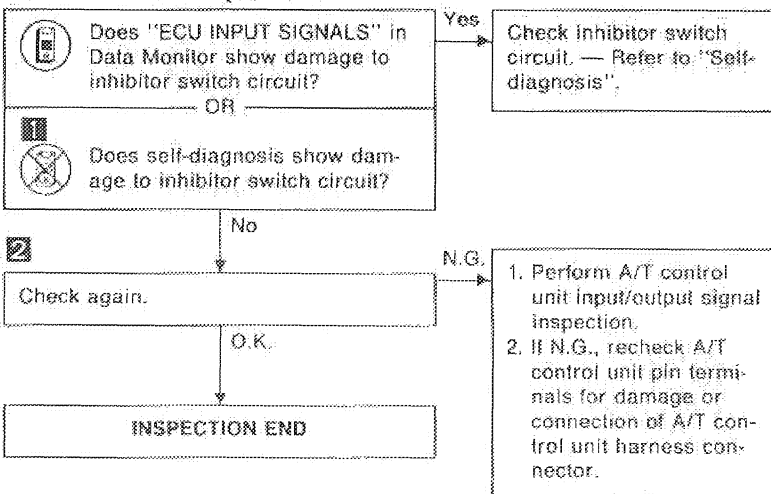
A/T does not shift from D_3 to 2_2 when changing selector lever from "D" to "2" position.



Diagnostic Procedure 22

SYMPTOM:

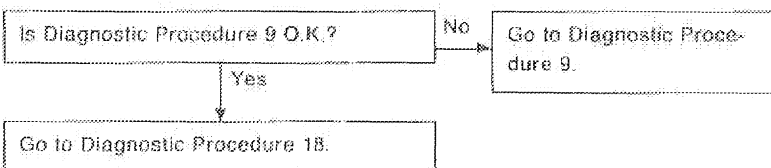
A/T does not shift from 2_2 to 1_1 when changing selector lever from "2" to "1" position.



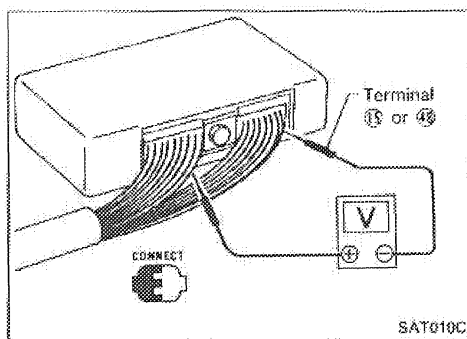
Diagnostic Procedure 23

SYMPTOM:

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



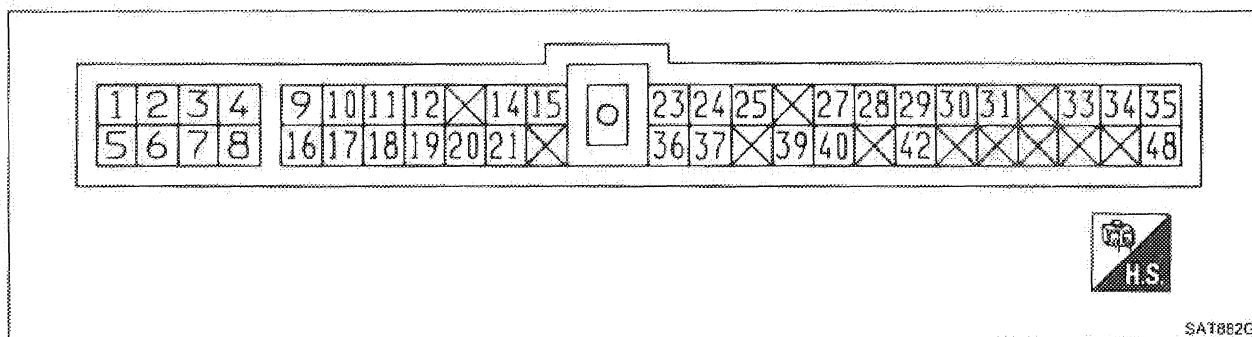
TROUBLE DIAGNOSES



Electrical Components Inspection

INSPECTION OF A/T CONTROL UNIT

- Measure voltage between each terminal and terminal ⑮ or ④⑧ 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.	5 - 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

TROUBLE DIAGNOSES











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



TROUBLE DIAGNOSES








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)	 or 	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.

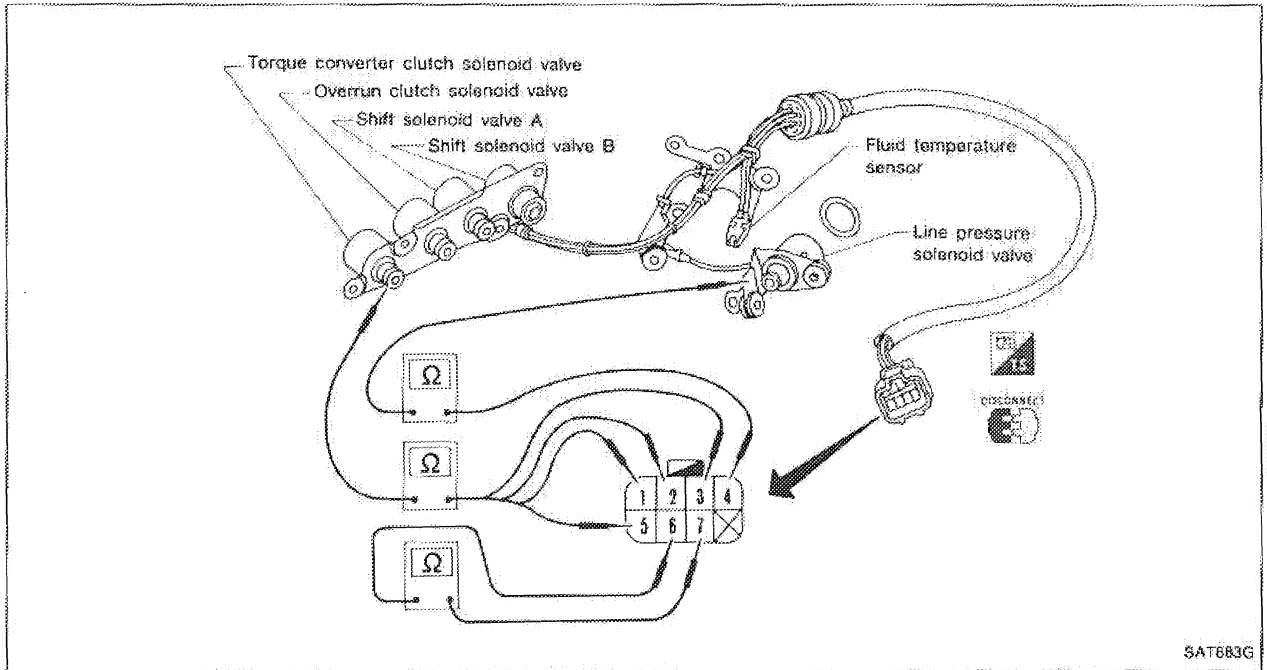
TROUBLE DIAGNOSES

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 - 3.8V
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 come 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		—	—

TROUBLE DIAGNOSES

Electrical Components Inspection (Cont'd) SOLENOID VALVES AND FLUID TEMPERATURE SENSOR

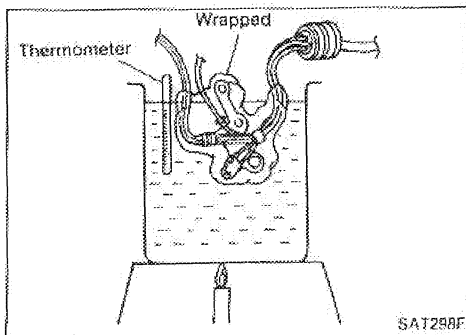


SA7683G

- 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



SA7298F

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

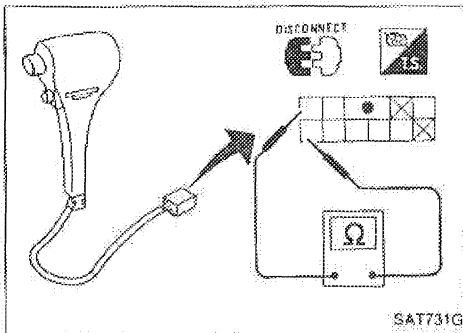
TROUBLE DIAGNOSES

Electrical Components Inspection (Cont'd)

OVERDRIVE SWITCH

- Check continuity between two terminals.

O.D. switch position	Continuity
ON	No
OFF	Yes

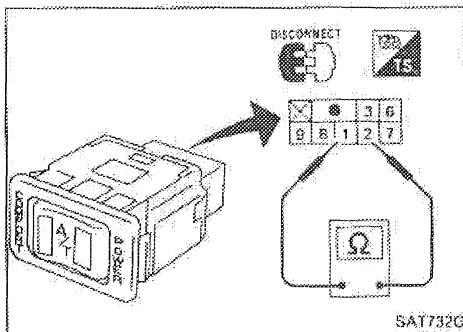


SAT731G

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

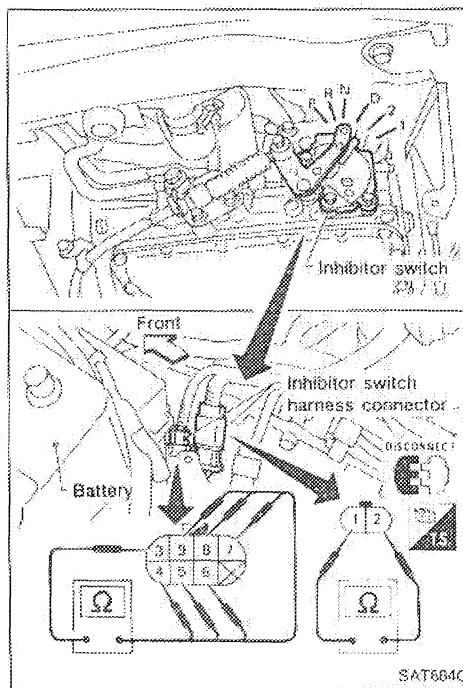


SAT732G

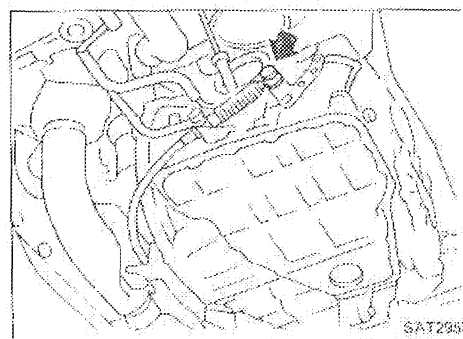
INHIBITOR SWITCH

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			○—○						○—○



SAT684G

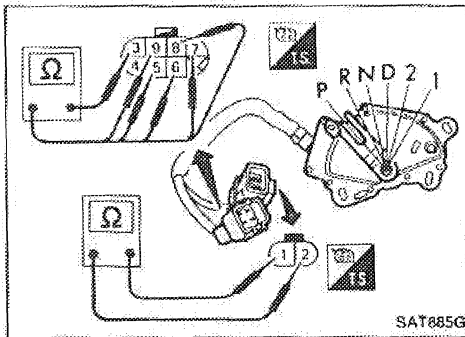


SAT259F

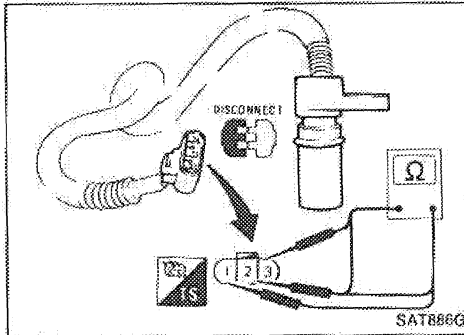
2. If N.G., check again with control cable disconnected from manual shaft of A/T assembly. — Refer to step 1.
3. If O.K. on step 2, adjust control cable. — Refer to "ON-VEHICLE SERVICE".

TROUBLE DIAGNOSES

Electrical Components Inspection (Cont'd)



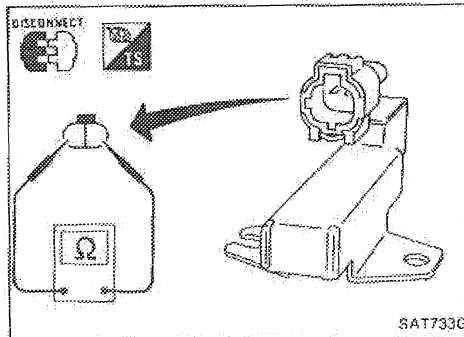
4. If N.G. on step 2, remove inhibitor switch from A/T and check continuity of inhibitor switch terminals. — Refer to step 1.
5. If O.K. on step 4, adjust inhibitor switch. — Refer to "ON-VEHICLE SERVICE".
6. If N.G. on step 4, replace inhibitor switch.



REVOLUTION SENSOR

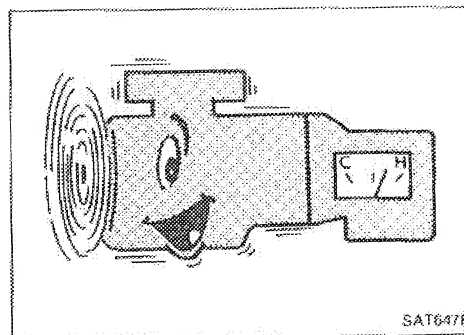
- For removal and installation, refer to "ON-VEHICLE SERVICE".
- Check resistance between terminals ①, ② and ③.

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

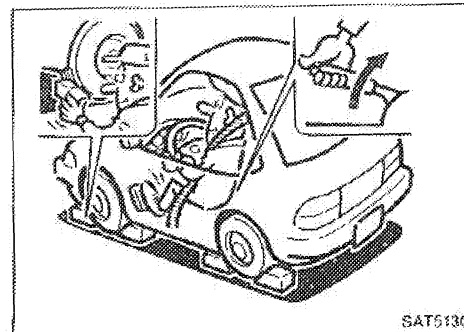
STALL TESTING

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.

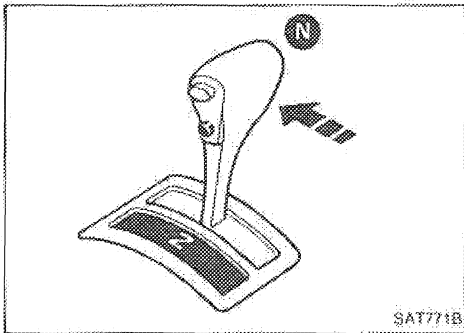
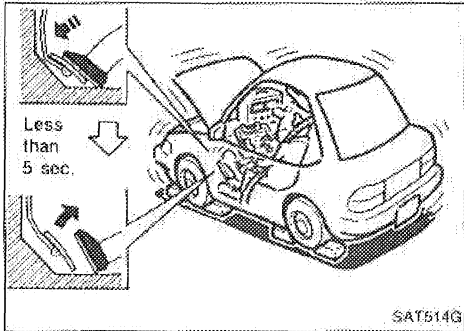
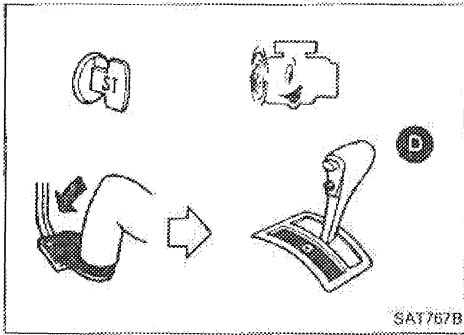
A.T.F. operating temperature:
50 - 80°C (122 - 176°F)

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.



TROUBLE DIAGNOSES

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.

TROUBLE DIAGNOSES

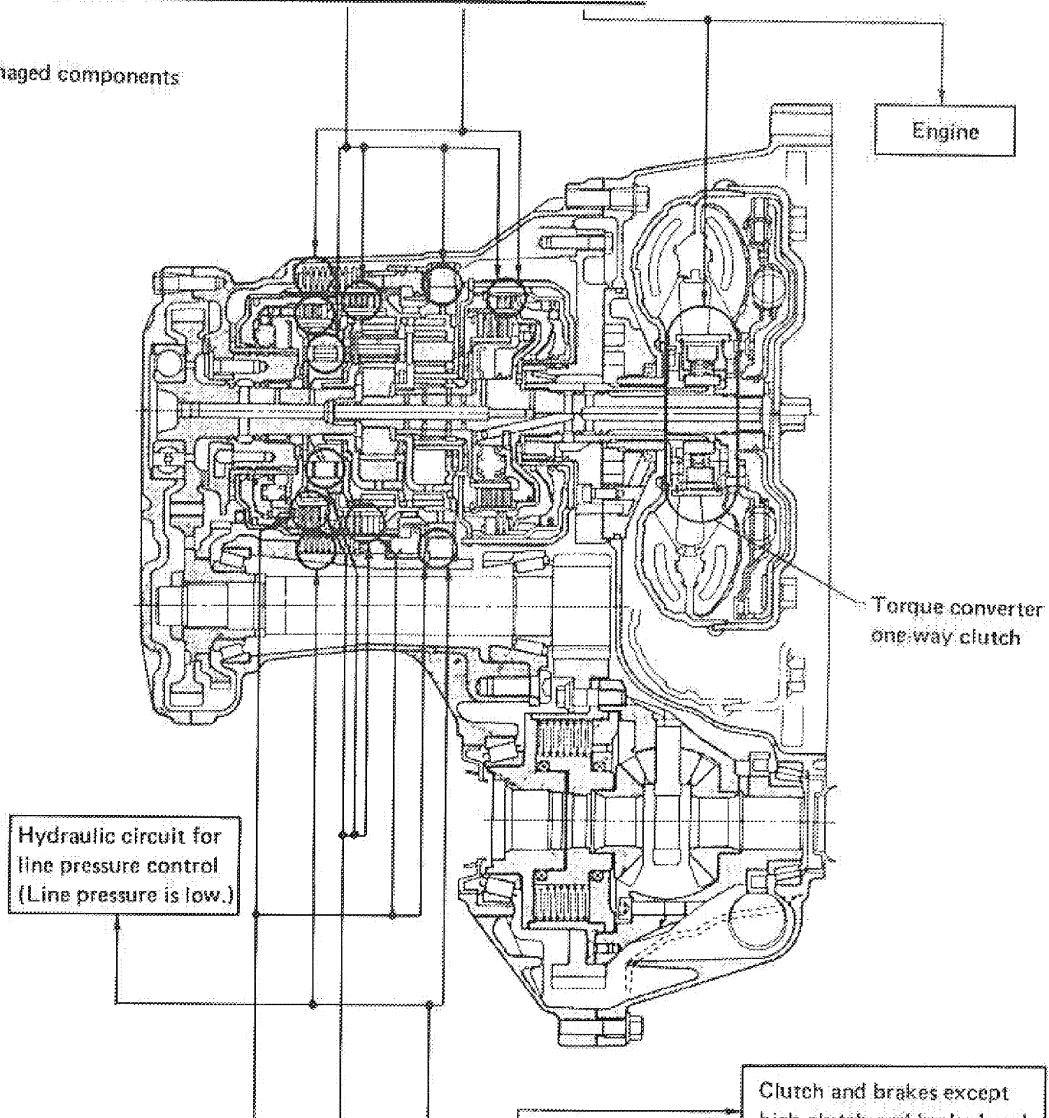
Final Check (Cont'd)

Judgement of stall test

Selector lever position	Judgement		
	D	2	1
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:



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

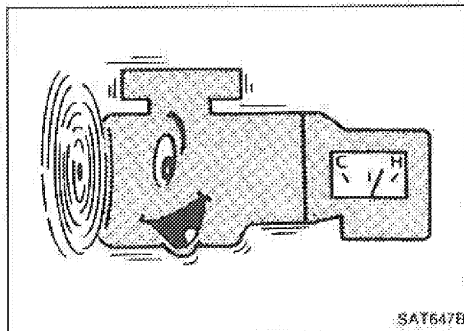
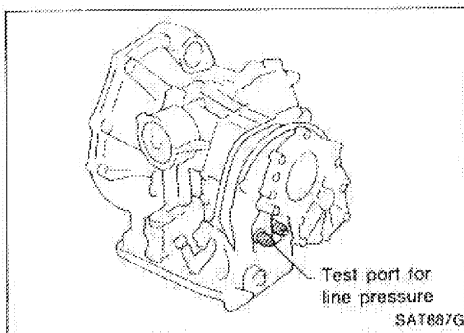
Clutch and brakes except high clutch and brake band are O.K. (Condition of high clutch and brake band cannot be confirmed by stall test.)

TROUBLE DIAGNOSES

Final Check (Cont'd)

PRESSURE TESTING

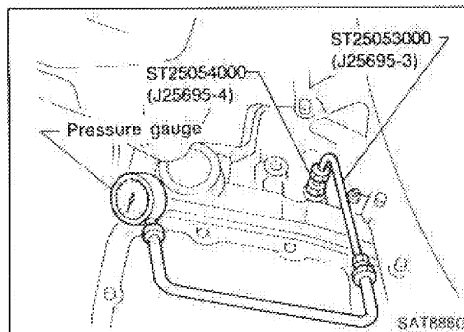
- Location of pressure test ports.
- Always replace pressure plugs as they are self-sealing bolts.



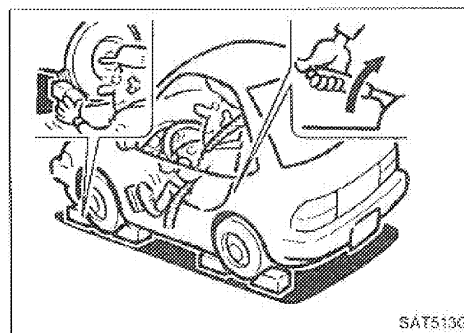
Line pressure test procedure

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)



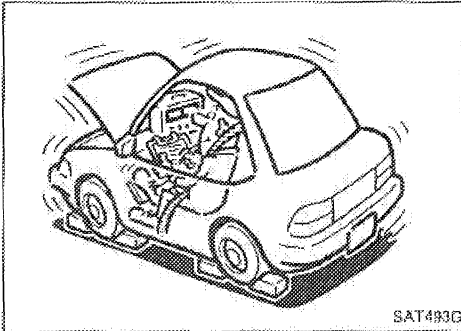
3. Install pressure gauge to corresponding line pressure port.



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

TROUBLE DIAGNOSES

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.	<ul style="list-style-type: none"> ● 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.	<ul style="list-style-type: none"> ● 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.	<ul style="list-style-type: none"> ● 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.	<ul style="list-style-type: none"> ● 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

TROUBLE DIAGNOSES

Symptom Chart

Reference page (AT-)	ON vehicle										OFF vehicle																								
	14, 84	84	36, 39, 47	48	41, 63	42, 48	43, 44	45, 83	63	94, 110	128, 133	138, 148	138	144, 157	—																				
Reference page (AT-)	Fluid level	Control cable	Inhibitor switch	Throttle position sensor (Adjusting)	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						
55	2	3																																	
55	1	2																																	
—	1		3	4	5	2													7	6															
55	3																													2					
56	1																					3		2	4										
56	1						2	4		3												5	6	7	8	9									
—	1	2					3	5		4													6	8	9				7						
—			2		6	1	3	7			6				4	8							5												
—	1																									3									
59	1						2	4		3						5						6	7	8	9	10									
—	1	2	3				4	6		5						7						10	11	12				13							
—						1																													
58, 59	1						2	3													6	5		4											
—	2	1		5			4	3																											
—	2	1		5			4	3															6												
—	2	1		4				3						5																					
61, 62, 63			3	2				3	4																										
—	1																2																		
—						1		3			2																								
—			1				2	4					5		3																				
—			1				2	3																											

TROUBLE DIAGNOSES

Symptom Chart (Cont'd)

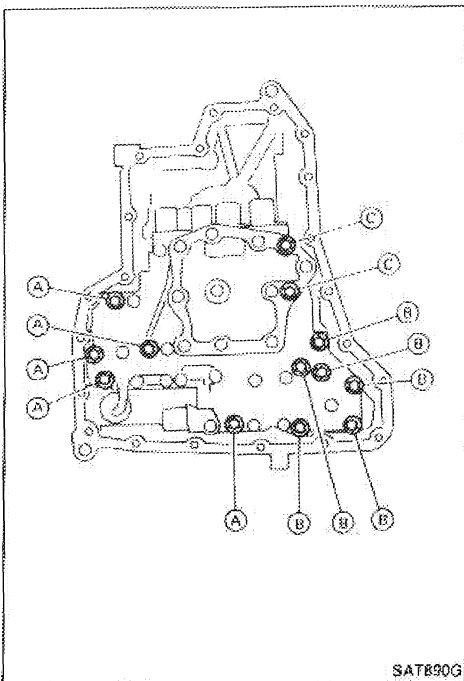
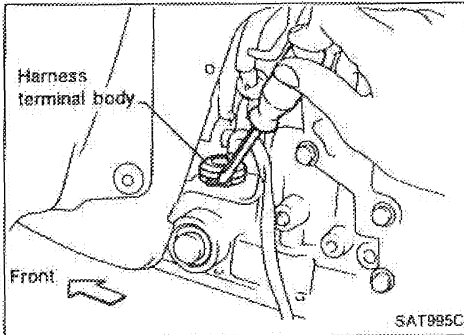
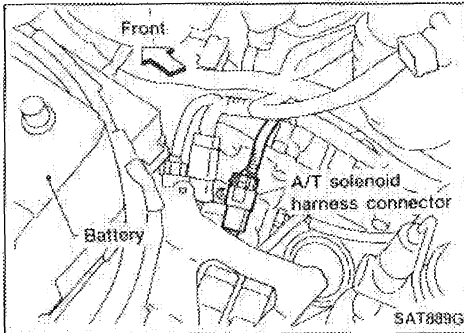
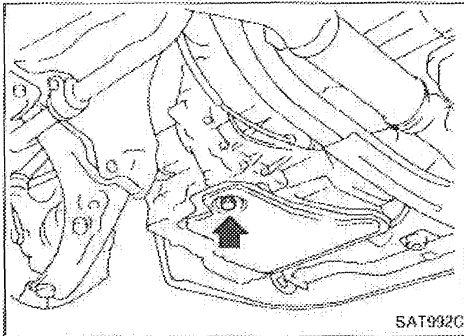
Reference page (AT-)	ON vehicle										OFF vehicle																							
	14, 84	84	38, 39, 41	48	41, 83	42, 48	43, 44	45, 83	83	94, 110	129, 133	138, 142	139	144, 157	—																			
Reference page (AT-)	Fluid level	Control cable	Inhibitor switch	Throttle position sensor (Adjustment)	Revolution 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 2 reverse brake	Brake band	Parking components					
—	Too sharp a shock in change from "D ₂ " to "D ₃ ".		1			2	3																		④									
—	Almost no shock or clutches slipping in change from "D ₁ " to "D ₂ ".	1		2				3	5								4														⑤			
—	Almost no shock or slipping in change from "D ₂ " to "D ₃ ".	1		2				3	4														⑥								⑥			
—	Almost no shock or slipping in change from "D ₃ " to "D ₄ ".	1		2				3	4														⑥								⑥			
—	Vehicle braked by gear change from "D ₄ " to "D ₃ ".	1																				②	③								③			
—	Vehicle braked by gear change from "D ₃ " to "D ₂ ".	1																				②	③								③			
—	Vehicle braked by gear change from "D ₂ " to "D ₁ ".	1																				②	③								③			
—	Maximum speed not attained. Acceleration poor.	1		2					5	3	4									⑩	⑪	⑥	⑦								⑨	⑧		
—	Failure to change gear from "D ₄ " to "D ₃ ".	1		2					6	4		5	3																			⑦		
—	Failure to change gear from "D ₃ " to "D ₂ " or from "D ₄ " to "D ₃ ".	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									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 ₃ " within kickdown vehicle speed.			1	2					3	4																							
—	Kickdown operates or engine overruns when depressing pedal in "D ₄ " beyond kickdown vehicle speed limit.			2	1					3	4																							
—	Races extremely fast or slips in changing from "D ₄ " to "D ₃ " when depressing pedal.	1		2				3	5				4										⑥	⑦										
—	Races extremely fast or slips in changing from "D ₄ " to "D ₂ " when depressing pedal.	1		2				3	6	5			4										⑧									⑦		
—	Races extremely fast or slips in changing from "D ₃ " to "D ₂ " when depressing pedal.	1		2				3	5				4										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	5				4										⑥	⑦								⑤		
—	Vehicle will not run in any position.	1	2					3					4							③	⑤	⑥										⑧	⑦	⑩
—	Transaxle noise in "D", "2", "1" and "R" positions.	1																			②													

TROUBLE DIAGNOSES

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-)		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	Cyanide clutch	Low one-way clutch	Low & reverse brake	Brake band	Parking components							
68	Failure to change from "D ₃ " to "2" when changing lever into "2" position.	7	1	2					8	9	4		9													5			6								
	Gear change from "2 ₅ " to "2" in "2" position.		1																																		
64	Engine brake does not operate in "1" position.	2	1	3	4				6	5				7												8		9									
	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												6		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	8		11		10		11	11							
	A.T.F. shoots out during operation	1																				2	2	5		6		7	4								
	White smoke emitted from exhaust pipe during operation.																																				
	Offensive smell at fluid charging pipe.	1																		3	3	4	5	7		6		9	6								
	Torque converter is not locked up.		3	1	2	4		6	8				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 ₃ " 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																								

ON-VEHICLE SERVICE



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.

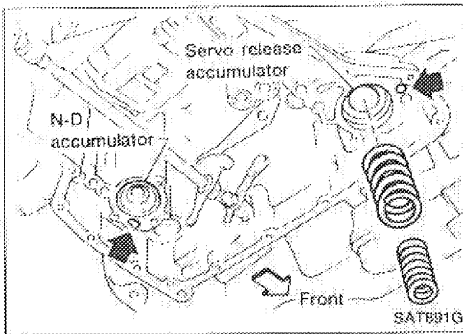
Bolt length, number and location:

Bolt symbol	A	B	C
Bolt length "f" ℓ	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".

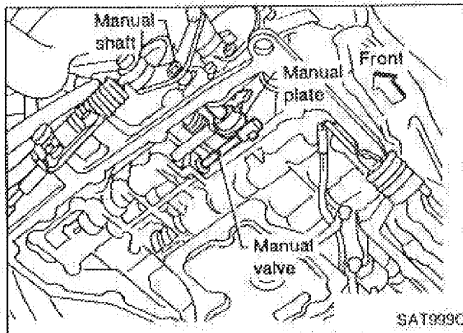
ON-VEHICLE SERVICE

Control Valve Assembly and Accumulator (Cont'd)



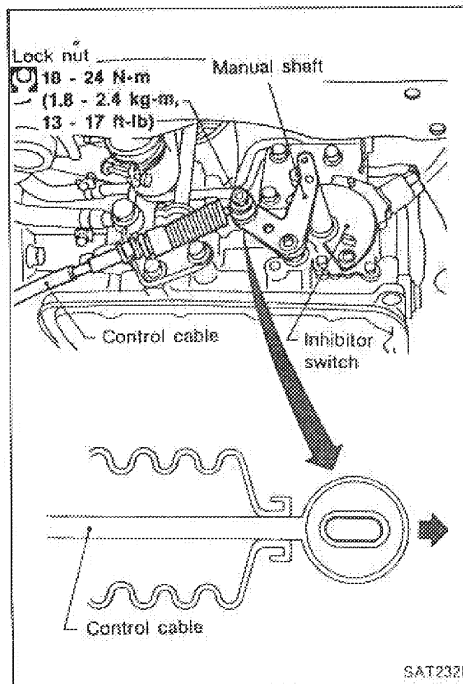
8. Remove servo release and N-D accumulators by applying compressed air if necessary.

- Hold each piston with a rag.



INSTALLATION

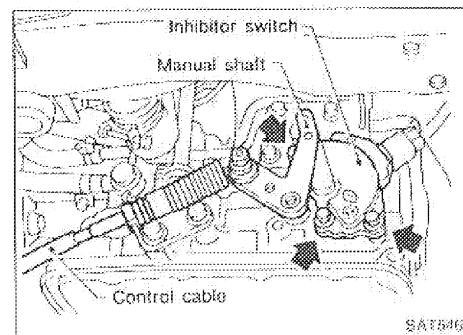
- Set manual shaft in Neutral position, then align manual plate with groove in manual valve.
- After installing control valve assembly to transmission case, make sure that selector lever can be moved to all positions.



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.

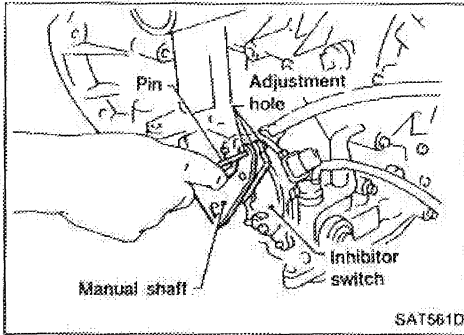


Inhibitor Switch Adjustment

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

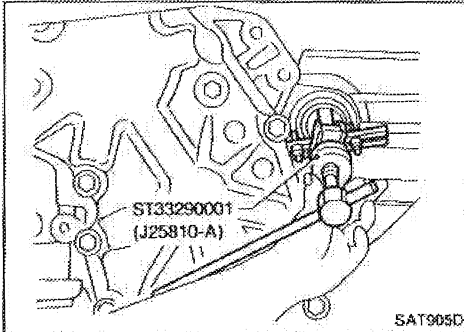
ON-VEHICLE SERVICE

Inhibitor Switch Adjustment (Cont'd)

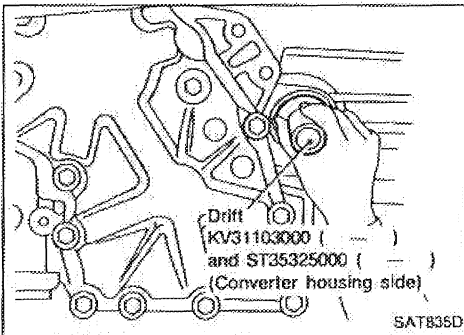


4. Insert 4.0 mm (0.157 in) dia. pin into adjustment hole in both inhibitor switch and manual shaft as near vertically as possible.
5. Tighten inhibitor switch fixing bolts.
6. Remove pin from adjustment hole after adjusting inhibitor switch.
7. Reinstall any part removed.
8. Adjust control cable — Refer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

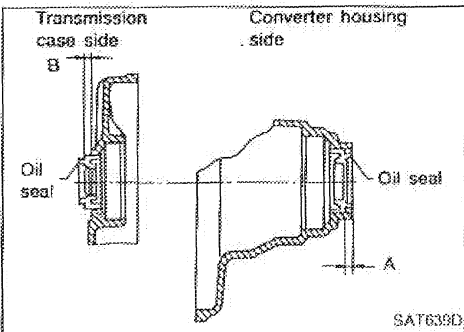
Differential Side Oil Seal Replacement



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.



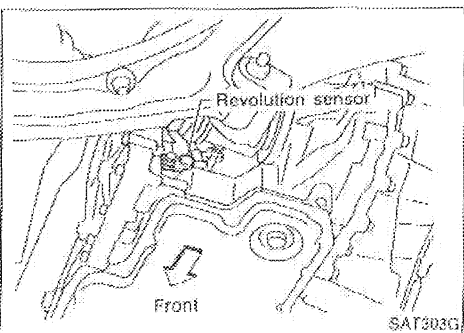
- Install oil seals so that dimensions "A" and "B" are within specifications.

Unit: mm (in)

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

4. Reinstall any part removed.

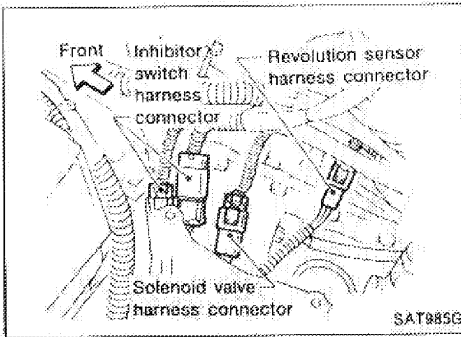
Revolution Sensor Replacement



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

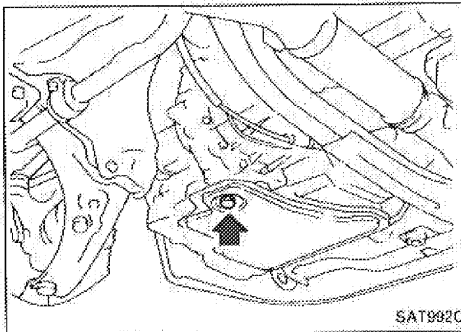
Always use new sealing parts.

REMOVAL AND INSTALLATION

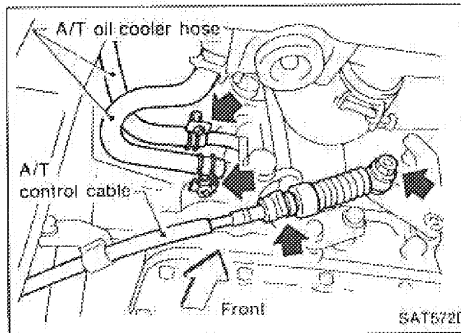


Removal

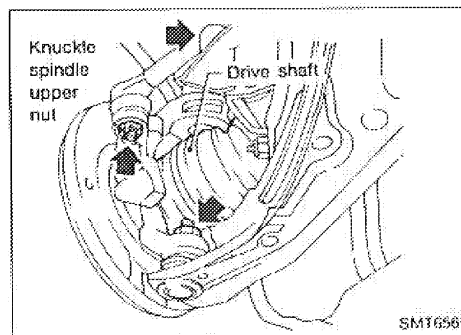
- Remove battery and bracket.
- Remove air duct.
- Disconnect solenoid valve harness connector, inhibitor switch harness connector and revolution sensor harness connector.



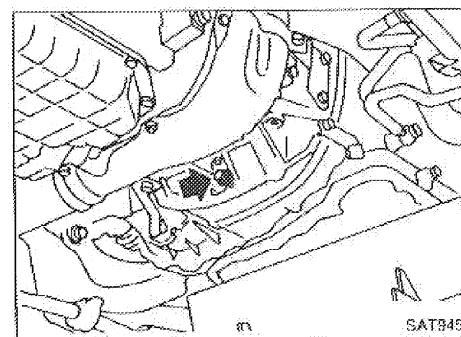
- Drain A.T.F. from transaxle.



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



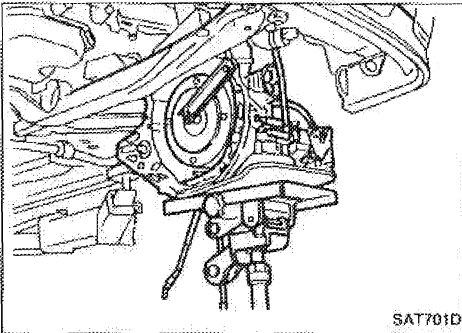
- Remove drive shafts — Refer to "Section FA".
- Remove front exhaust tube.
- Remove starter motor from transaxle.



- 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 AND INSTALLATION

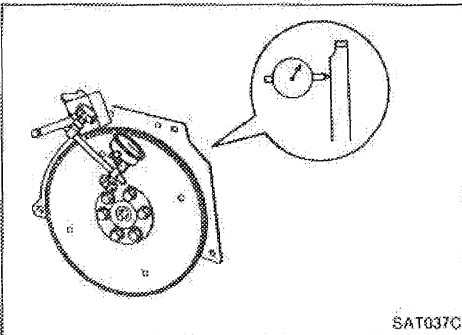
Removal (Cont'd)



SAT701D

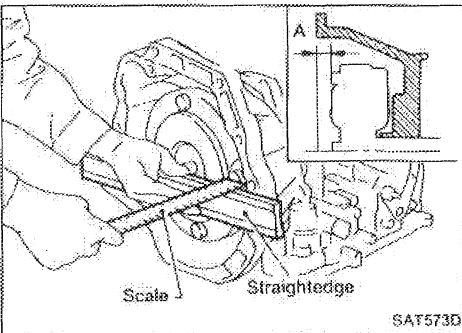
- Support transaxle with a jack.
- Remove mountings from transaxle.
- Remove bolts fixing A/T to engine.
- Lower transaxle while supporting it with a jack.

Installation



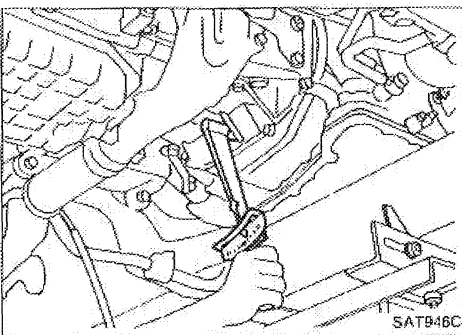
SAT637C

- 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.



SAT573D

- 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**

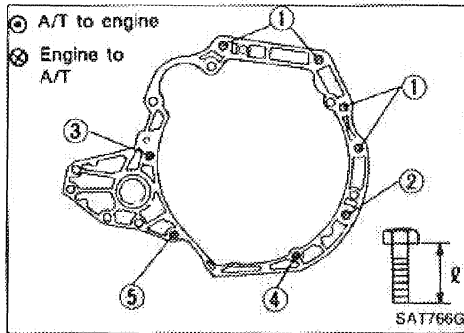


SAT846C

- 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.

REMOVAL AND INSTALLATION

Installation (Cont'd)



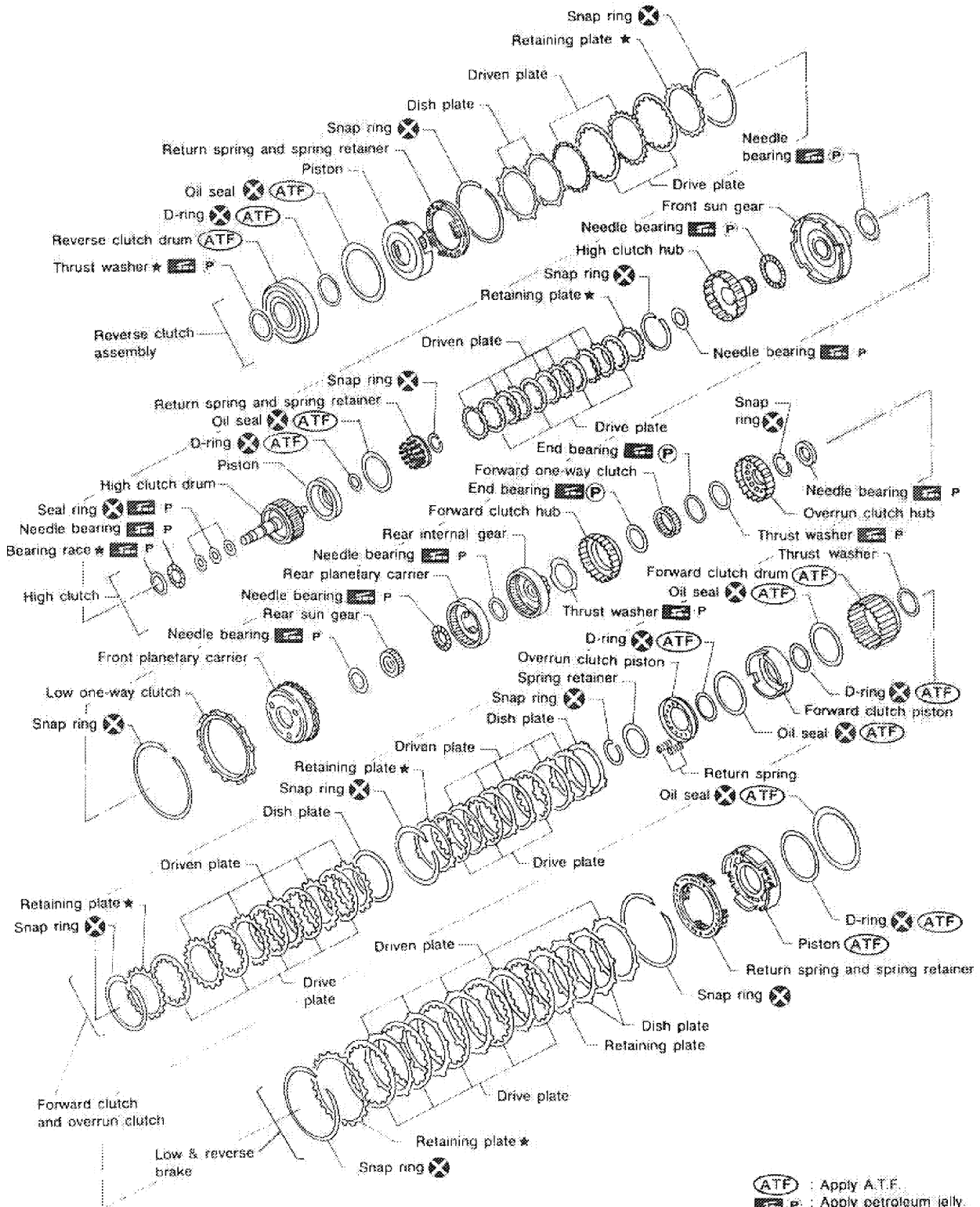
- Tighten bolts fixing transaxle



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".

MAJOR OVERHAUL

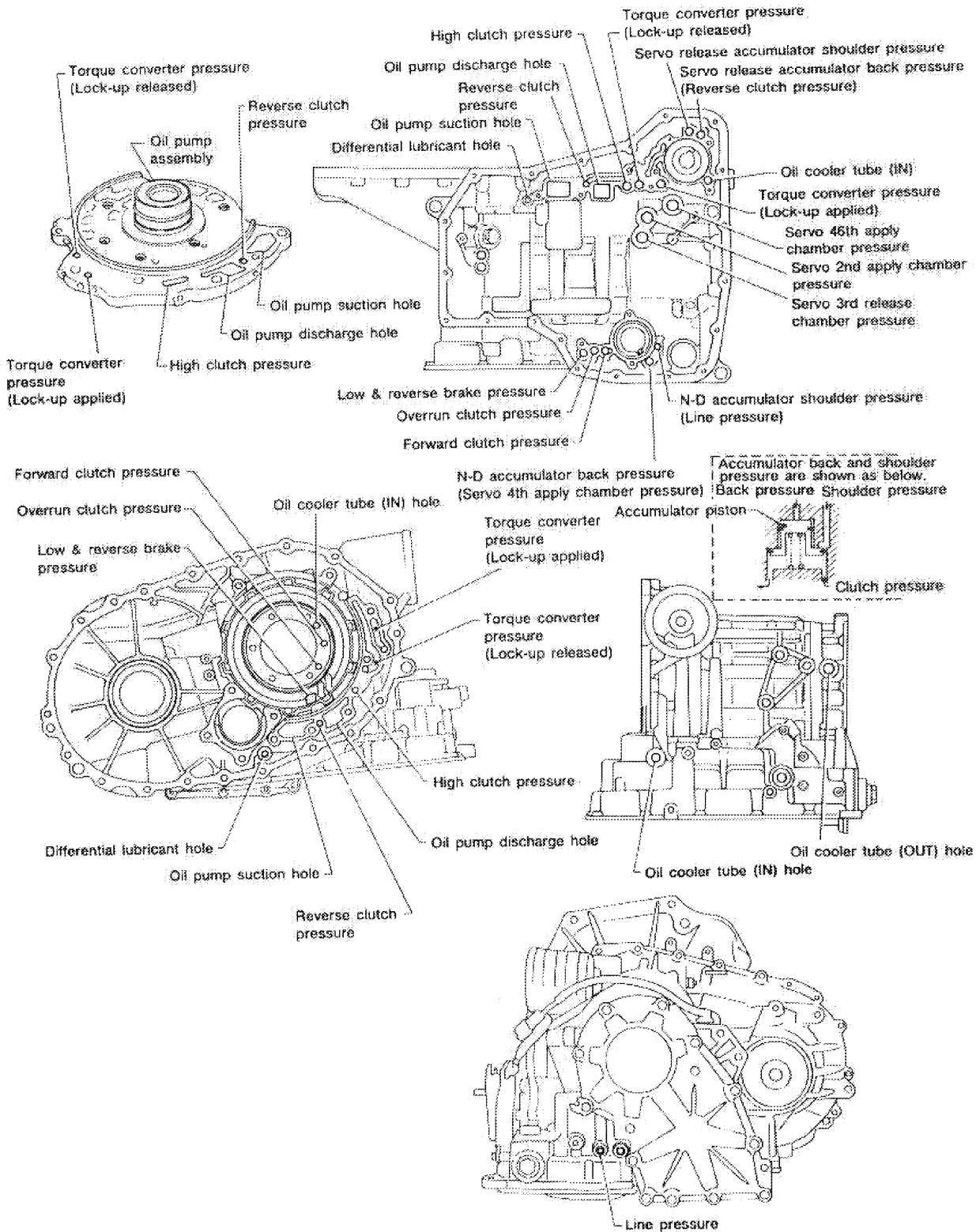
RE4F03A and RE4F03V (Cont'd)



 : Apply A.T.F.
 : Apply petroleum jelly.
 * : Select proper thickness.

MAJOR OVERHAUL

Oil Channel



MAJOR OVERHAUL

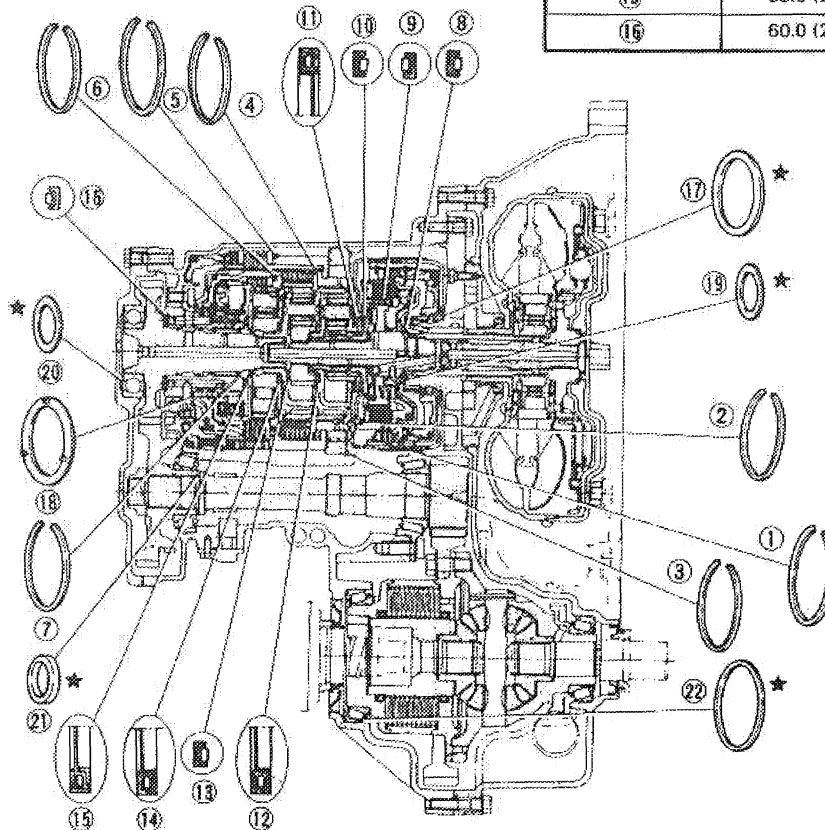
Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

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.

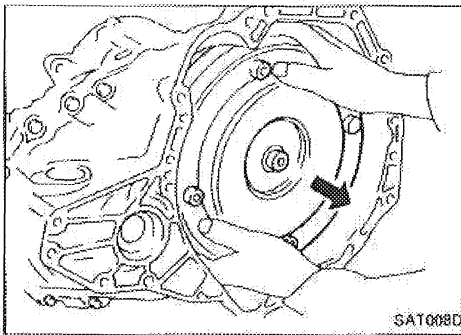
Outer & inner diameter of bearing race and adjusting shims

Item number	Outer diameter mm (in)	Inner diameter mm (in)
⑱	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)

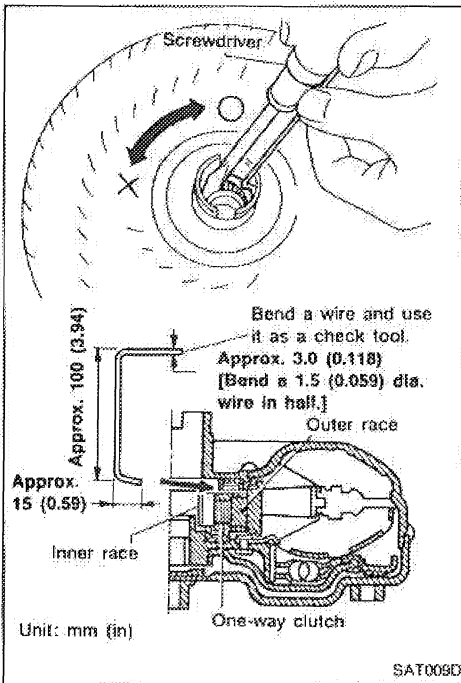
Outer diameter of snap rings

Item number	Outer 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)

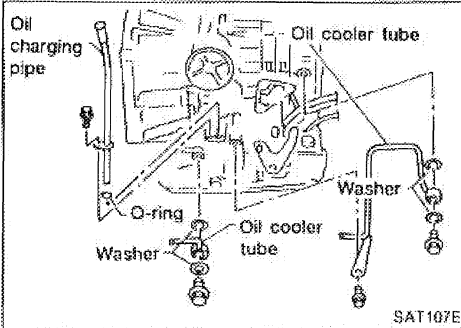
DISASSEMBLY



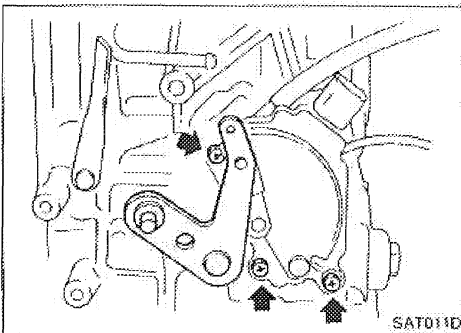
1. Drain A.T.F. through drain plug.
2. Remove torque converter.



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.

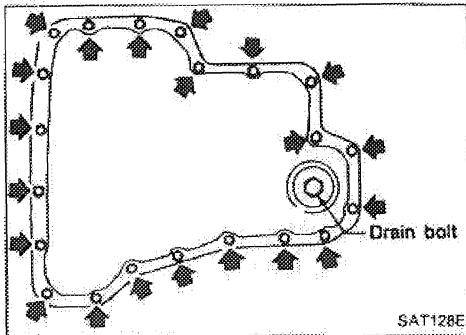


4. Remove oil charging pipe and oil cooler tube.

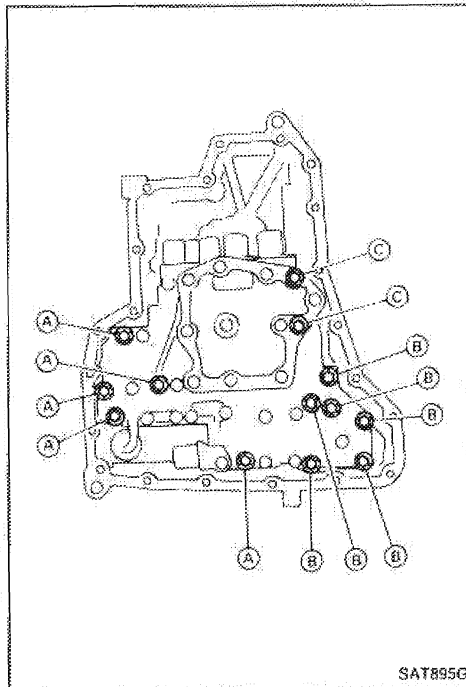


5. Set manual lever to "P" position.
6. Remove inhibitor switch.

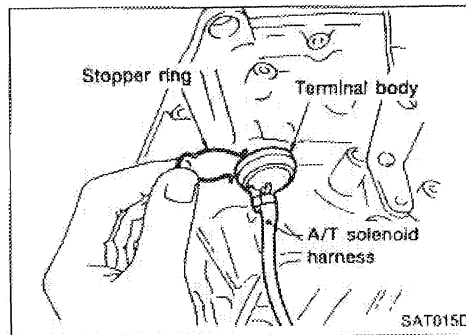
DISASSEMBLY



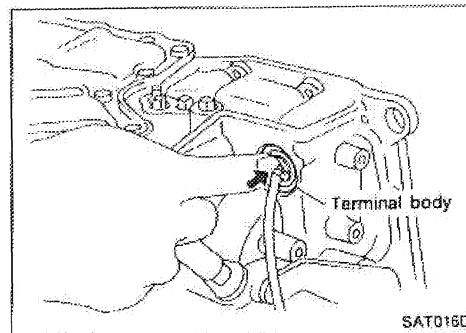
7. Remove oil pan and oil pan gasket.
 - **Do not reuse oil pan bolts.**
8. Check foreign materials in oil pan to help determine cause of malfunction. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that 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 (A), (B) and (C).

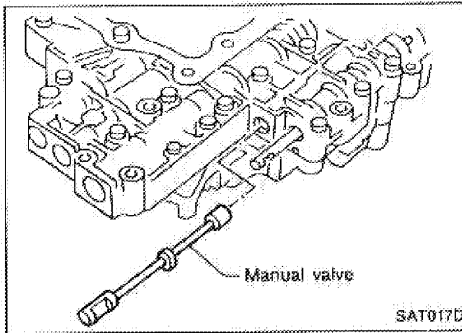


- b. Remove stopper ring from terminal body.

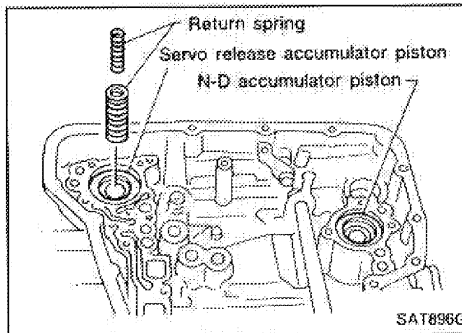


- c. Push terminal body into transmission case and draw out solenoid harness.

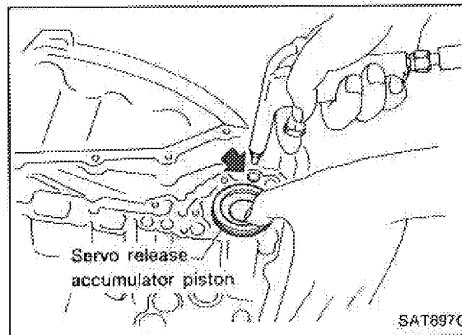
DISASSEMBLY



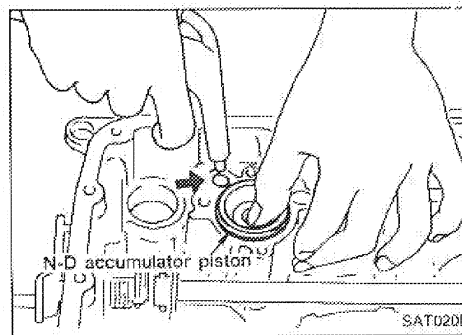
10. Remove manual valve from control valve assembly as a precaution.



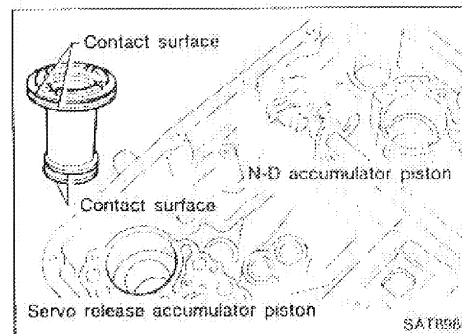
11. Remove return spring from servo release accumulator piston.



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.

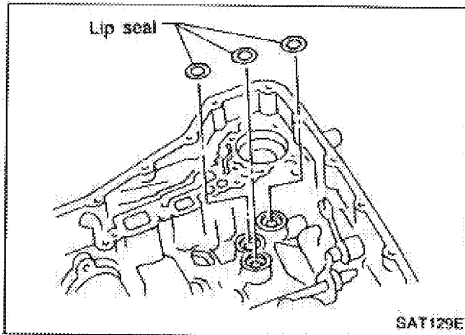


16. Check accumulator pistons and contact surface of transmission case for damage.
17. Check accumulator return springs for damage and free length.

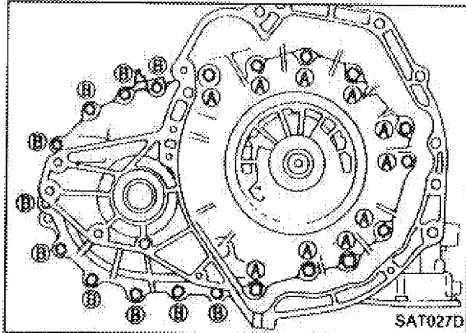
Unit: mm (in)

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)

DISASSEMBLY

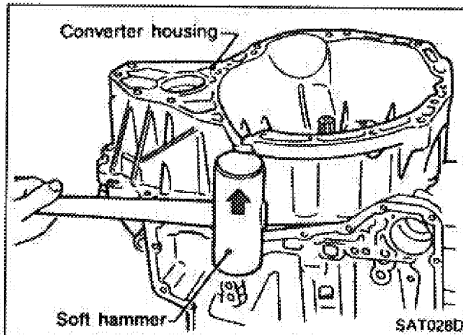


18. Remove lip seals from band servo oil port.

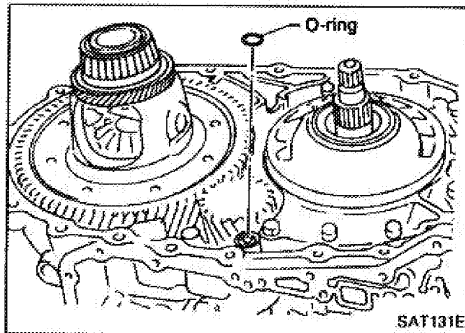


19. Remove converter housing according to the following procedures.

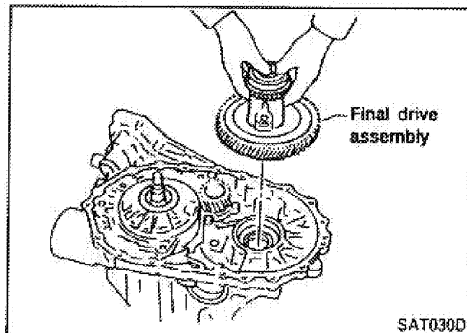
a. Remove converter housing mounting bolts (A) and (B).



b. Remove converter housing.

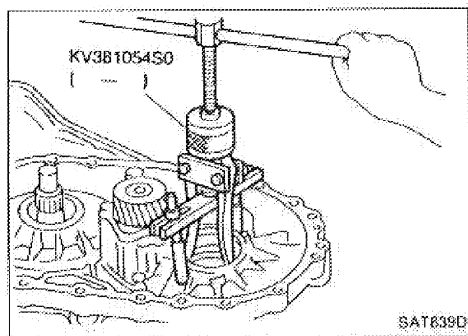


c. Remove O-ring from differential oil port.

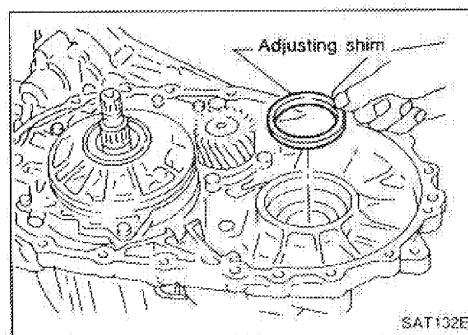


20. Remove final drive assembly from transmission case.

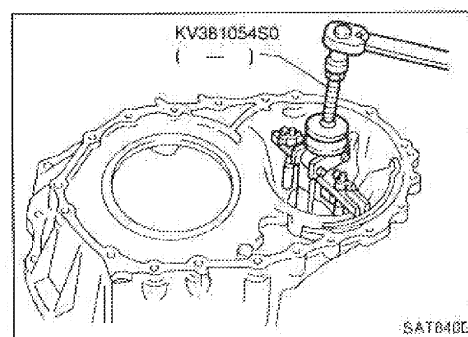
DISASSEMBLY



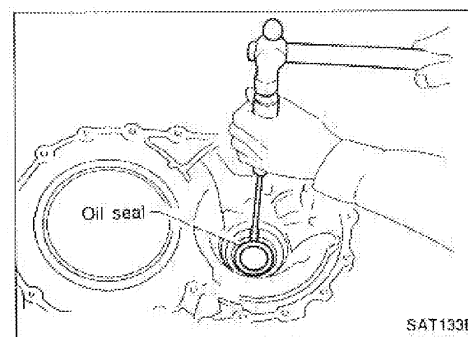
21. Remove differential side bearing outer race from transmission case.



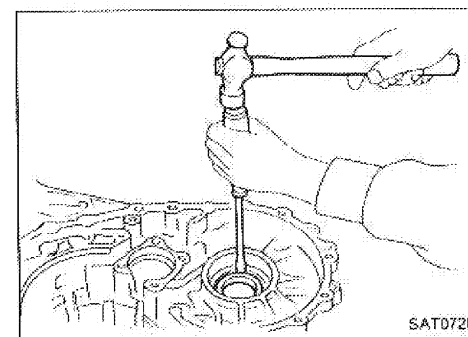
22. Remove differential side bearing adjusting shim from transmission case.



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

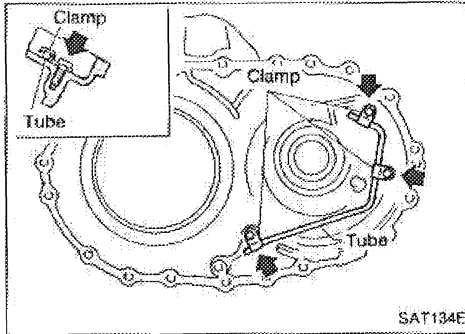


24. Remove oil seal from converter housing using a screwdriver.
- Be careful not to damage case.

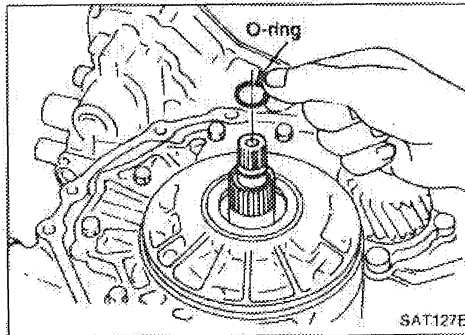


25. Remove side oil seal from transmission case using a screwdriver.

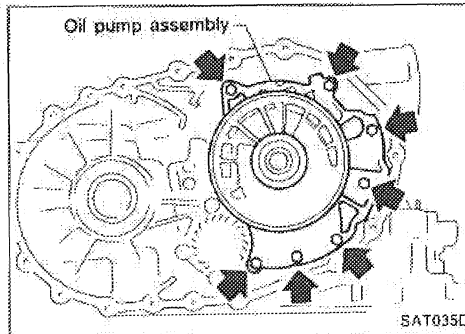
DISASSEMBLY



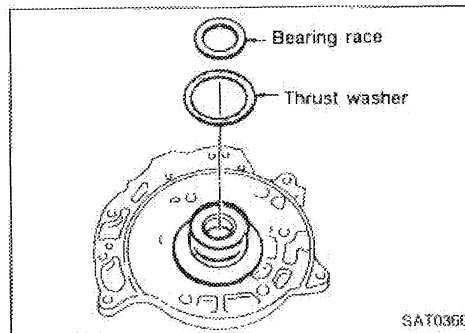
26. Remove oil tube from converter housing.



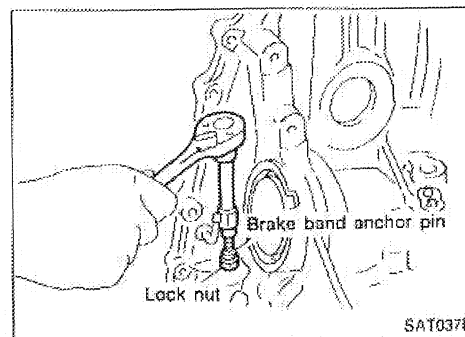
27. Remove oil pump according to the following procedures.
a. Remove O-ring from input shaft.



b. Remove oil pump assembly from transmission case.

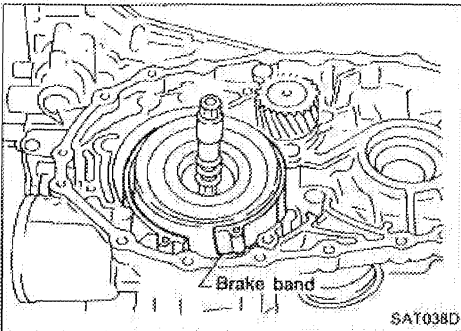


c. Remove thrust washer and bearing race from oil pump assembly.

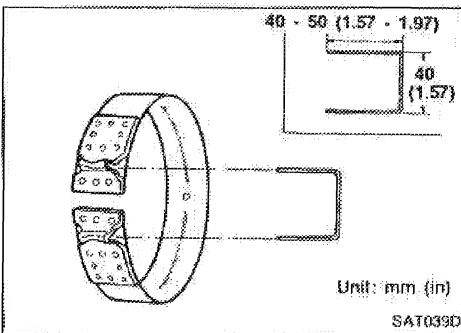


28. Remove brake band according to the following procedures.
a. Loosen lock nut, then back off band servo anchor end pin.

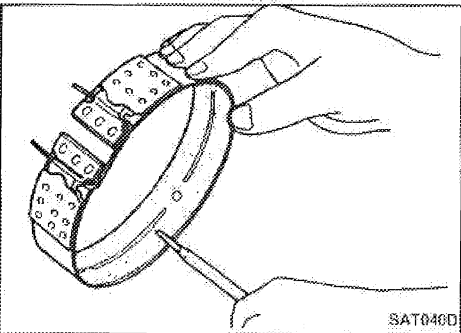
DISASSEMBLY



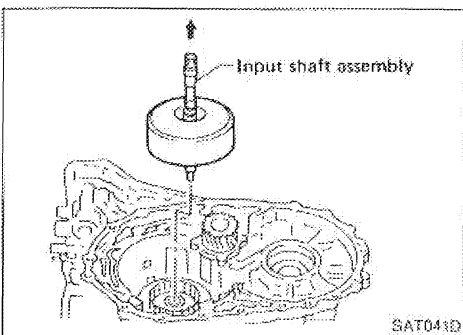
- b. Remove brake band from transmission case.



- 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.

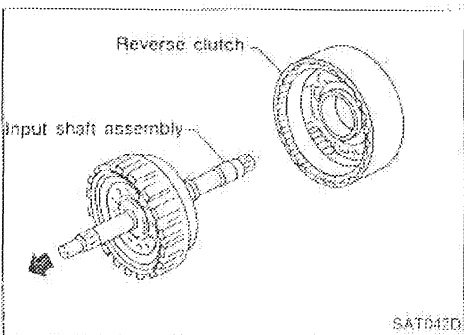


- c. Check brake band facing for damage, cracks, wear or burns.



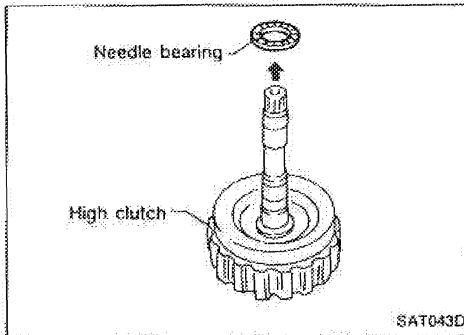
29. Remove input shaft assembly (high clutch) and reverse clutch according to the following procedures.

- a. Remove input shaft assembly (high clutch) with reverse clutch.

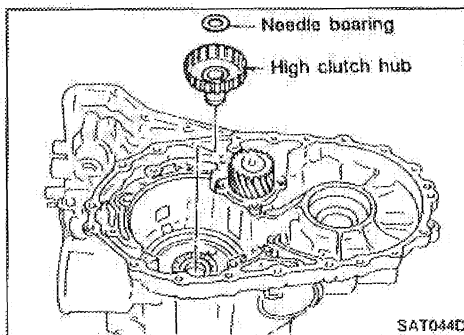


- b. Remove input shaft assembly (high clutch) from reverse clutch.

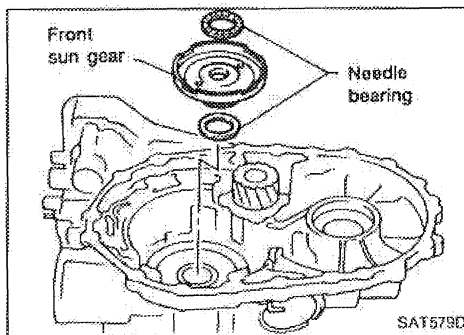
DISASSEMBLY



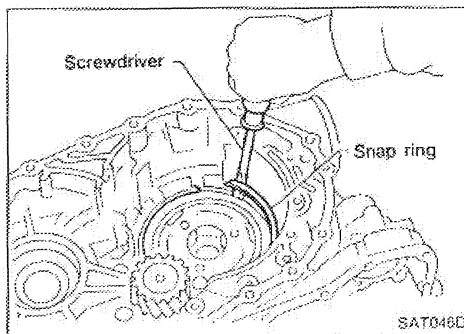
- c. Remove needle bearing from high clutch drum.
- d. Check input shaft assembly and needle bearing for damage or wear.



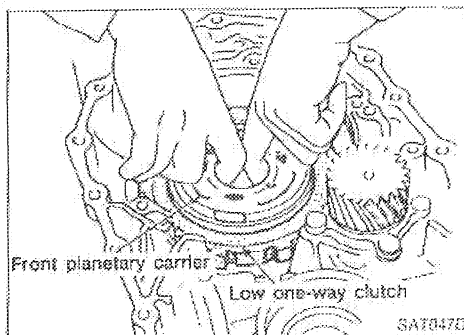
- 30. Remove high clutch hub and needle bearing from transmission case.
- 31. Check high clutch hub and needle bearing for damage or wear.



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

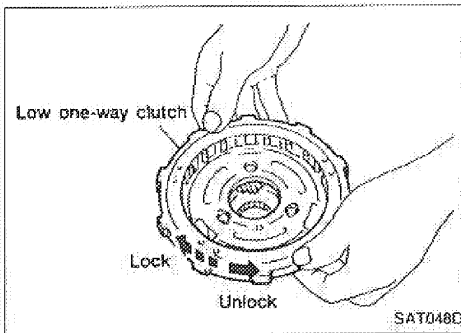


- 34. Remove front planetary carrier assembly and low one-way clutch according to the following procedures.
 - a. Remove snap ring using a screwdriver.

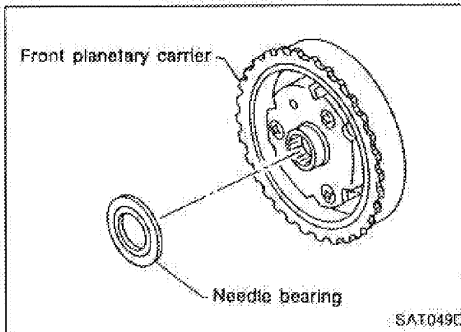


- b. Remove front planetary carrier with low one-way clutch.

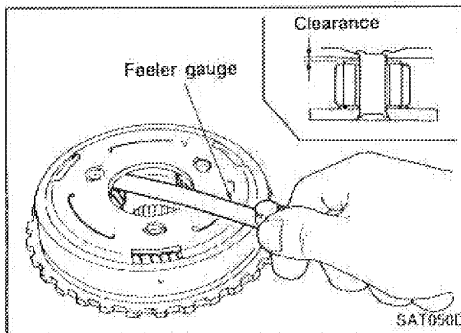
DISASSEMBLY



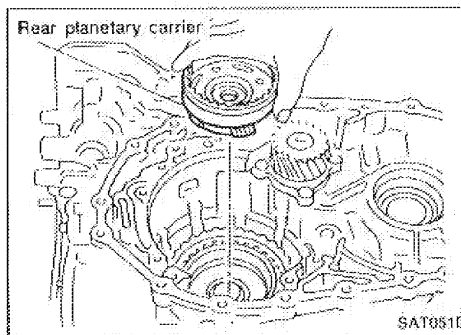
- c. Check that low one-way clutch rotates in the direction of the arrow and locks in the opposite direction.
- d. Remove low one-way clutch from front planetary carrier by rotating it in the direction of unlock.



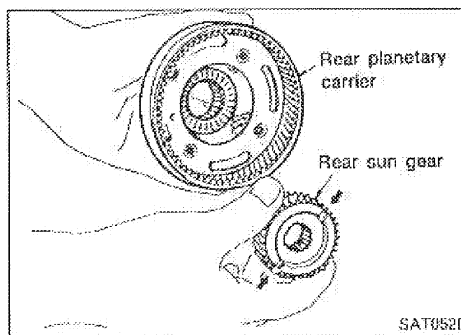
- e. Remove needle bearing from front planetary carrier.



- 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.

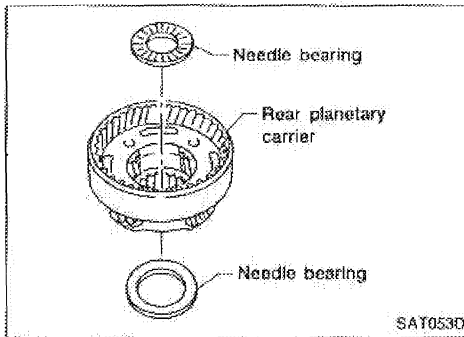


35. Remove rear planetary carrier assembly and rear sun gear according to the following procedures.
 - a. Remove rear planetary carrier assembly from transmission case.

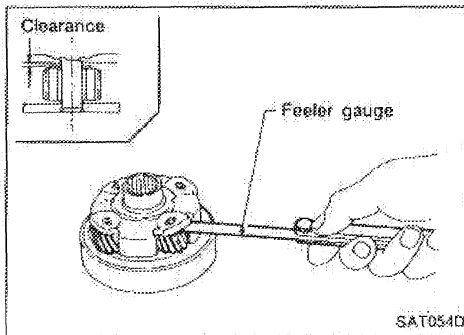


- b. Remove rear sun gear from rear planetary carrier.

DISASSEMBLY



- 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.

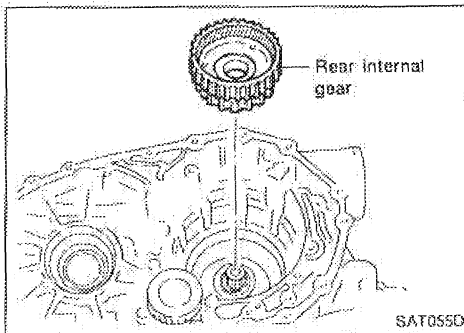
Standard clearance:

0.15 - 0.70 mm (0.0059 - 0.0276 in)

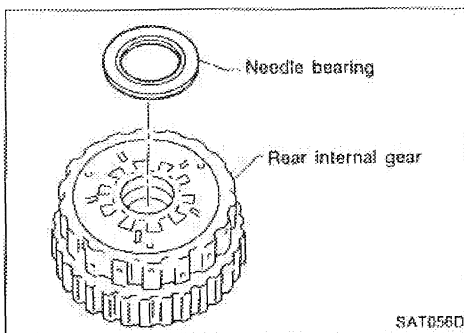
Allowable limit:

0.80 mm (0.0315 in)

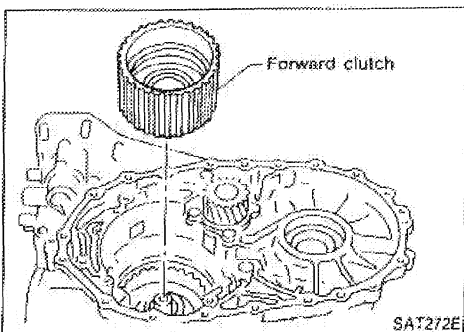
Replace rear planetary carrier if the clearance exceeds allowable limit.



36. Remove rear internal gear from transmission case.



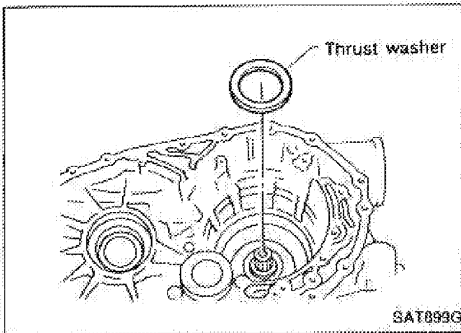
37. Remove needle bearing from rear internal gear.
38. Check needle bearing for damage or wear.



39. Remove forward clutch assembly from transmission case.

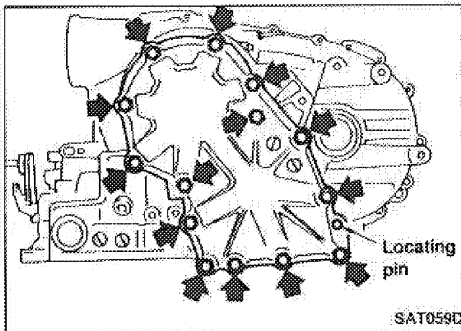
DISASSEMBLY

40. Remove thrust washer from transmission case.



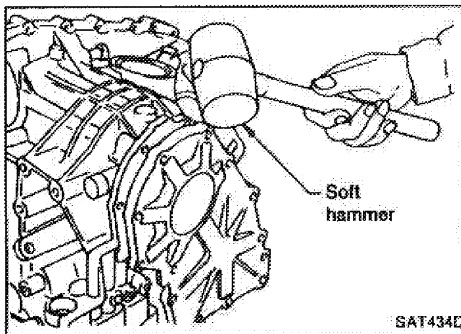
41. Remove output shaft assembly according to the following procedures.

a. Remove side cover bolts.

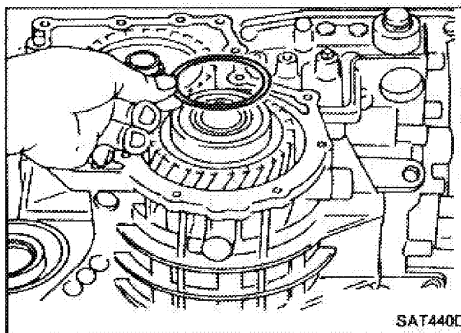


b. Remove side cover by lightly tapping it with a soft hammer.

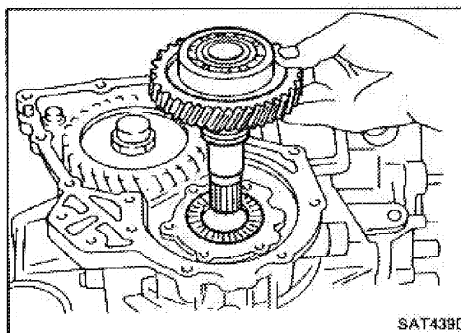
● **Be careful not to drop output shaft assembly as output shaft assembly may be removed together with side cover.**



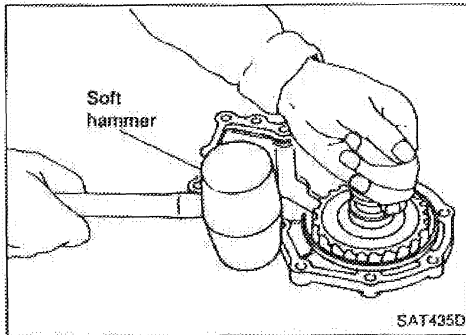
c. Remove adjusting shim.



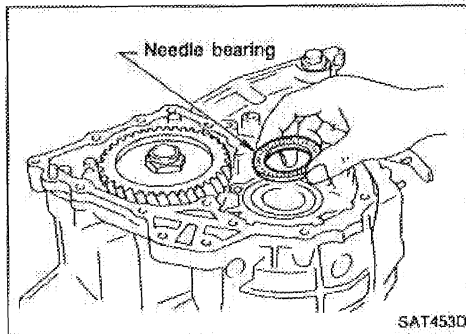
d. Remove output shaft assembly.



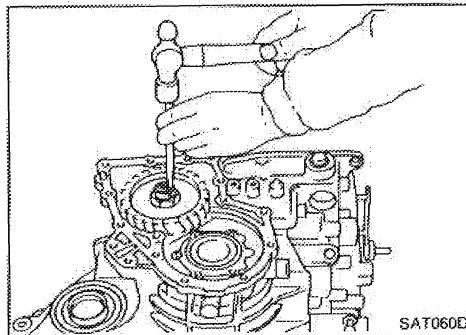
DISASSEMBLY



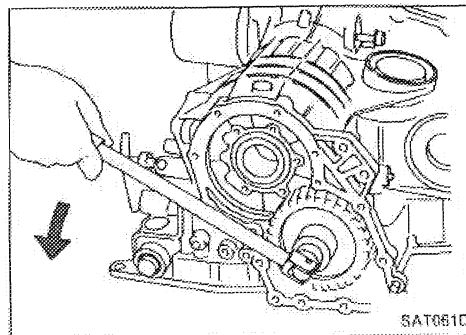
- If output shaft assembly was removed together with side cover, remove side cover by tapping it lightly with a soft hammer.



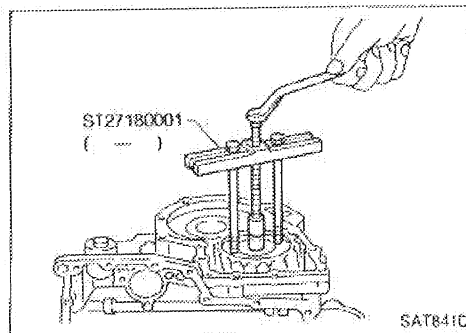
- e. Remove needle bearing.



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.

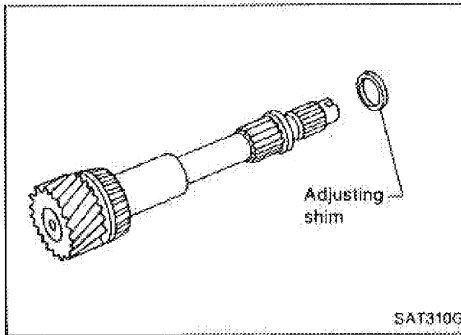


- c. Remove idler gear lock nut.
- Do not reuse idler gear lock nut.

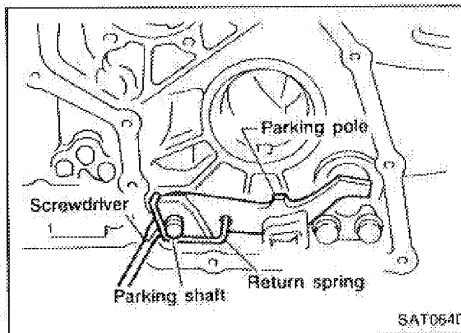


- d. Remove idler gear with puller.

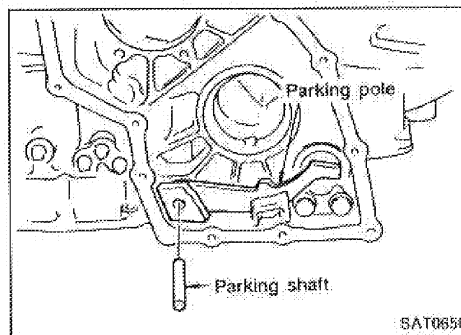
DISASSEMBLY



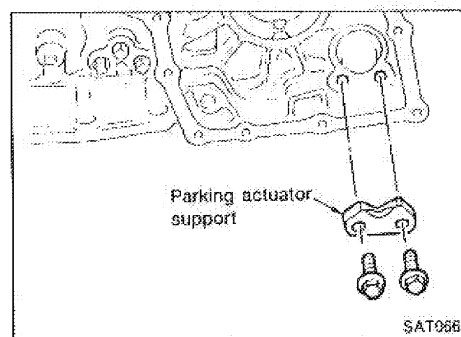
- e. Remove reduction gear.
- f. Remove adjusting shim from reduction gear.



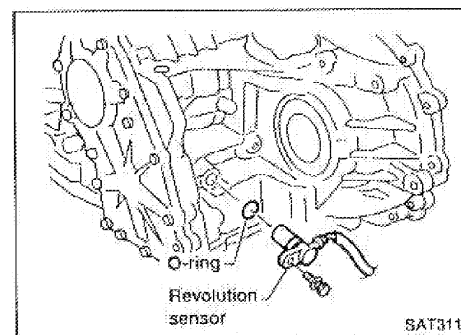
- 43. Remove return spring from parking shaft using a screwdriver.



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



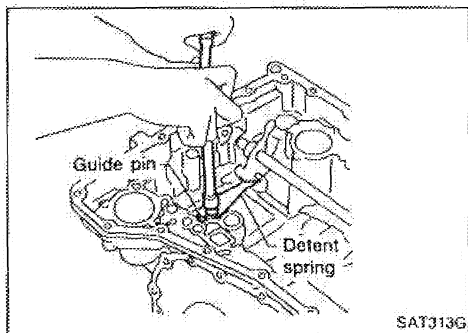
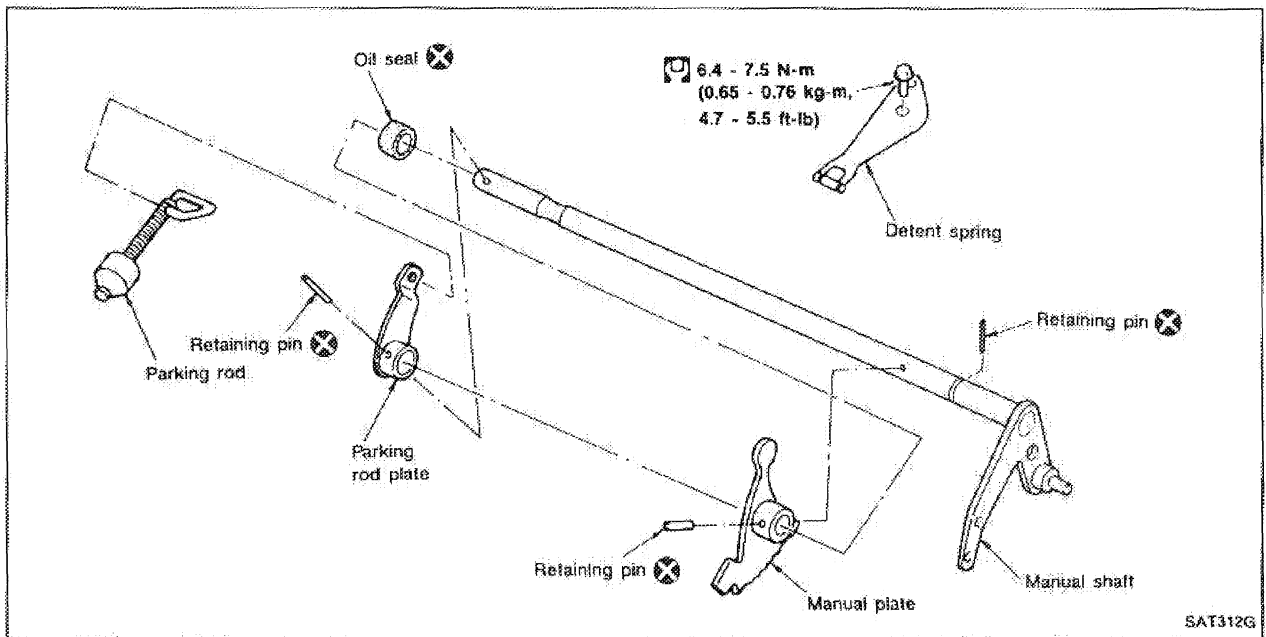
- 46. Remove parking actuator support from transmission case.
- 47. Check parking actuator support for damage or wear.



- 48. Remove revolution sensor from transmission case.

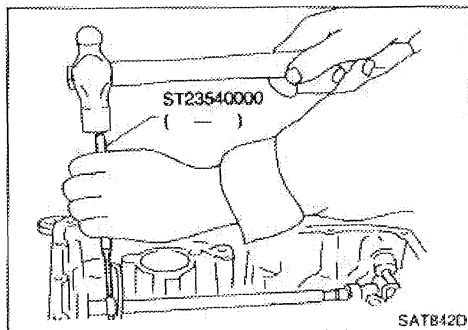
REPAIR FOR COMPONENT PARTS

Manual Shaft

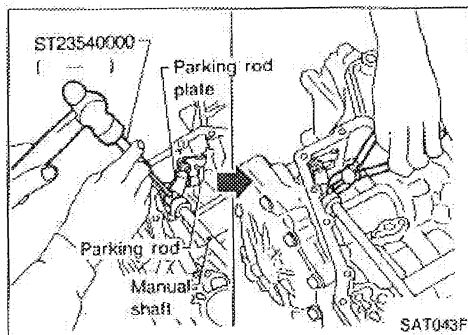


REMOVAL

1. Remove detent spring from transmission case.



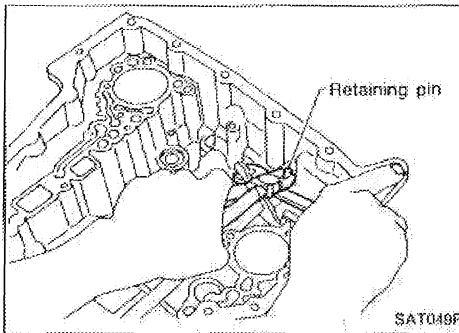
2. Drive out manual plate retaining pin.



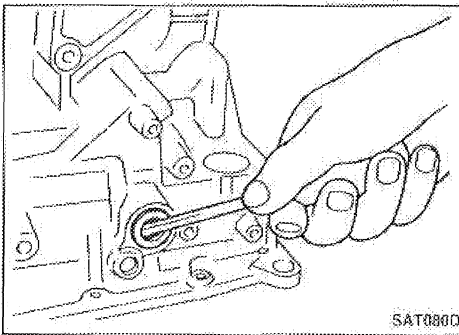
3. Drive and pull out parking rod plate retaining pin.
4. Remove parking rod plate from manual shaft.
5. Draw out parking rod from transmission case.

REPAIR FOR COMPONENT PARTS

Manual Shaft (Cont'd)



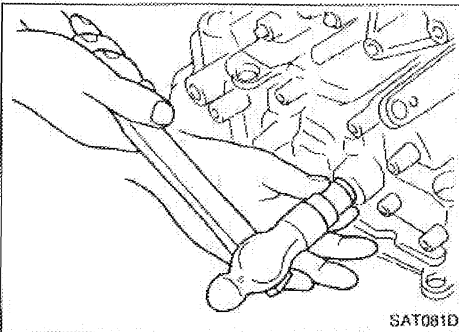
6. Pull out manual shaft retaining pin.
7. Remove manual shaft and manual plate from transmission case.



8. Remove manual shaft oil seal.

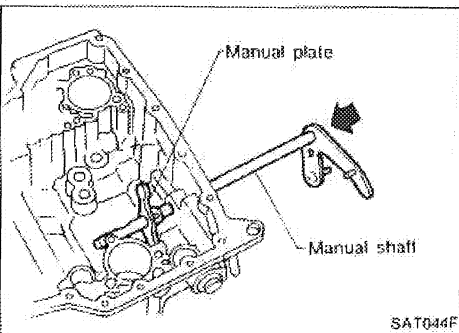
INSPECTION

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



INSTALLATION

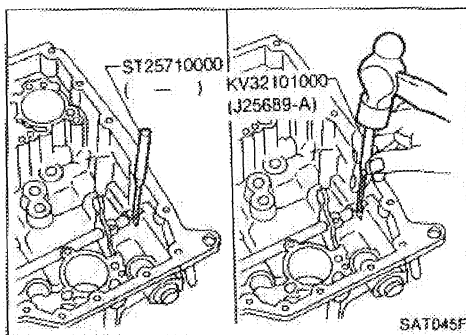
1. Install manual shaft oil seal.
- Apply A.T.F. to outer surface of oil seal.



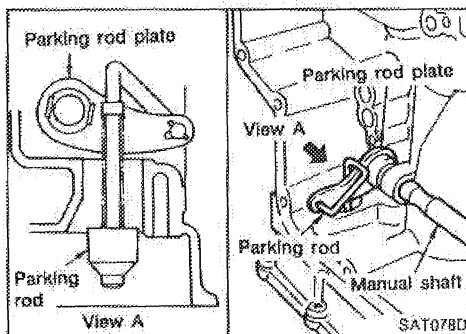
2. Install manual shaft and manual plate.

REPAIR FOR COMPONENT PARTS

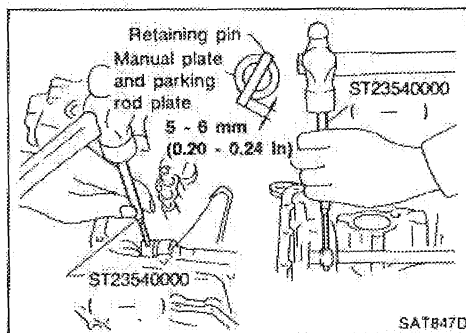
Manual Shaft (Cont'd)



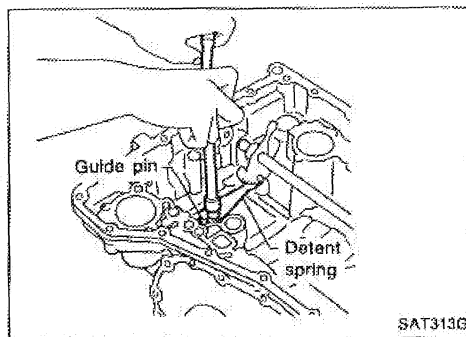
3. Align groove of manual shaft and hole of transmission case.
4. Install manual shaft retaining pin.



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



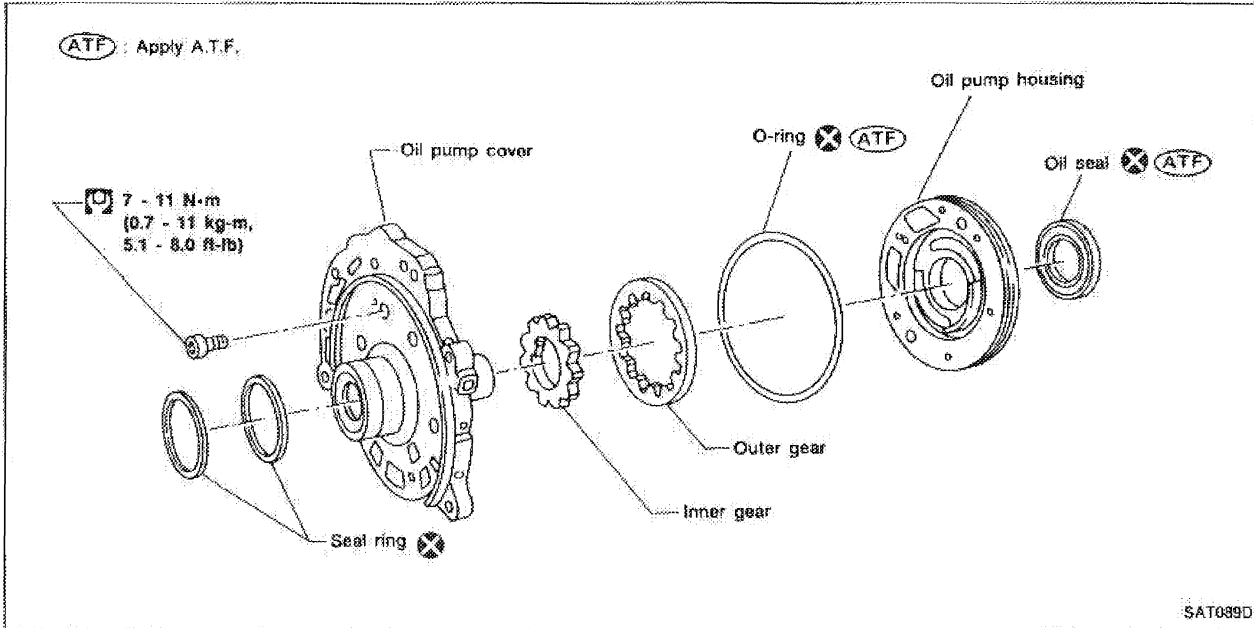
7. Drive in manual plate retaining pin and parking rod plate retaining pin.



8. Install detent spring.

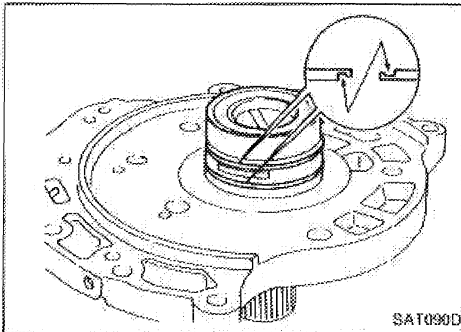
REPAIR FOR COMPONENT PARTS

Oil Pump

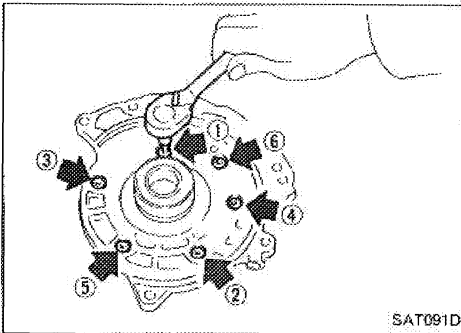


DISASSEMBLY

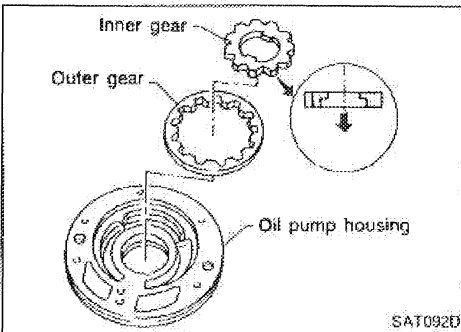
1. Remove seal rings by undoing hooks.



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

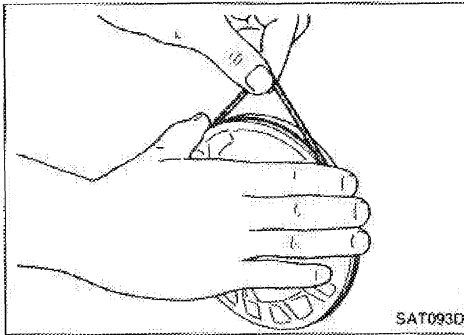


3. Remove inner and outer gear from oil pump housing.

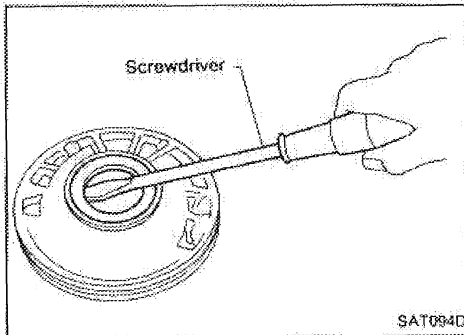


REPAIR FOR COMPONENT PARTS

Oil Pump (Cont'd)



4. Remove O-ring from oil pump housing.

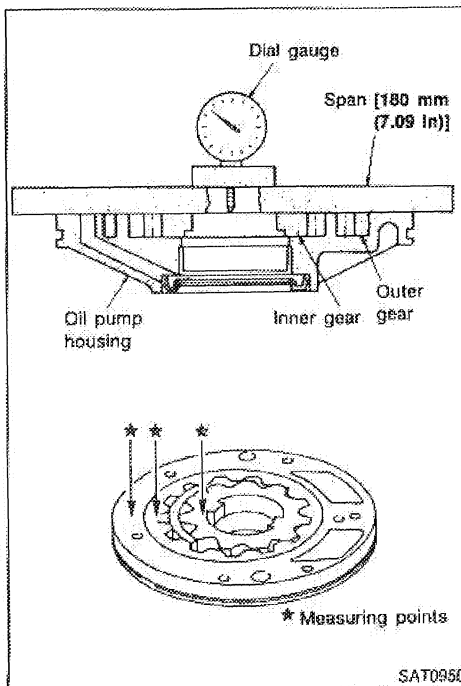


5. Remove oil pump housing oil seal.

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.

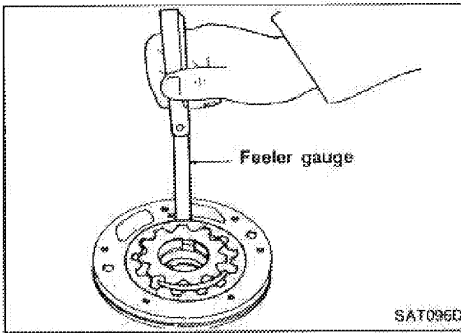
Inner and outer gear:

Refer to S.D.S.

- If clearance is more than standard, replace whole oil pump assembly except oil pump cover.

REPAIR FOR COMPONENT PARTS

Oil Pump (Cont'd)



- Measure clearance between outer gear and oil pump housing.

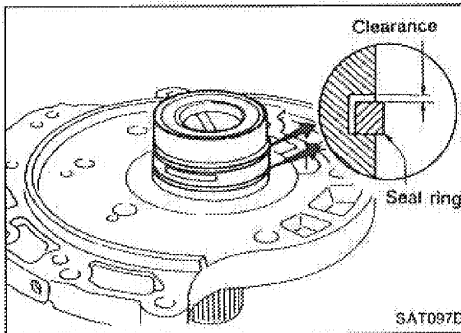
Standard clearance:

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.

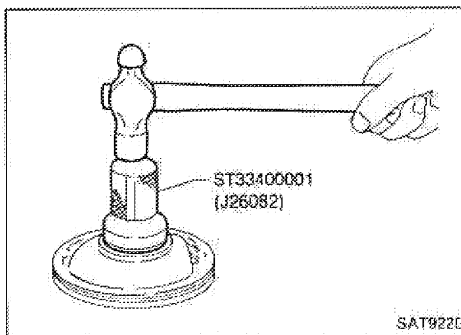
Standard clearance:

0.1 - 0.25 mm (0.0039 - 0.0098 in)

Allowable limit:

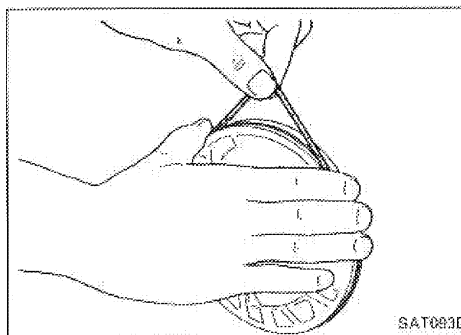
0.25 mm (0.0098 in)

- If not within allowable limit, replace oil pump cover assembly.



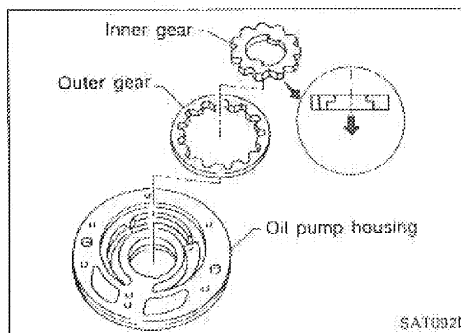
ASSEMBLY

1. Install oil seal on oil pump housing.



2. Install O-ring on oil pump housing.

- Apply A.T.F. to O-ring.

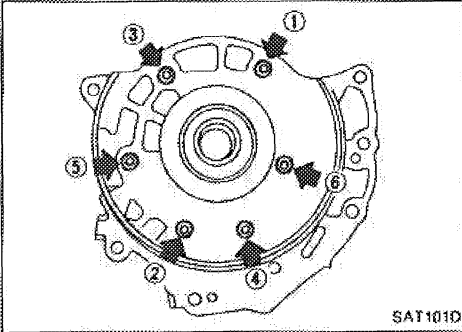


3. Install inner and outer gears on oil pump housing.

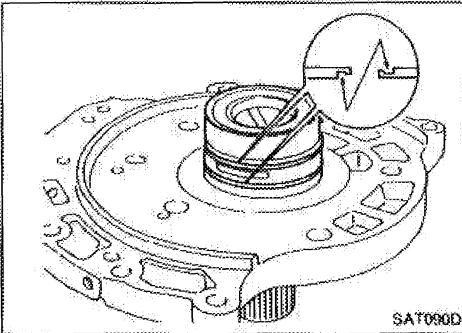
- Take care with the direction of the inner gear.

REPAIR FOR COMPONENT PARTS

Oil Pump (Cont'd)



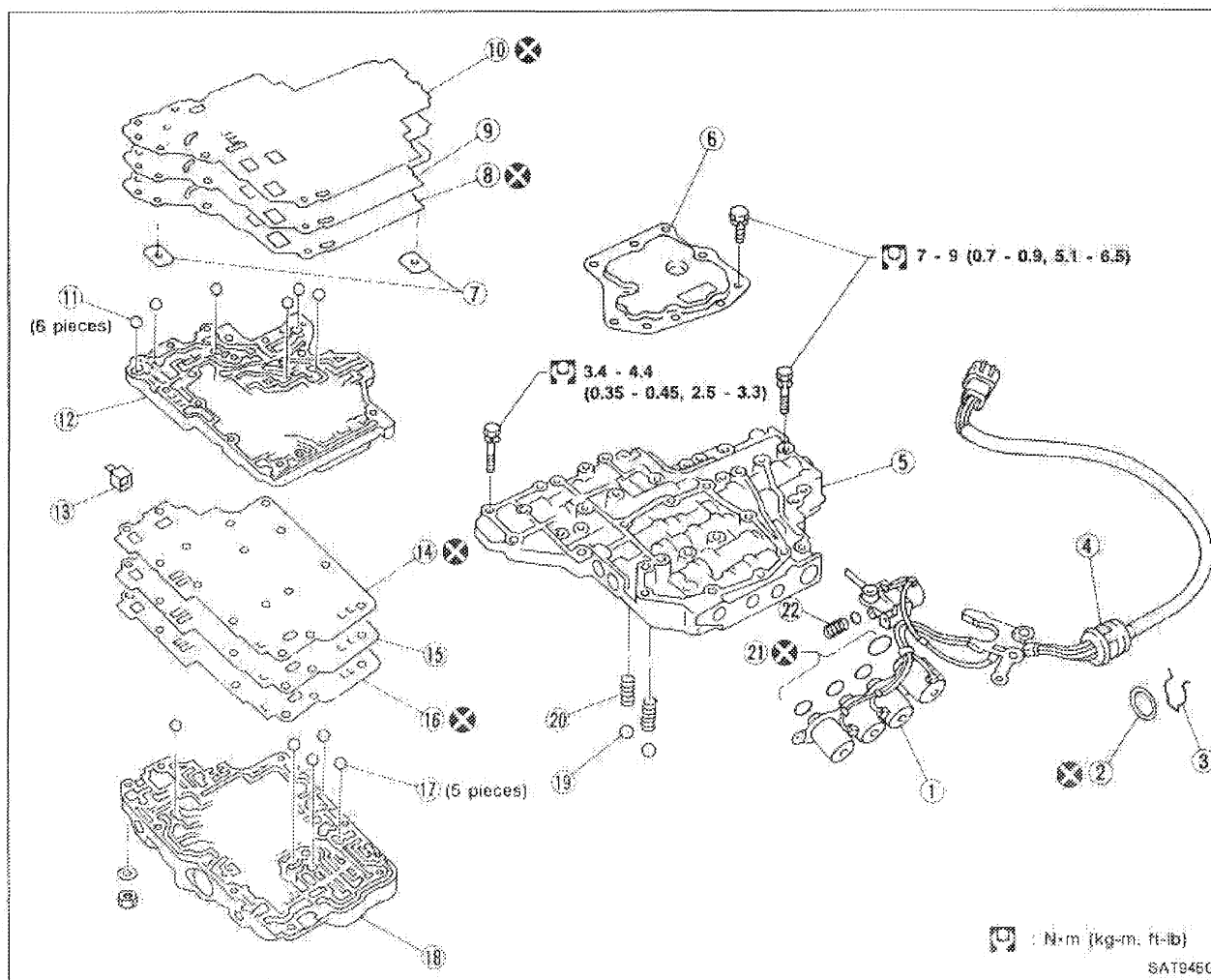
4. Install oil pump cover on oil pump housing.
 - a. Wrap masking tape around splines of oil pump cover assembly to protect seal. Position oil pump cover assembly on oil pump housing assembly, then remove masking tape.
 - b. Tighten bolts in numerical order.



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.**

REPAIR FOR COMPONENT PARTS

Control Valve Assembly




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

DISASSEMBLY

- Disassemble upper, inter and lower bodies.

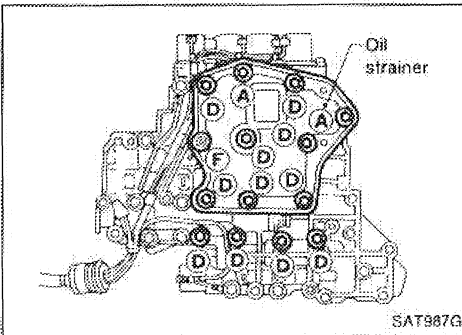
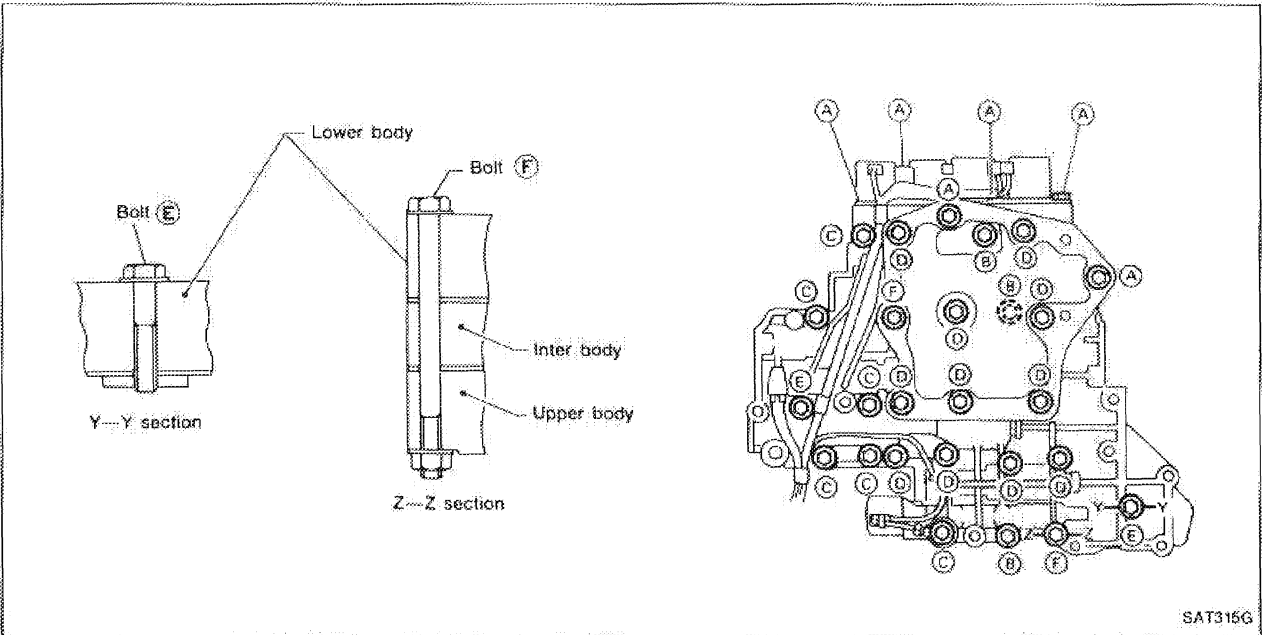
Bolt length, number and location:

Bolt symbol	A	B	C	D	E	F
Bolt length "F" mm (in)	13.5	58.0	40.0	66.0	33.0	78.0
	(0.531)	(2.283)	(1.575)	(2.598)	(1.299)	(3.071)
Number of bolts	6	3	6	11	2	2

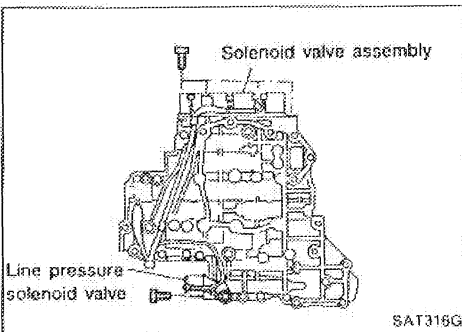
F: Reamer bolt with nut

REPAIR FOR COMPONENT PARTS

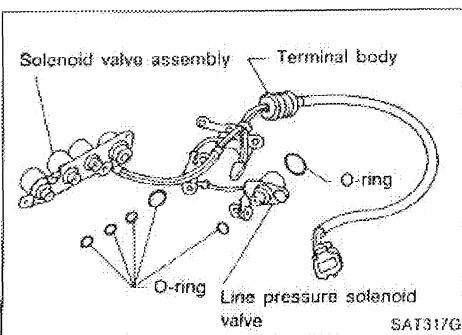
Control Valve Assembly (Cont'd)



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



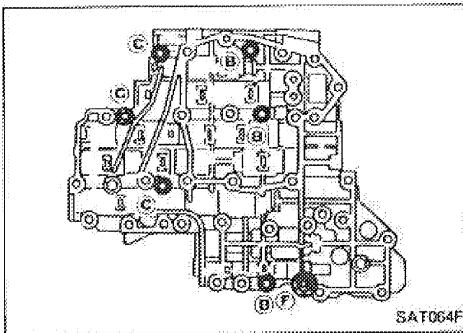
- b. Remove solenoid valve assembly and line pressure solenoid valve from control valve assembly.
- Be careful not to lose the line pressure solenoid valve spring.



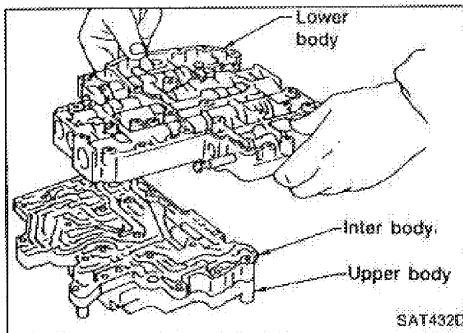
- c. Remove O-rings from solenoid valves and terminal body.

REPAIR FOR COMPONENT PARTS

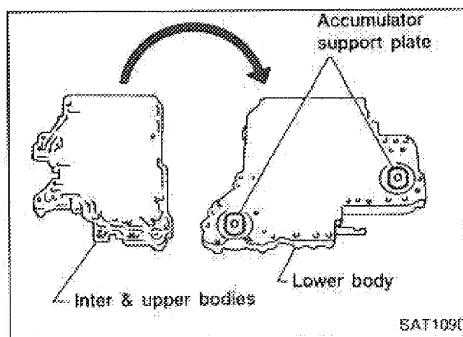
Control Valve Assembly (Cont'd)



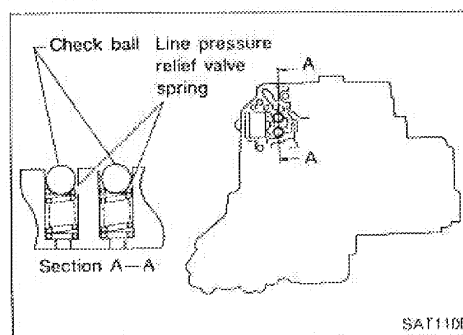
- d. Place upper body facedown, and remove bolts **(B)**, **(C)** and **(E)**.



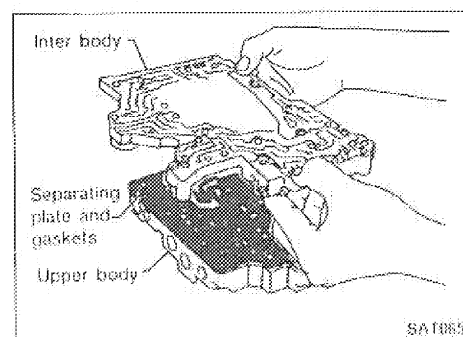
- e. Remove lower body from inter body.



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



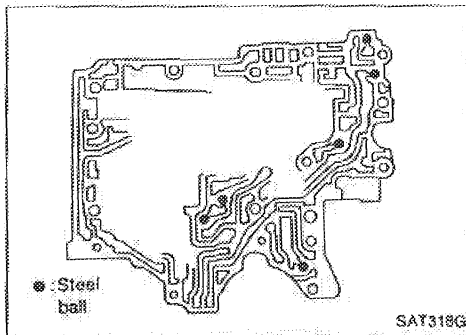
- g. Remove bolts **(E)**, separating plate and separating gaskets from lower body.
h. Remove steel balls and relief valve springs from lower body.
● **Be careful not to lose steel balls and relief valve springs.**



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

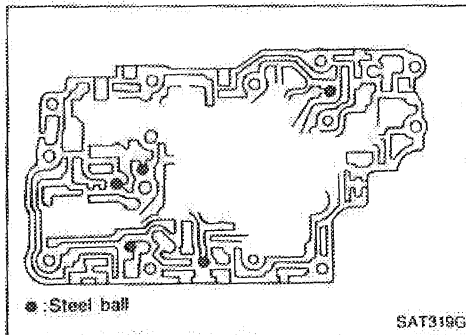
REPAIR FOR COMPONENT PARTS

Control Valve Assembly (Cont'd)



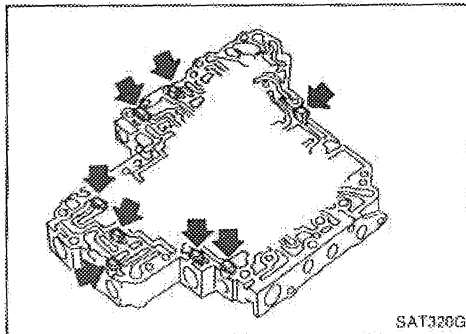
k. Check to see that steel balls are properly positioned in inter body and then remove them from inter body.

- 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.

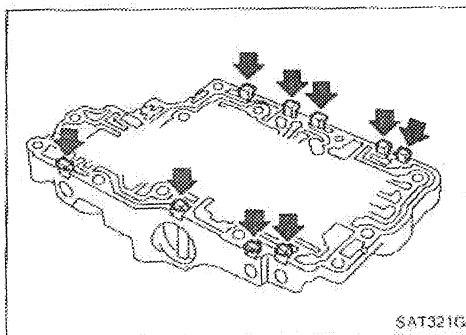
- Be careful not to lose steel balls.



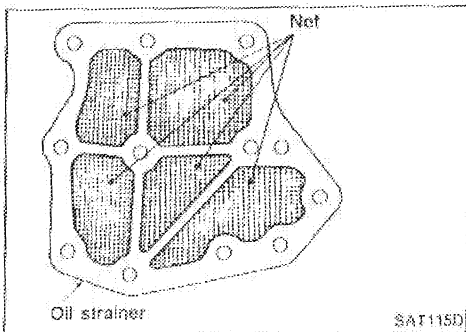
INSPECTION

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.

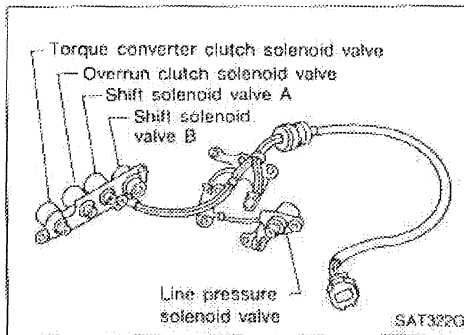


Oil strainer

● Check wire netting of oil strainer for damage.

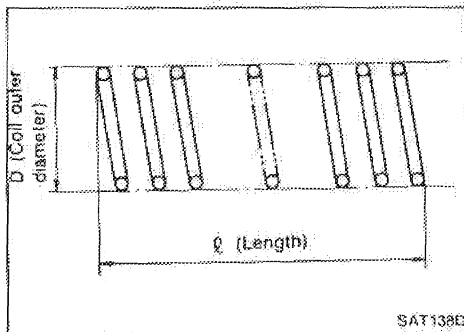
REPAIR FOR COMPONENT PARTS

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".

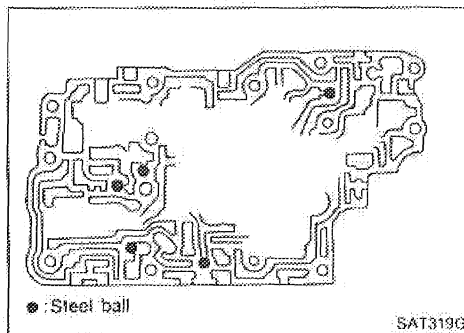


Oil cooler relief valve spring

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

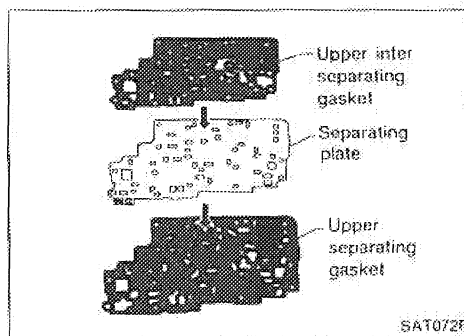
Inspection standard:

Part No.	Unit: mm (in)	
	ℓ	D
31872 31X00	17.02 (1.6701)	8.0 (0.315)



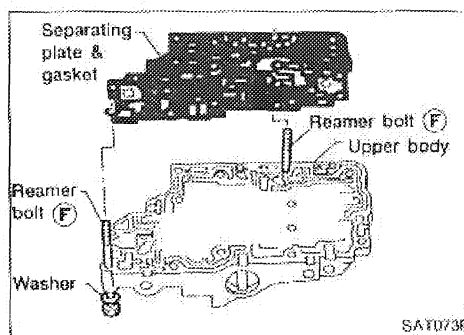
ASSEMBLY

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.

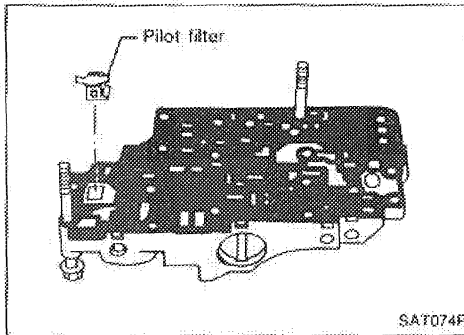
- Always use new gaskets.



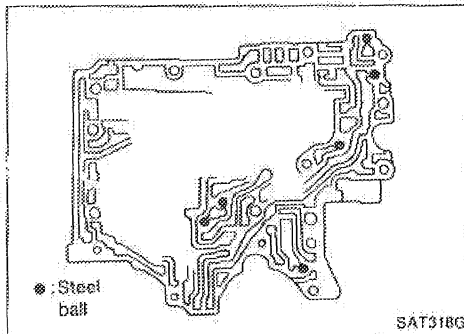
- c. Install reamer bolts (F) from bottom of upper body and install separating plate and gaskets as a set on upper body using reamer bolts as guides.

REPAIR FOR COMPONENT PARTS

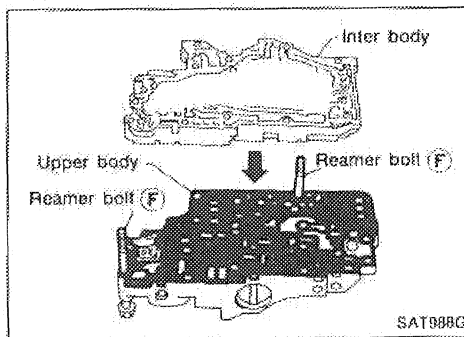
Control Valve Assembly (Cont'd)



d. Install pilot filter.

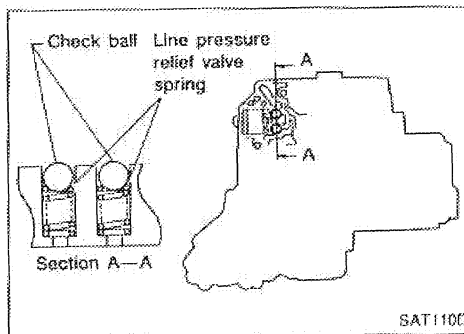


e. Place inter body as shown in the illustration. Install steel balls in their proper positions.

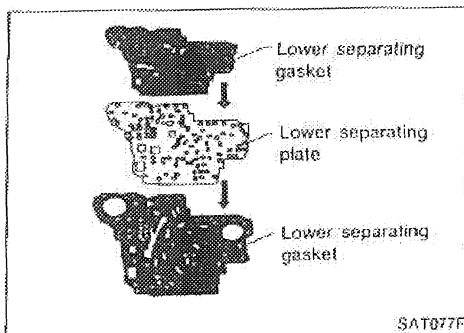


f. Install inter body on upper body using reamer bolts (F) as guides.

● Be careful not to dislocate or drop steel balls.



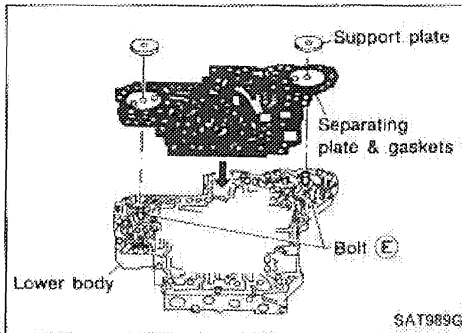
g. Install steel balls and relief valve springs in their proper positions in lower body.



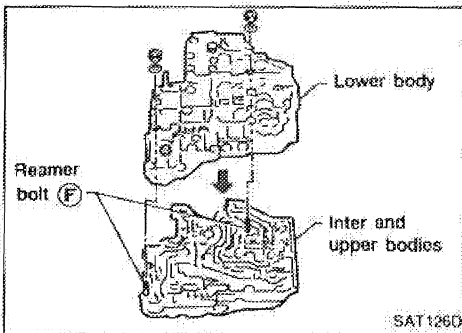
h. Install lower separating gasket, inner separating gasket and lower separating plate in order shown in the illustration.

REPAIR FOR COMPONENT PARTS

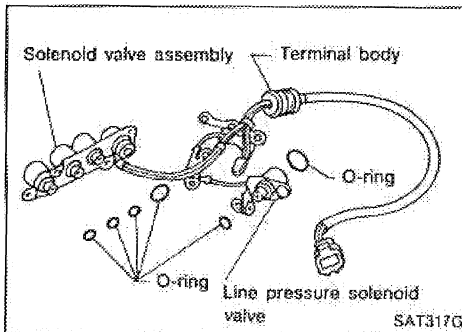
Control Valve Assembly (Cont'd)



- 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.

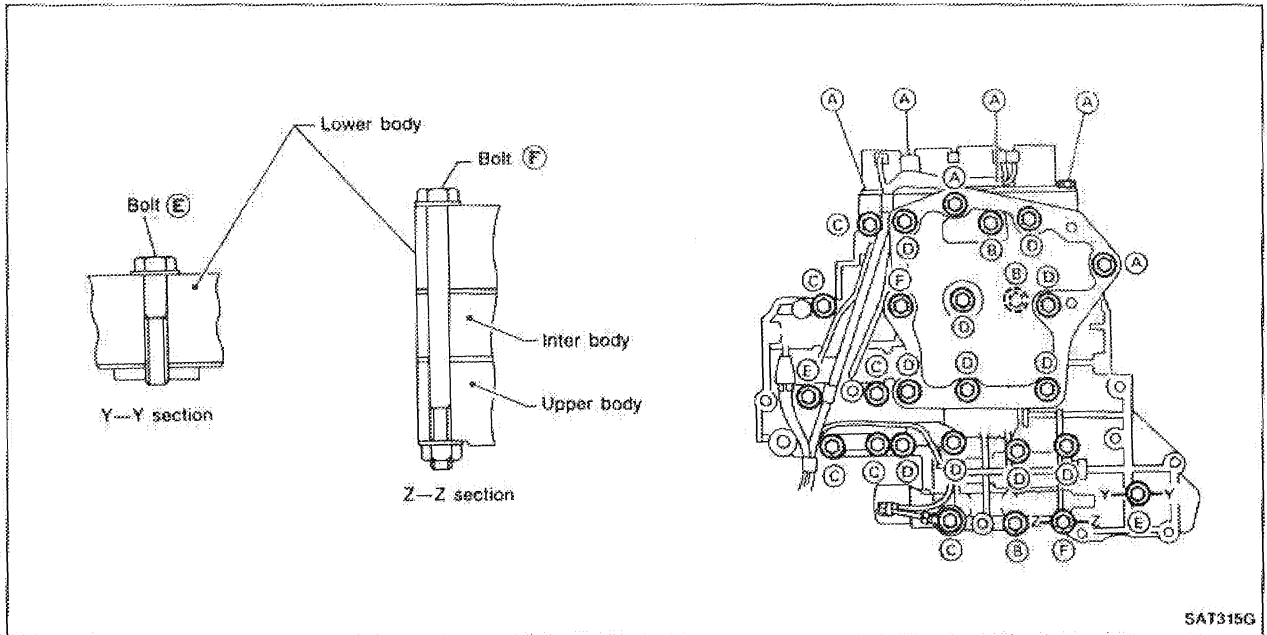
3. Install and tighten bolts.

Bolt length, number and location:

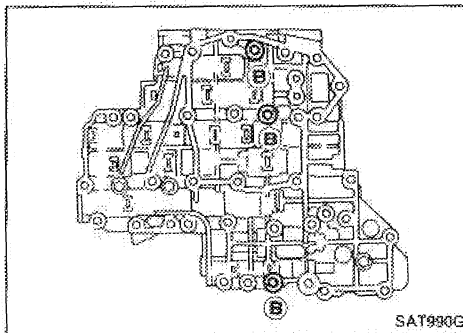
Bolt symbol	A	B	C	D	E	F
Bolt length "f" mm (in)	13.5 (0.531)	58.0 (2.283)	44.0 (1.732)	66.0 (2.598)	33.0 (1.299)	78.0 (3.071)
Number of bolts	6	3	6	11	2	2

REPAIR FOR COMPONENT PARTS

Control Valve Assembly (Cont'd)

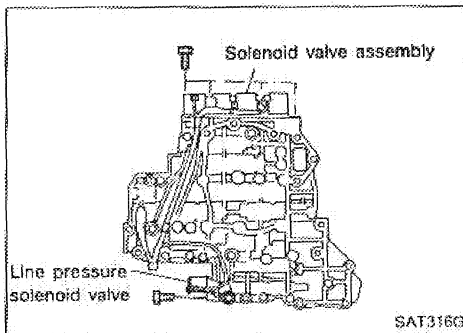


SAT315G



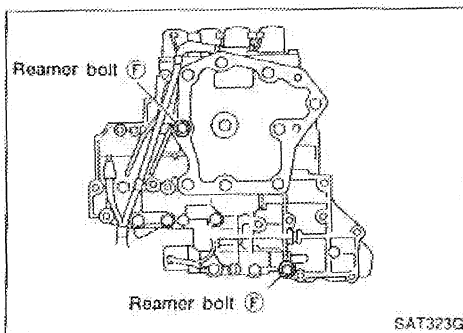
SAT990G

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



SAT316G

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

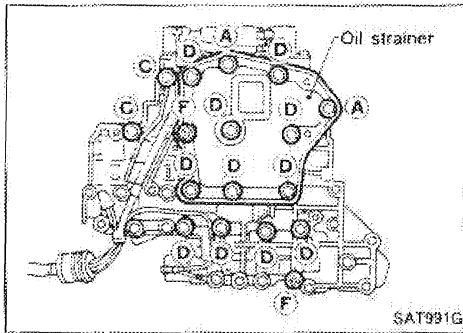


SAT323G

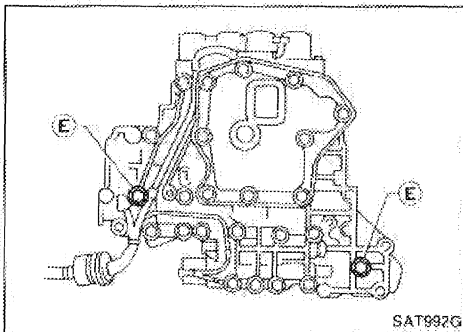
- c. Remove reamer bolts (F) and set oil strainer on control valve assembly.
 d. Reinstall reamer bolts (F) from lower body side.

REPAIR FOR COMPONENT PARTS

Control Valve Assembly (Cont'd)



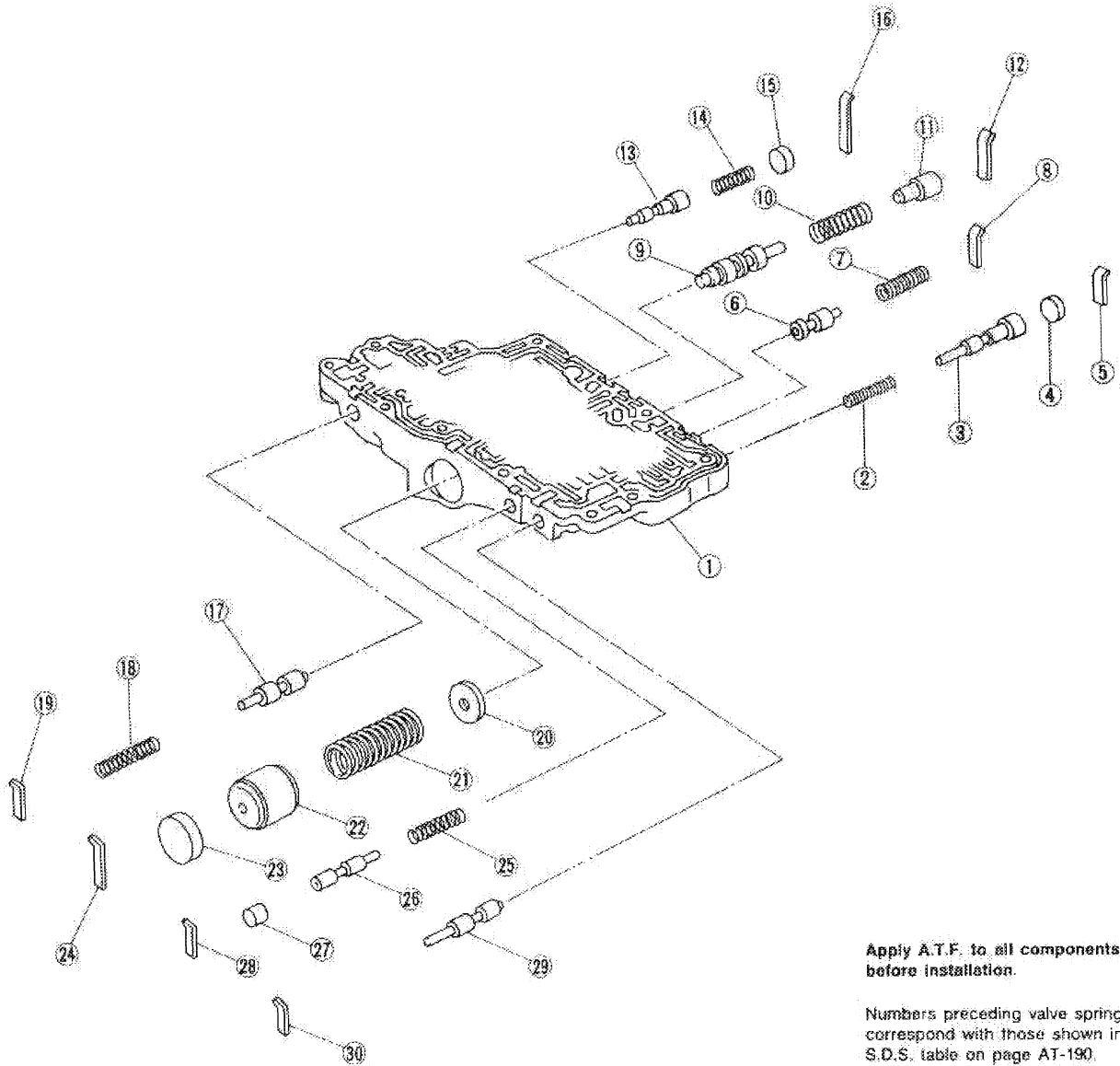
e. Tighten bolts (A), (C), (D) and (F) to specified torque.



f. Tighten bolts (E) to specified torque.

REPAIR FOR COMPONENT PARTS

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.

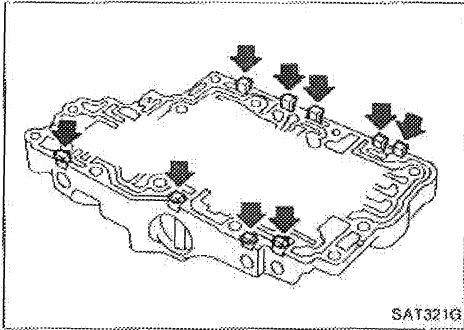
SAT944G

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

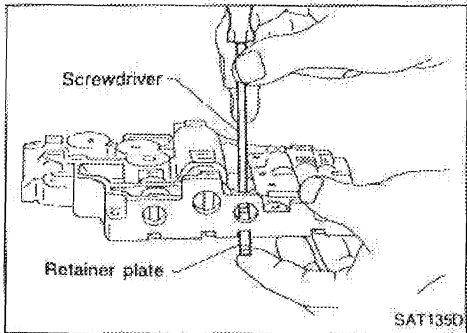
REPAIR FOR COMPONENT PARTS

Control Valve Upper Body (Cont'd)

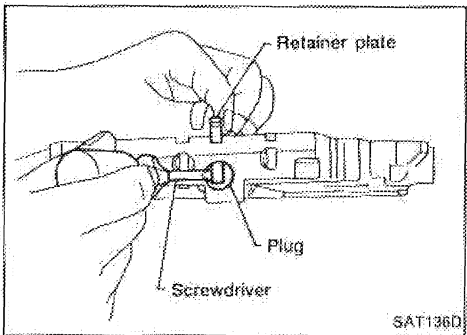
DISASSEMBLY



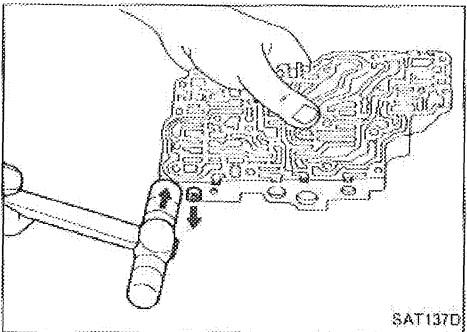
1. Remove valves at retainer plates.
 - Do not use a magnetic "hand".



- 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

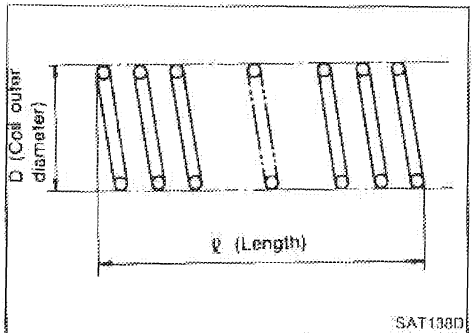
- Measure free length and outer diameter of each valve spring. Also check for damage or deformation.

Inspection standard: Refer to S.D.S.

- Replace valve springs if deformed or fatigued.

Control valves

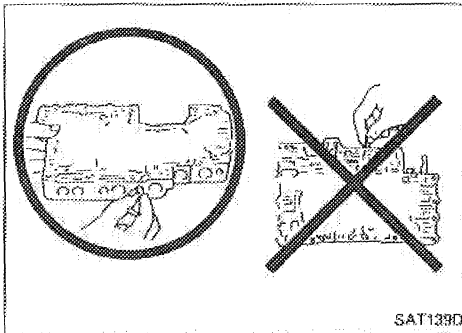
- Check sliding surfaces of valves, sleeves and plugs.



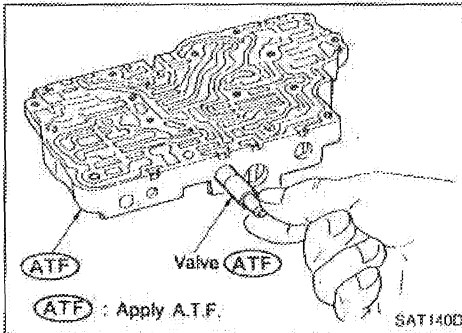
REPAIR FOR COMPONENT PARTS

Control Valve Upper Body (Cont'd)

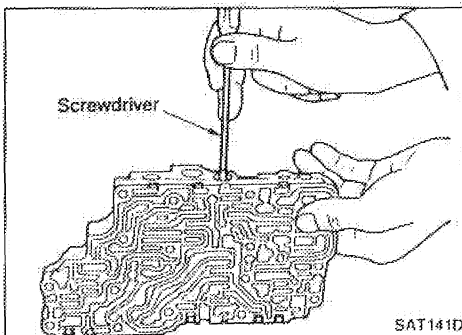
ASSEMBLY



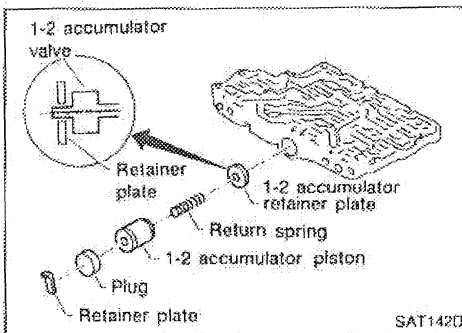
- Lay control valve body down when installing valves. Do not stand the control valve body upright.



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.

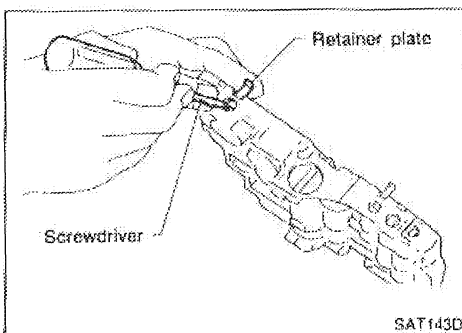


- Wrap a small screwdriver with vinyl tape and use it to insert the valves into their proper positions.



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.



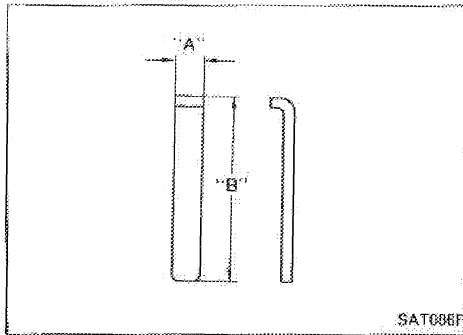
2. Install retainer plates
- Install retainer plate while pushing plug or return spring.

REPAIR FOR COMPONENT PARTS

Control Valve Upper Body (Cont'd)

Retainer plate

Unit: mm (in)

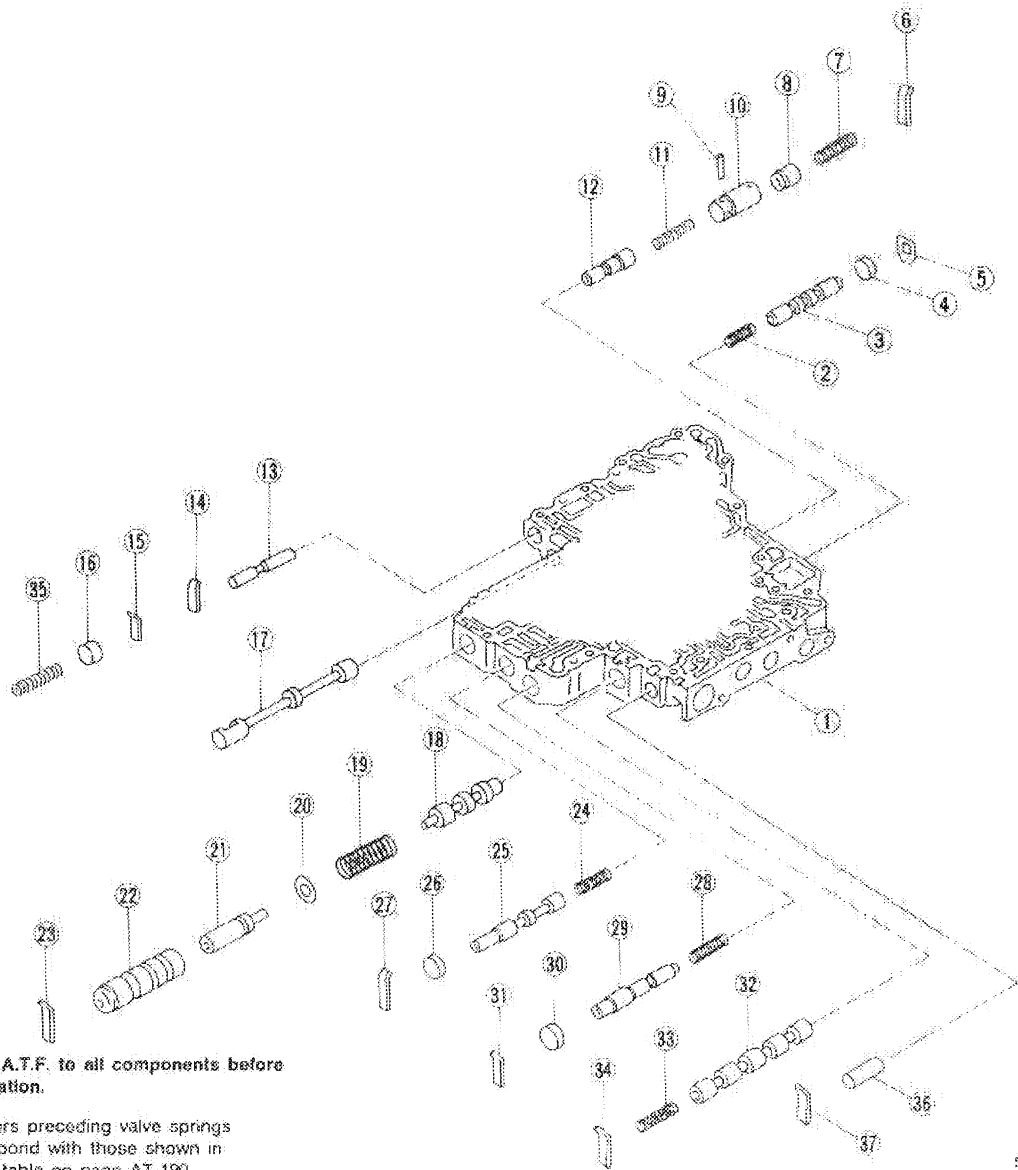


Name of control valve	Length A	Length B
Pilot valve	6.0 (0.236)	21.5 (0.846)
1-2 accumulator valve		38.5 (1.516)
1-2 accumulator piston valve		21.5 (0.846)
1st reducing valve		24.0 (0.945)
Overrun clutch reducing valve		21.5 (0.846)
Torque converter relief valve		28.0 (1.102)
Lock-up control valve		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

- Install proper retainer plates.

REPAIR FOR COMPONENT PARTS

Control Valve Lower Body



SAT945G

- | | | |
|----------------------------|--------------------------------|-----------------------------|
| ① Control valve lower body | ⑭ Retainer plate | ⑳ Plug |
| ② Return spring | ⑮ Retainer plate | ㉑ Retaining plate |
| ③ Shift valve B | ⑯ Plug | ㉒ Return spring |
| ④ Plug | ⑰ Manual valve | ㉓ Accumulator control valve |
| ⑤ Retainer plate | ⑱ Pressure regulator valve | ㉔ Plug |
| ⑥ Retainer plate | ㉒ Return spring | ㉕ Retainer plate |
| ⑦ Return spring | ㉔ Spring seat | ㉖ Shift valve A |
| ⑧ Piston | ㉕ Plug | ㉗ Return spring |
| ⑨ Parallel pin | ㉖ Sleeve | ㉘ Retainer plate |
| ⑩ Sleeve | ㉗ Retaining plate | ㉙ Return spring |
| ⑪ Return spring | ㉘ Return spring | ㉚ Plug |
| ⑫ Pressure modifier valve | ㉙ Overrun clutch control valve | ㉛ Retainer plate |
| ⑬ Accumulator shift valve | | |

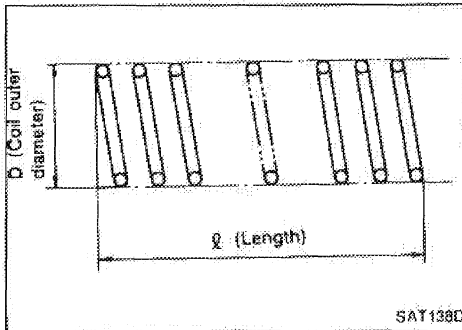
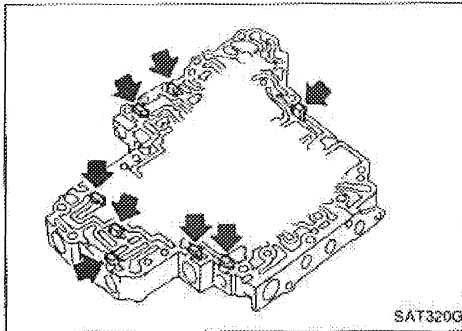
REPAIR FOR COMPONENT PARTS

Control Valve Lower Body (Cont'd)

DISASSEMBLY

Remove valves at retainer plate.

For removal procedures, refer to "DISASSEMBLY" of Control Valve Upper Body.



INSPECTION

Valve springs

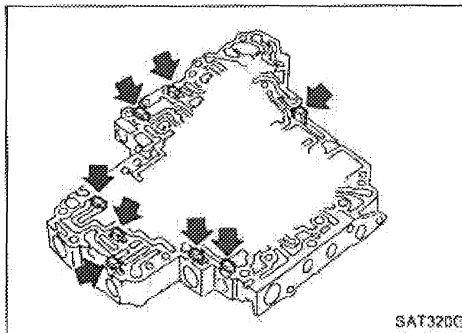
- Check each valve spring for damage or deformation. Also measure free length and outer diameter.

Inspection standard: Refer to S.D.S.

- Replace valve springs if deformed or fatigued.

Control valves

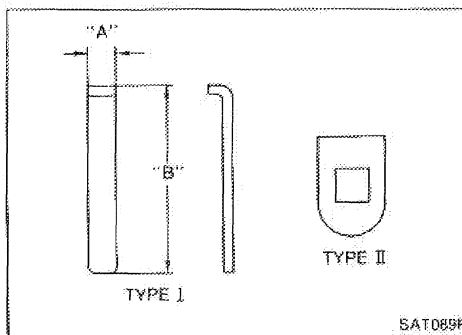
- Check sliding surfaces of control valves, sleeves and plugs for damage.



ASSEMBLY

- Install control valves.

For installation procedures, refer to "ASSEMBLY" of Control Valve Upper Body.



Retainer plate

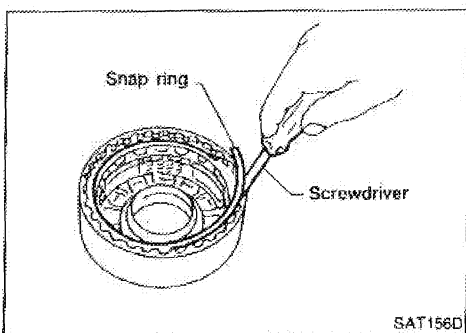
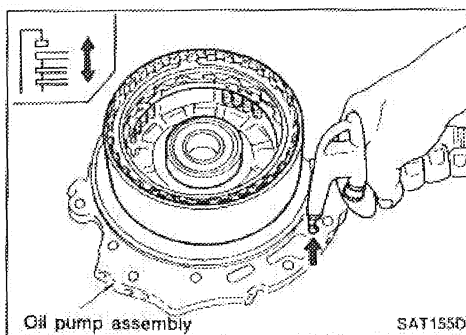
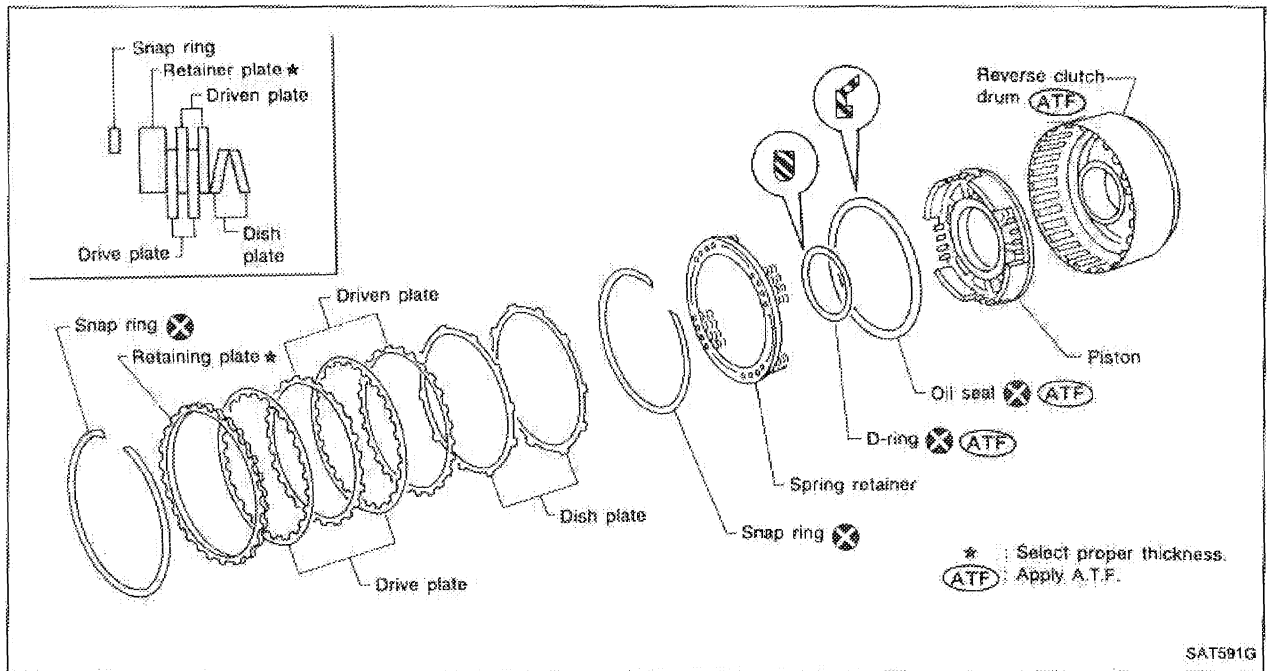
Unit: mm (in)

Name of control valve	Length A	Length B	Type
Accumulator shift valve	6.0 (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	—	—	II
Shift valve B			

- Install proper retainer plates

REPAIR FOR COMPONENT PARTS

Reverse Clutch

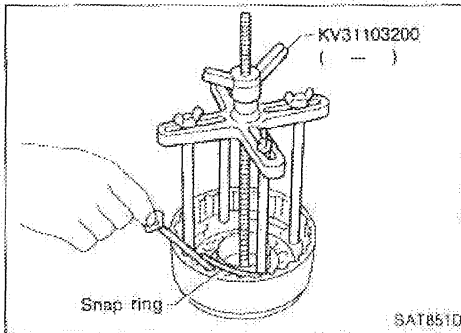


DISASSEMBLY

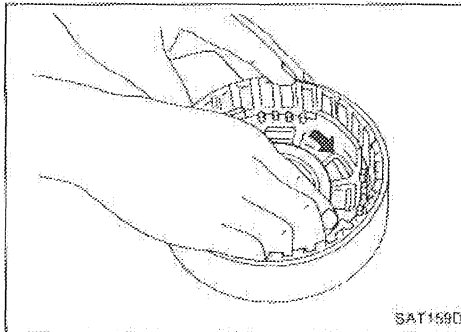
1. Check operation of reverse clutch.
 - a. Install seal ring onto drum support of oil pump cover and install reverse clutch assembly. Apply compressed air to oil hole.
 - b. Check to see that retaining plate moves to snap ring.
 - c. If retaining plate does not move to snap ring, D-ring or oil seal 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.

REPAIR FOR COMPONENT PARTS

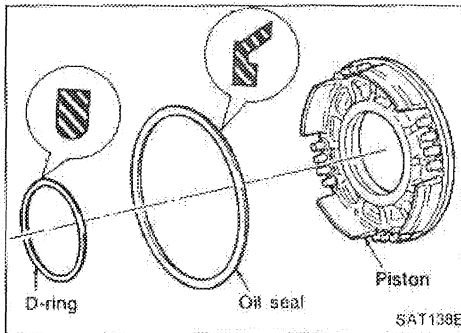
Reverse Clutch (Cont'd)



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.

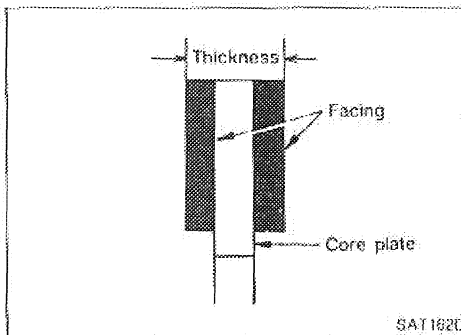
INSPECTION

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.

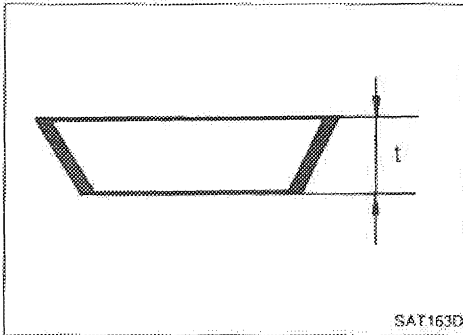


REPAIR FOR COMPONENT PARTS

Reverse Clutch (Cont'd)

Reverse clutch dish plates

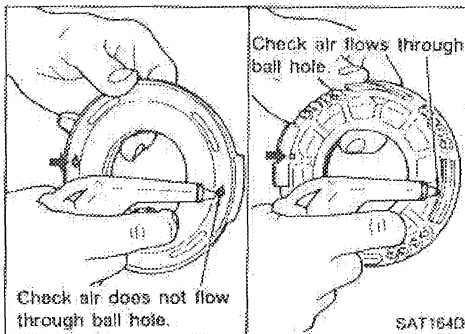
- Check for deformation or damage.
- Measure thickness of dish plate.
Thickness of dish plate "t": 2.8 mm (0.110 in)
- If deformed or fatigued, replace.



SAT163D

Reverse clutch piston

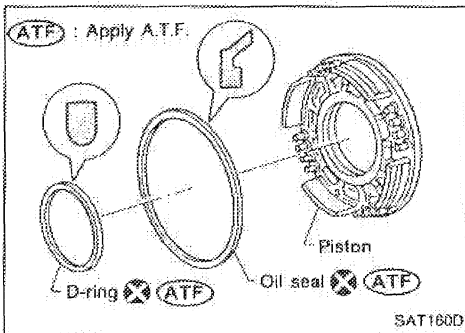
- Make sure check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring to make sure that there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure air leaks past ball.



SAT164D

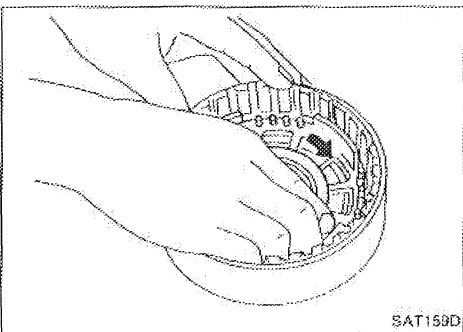
ASSEMBLY

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.



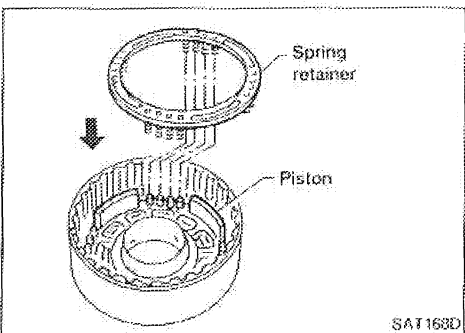
SAT160D

2. Install piston assembly by turning it slowly.
 - Apply A.T.F. to inner surface of drum.



SAT159D

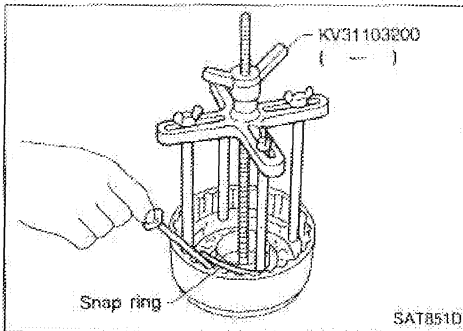
3. Install return springs and spring retainer on piston.



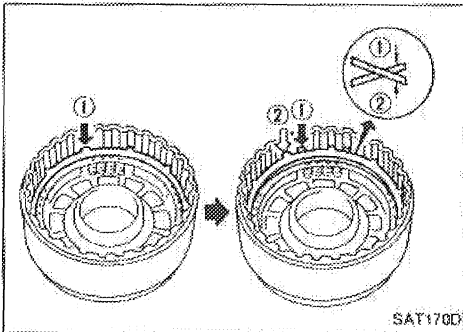
SAT168D

REPAIR FOR COMPONENT PARTS

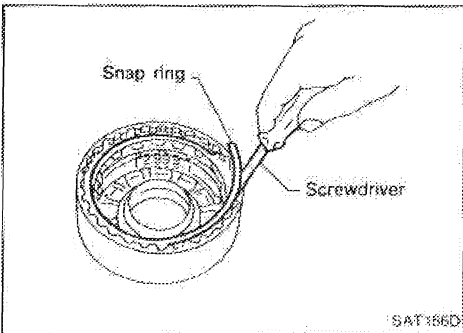
Reverse Clutch (Cont'd)



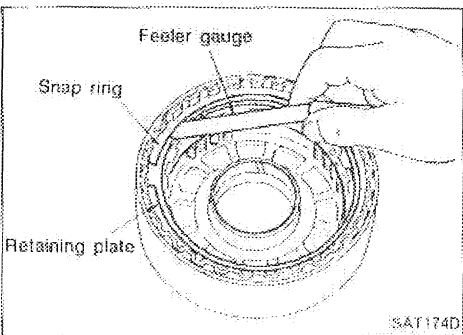
4. Set Tool on spring retainer and install snap ring while compressing return springs.
 - Set Tool directly above return springs.



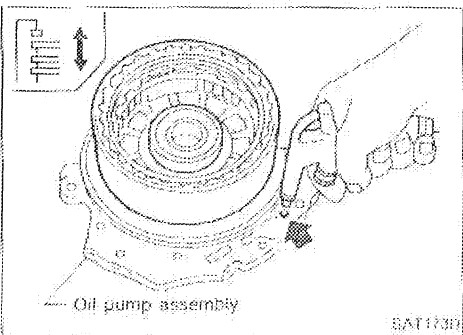
5. Install drive plates, driven plates, retaining plate and dish plates.
 - Do not align the projections of any two dish plates.
 - Take care with the order and direction of plates.



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.

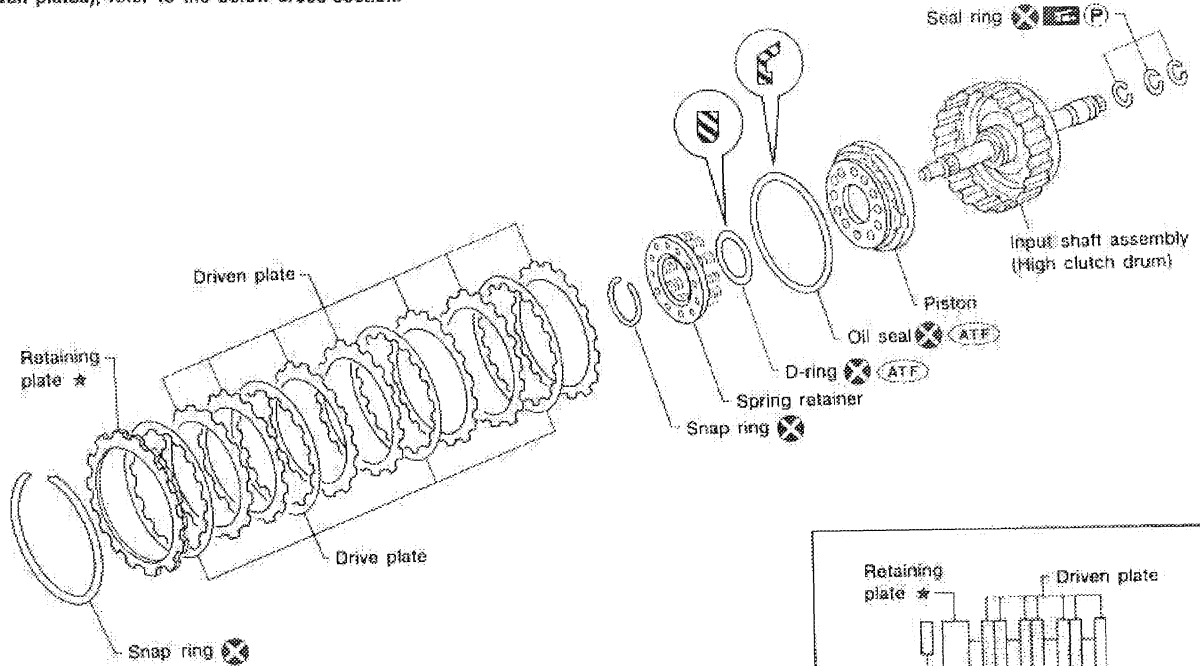


8. Check operation of reverse clutch. Refer to "DISASSEMBLY" in "Reverse Clutch."

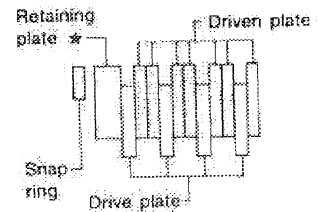
REPAIR FOR COMPONENT PARTS

High Clutch

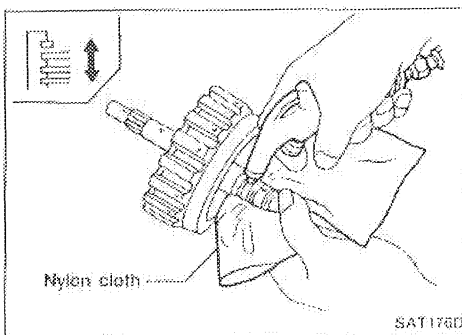
For the number of clutch sheets (drive plates and driven plates), refer to the below cross-section.



- : Apply petroleum jelly.
- : Apply A.T.F.
- ★ : Select proper thickness.

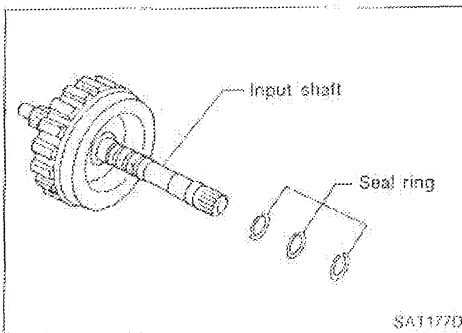


SAT950G



SAT178D

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.

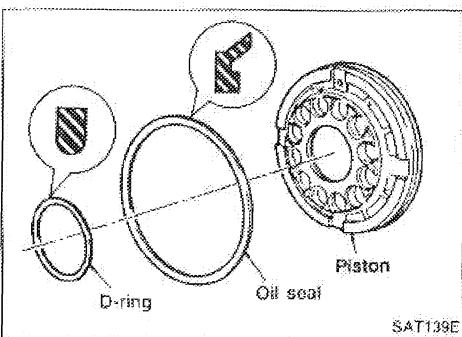
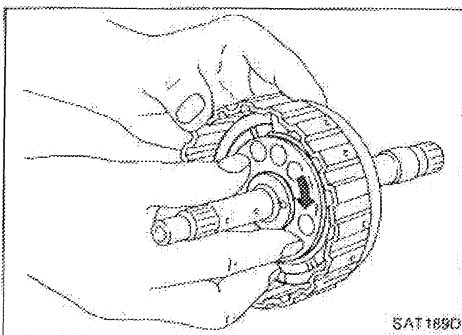
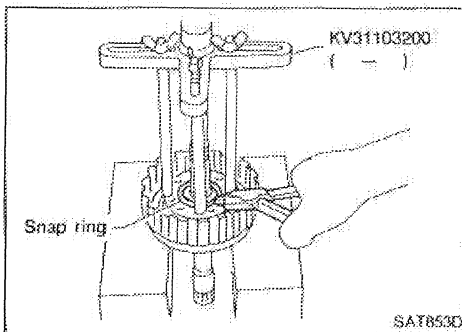
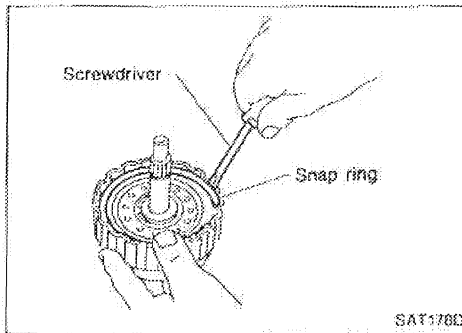


SAT177D

2. Remove seal rings from input shaft.

REPAIR FOR COMPONENT PARTS

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.

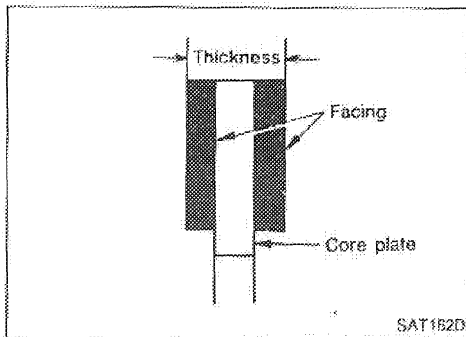
INSPECTION

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.

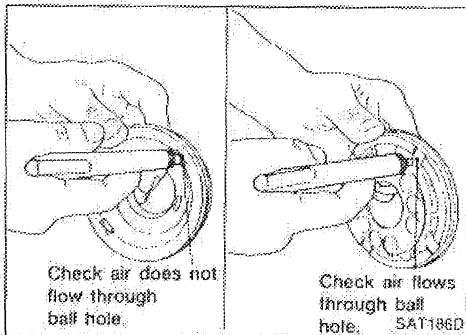
REPAIR FOR COMPONENT PARTS

High Clutch (Cont'd)



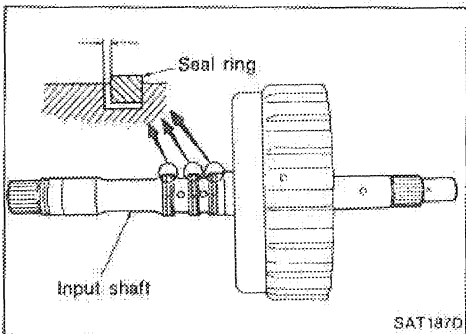
High clutch drive plates

- 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.



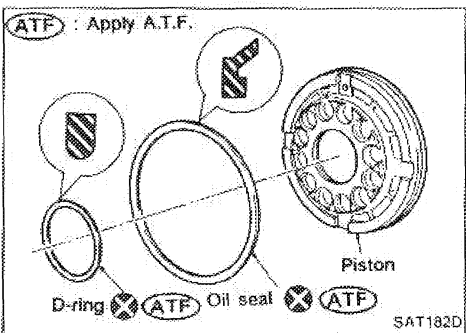
High clutch piston

- 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.



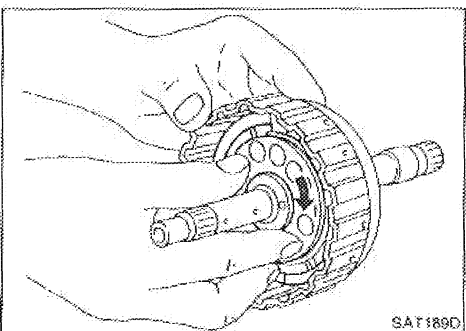
Seal ring clearance

- 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.



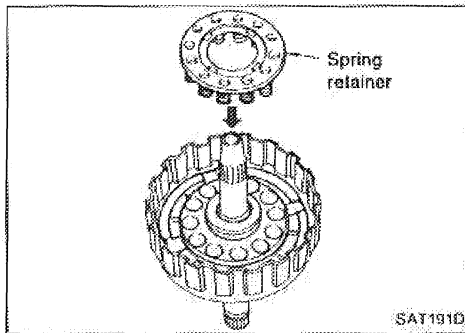
ASSEMBLY

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.

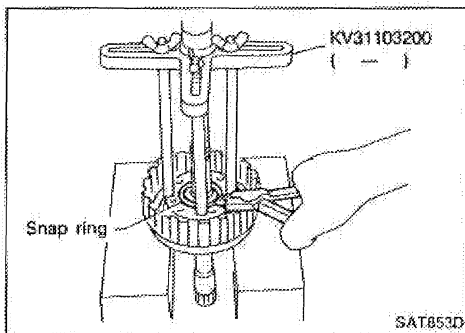


REPAIR FOR COMPONENT PARTS

High Clutch (Cont'd)

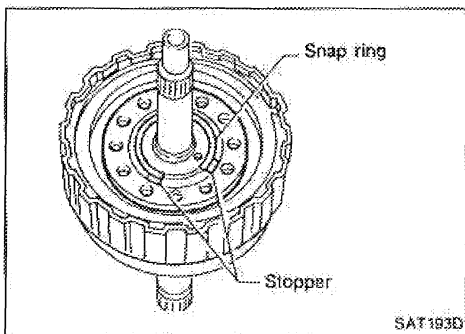


3. Install return springs and spring retainer on piston.

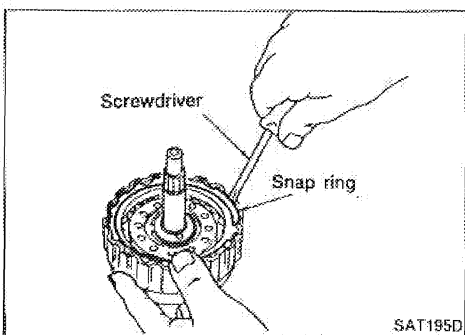


4. Set Tool on spring retainer and install snap ring while compressing return springs.

● Set Tool directly above return springs.



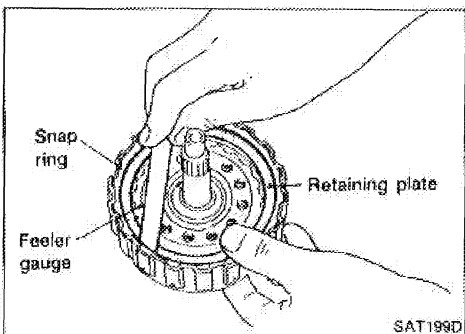
● Do not align snap ring gap with spring retainer stopper.



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:

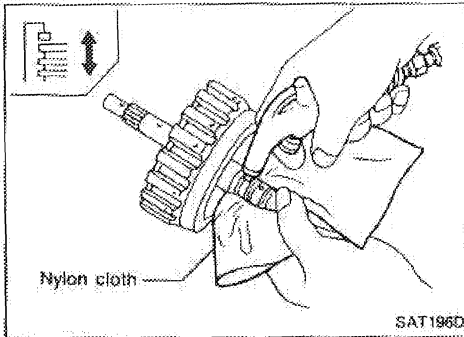
Standard: 1.4 - 1.8 mm (0.055 - 0.071 in)

Allowable limit: 2.6 mm (0.102 in)

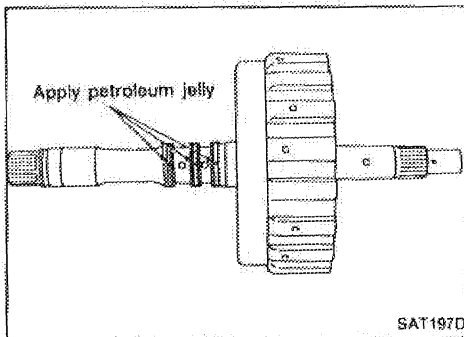
Retaining plate: Refer to S.D.S.

REPAIR FOR COMPONENT PARTS

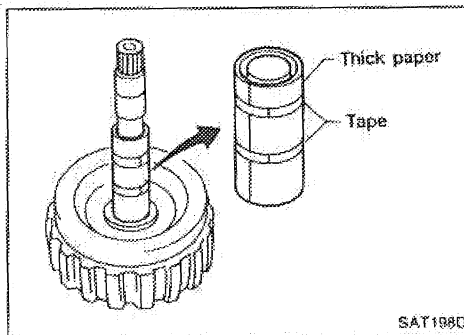
High Clutch (Cont'd)



8. Check operation of high clutch.
Refer to "DISASSEMBLY" in "High Clutch".



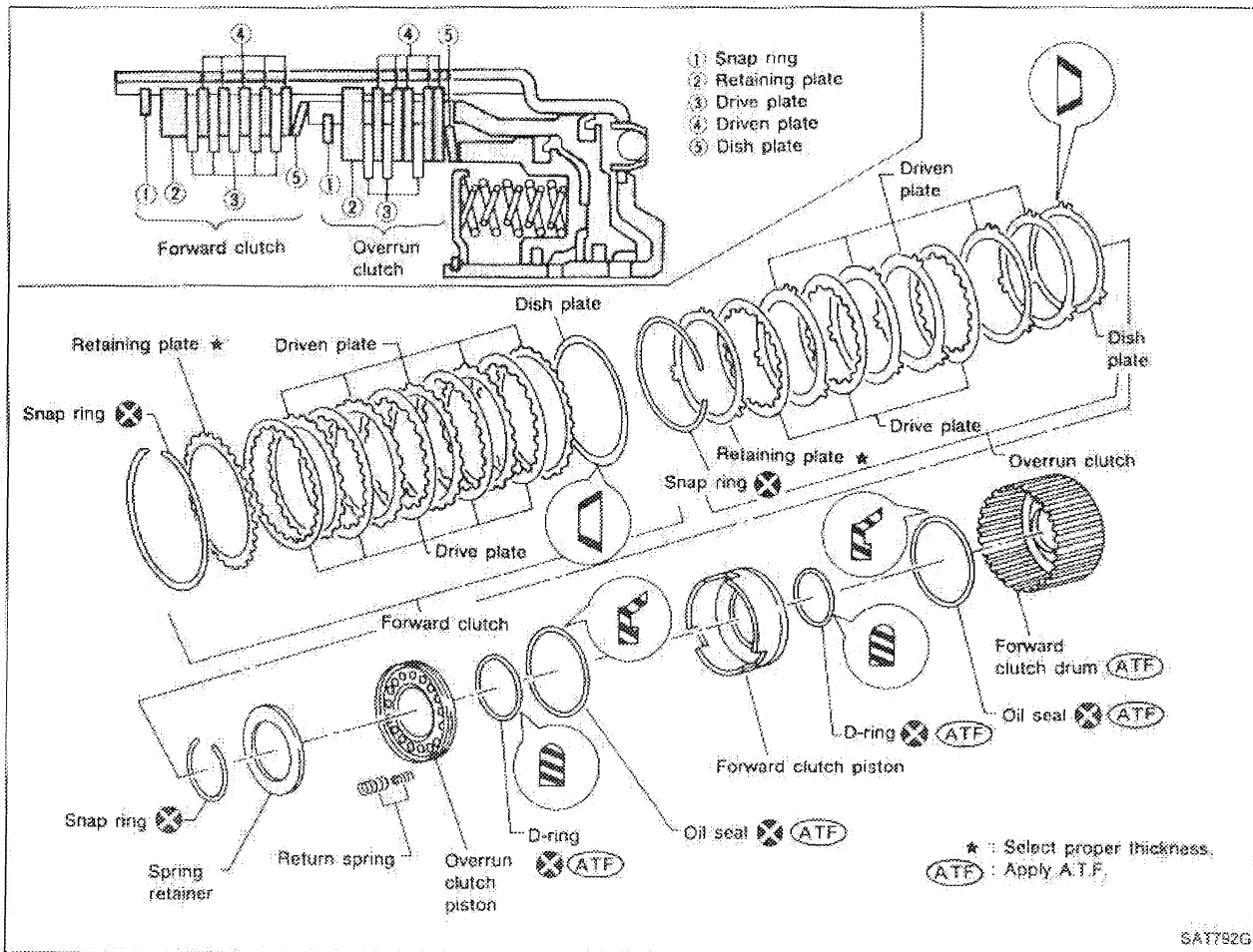
9. Install seal rings to input shaft.
 - Apply petroleum jelly to seal rings.



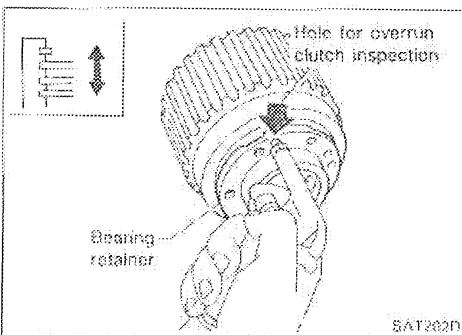
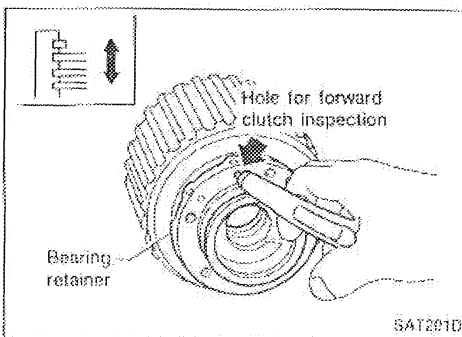
- Roll paper around seal rings to prevent seal rings from spreading.

REPAIR FOR COMPONENT PARTS

Forward Clutch and Overrun Clutch



SAT792G

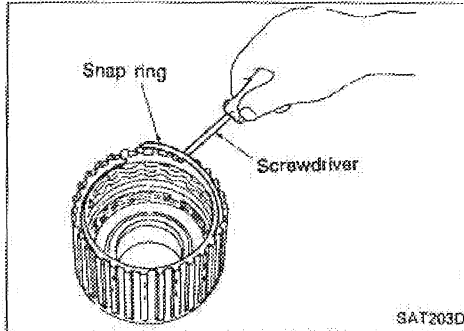


DISASSEMBLY

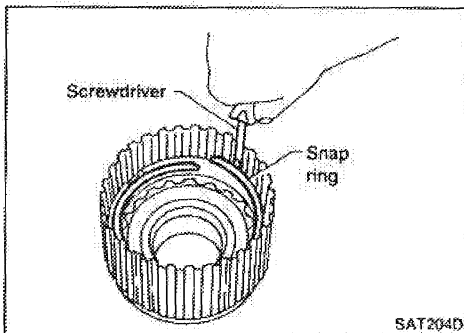
1. Check operation of forward clutch and overrun clutch.
 - a. Install bearing retainer on forward clutch drum.
 - b. Apply compressed air to oil hole of forward clutch drum.
 - c. Check to see that retaining plate moves to snap ring.
- d. If retaining plate does not move to snap ring, D-ring or oil seal may be damaged or fluid may be leaking at piston check ball.

REPAIR FOR COMPONENT PARTS

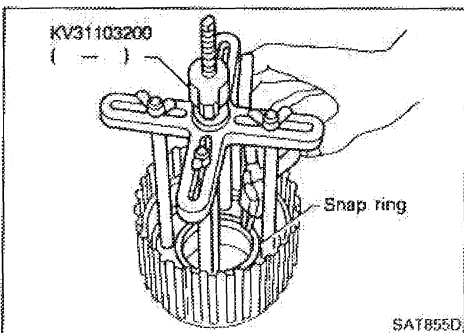
Forward Clutch and Overrun Clutch (Cont'd)



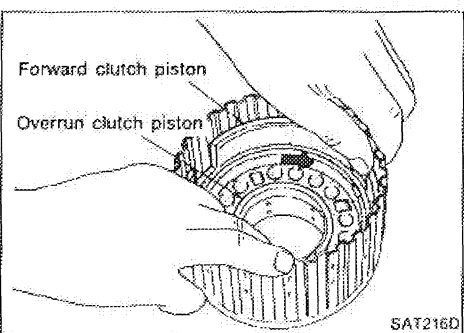
2. Remove snap ring for forward clutch.
3. Remove drive plates, driven plates, retaining plate and dish plate for forward clutch.



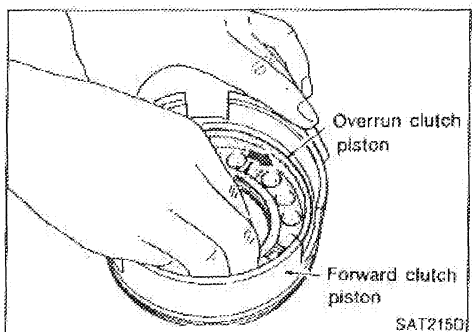
4. Remove snap ring for overrun clutch.
5. Remove drive plates, driven plates, retaining plate and dish plate for overrun clutch.



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.



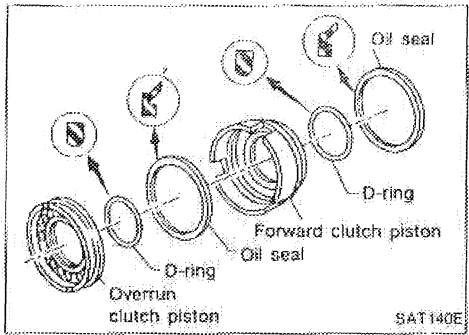
8. Remove forward clutch piston with overrun clutch piston from forward clutch drum by turning it.



9. Remove overrun clutch piston from forward clutch piston by turning it.

REPAIR FOR COMPONENT PARTS

Forward Clutch and Overrun Clutch (Cont'd)

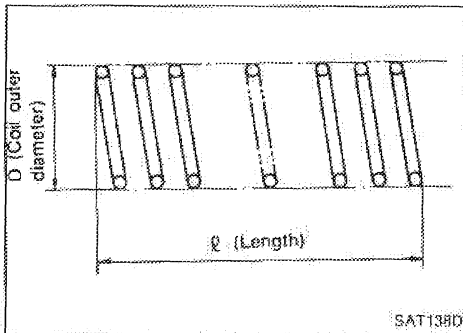


10. Remove D-rings and oil seals from forward clutch piston and overrun clutch piston.

INSPECTION

Snap rings and spring retainer

- Check for deformation, fatigue or damage.



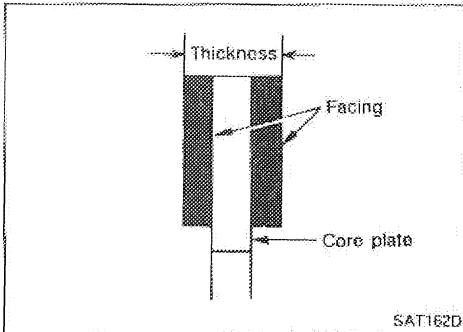
Forward clutch and overrun clutch return springs

- 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)

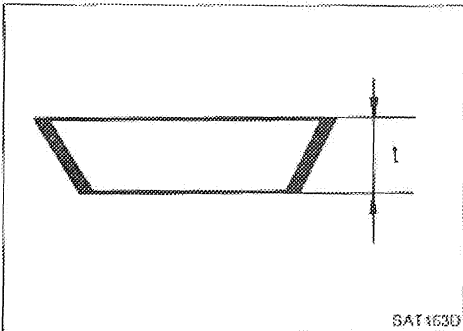
Wear limit: 1.6 mm (0.063 in)

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)

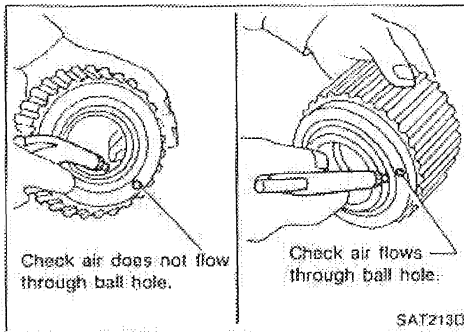
Overrun clutch: 2.15 mm (0.0846 in)

- If deformed or fatigued, replace.

REPAIR FOR COMPONENT PARTS

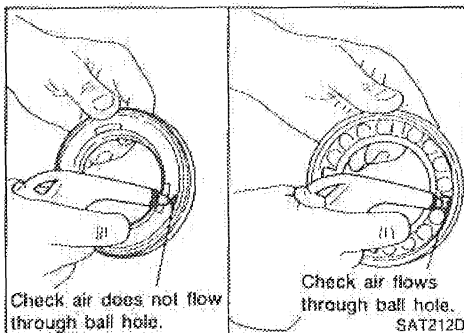
Forward Clutch and Overrun Clutch (Cont'd)

Forward clutch drum



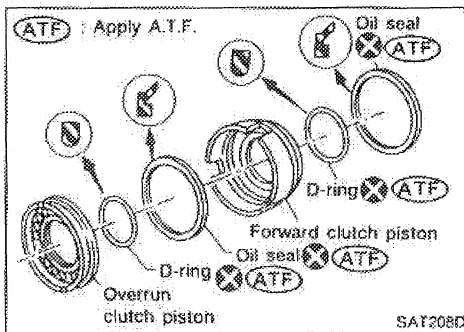
- Make sure check balls are not fixed.
- Apply compressed air to check ball oil hole from outside of forward clutch drum to make sure air leaks past ball.
- Apply compressed air to oil hole from inside of forward clutch drum to make sure there is no air leakage.

Overrun clutch piston

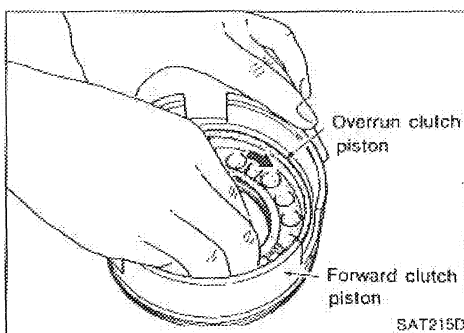


- Make sure check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring to make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure air leaks past ball.

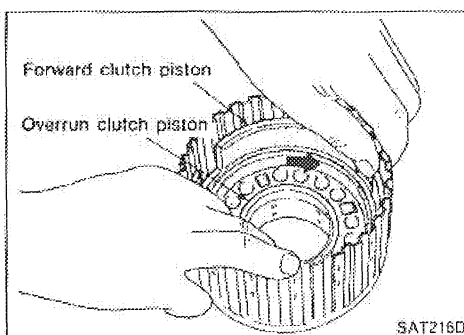
ASSEMBLY



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.



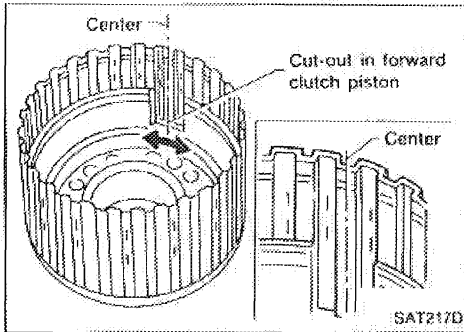
2. Install overrun clutch piston assembly on forward clutch piston while turning it slowly.
 - Apply A.T.F. to inner surface of forward clutch piston.



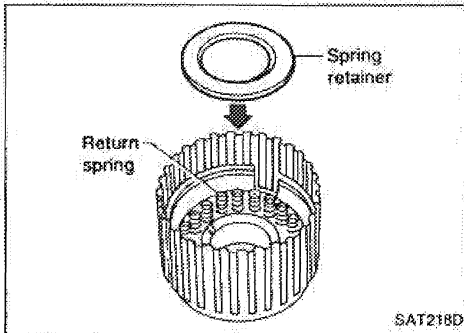
3. Install forward clutch piston assembly on forward clutch drum while turning it slowly.
 - Apply A.T.F. to inner surface of drum.

REPAIR FOR COMPONENT PARTS

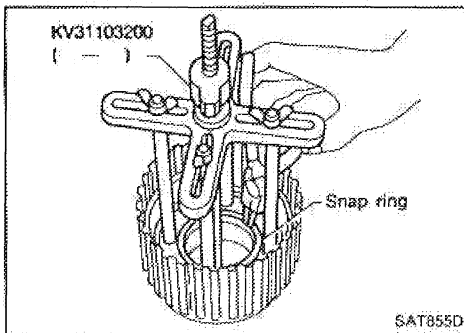
Forward Clutch and Overrun Clutch (Cont'd)



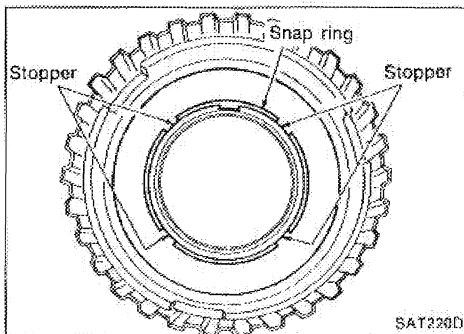
4. Align notch in forward clutch piston with groove in forward clutch drum.



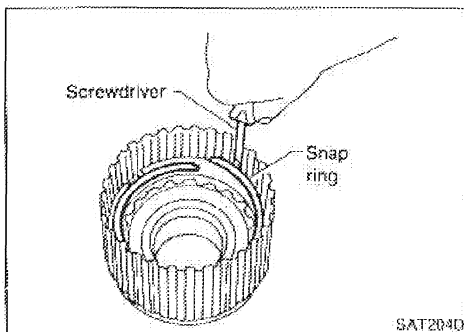
5. Install return spring on piston.
6. Install spring retainer on return springs.



7. Set Tool on spring retainer and install snap ring while compressing return springs.
- Set Tool directly above return springs.



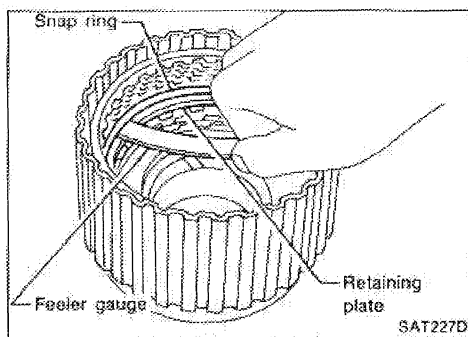
- Do not align snap ring gap with spring retainer stopper.



8. Install drive plates, driven plates, retaining plate and dish plate for overrun clutch.
9. Install snap ring for overrun clutch.

REPAIR FOR COMPONENT PARTS

Forward Clutch and Overrun Clutch (Cont'd)



10. Measure clearance between overrun clutch retaining plate and snap ring.

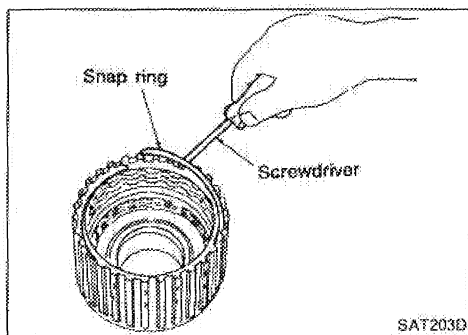
If not within allowable limit, select proper retaining plate.

Specified clearance:

Standard: 1.0 - 1.4 mm (0.039 - 0.055 in)

Allowable limit: 2.0 mm (0.079 in)

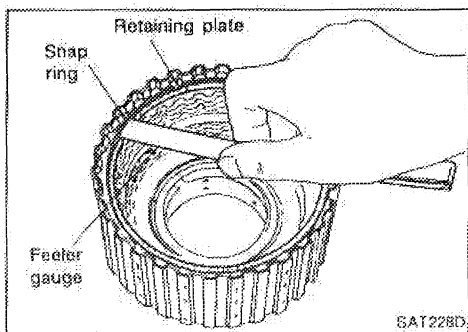
Overrun clutch retaining plate: Refer to S.D.S.



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.

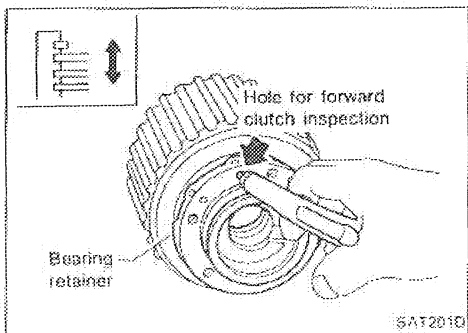
If not within allowable limit, select proper retaining plate.

Specified clearance:

Standard: 0.45 - 0.85 mm (0.0177 - 0.0335 in)

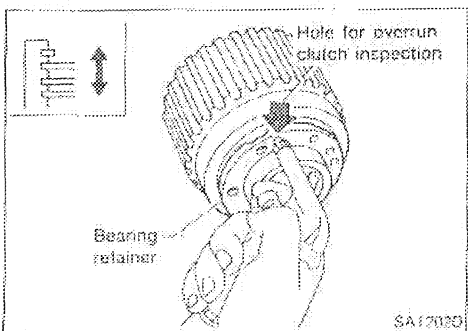
Allowable limit: 1.85 mm (0.0728 in)

Forward clutch retaining plate: Refer to S.D.S.



14. Check operation of forward clutch.

Refer to "DISASSEMBLY" in "Forward Clutch and Overrun Clutch."

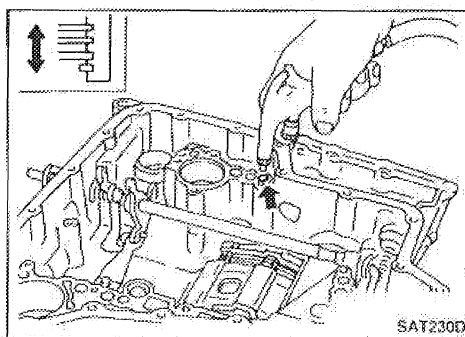
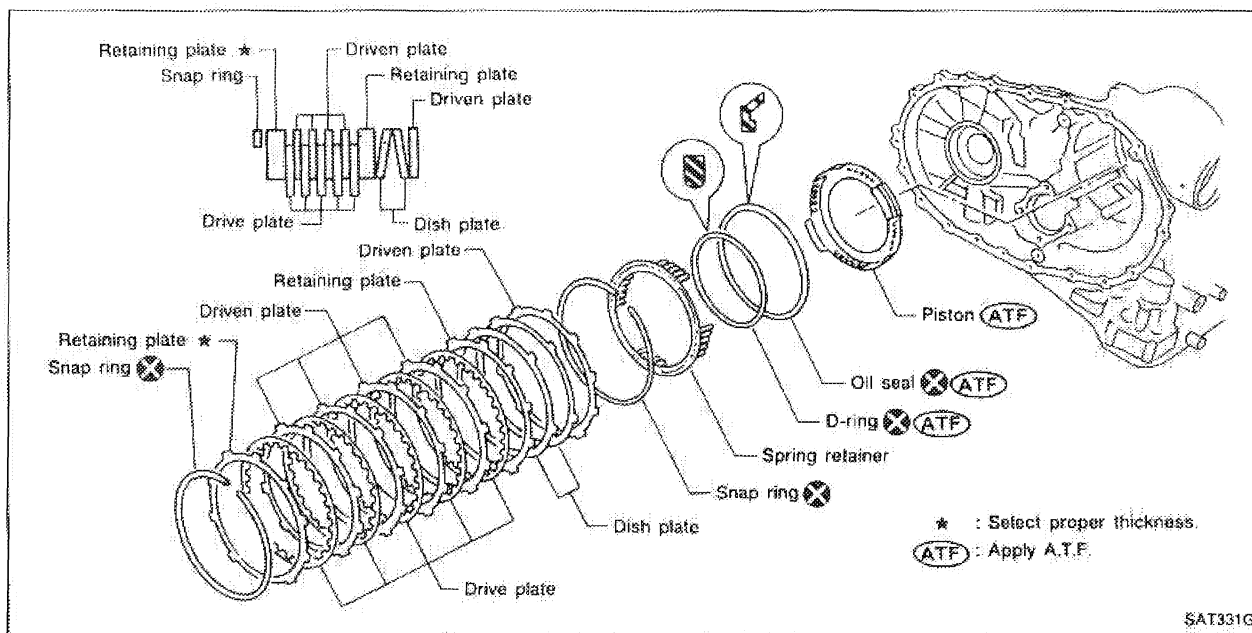


15. Check operation of overrun clutch.

Refer to "DISASSEMBLY" in "Forward Clutch and Overrun Clutch."

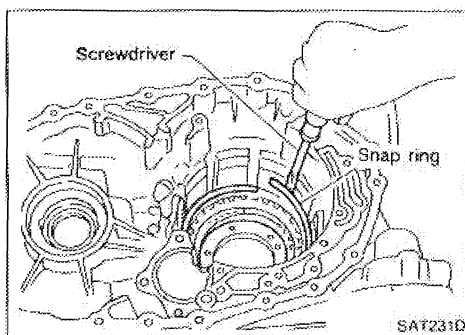
REPAIR FOR COMPONENT PARTS

Low & Reverse Brake

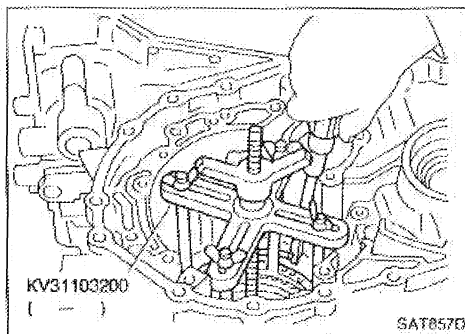


DISASSEMBLY

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.



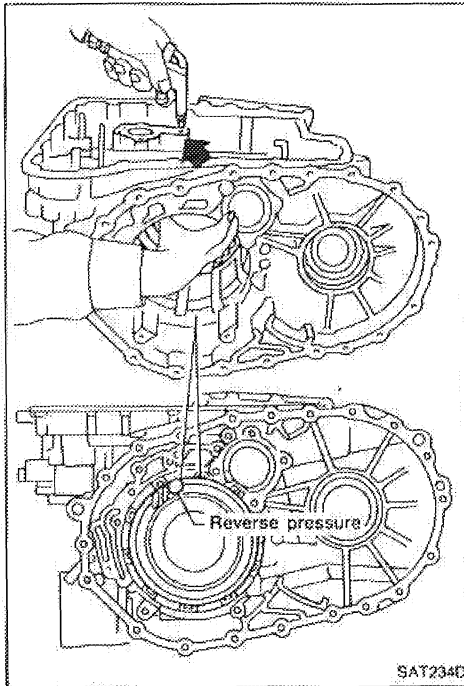
2. Stand transmission case.
3. Remove snap ring.
4. Remove drive plates, driven plates, retaining plate from transmission case.



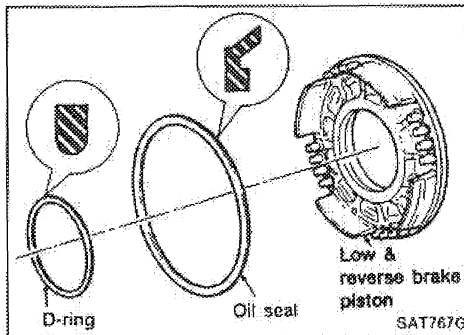
5. Set Tool on spring retainer and remove snap ring while compressing return springs.
 - Set Tool directly above return springs.
 - Do not expand snap ring excessively.
6. Remove spring retainer and return springs.
 - Do not remove return springs from spring retainer.

REPAIR FOR COMPONENT PARTS

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.

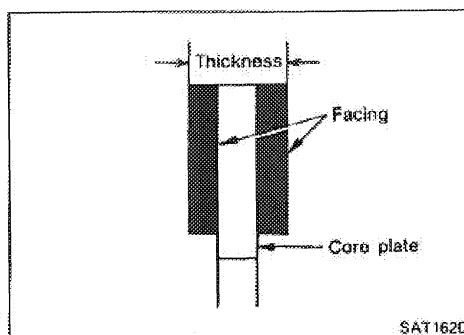
INSPECTION

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.

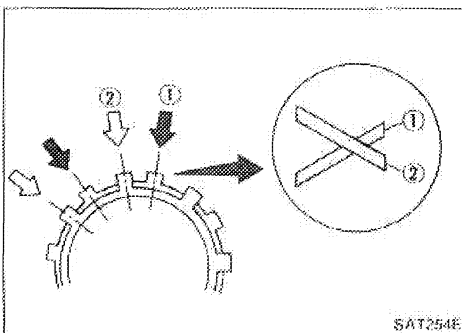
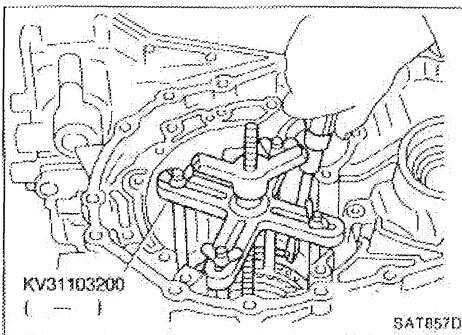
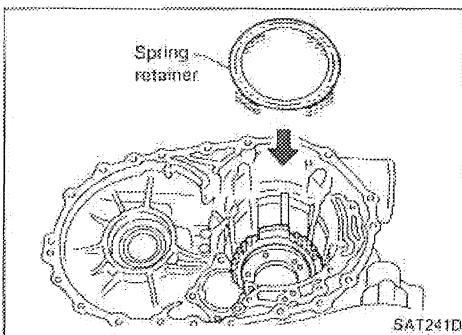
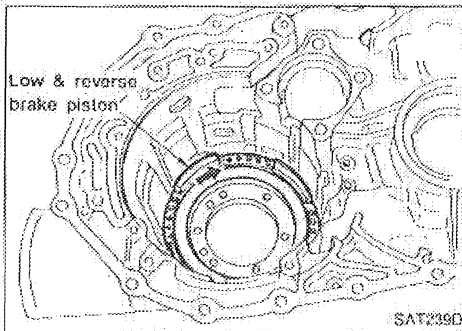
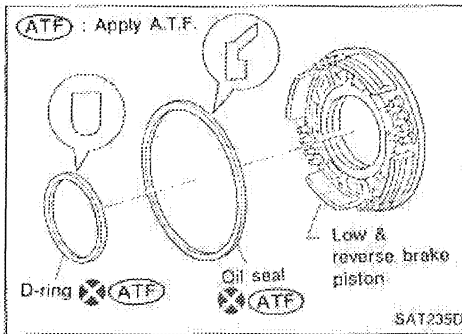


REPAIR FOR COMPONENT PARTS

Low & Reverse Brake (Cont'd)

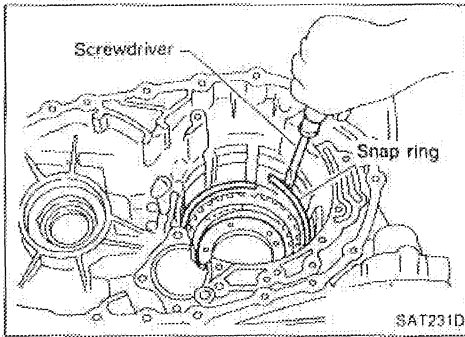
ASSEMBLY

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.

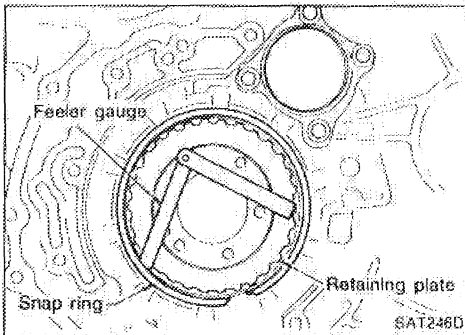


REPAIR FOR COMPONENT PARTS

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).

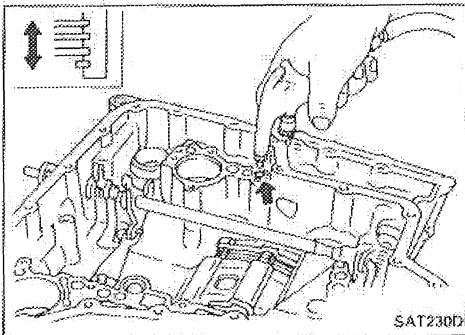
Specified clearance:

Standard: 1.4 - 1.8 mm (0.055 - 0.071 in)

Allowable limit:

2.8 mm (0.110 in)

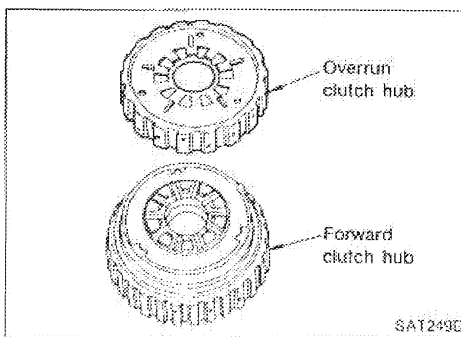
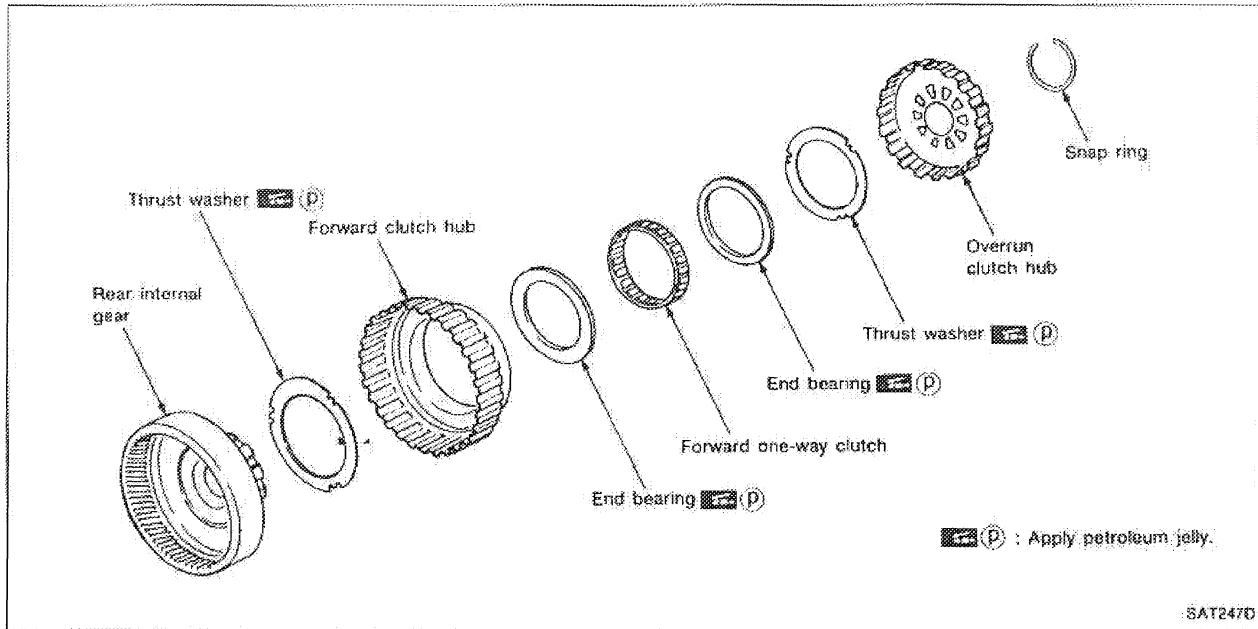
Retaining plate: Refer to S.D.S.



9. Check operation of low & reverse brake. Refer to "DISASSEMBLY" in "Low & Reverse Brake."

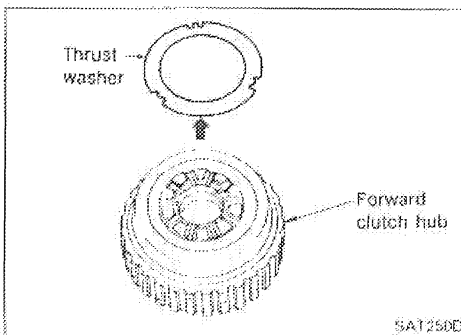
REPAIR FOR COMPONENT PARTS

Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub



DISASSEMBLY

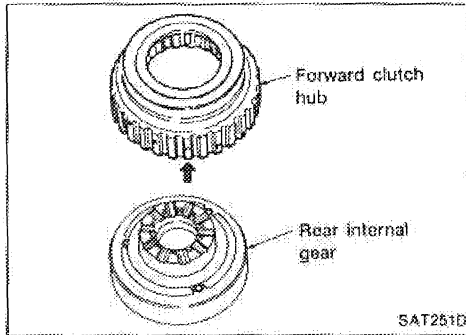
1. Remove snap ring from overrun clutch hub.
2. Remove overrun clutch hub from forward clutch hub.



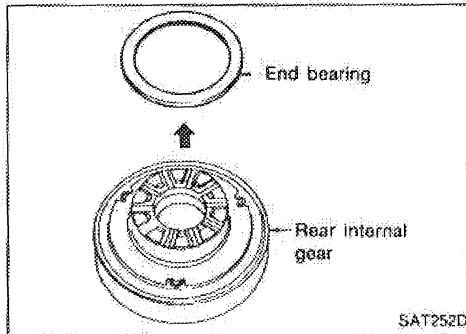
3. Remove thrust washer from forward clutch hub.

REPAIR FOR COMPONENT PARTS

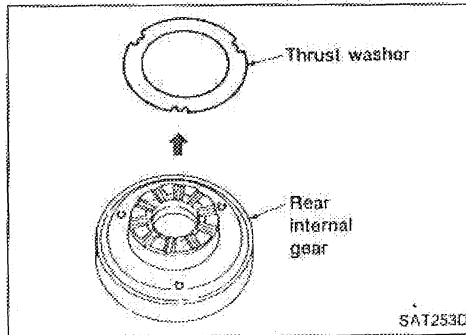
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub (Cont'd)



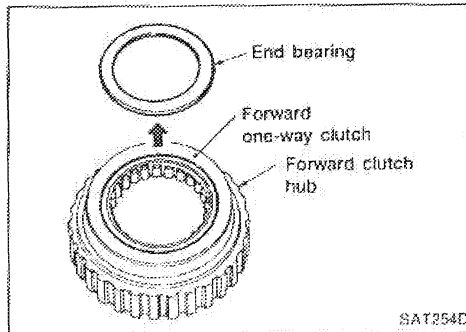
4. Remove forward clutch hub from rear internal gear.



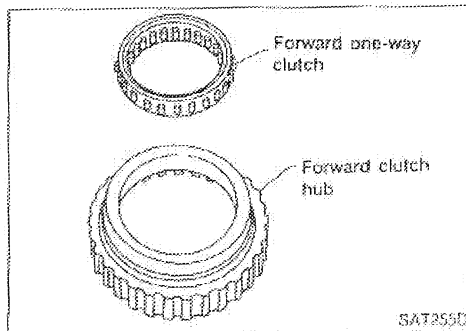
5. Remove end bearing from rear internal gear.



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.

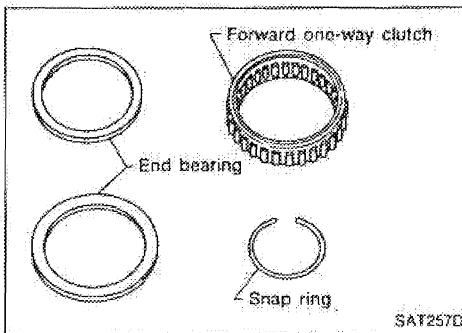
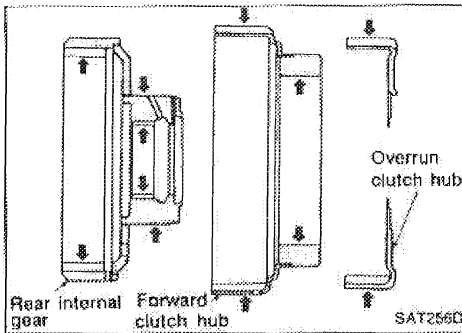
REPAIR FOR COMPONENT PARTS

Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub (Cont'd)

INSPECTION

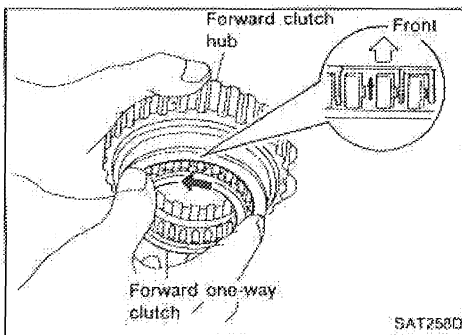
Rear internal gear, forward clutch hub and overrun clutch hub

- Check rubbing surface for wear or damage.



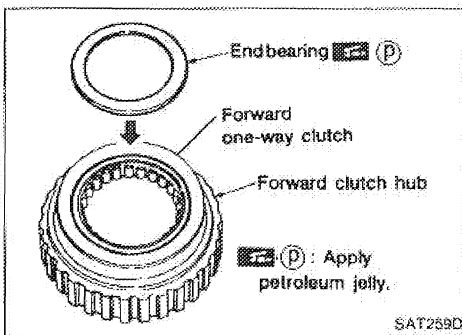
Snap ring, end bearings and forward one-way clutch

- Check snap ring and end bearings for deformation and damage.
- Check forward one-way clutch for wear and damage.

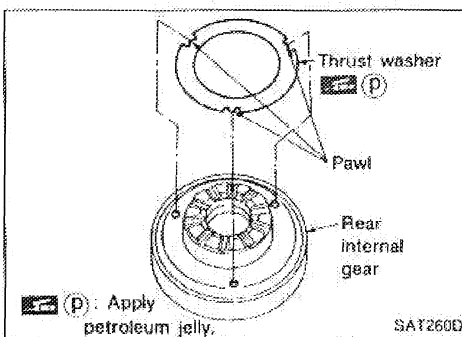


ASSEMBLY

1. Install forward one-way clutch on forward clutch.
 - Take care with the direction of the forward one-way clutch.



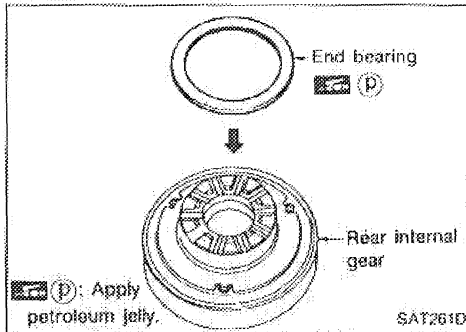
2. Install end bearing on forward one-way clutch.
 - Apply petroleum jelly to end bearing.



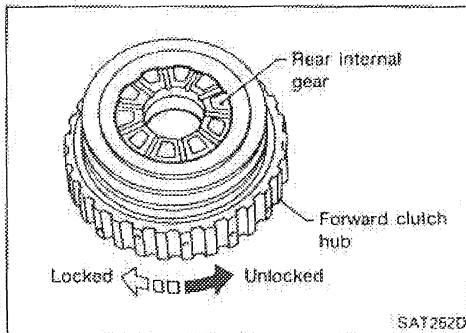
3. Install thrust washer on rear internal gear.
 - Apply petroleum jelly to thrust washer.
 - Align pawls of thrust washer with holes of rear internal gear.

REPAIR FOR COMPONENT PARTS

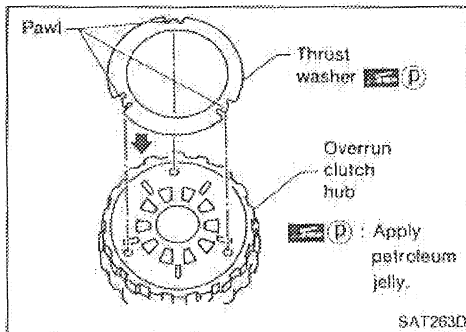
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub (Cont'd)



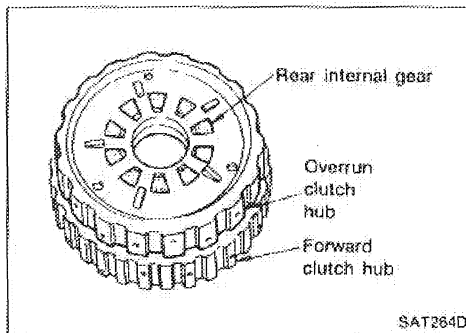
4. Install end bearing on rear internal gear.
 - Apply petroleum jelly to end bearing.



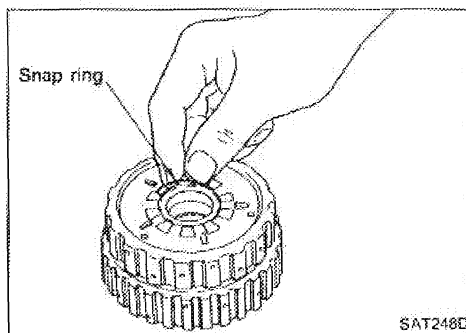
5. Install forward clutch hub on rear internal gear.
 - Check operation of forward one-way clutch.



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.



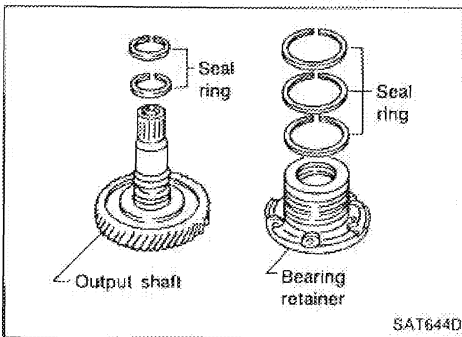
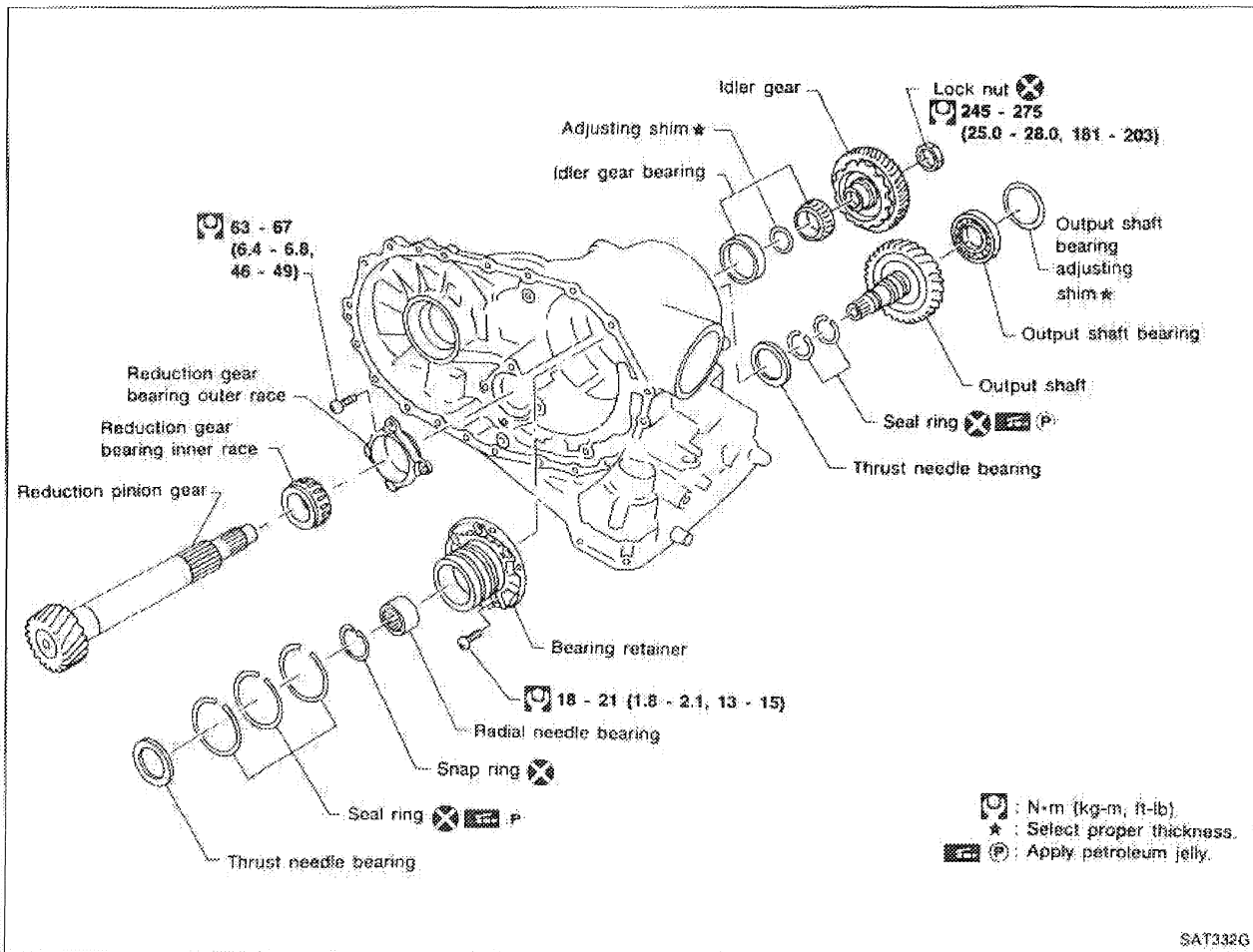
7. Install overrun clutch hub on rear internal gear.
 - Align projections of rear internal gear with holes of overrun clutch hub.



8. Install snap ring to groove of rear internal gear.

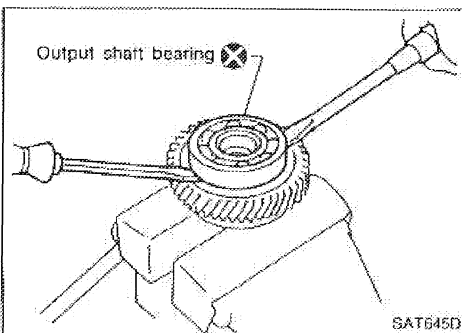
REPAIR FOR COMPONENT PARTS

Output Shaft, Idler Gear, Reduction Gear and Bearing Retainer



DISASSEMBLY

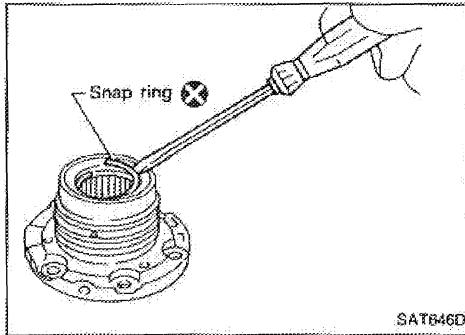
1. Remove seal rings from output shaft and bearing retainer.



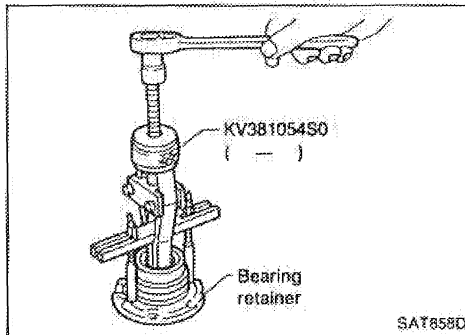
2. Remove output shaft bearing with screwdrivers.
 - Always replace bearing with a new one when removed.
 - Do not damage output shaft.

REPAIR FOR COMPONENT PARTS

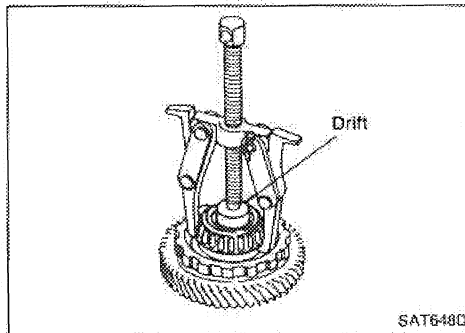
Output Shaft, Idler Gear, Reduction Gear and Bearing Retainer (Cont'd)



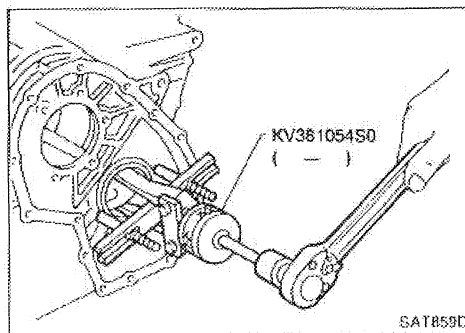
3. Remove snap ring from bearing retainer.



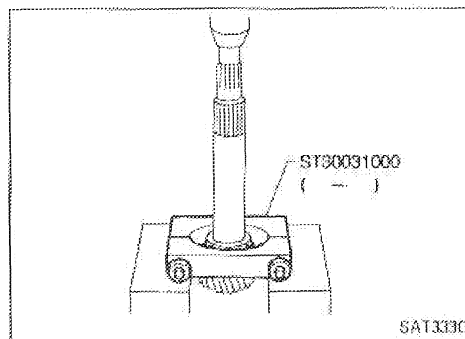
4. Remove needle bearing from bearing retainer.



5. Remove idler gear bearing inner race from idler gear.



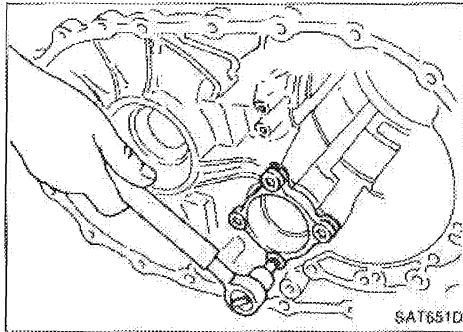
6. Remove idler gear bearing outer race from transmission case.



7. Press out reduction gear bearing inner race from reduction gear.

REPAIR FOR COMPONENT PARTS

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

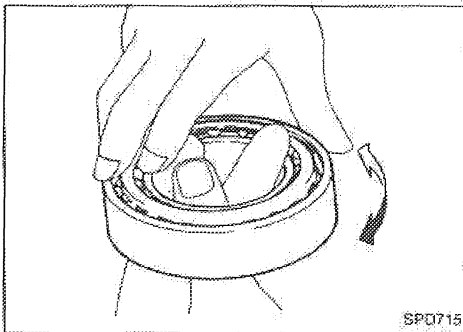


8. Remove reduction gear bearing outer race from transmission case.

INSPECTION

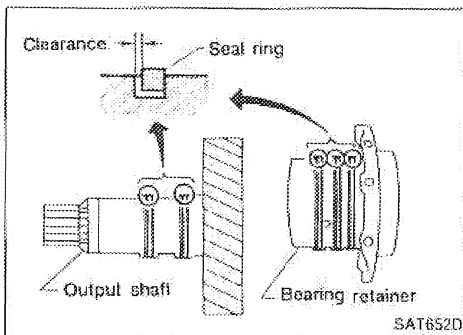
Output shaft, idler gear and reduction gear

- 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:

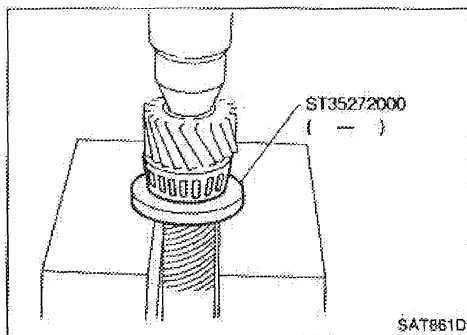
0.25 mm (0.0098 in)

- If not within allowable limit, replace bearing retainer.

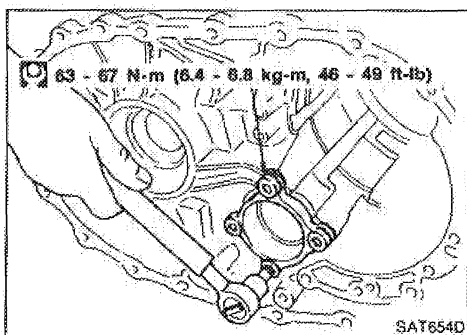
REPAIR FOR COMPONENT PARTS

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

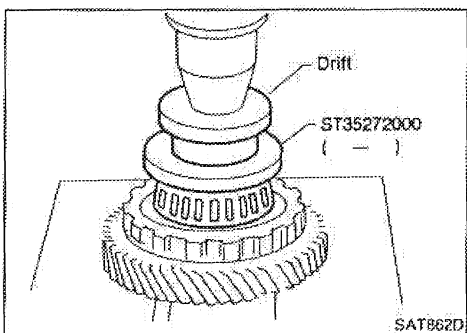
ASSEMBLY



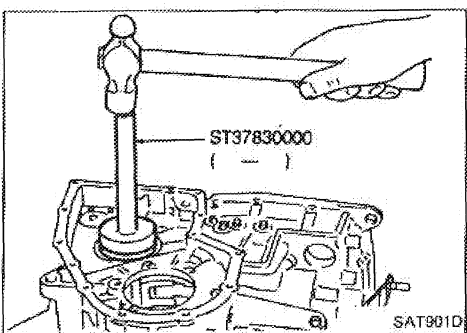
1. Press reduction gear bearing inner race on reduction gear.



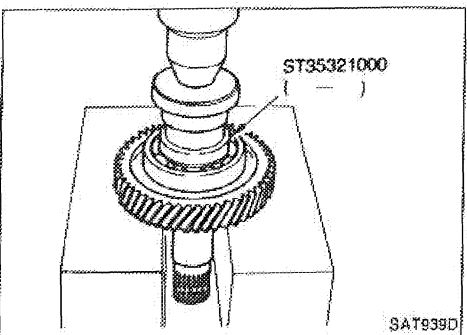
2. Install reduction gear bearing outer race on transmission case.



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



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

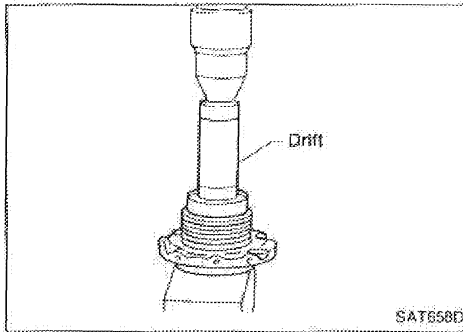


5. Press output shaft bearing on output shaft.

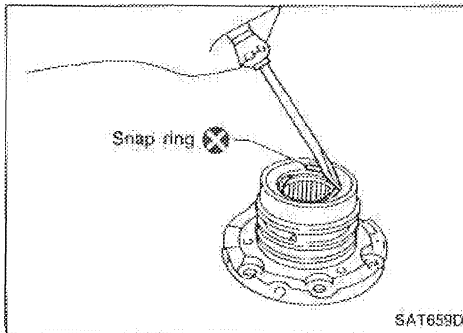
REPAIR FOR COMPONENT PARTS

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

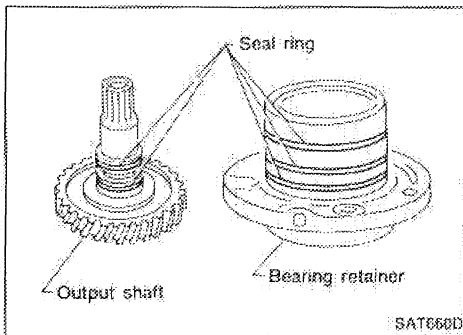
6. Press needle bearing on bearing retainer.



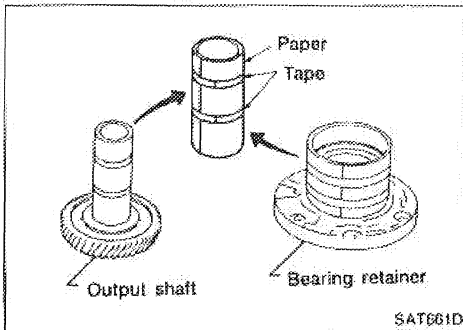
7. Install snap ring to bearing retainer.



8. Install new seal rings to output shaft and bearing retainer carefully after packing ring grooves with petroleum jelly.

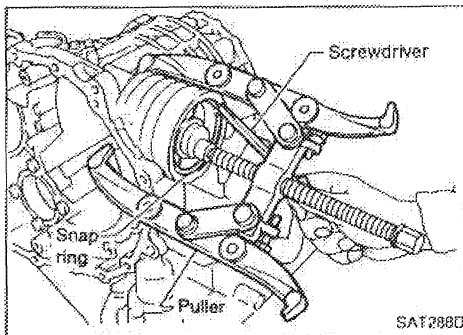
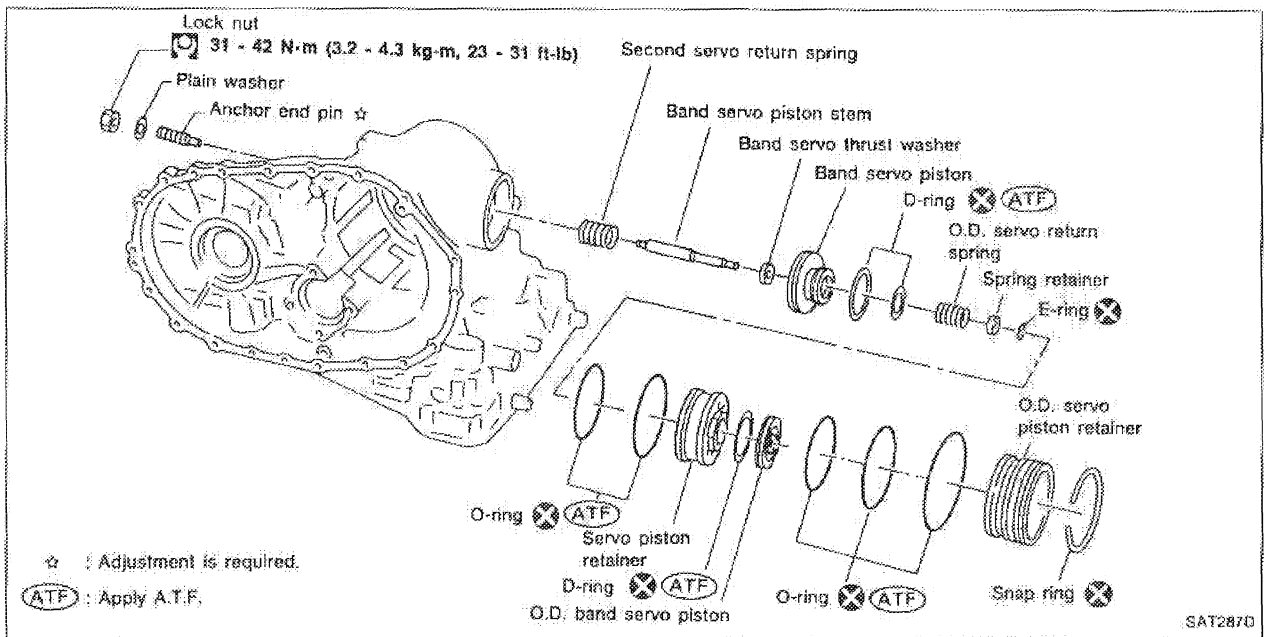


- Roll paper around seal rings to prevent seal rings from spreading.



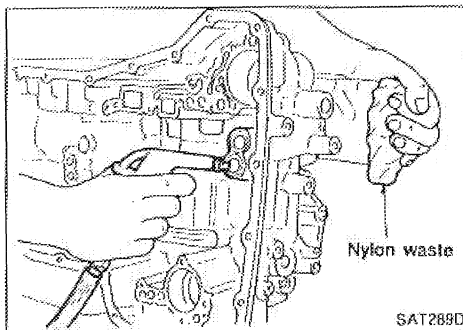
REPAIR FOR COMPONENT PARTS

Band Servo Piston Assembly



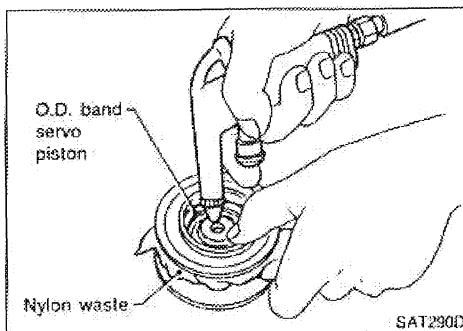
DISASSEMBLY

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.



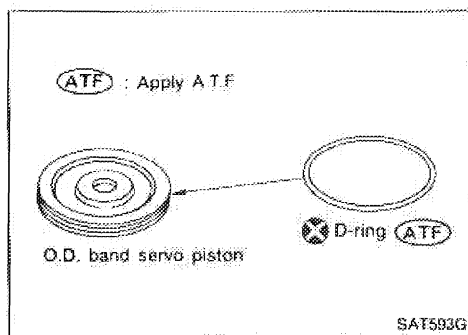
3. Apply compressed air to oil hole in O.D. servo piston retainer to remove O.D. band servo piston from retainer.

- Hold O.D. band servo piston while applying compressed air.

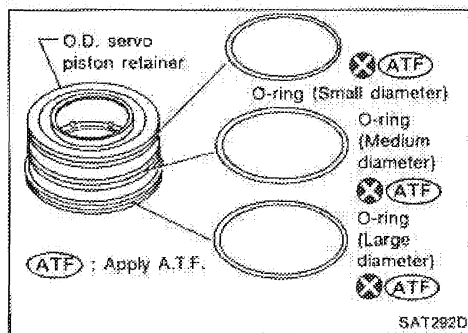
REPAIR FOR COMPONENT PARTS

Band Servo Piston Assembly (Cont'd)

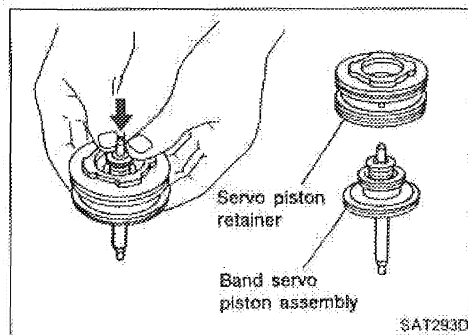
4. Remove D-ring from O.D. band servo piston.



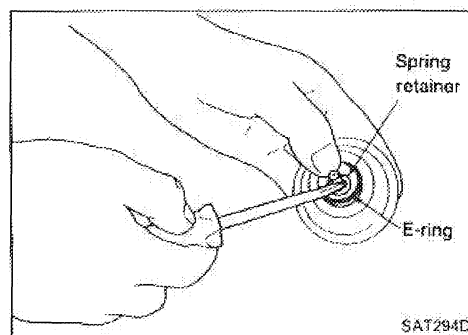
5. Remove O-rings from O.D. servo piston retainer.



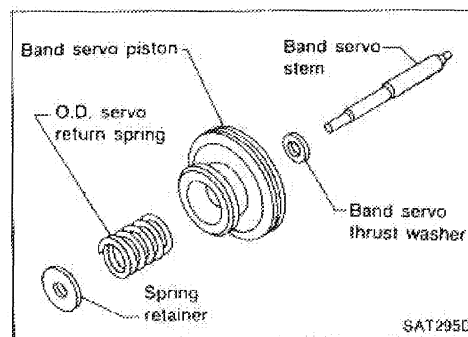
6. Remove band servo piston assembly from servo piston retainer by pushing it forward.



7. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, remove E-ring.



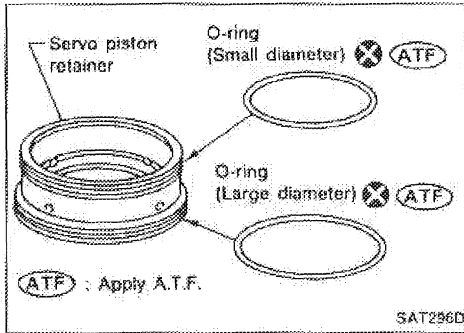
8. Remove O.D. servo return spring, band servo thrust washer and band servo piston stem from band servo piston.



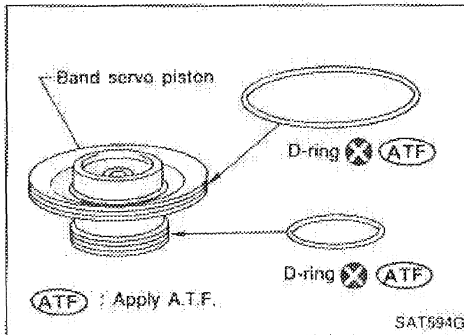
REPAIR FOR COMPONENT PARTS

Band Servo Piston Assembly (Cont'd)

9. Remove O-rings from servo piston retainer.



10. Remove D-rings from band servo piston.



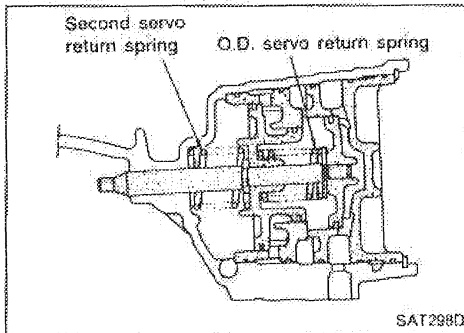
INSPECTION

Pistons, retainers and piston stem

- Check frictional surfaces for abnormal wear or damage.

Return springs

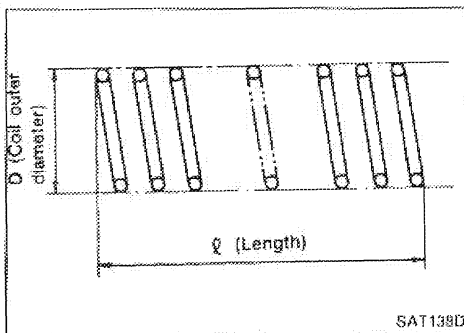
- Check for deformation or damage.
- Measure free length and outer diameter.



Inspection standard

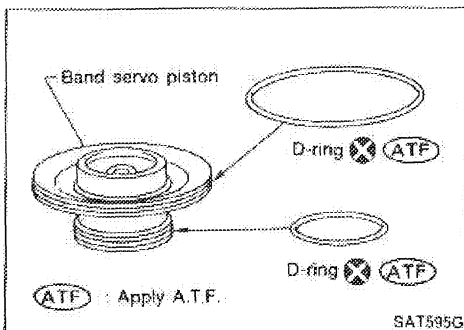
Unit: mm (in)

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)



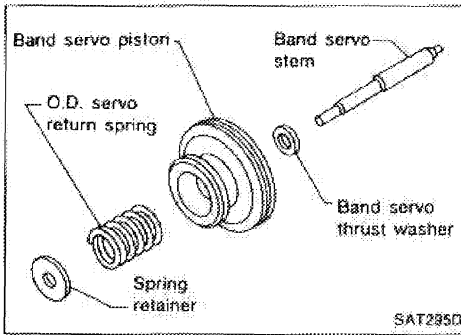
ASSEMBLY

1. Install D-rings to servo piston retainer.
 - Apply A.T.F. to O-rings.
 - Pay attention to position of each O-ring.

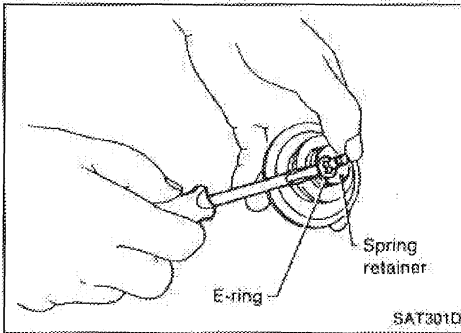


REPAIR FOR COMPONENT PARTS

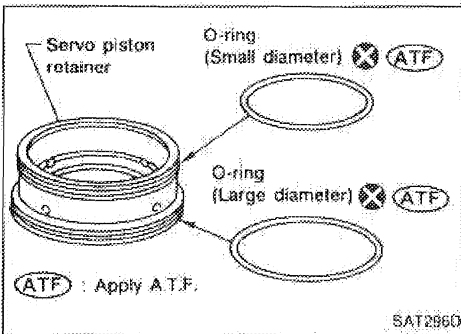
Band Servo Piston Assembly (Cont'd)



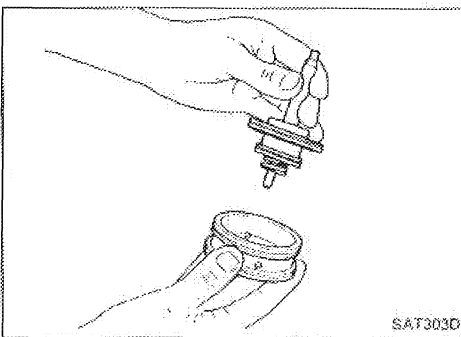
2. Install band servo piston stem, band servo thrust washer, O.D. servo return spring and spring retainer to band servo piston.



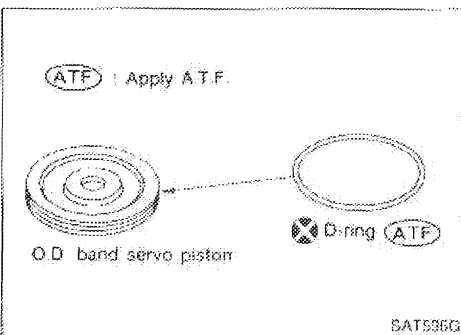
3. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, install E-ring.



4. Install O-rings to servo piston retainer.
 - Apply A.T.F. to O-rings.
 - Pay attention to the positions of the O-rings.



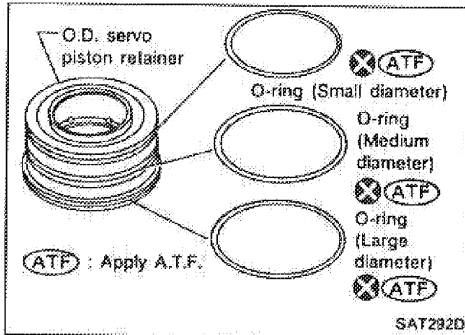
5. Install band servo piston assembly to servo piston retainer by pushing it inward.



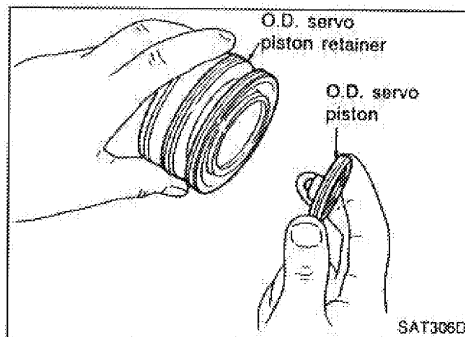
6. Install D-ring to O.D. band servo piston.
 - Apply A.T.F. to D-ring.

REPAIR FOR COMPONENT PARTS

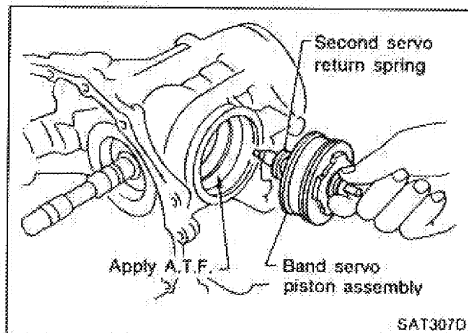
Band Servo Piston Assembly (Cont'd)



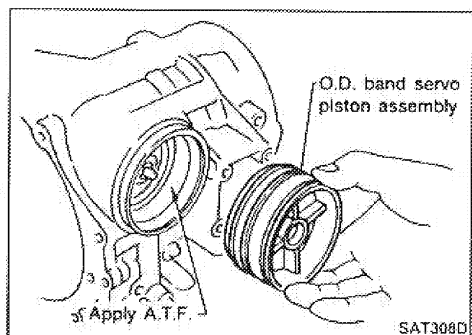
7. Install O-rings to O.D. servo piston retainer.
 - Apply A.T.F. to O-rings.
 - Pay attention to the positions of the O-rings.



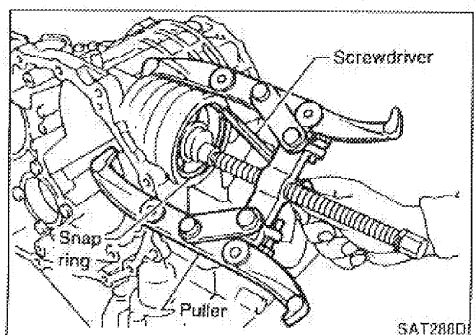
8. Install O.D. band servo piston to O.D. servo piston retainer.



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.



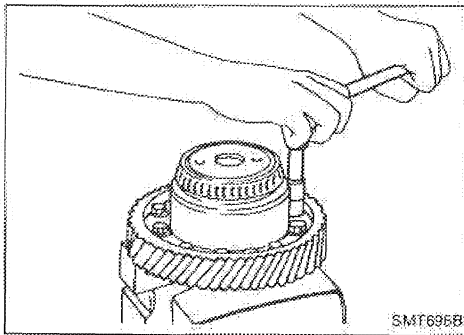
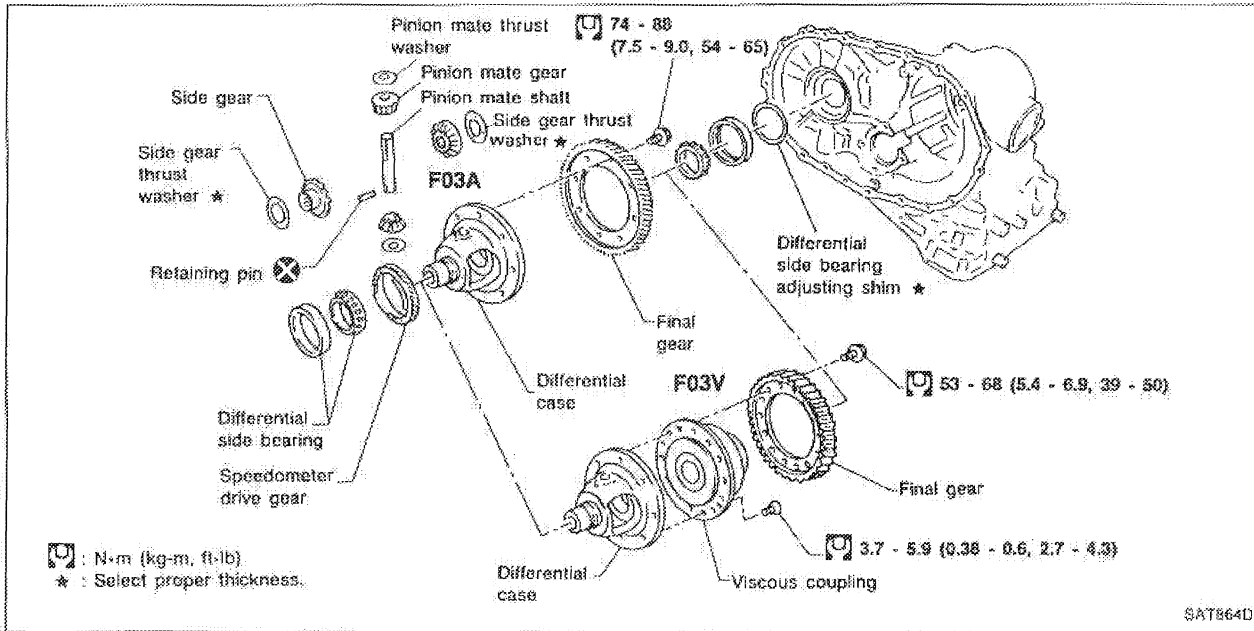
10. Install O.D. band servo piston assembly to transmission case.
 - Apply A.T.F. to O-ring of band servo piston and transmission case.



11. Install band servo piston snap ring to transmission case.

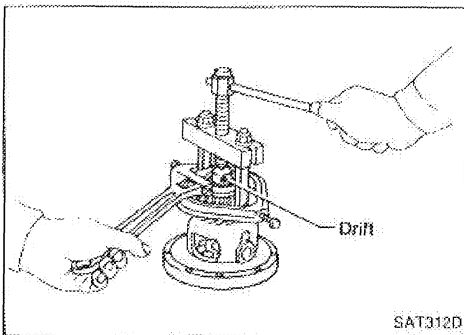
REPAIR FOR COMPONENT PARTS

Final Drive

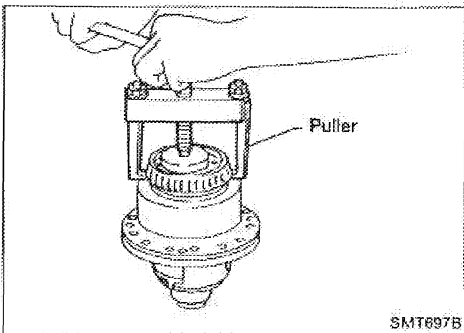


DISASSEMBLY

1. Remove final gear.

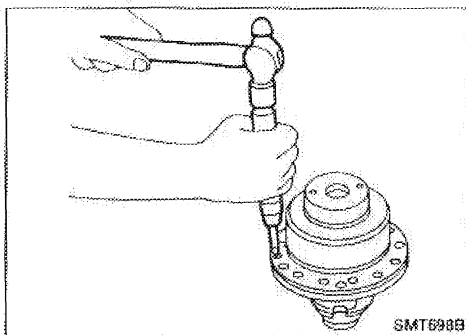


2. Press out differential side bearings.

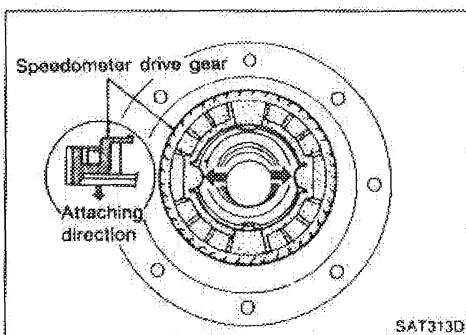


REPAIR FOR COMPONENT PARTS

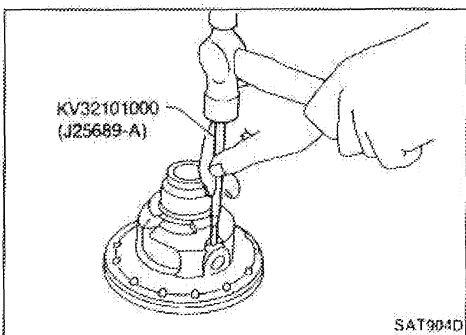
Final Drive (Cont'd)



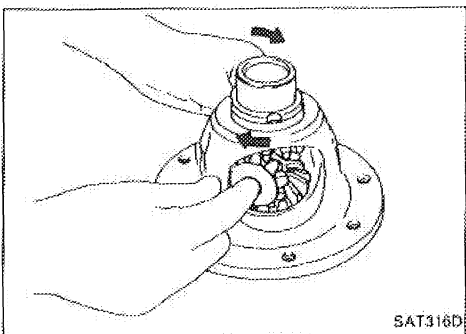
3. Remove viscous coupling — RE4F03V.



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.

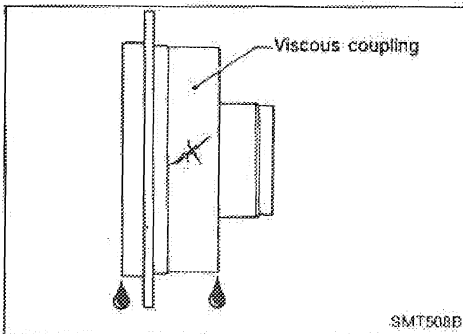
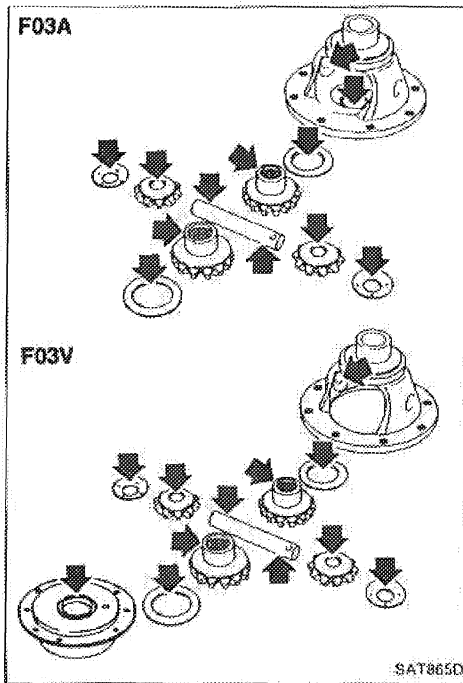
REPAIR FOR COMPONENT PARTS

Final Drive (Cont'd)

INSPECTION

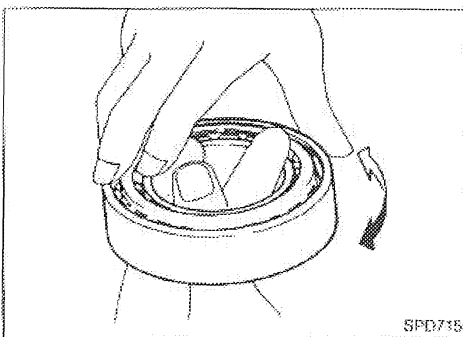
Gear, washer, shaft and case

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



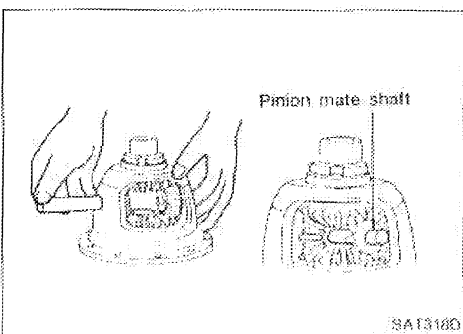
Viscous coupling — RE4F03V

- 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.

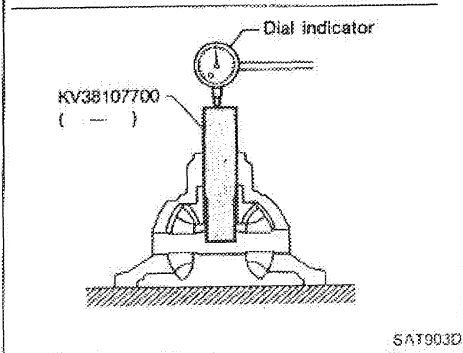
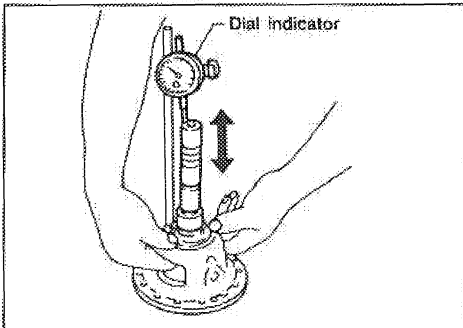
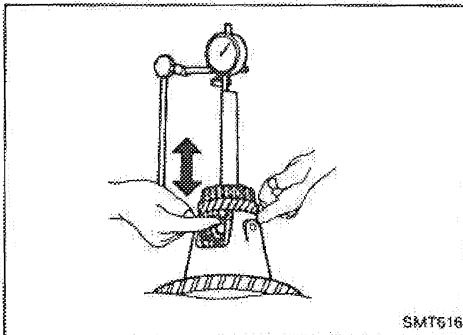
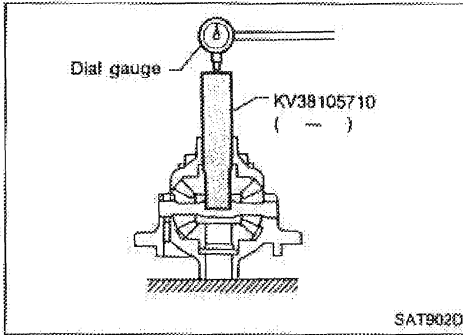


ASSEMBLY

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.

REPAIR FOR COMPONENT 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)

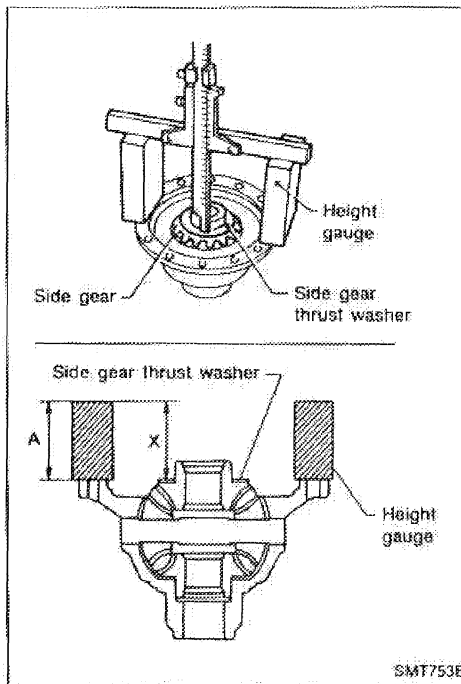
- c. If not within specification adjust clearance by changing thickness of side gear thrust washer.

Side gear thrust washers for differential case side:

Refer to S.D.S.

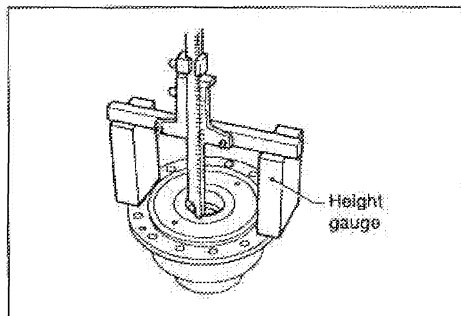
REPAIR FOR COMPONENT PARTS

Final Drive (Cont'd)

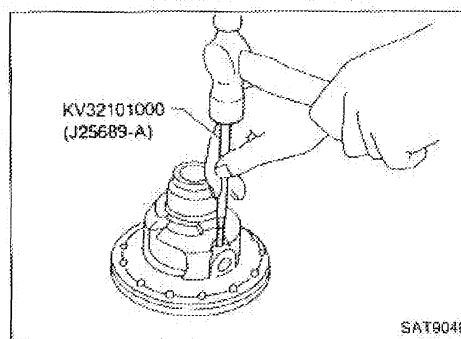
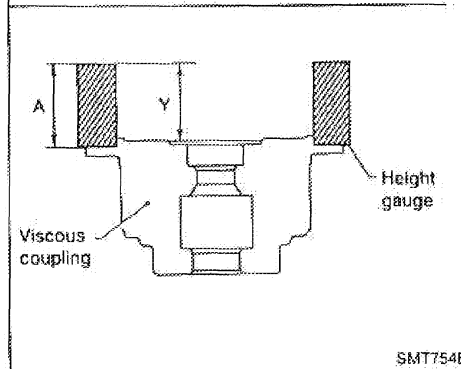


Viscous coupling side

- Place side gear and thrust washer on pinion mate gears installed on differential case.
 - Measure dimension X.
- Measure dimension X in at least two places.



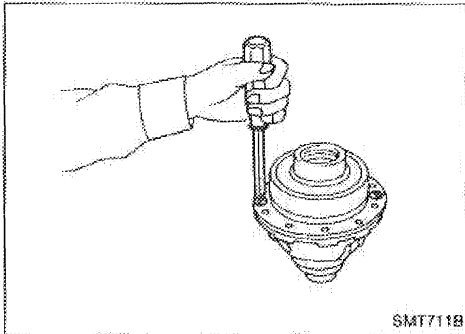
- Measure dimension Y.
- Measure dimension Y in at least two places.
Clearance between side gear and viscous coupling
= $X + Y - 2A$: 0.1 - 0.2 mm (0.004 - 0.008 in)
A: Height of gauge
- If not within specification, adjust clearance by changing thickness of side gear thrust washer.
Side gear thrust washers for viscous coupling side:
Refer to S.D.S.



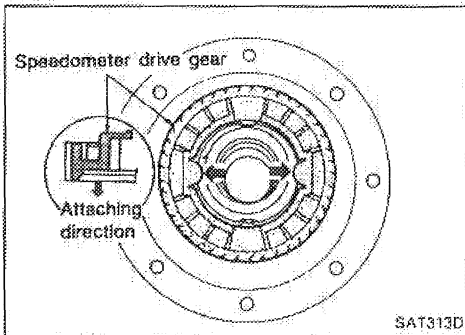
- Install retaining pin.
- Make sure that retaining pin is flush with case.

REPAIR FOR COMPONENT PARTS

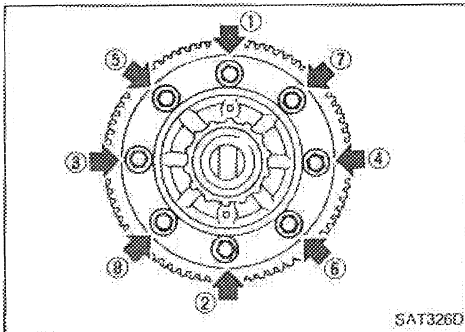
Final Drive (Cont'd)



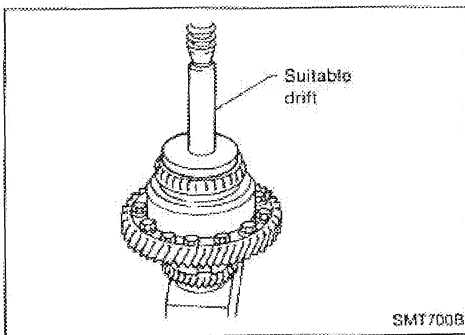
5. Install side gear (viscous coupling side) on differential case and then install viscous coupling — RE4F03V.



6. Install speedometer drive gear on differential case.
 - Align the projection of speedometer drive gear with the groove of differential case.

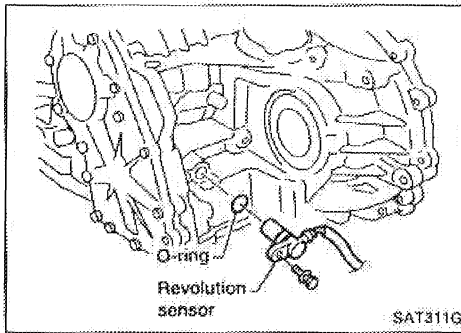


7. Install final gear and tighten fixing bolts in numerical order.



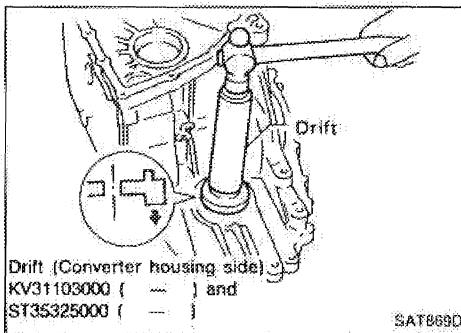
8. Press on differential side bearings.

ASSEMBLY

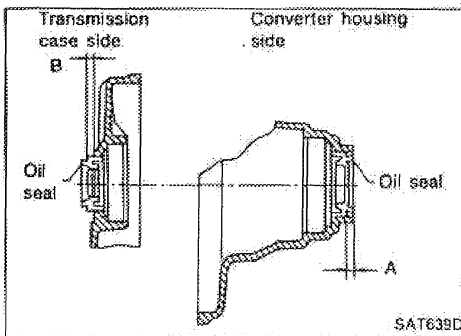


Assembly 1

1. Install revolution sensor onto transmission case.
Always use new sealing parts.

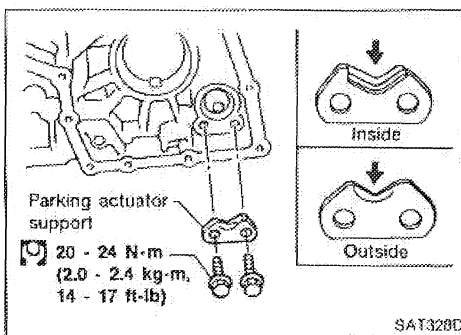


2. Install differential side oil seals on transmission case and converter housing, so that "A" and "B" are within specifications.

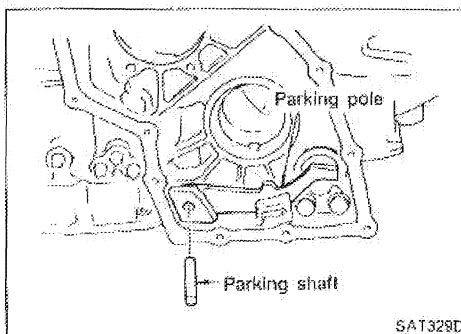


Unit: mm (in)

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.

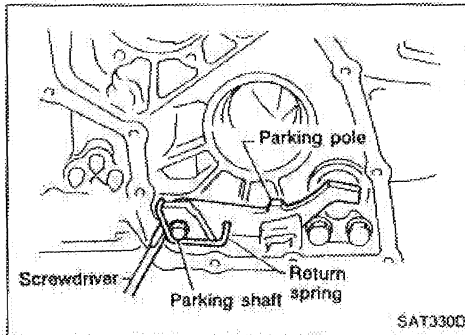


4. Install parking pawl on transmission case and fix it with parking shaft.

ASSEMBLY

Assembly 1 (Cont'd)

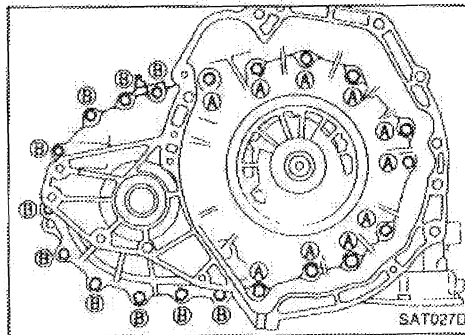
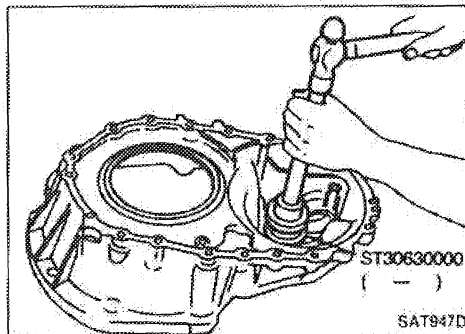
5. Install return spring.



Adjustment 1

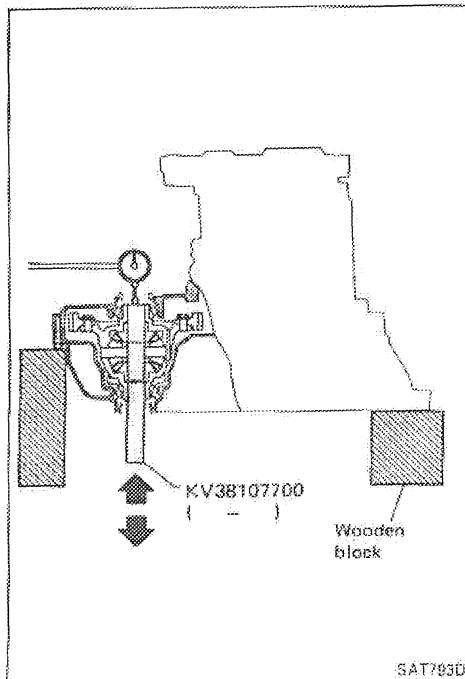
DIFFERENTIAL SIDE BEARING PRELOAD

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 (A) and (B) to the specified torque.



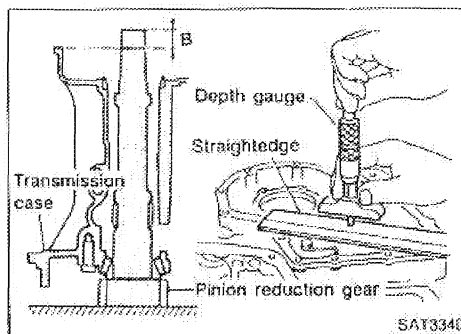
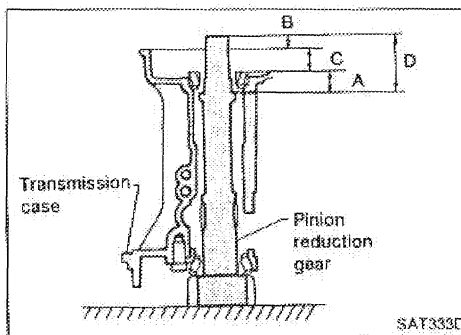
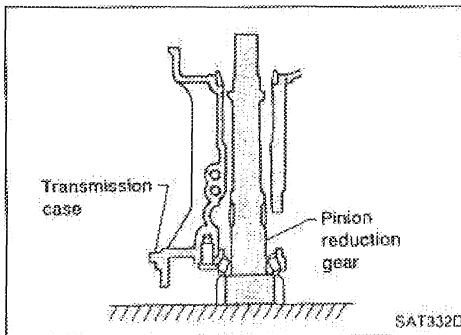
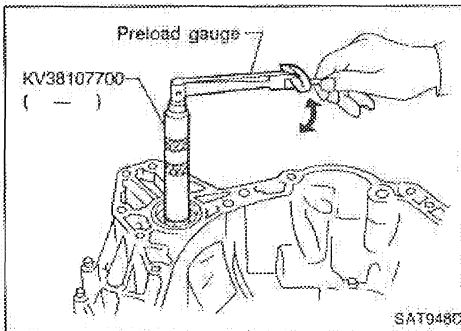
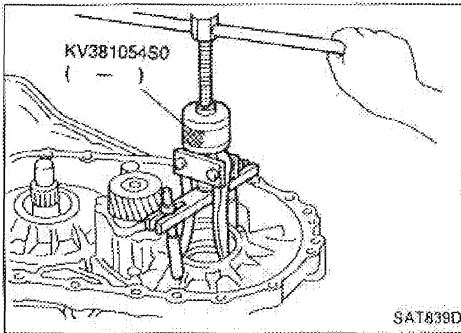
5. Attach dial indicator on differential case at transmission case side.
6. Insert Tool into differential side gear from converter housing.
7. Move Tool up and down and measure dial indicator deflection.
8. Select proper thickness of differential side bearing adjusting shim(s) using S.D.S. table as a guide.

Differential side bearing adjusting shim: Refer to S.D.S.



ASSEMBLY

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".

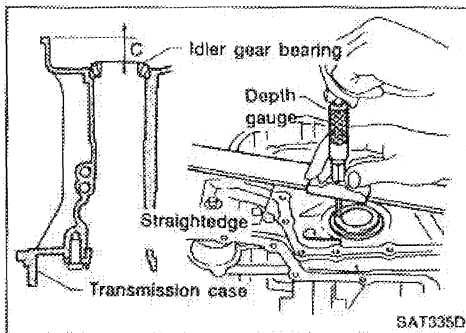
$$A = D - (B + C)$$

"A": Distance between the surface of idler gear bearing inner race and the adjusting shim mating surface of reduction gear.

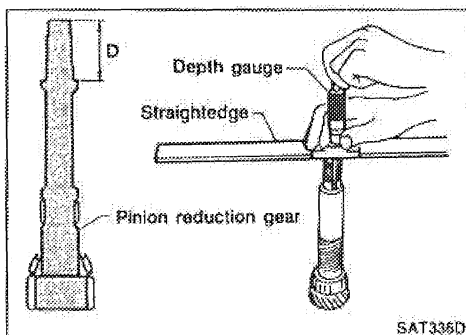
 - Measure dimension "B" between the end of reduction gear and the surface of transmission case.
 - Measure dimension "B" in at least two places.

ASSEMBLY

Adjustment 1 (Cont'd)

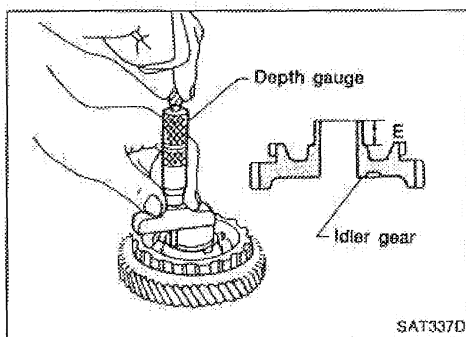


- Measure dimension "C" between the surface of idler gear bearing inner race and the surface of transmission case.
- Measure dimension "C" in at least two places.



- 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"

$$A = D - (B + C)$$

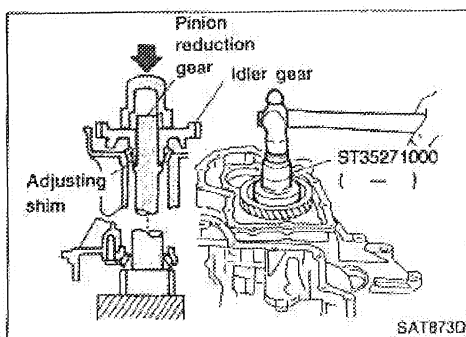


- d. Measure dimension "E" between the end of idler gear and the idler gear bearing inner race mating surface of idler gear.
- Measure dimension "E" in at least two places.

- e. Calculate "T" and select proper thickness of reduction gear bearing adjusting shim using S.D.S. table as a guide.

$$T = A - E$$

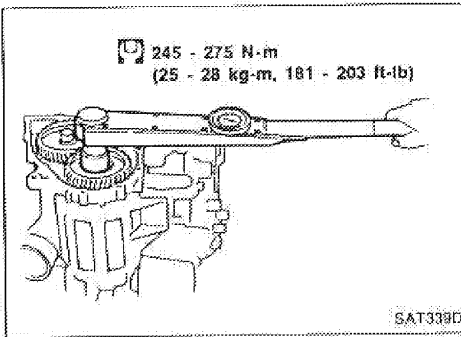
Reduction gear bearing adjusting shim: Refer to S.D.S.



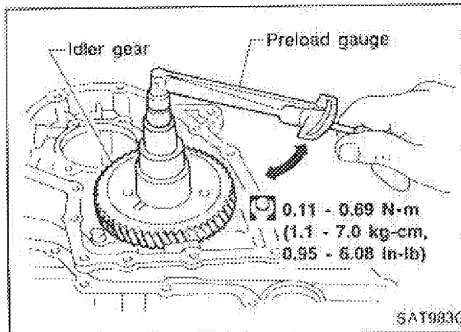
3. Install reduction gear and reduction gear bearing adjusting shim selected in step 2-e on transmission case.
4. Press idler gear bearing inner race on idler gear.
5. Press idler gear on reduction gear.
- Press idler gear so that idler gear can be locked by parking pawl.

ASSEMBLY

Adjustment 1 (Cont'd)



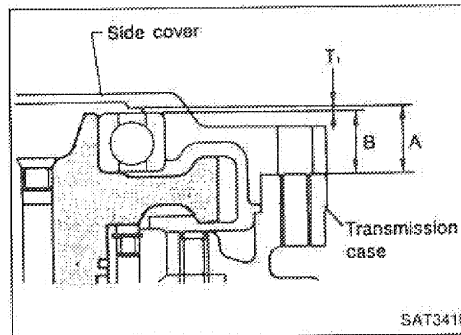
6. Tighten idler gear lock nut to the specified torque.
- Lock idler gear with parking pawl when tightening lock nut.



7. Measure turning torque of reduction gear.
- When measuring turning torque, turn reduction gear in both directions several times to seat bearing rollers correctly.

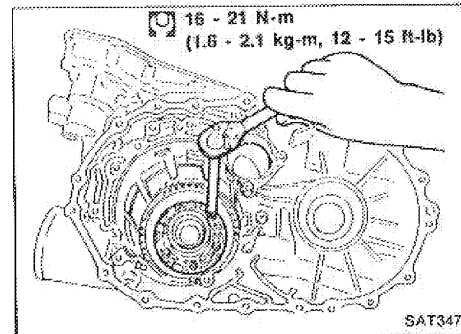
Turning torque of reduction gear:

0.11 - 0.69 N·m (1.1 - 7.0 kg·cm, 0.95 - 6.08 in·lb)

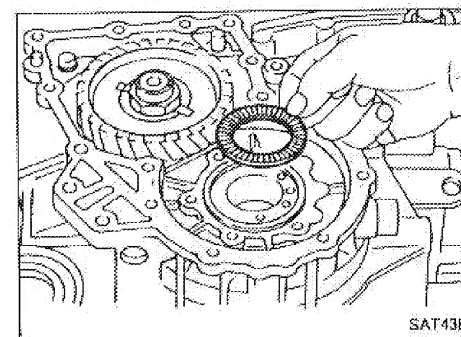


OUTPUT SHAFT END PLAY

- 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.



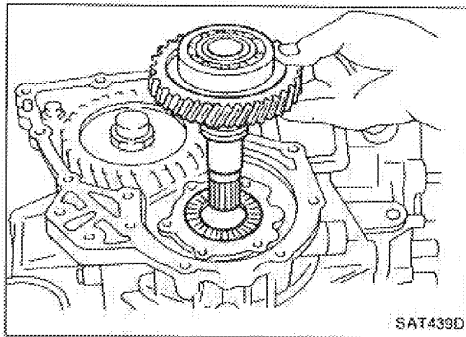
1. Install bearing retainer for output shaft.



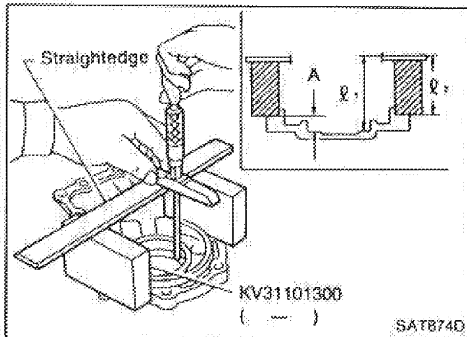
2. Install output shaft thrust needle bearing on bearing retainer.

ASSEMBLY

Adjustment 1 (Cont'd)



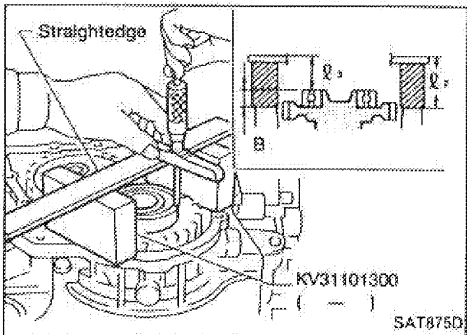
3. Install output shaft on transmission case.



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.

$$A = l_1 - l_2 \quad l_2: \text{Height of gauge}$$

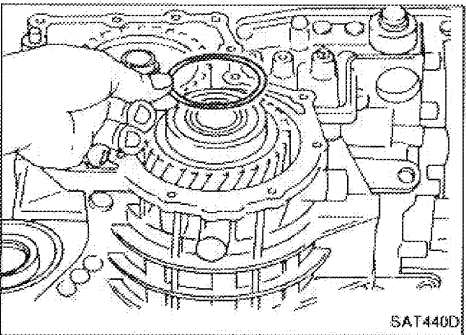


5. Measure dimensions " l_2 " and " l_3 " and then calculate dimension "B".

- 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.

$$B = l_2 - l_3 \quad l_2: \text{Height of gauge}$$



6. Select proper thickness of adjusting shim so that output shaft end play (clearance between side cover and output shaft bearing) is within specifications.

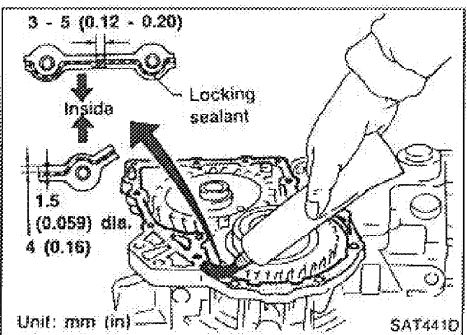
Output shaft end play (A - B):

0 - 0.5 mm (0 - 0.020 in)

Output shaft end play adjusting shim:

Refer to S.D.S.

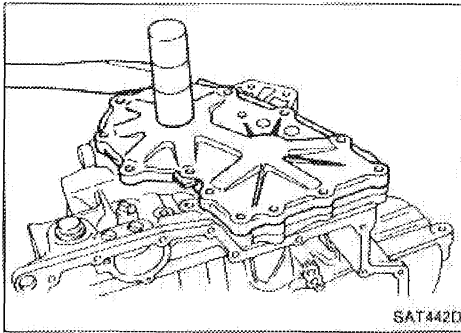
7. Install adjusting shim on output shaft bearing.



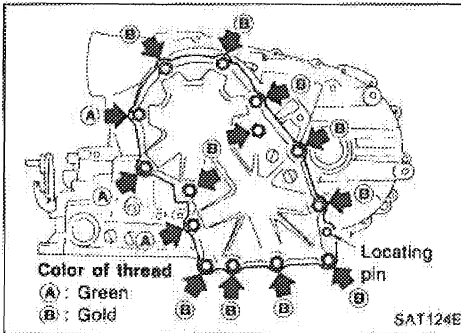
8. Apply locking sealant to transmission case as shown in illustration.

ASSEMBLY

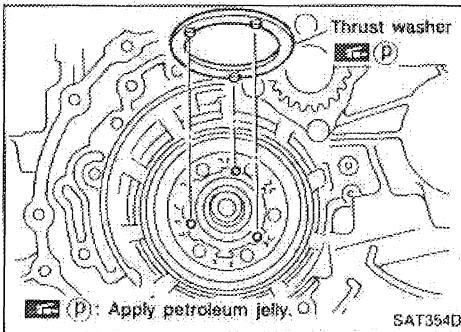
Adjustment 1 (Cont'd)



9. Install side cover on transmission case.
 - Apply locking sealant to the mating surface of transmission case.

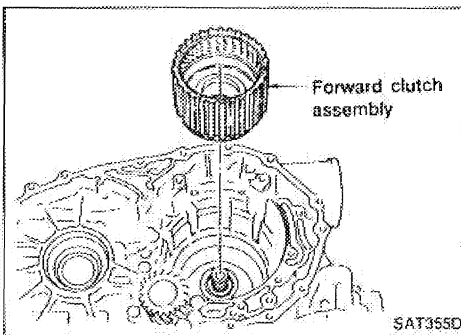


10. Tighten side cover fixing bolts to specified torque.
 - Do not mix bolts (A) and (B).
 - Always replace bolts (A) as they are self-sealing bolts.

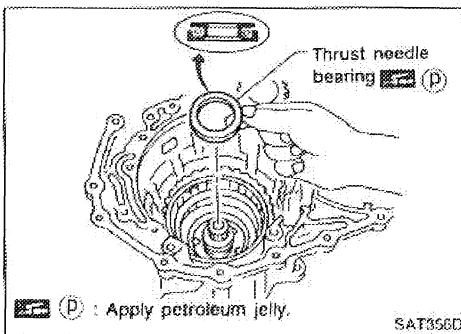


Assembly 2

1. Remove paper rolled around bearing retainer.
2. Install thrust washer on bearing retainer.
 - Apply petroleum jelly to thrust washer.



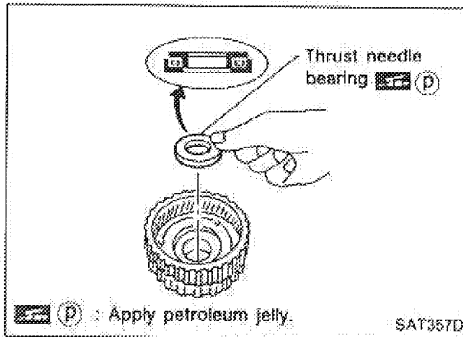
3. Install forward clutch assembly.
 - Align teeth of low & reverse brake drive plates before installing.
 - Make sure that bearing retainer seal rings are not spread.



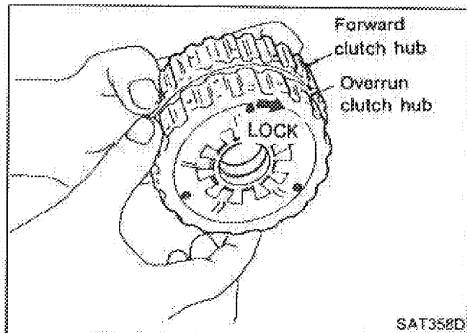
4. Install thrust needle bearing on bearing retainer.
 - Apply petroleum jelly to thrust bearing.
 - Pay attention to direction of thrust needle bearing.

ASSEMBLY

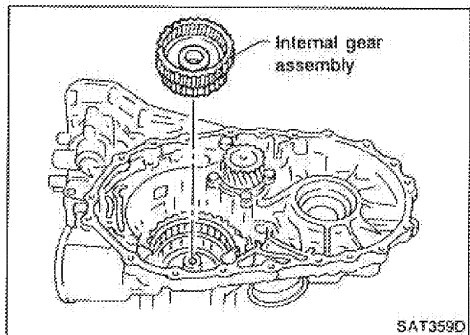
Assembly 2 (Cont'd)



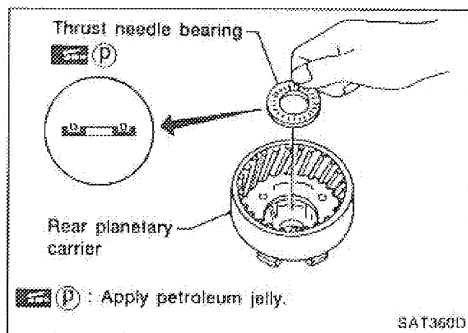
5. Install thrust needle bearing on rear internal gear.
 - Apply petroleum jelly to thrust needle bearing.
 - Pay attention to direction of thrust needle bearing.



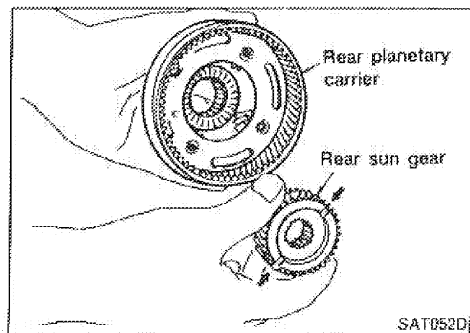
6. Hold forward clutch hub and turn overrun clutch hub.
 - Check overrun clutch hub for directions of lock and unlock.
 - If not as shown in illustration, check installed direction of forward one-way clutch.



7. Install rear internal gear assembly.
 - Align teeth of forward clutch and overrun clutch drive plate.



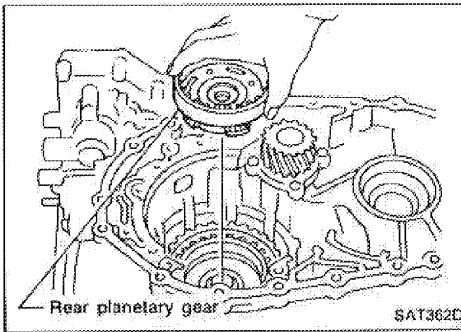
8. Install needle bearing on rear planetary carrier.
 - Apply petroleum jelly to needle bearing.
 - Pay attention to direction of needle bearing.



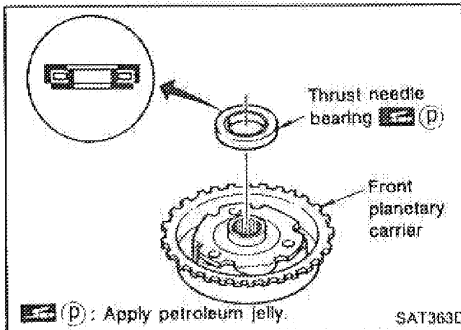
9. Install rear sun gear on rear planetary carrier.
 - Pay attention to direction of rear sun gear.

ASSEMBLY

Assembly 2 (Cont'd)

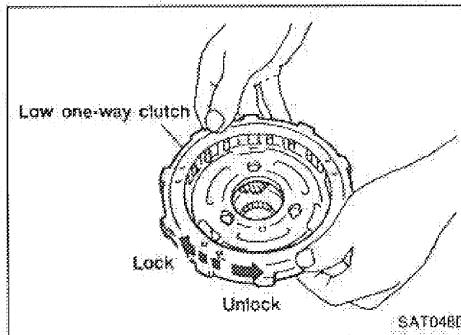


10. Install rear planetary carrier on transmission case.



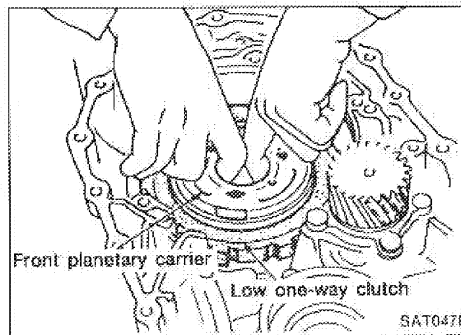
11. Install thrust needle bearing on front planetary carrier.

- Apply petroleum jelly to thrust needle bearing.
- Pay attention to direction of thrust needle bearing.

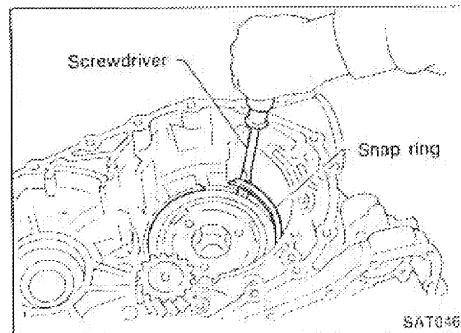


12. Install low one-way clutch to front planetary carrier by turning it in the direction of the arrow as shown.

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.

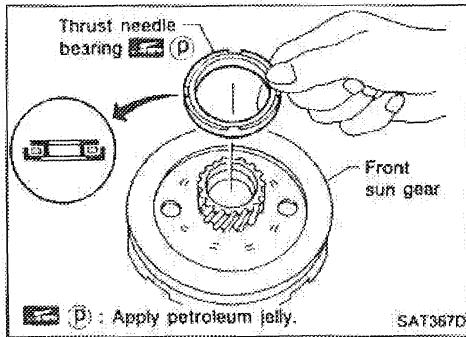


15. Install snap ring with screwdriver.

- If forward clutch and bearings are not installed correctly, snap ring will not fit groove of transmission case.

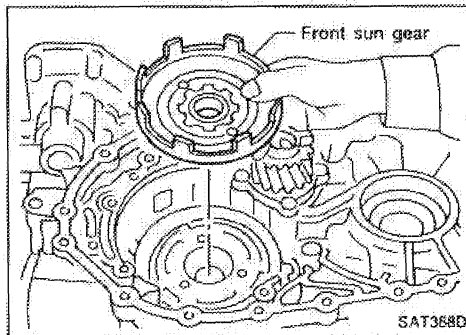
ASSEMBLY

Assembly 2 (Cont'd)

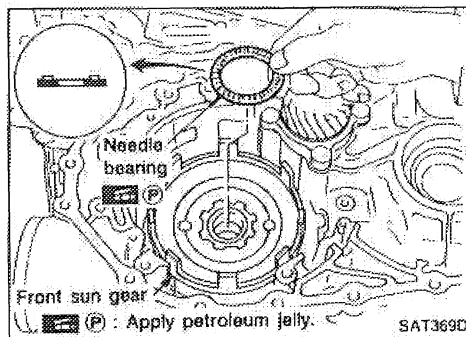


16. Install needle bearing on front sun gear.

- Apply petroleum jelly to needle bearing.
- Pay attention to direction of needle bearing.

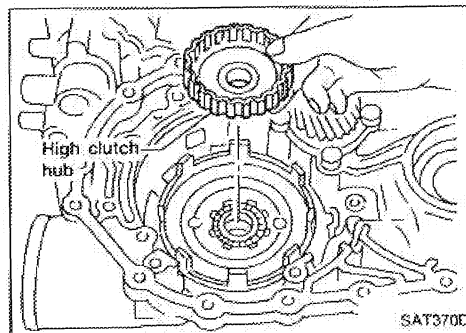


17. Install front sun gear on front planetary carrier.

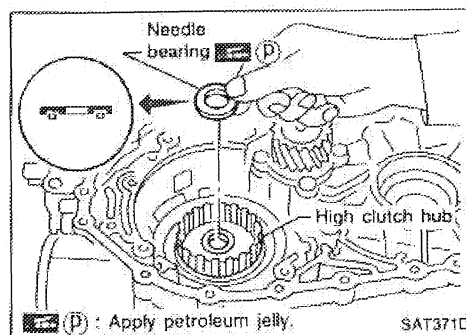


18. Install needle bearing on front sun gear.

- Apply petroleum jelly to needle bearing.
- Pay attention to direction of needle bearing.



19. Install high clutch hub on front sun gear.

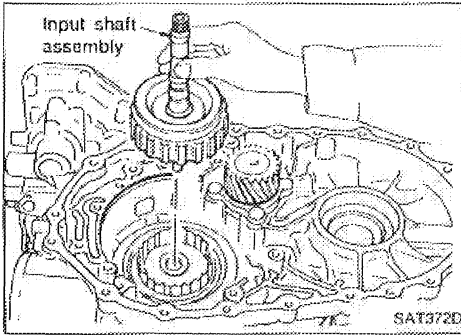


20. Install needle bearing on high clutch hub.

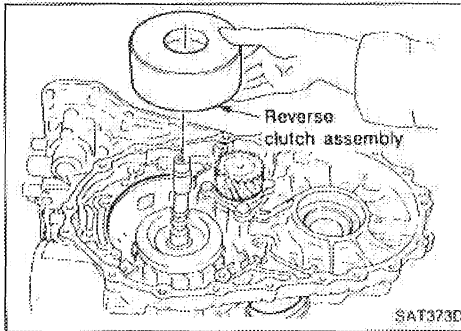
- Apply petroleum jelly to needle bearing.
- Pay attention to direction of needle bearing.

ASSEMBLY

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.

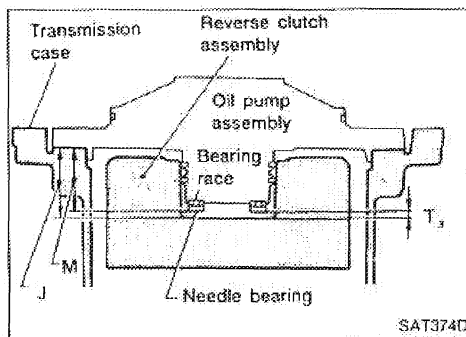


23. Install reverse clutch assembly.
 - Align teeth of reverse clutch drive plates before installing.

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	●	●

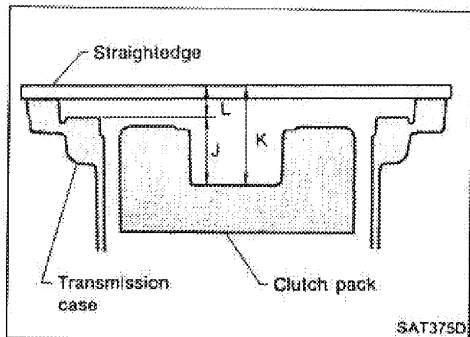


TOTAL END PLAY

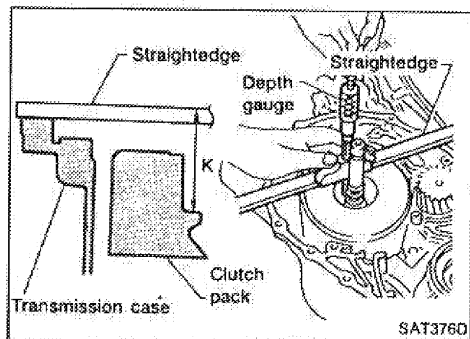
- Measure clearance between reverse clutch drum and needle bearing for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.

ASSEMBLY

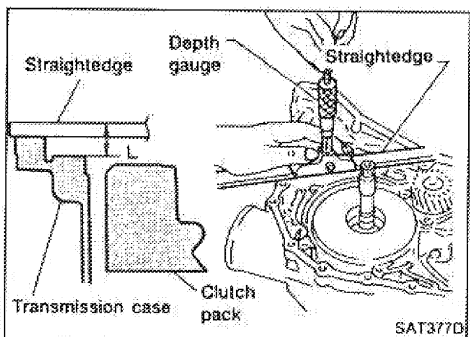
Adjustment 2 (Cont'd)



1. Measure dimensions "K" and "L" and then calculate dimension "J".



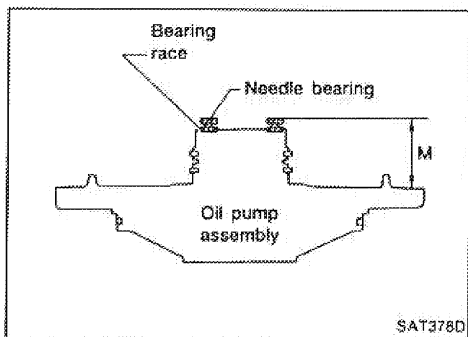
- a. Measure dimension "K".



- b. Measure dimension "L".
- c. Calculate dimension "J".

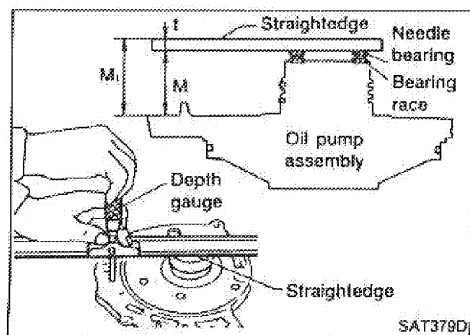
"J": Distance between oil pump fitting surface of transmission case and needle bearing mating surface of high clutch drum.

$$J = K - L$$



2. Measure dimension "M".

- a. Place bearing race and needle bearing on oil pump assembly.



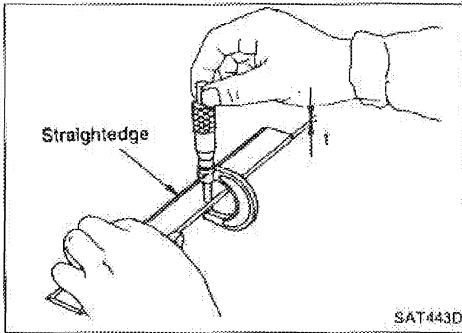
- b. Measure dimension "M".

"M": Distance between transmission case fitting surface and needle bearing on oil pump cover.

"M₁": Indication of gauge.

ASSEMBLY

Adjustment 2 (Cont'd)



- c. Measure thickness of straightedge "t".
 $M = M_1 - t$

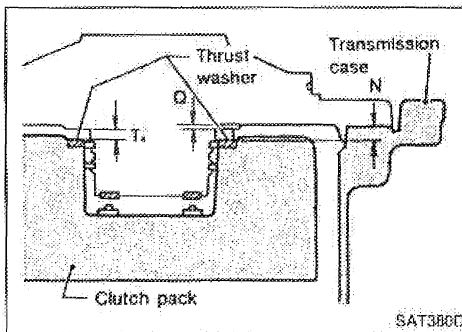
3. Adjust total end play " T_3 ".

$$T_3 = J - M$$

Total end play " T_3 ":

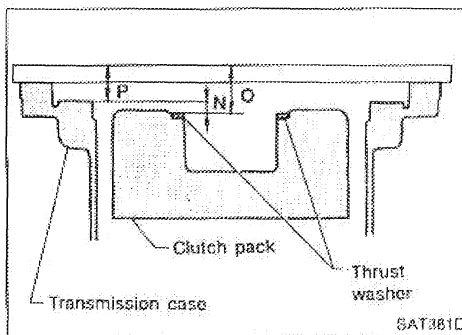
0.25 - 0.55 mm (0.0098 - 0.0217 in)

- Select proper thickness of bearing race so that total end play is within specifications.
Bearing races: Refer to S.D.S.

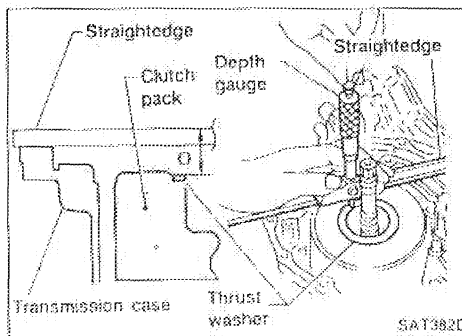


REVERSE CLUTCH END PLAY

- 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.



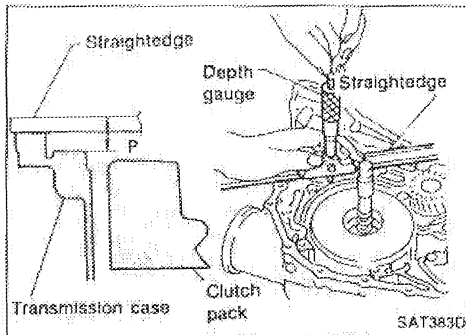
1. Measure dimensions "O" and "P" and then calculate dimension "N".



- a. Place thrust washer on reverse clutch drum.
 b. Measure dimension "O".

ASSEMBLY

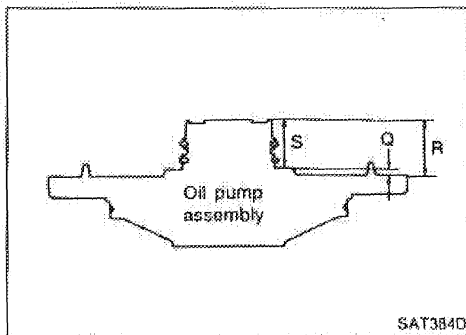
Adjustment 2 (Cont'd)



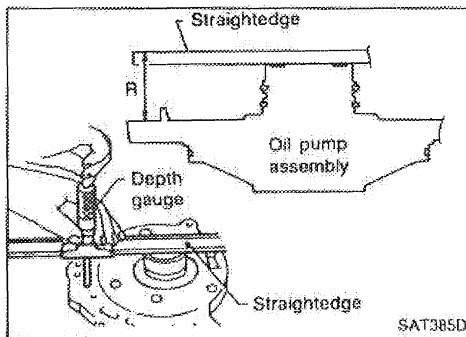
- c. Measure dimension "P".
- d. Calculate dimension "N".

"N": Distance between oil pump fitting surface of transmission case and thrust washer on reverse clutch drum.

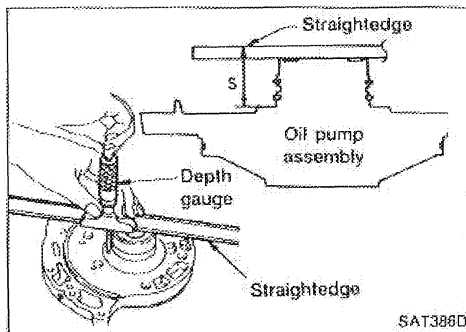
$$N = O - P$$



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 ".

$$T_4 = N - Q$$

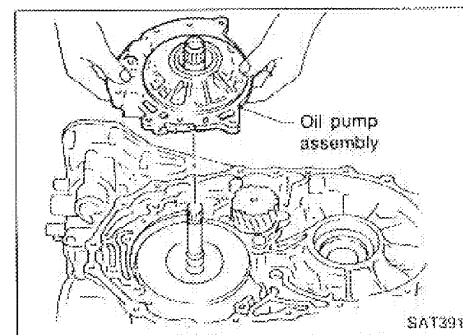
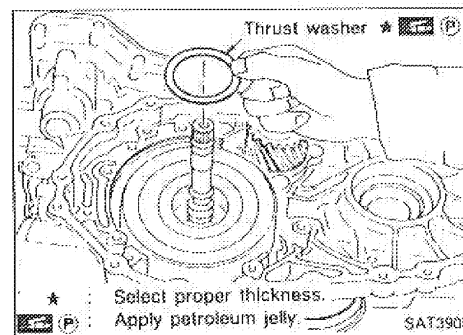
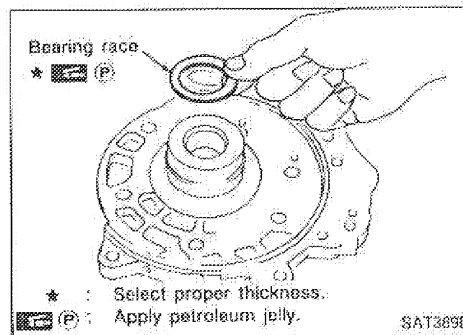
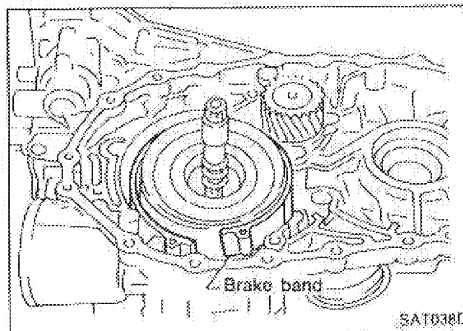
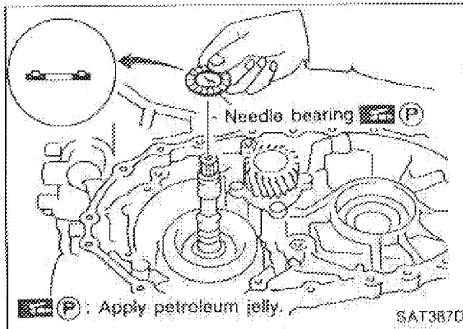
Reverse clutch end play:

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

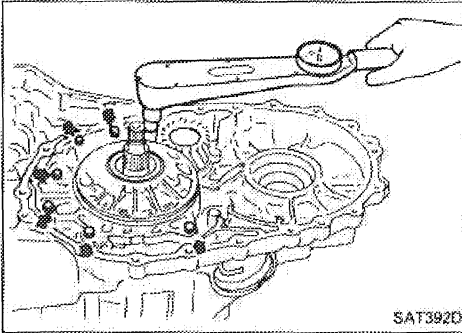


Assembly 3

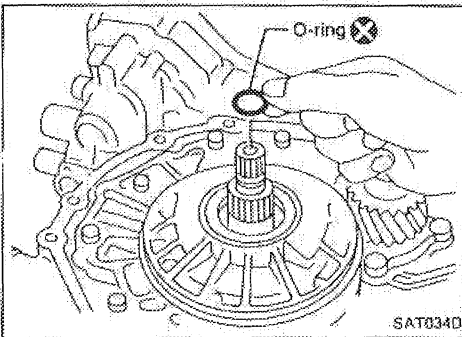
1. Remove reverse clutch assembly and install needle bearing on high clutch assembly.
 - Pay attention to direction of needle bearing.
2. Install reverse clutch assembly.
3. Install anchor end pin, washer and lock nut on transmission case.
4. Place brake band on periphery of reverse clutch drum. Then, 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

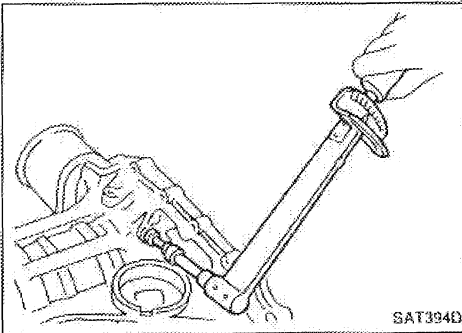
Assembly 3 (Cont'd)



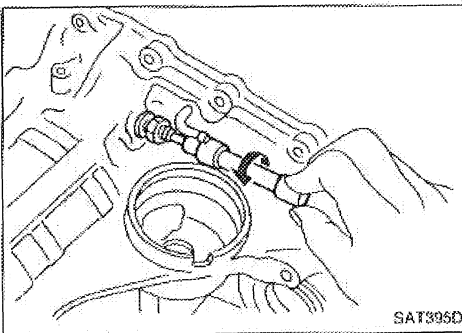
8. Tighten oil pump fixing bolts to specified torque.



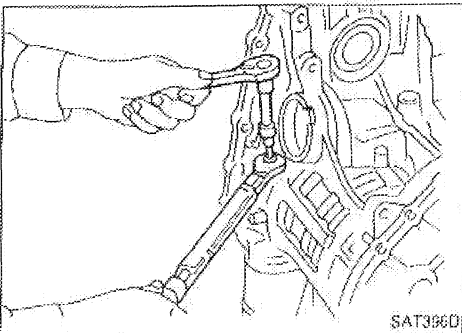
9. Install O-ring to input shaft.
● Apply A.T.F. to O-ring.



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)



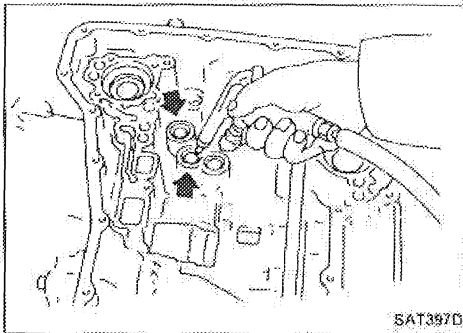
- b. Back off anchor end pin two and a half turns.



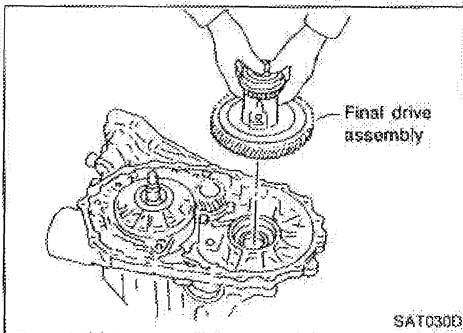
- c. While holding anchor end pin, tighten lock nut.

ASSEMBLY

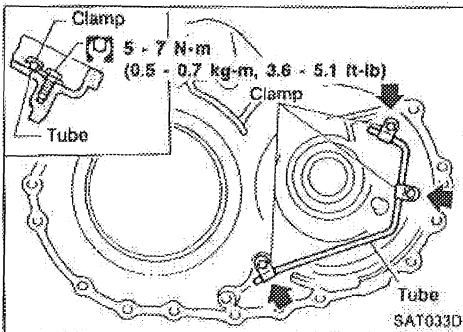
Assembly 3 (Cont'd)



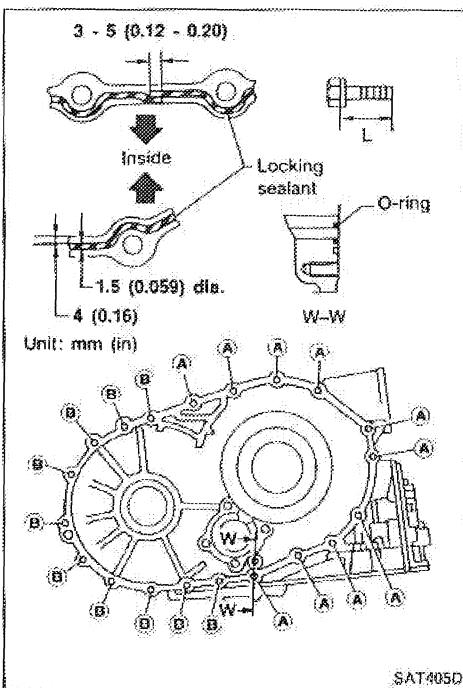
11. Apply compressed air to oil holes of transmission case and check operation of brake band.



12. Install final drive assembly on transmission case.



13. Install oil tube on converter housing.



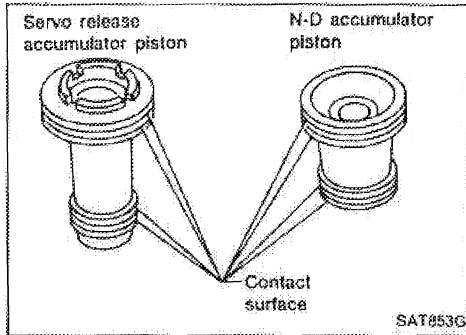
14. Install O-ring on differential oil port of transmission case.
15. Install converter housing on transmission case.

- Apply locking sealant to mating surface of converter housing.

Bolt	Length mm (in)
(A)	30 (1.18)
(B)	40 (1.57)

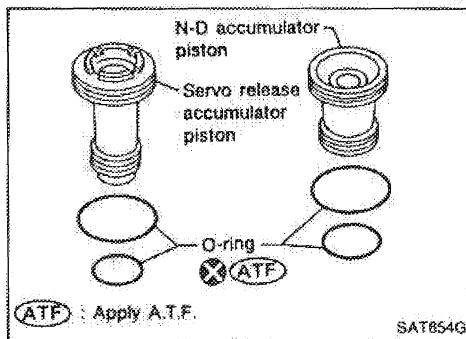
ASSEMBLY

Assembly 3 (Cont'd)



16. Install accumulator piston.

- a. Check contact surface of accumulator piston for damage.



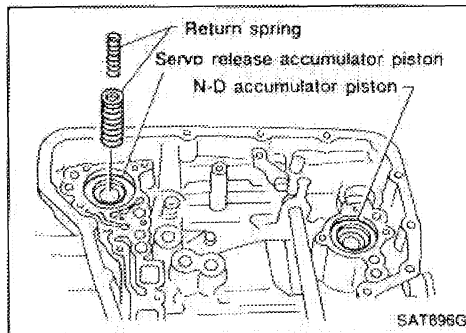
b. Install O-rings on accumulator piston.

- 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)



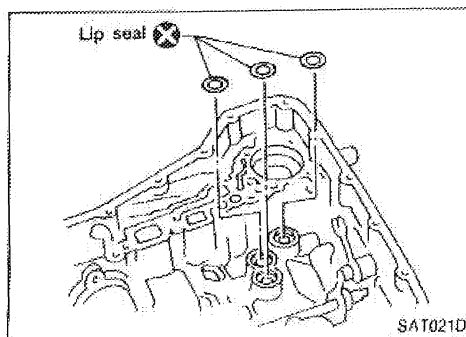
c. Install accumulator pistons and return springs on transmission case.

- 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)

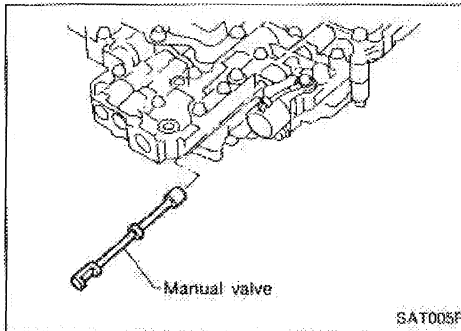


17. Install lip seals for band servo oil holes on transmission case.

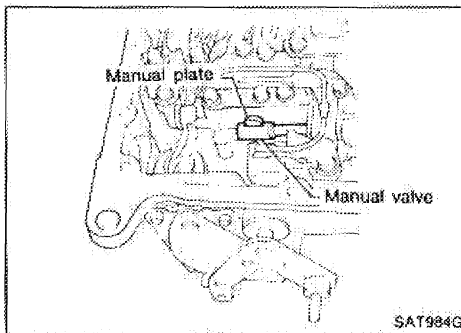
- Apply petroleum jelly to lip seals.

ASSEMBLY

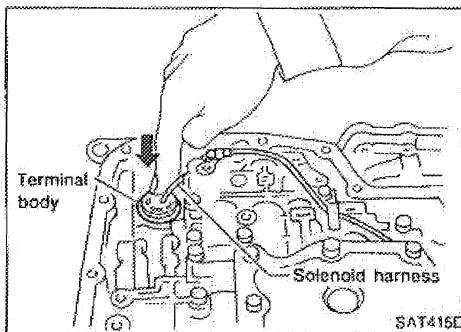
Assembly 3 (Cont'd)



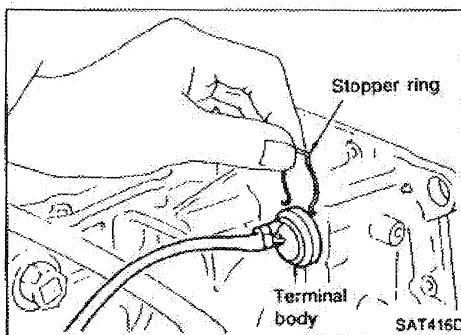
18. Install control valve assembly.
 - a. Insert manual valve into control valve assembly.
 - Apply A.T.F. to manual valve.



- 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.

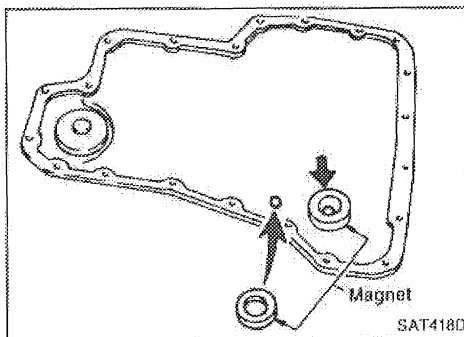
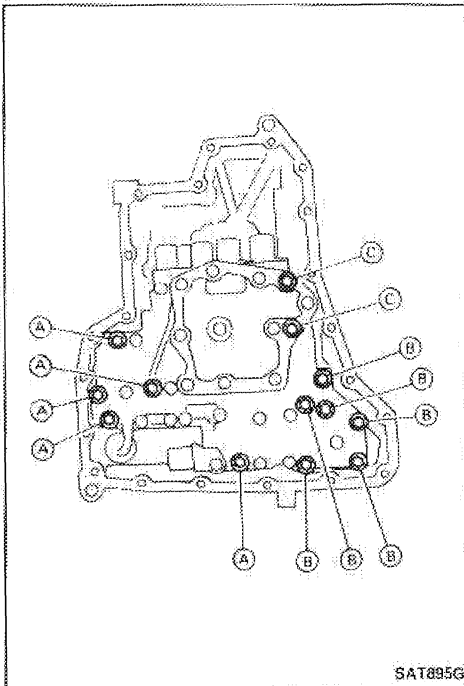
ASSEMBLY

Assembly 3 (Cont'd)

f. Tighten bolts **(A)**, **(B)** and **(C)**.

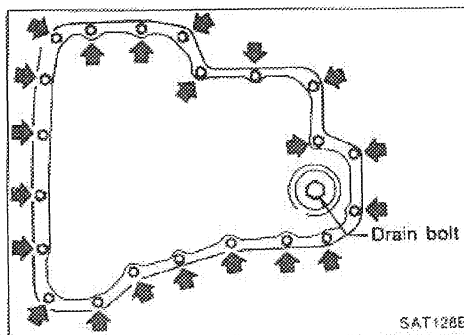
Bolt length, number and location

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



19. Install oil pan.

a. Attach magnet to oil pan.

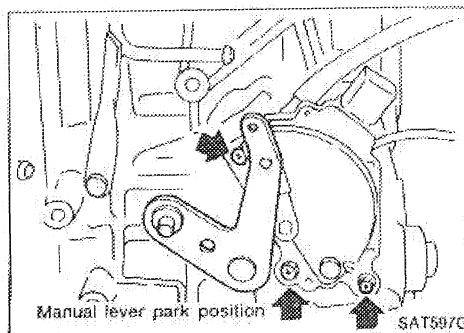


b. Install new oil pan gasket on transmission case.

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.

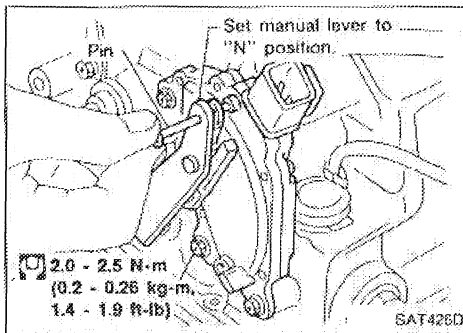
a. Set manual lever in "P" position.

b. Temporarily install inhibitor switch on manual shaft.

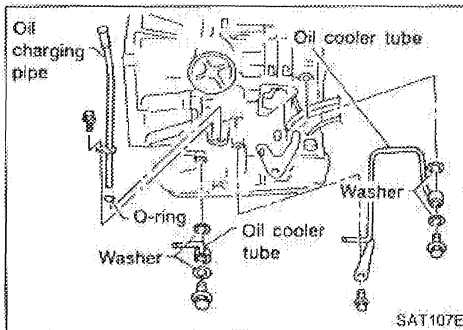
c. Move selector lever to "N" position.

ASSEMBLY

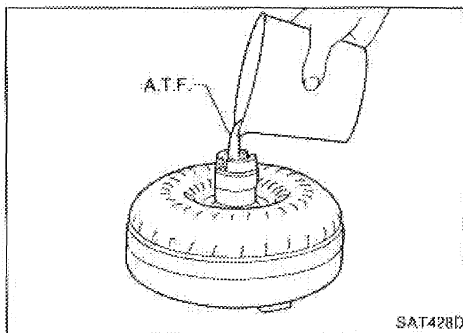
Assembly 3 (Cont'd)



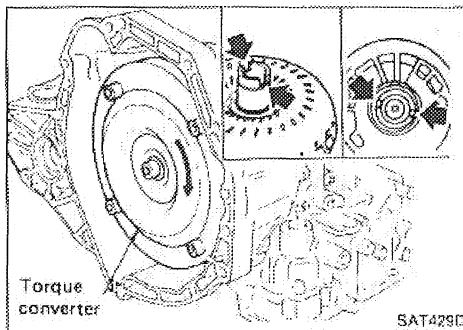
- d. Insert 4.0 mm (0.157 in) dia. pin into adjustment hole in both inhibitor switch and manual shaft as near vertically as possible.
- e. Tighten inhibitor switch fixing bolts.
- f. Remove pin from adjustment hole after adjusting inhibitor switch.



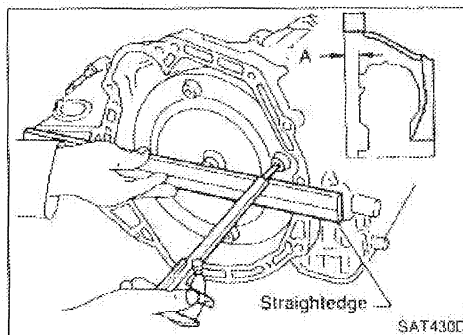
21. Install oil charging pipe and oil cooler tube to transmission case.



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

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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 ^{III} MILE	
Oil capacity	ℓ (US qt, Imp qt)	7.0 (7-3/8, 6-1/8)

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

Specifications and Adjustments

VEHICLE SPEED WHEN SHIFTING GEARS

Throttle position	Shift pattern	Vehicle speed km/h (MPH)					
		D ₁ → D ₂	D ₂ → D ₃	D ₃ → D ₄	D ₄ → D ₅	D ₅ → D ₆	D ₆ → D ₇
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)	116 - 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)

STALL REVOLUTION

Engine	Stall revolution rpm
SR20DE	1,900 - 2,200

LINE PRESSURE

Engine speed rpm	Line pressure kPa (kg/cm ² , 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	Ⓐ Pilot valve spring	31742-80X14	36.0 (1.417)	8.1 (0.319)
	Ⓑ 1-2 accumulator valve spring	31742-80X10	20.5 (0.807)	7.0 (0.276)
	Ⓒ 1-2 accumulator piston spring	31742-33X02	48.8 (1.921)	19.6 (0.772)
	Ⓓ 1st reducing valve spring	31742-80X05	27.0 (1.063)	7.0 (0.276)
	Ⓔ Overrun clutch reducing valve spring	31742-80X05	37.5 (1.476)	7.0 (0.276)
	Ⓕ Torque converter relief valve spring	31742-33X00	31.0 (1.220)	8.9 (0.350)
	Ⓖ 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	Ⓘ Line pressure solenoid valve spring	31742-80X11	17.0 (0.669)	10.7 (0.421)
	Ⓚ Pressure regulator valve spring	31742-80X13	45.0 (1.772)	15.0 (0.591)
	Ⓛ Overrun clutch control valve spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	Ⓜ Accumulator control valve spring	31742-80X02	22.0 (0.866)	6.5 (0.256)
	Ⓝ Shift valve A spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	Ⓖ Shift valve B spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	Ⓞ Pressure modifier valve spring	31742-41X15	30.5 (1.201)	9.8 (0.386)
		31742-80X16	32.0 (1.260)	6.9 (0.272)

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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	1.6 (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)

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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)	
Oil pump cover seal ring clearance mm (in)	Standard	
	0.1 - 0.25 (0.0039 - 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)	
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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)
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)
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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)
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SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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)

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

Specifications and Adjustments (Cont'd)

Table for selecting differential side bearing adjusting shim(s) for F03V

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 pre-load 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)
--	--------------------------------------

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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)

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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

Accumulator	Unit: mm (in)	
	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

Accumulator	Unit: mm (in)		
	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

Return spring	Unit: mm (in)	
	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**

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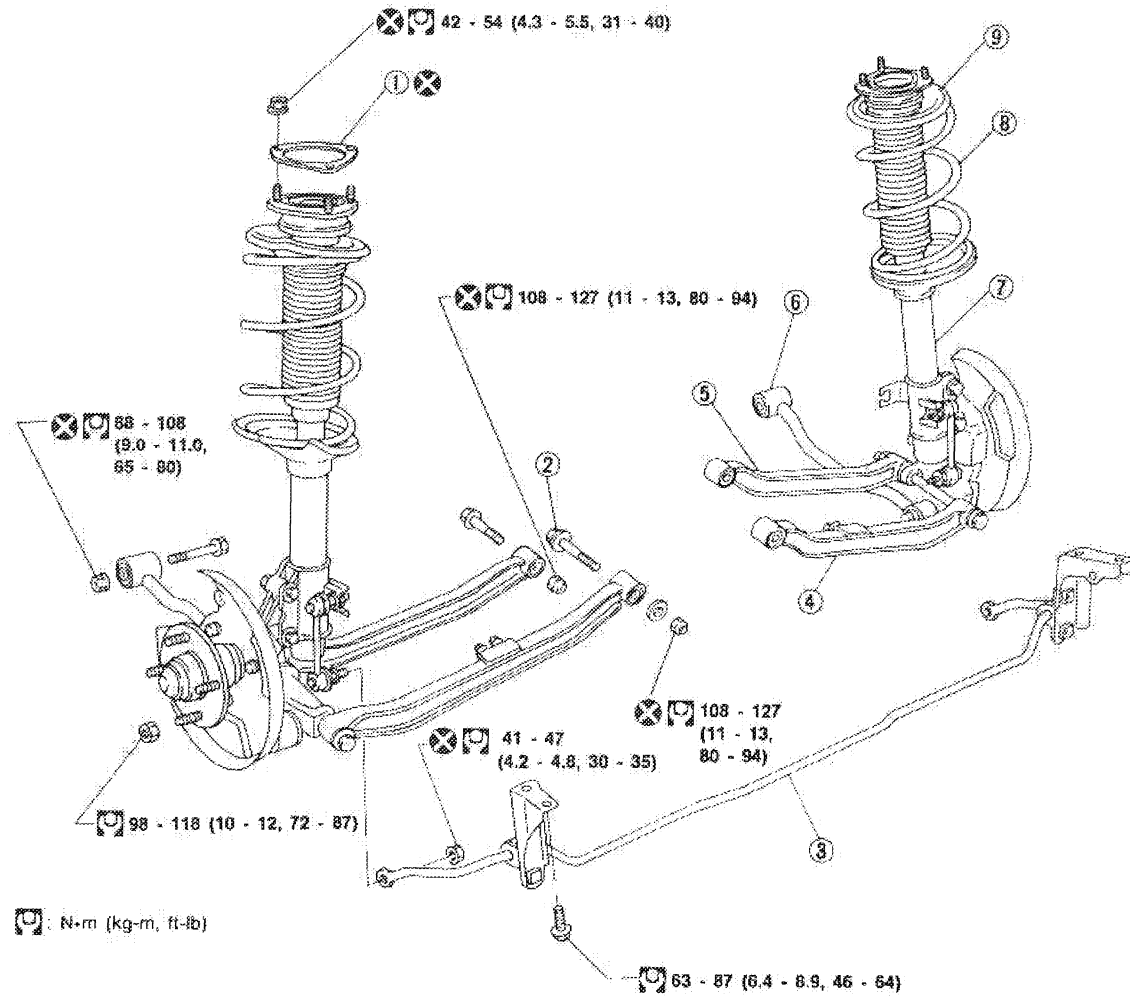
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RA

REAR AXLE AND REAR SUSPENSION

When installing each rubber part, final tightening must be carried out under unfaden 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 | ④ Rear parallel link | ⑦ Strut assembly |
| ② Adjusting bolt | ⑤ Front parallel link | ⑧ Coil spring |
| ③ Stabilizer bar | ⑥ Radius rod | ⑨ Strut mounting insulator assembly |

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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.

BRAKE SYSTEM

SECTION **BR**

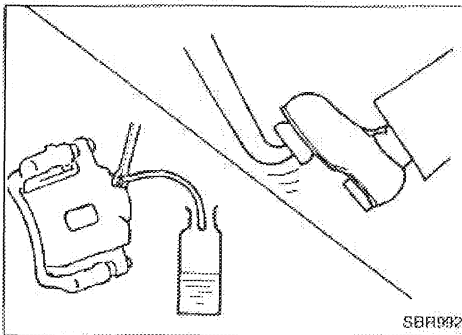
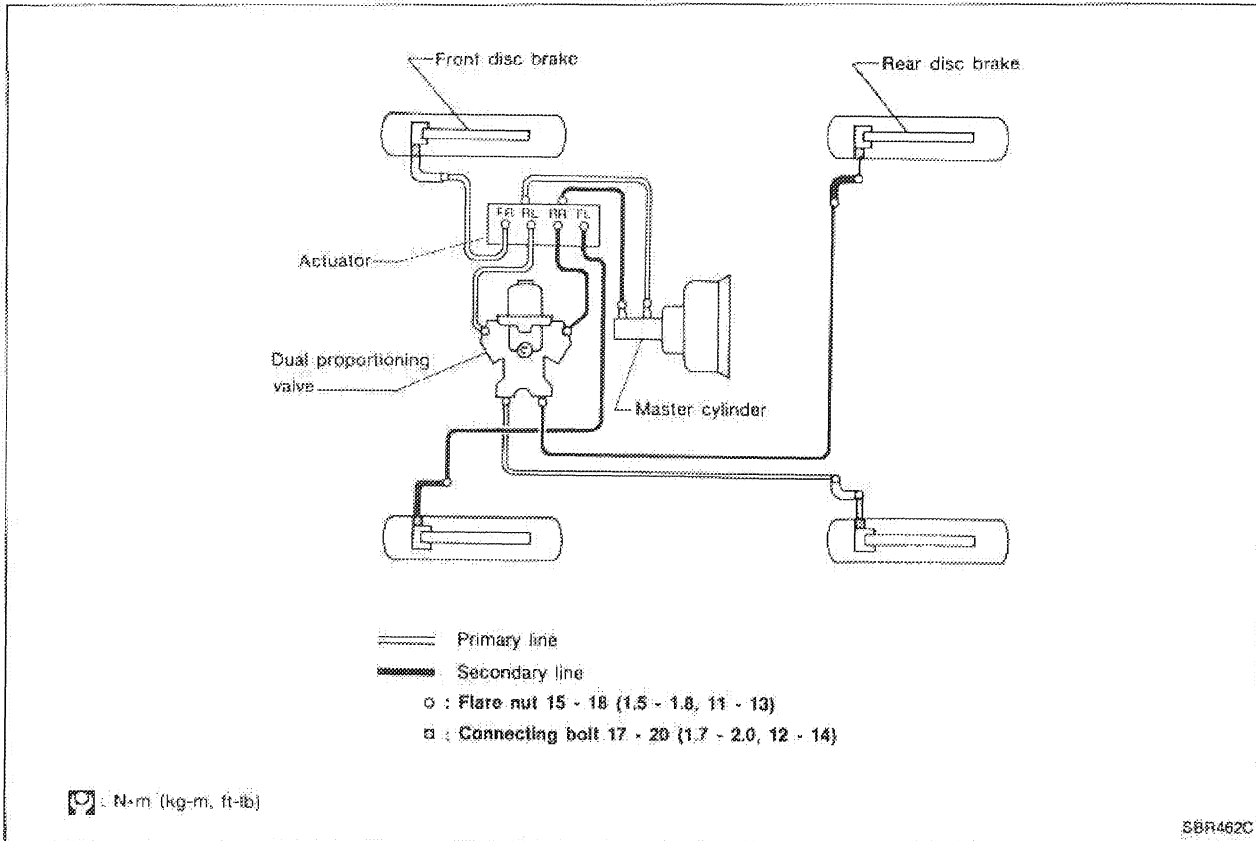
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BR

BRAKE HYDRAULIC LINE/CONTROL VALVE

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.

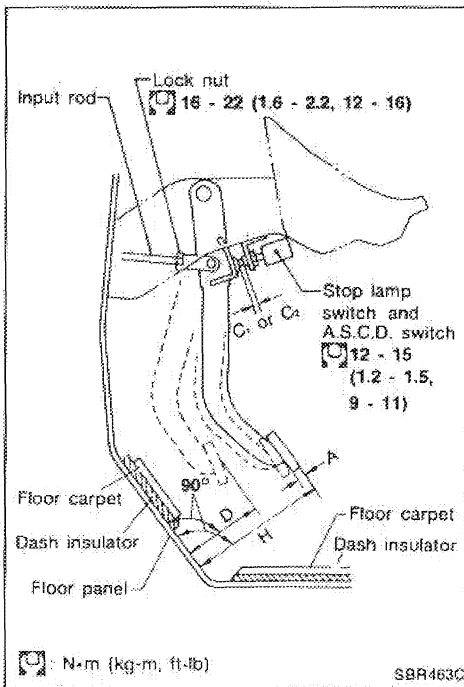
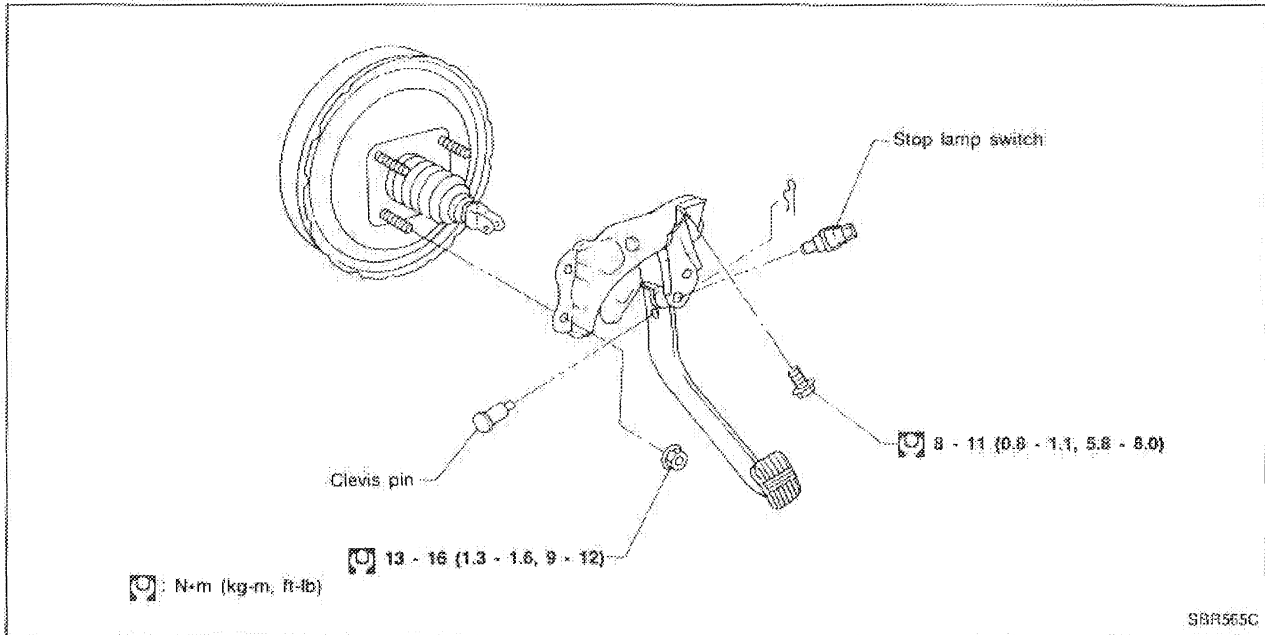
1. Connect vinyl tube to air bleeder valve.
2. Drain brake fluid from each air bleeder valve by depressing brake pedal.
3. Remove flare nut connecting brake tube and hose, then withdraw lock spring.
4. Cover openings to prevent entrance of dirt whenever disconnecting brake line.

INSPECTION

Check brake lines (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.

BRAKE PEDAL AND BRACKET

Removal and Installation



Inspection

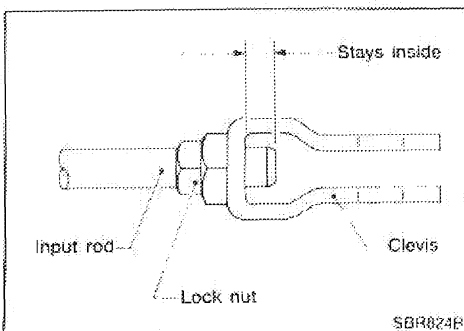
Check brake pedal for following items.

- 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
- C₁, C₂:** 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)

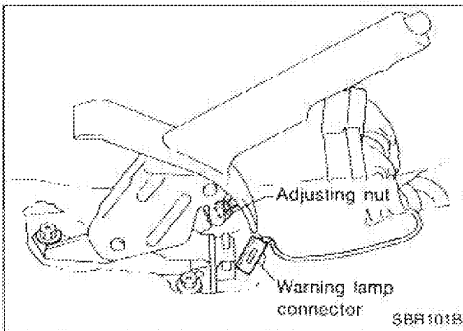
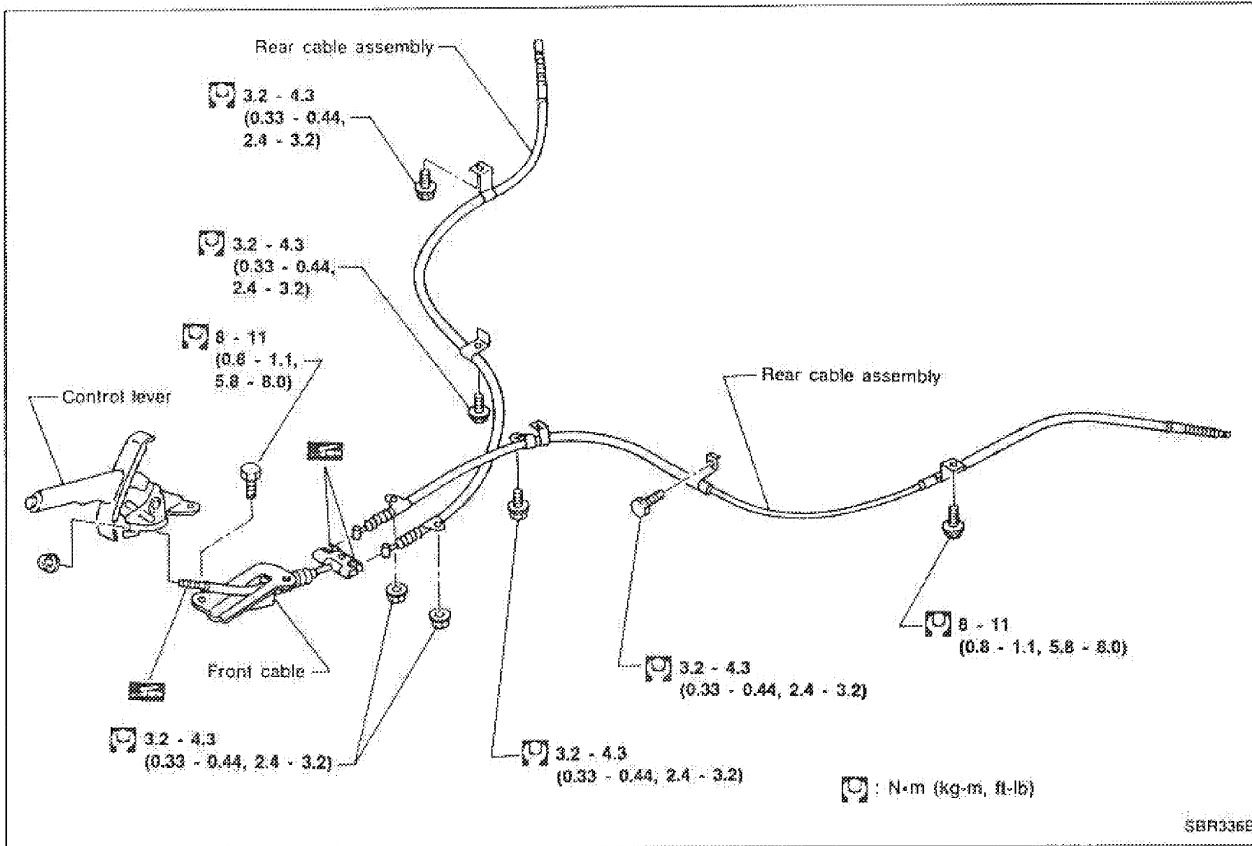


1. Loosen lock nut and adjust pedal free height by turning brake booster input rod. Then tighten lock nut.
2. Check pedal free play.

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

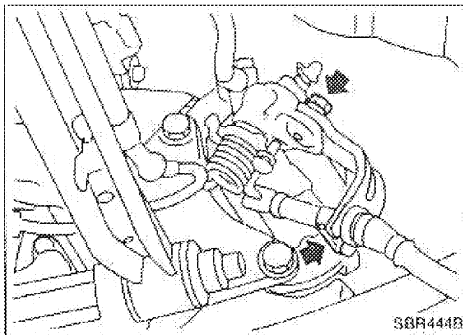
3. Check brake pedal's depressed height while engine is running.
If depressed height is below specified value, check brake system for leaks, accumulation of air or any damage to components (master cylinder, wheel cylinder, etc.); then make necessary repairs.

PARKING BRAKE CONTROL



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.

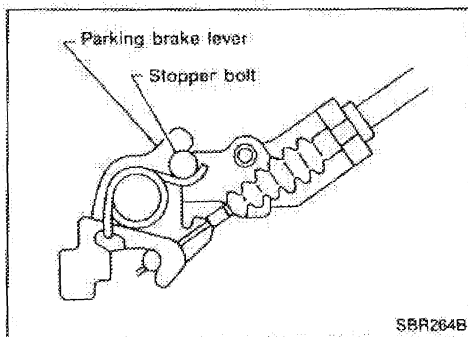


4. Remove cable mounting bracket and lock plate.

PARKING BRAKE CONTROL

Inspection

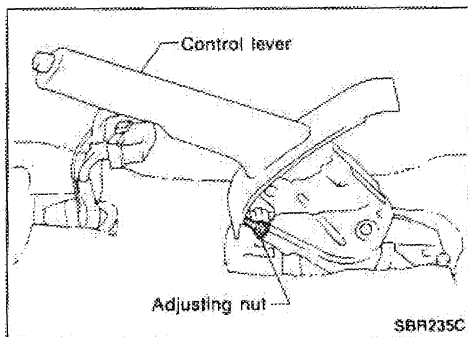
1. Check control lever for wear or other damage. Replace if necessary.
2. Check wires for discontinuity or deterioration. Replace if necessary.
3. Check warning lamp and switch. Replace if necessary.
4. Check parts at each connecting portion and, if found deformed or damaged, replace.



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.

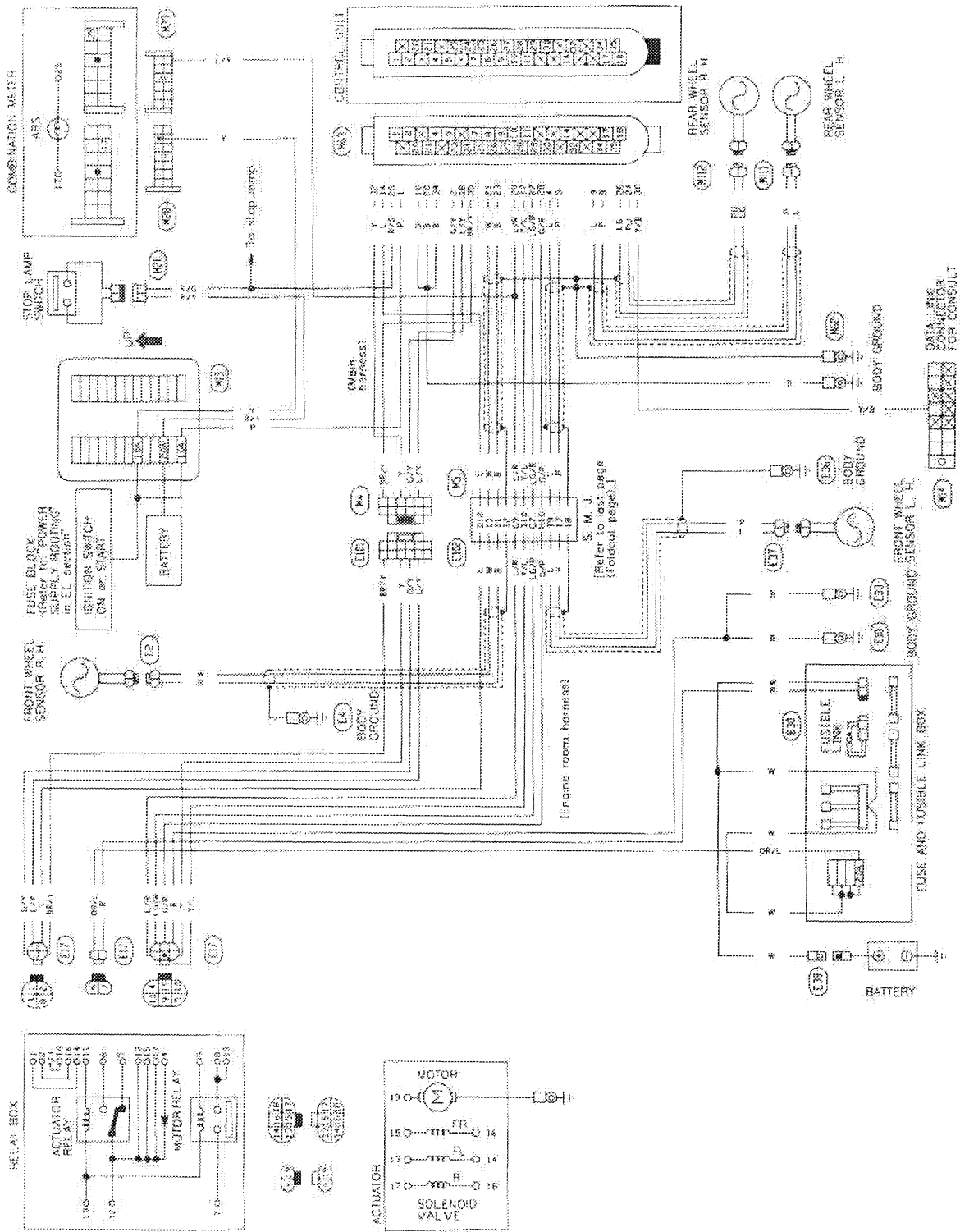
Number of notches : 6 - 8 [196 N (20 kg, 44 lb)]

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.

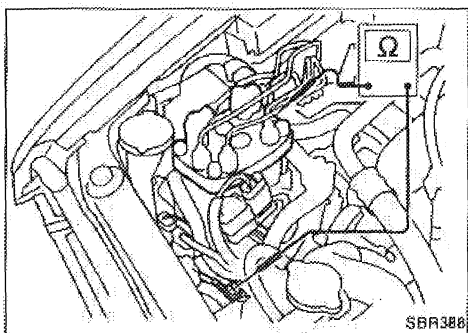
Number of "A" notches : 1

ANTI-LOCK BRAKE SYSTEM

Wiring Diagram



TROUBLE DIAGNOSES



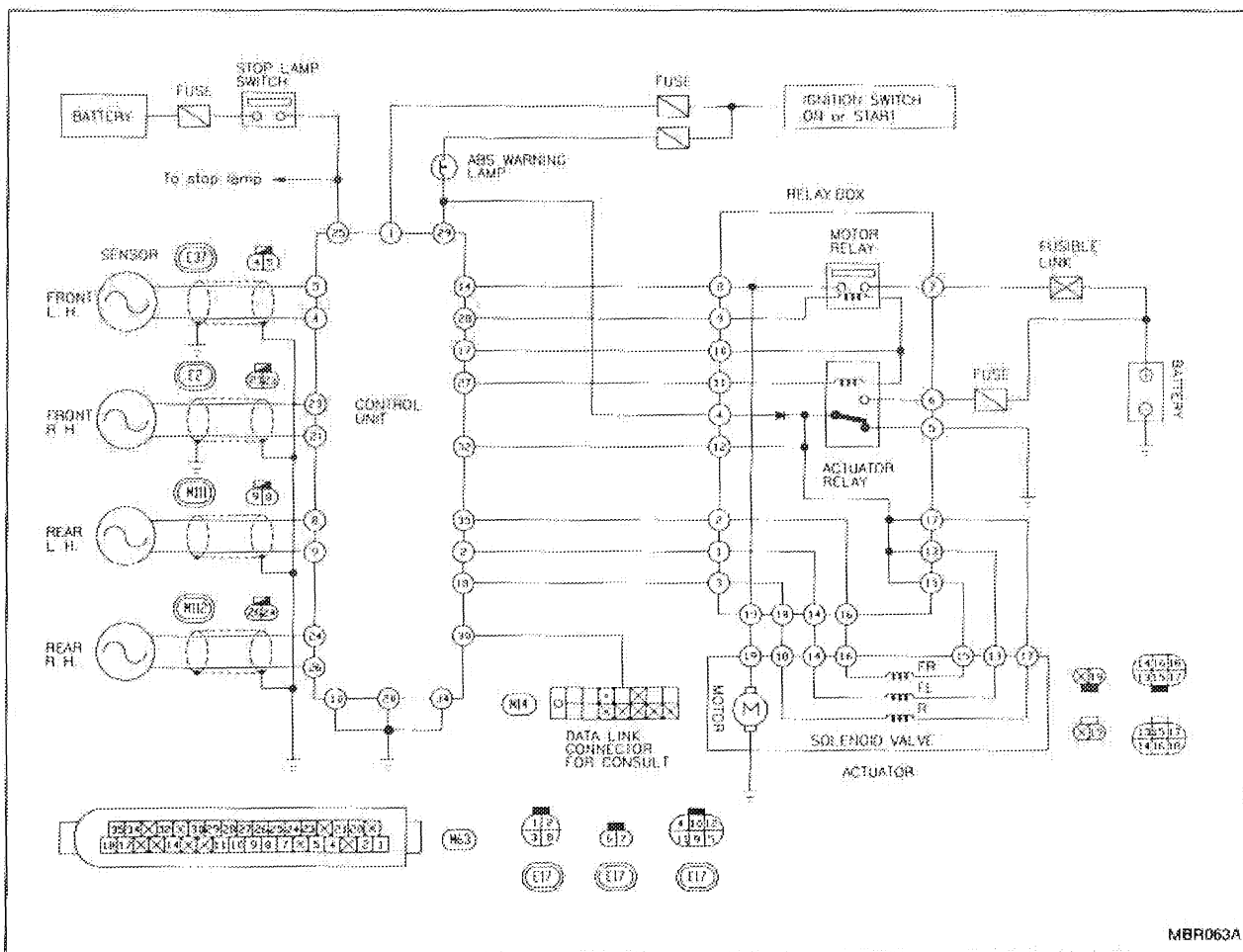
Ground Circuit Check

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 "○".



SERVICE DATA AND SPECIFICATIONS (S.D.S.)

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)

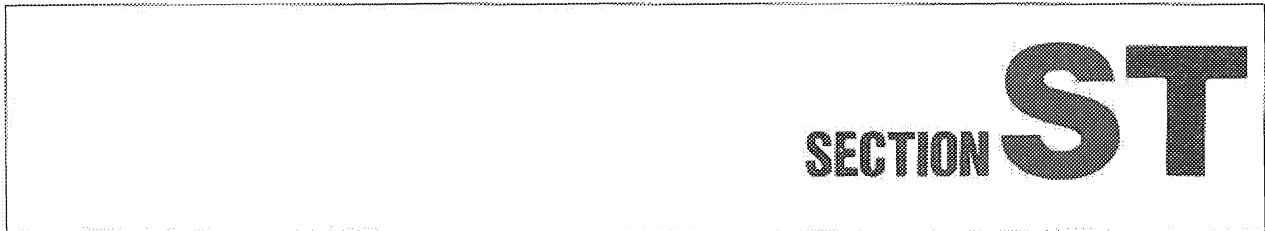
PARKING BRAKE

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.S.C.D. switch mm (in)	0.3 - 1.0 (0.012 - 0.039)

STEERING SYSTEM



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PRECAUTIONS AND PREPARATION

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.

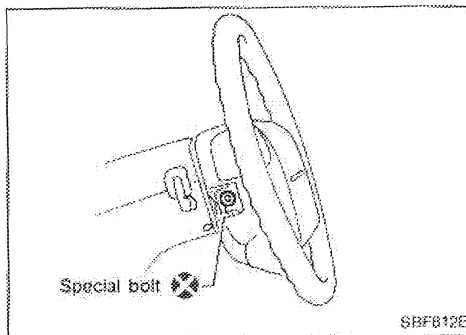
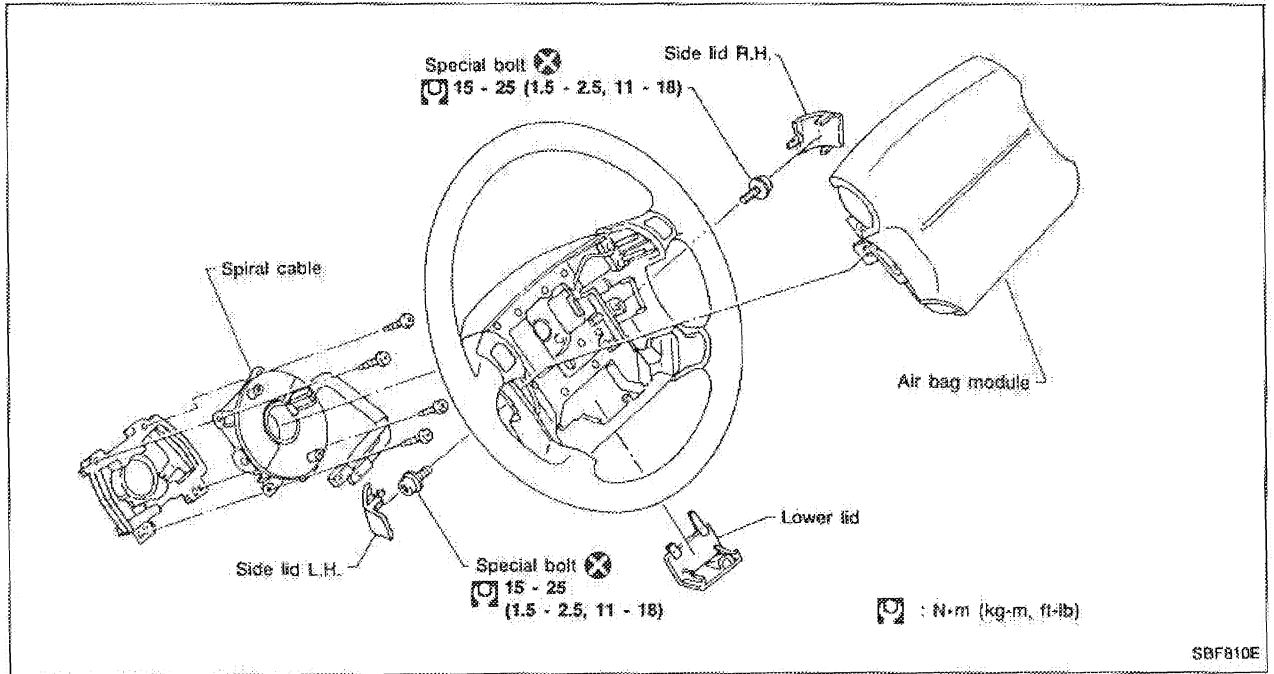
WARNING:

- 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.

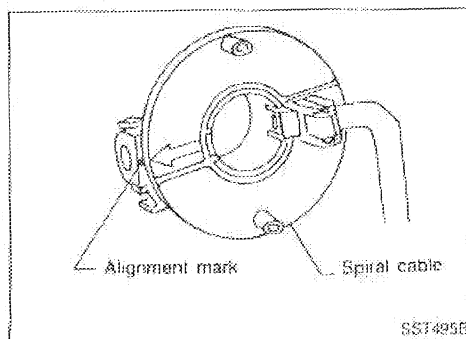
STEERING WHEEL AND STEERING COLUMN

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.

SECTION BF

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GENERAL SERVICING

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.

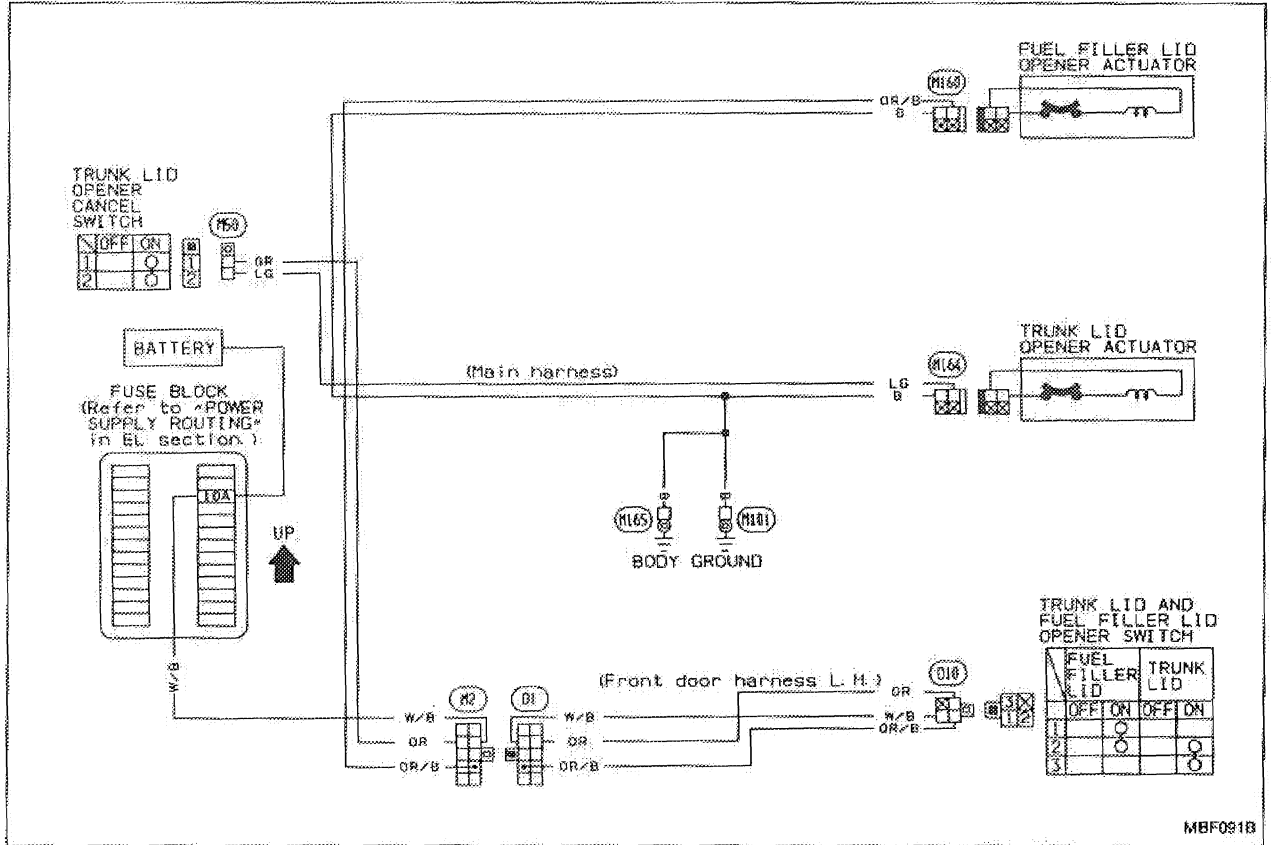
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BODY END

Body Rear End and Opener

TRUNK LID AND FUEL FILLER LID OPENER/WIRING DIAGRAM

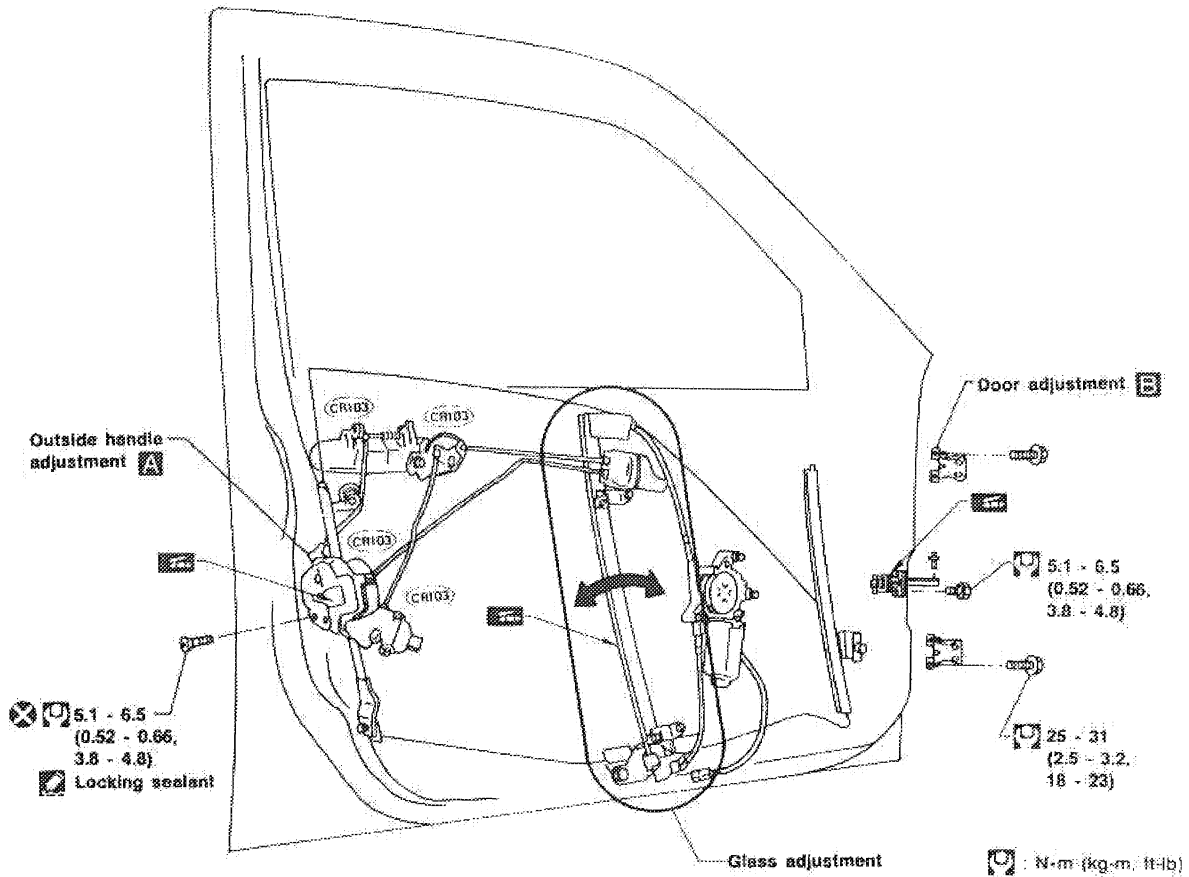


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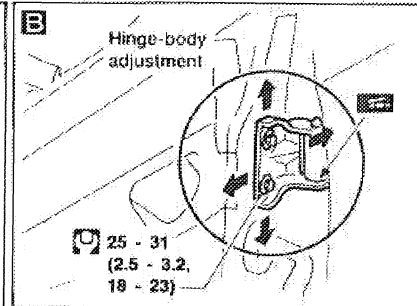
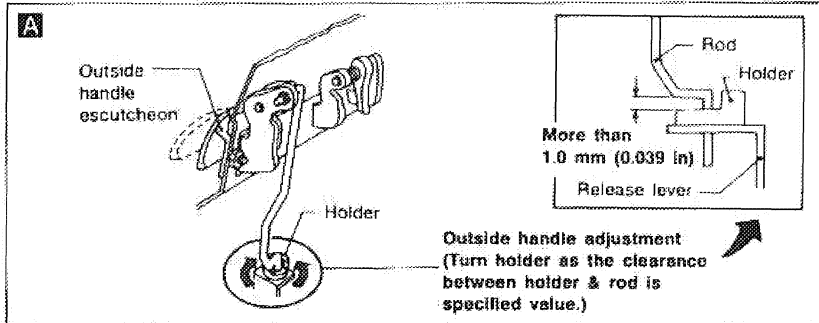
DOOR

Front Door

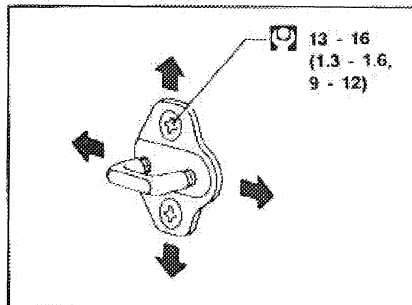
- After adjusting door or door lock, check door lock operation.



Outside handle adjustment

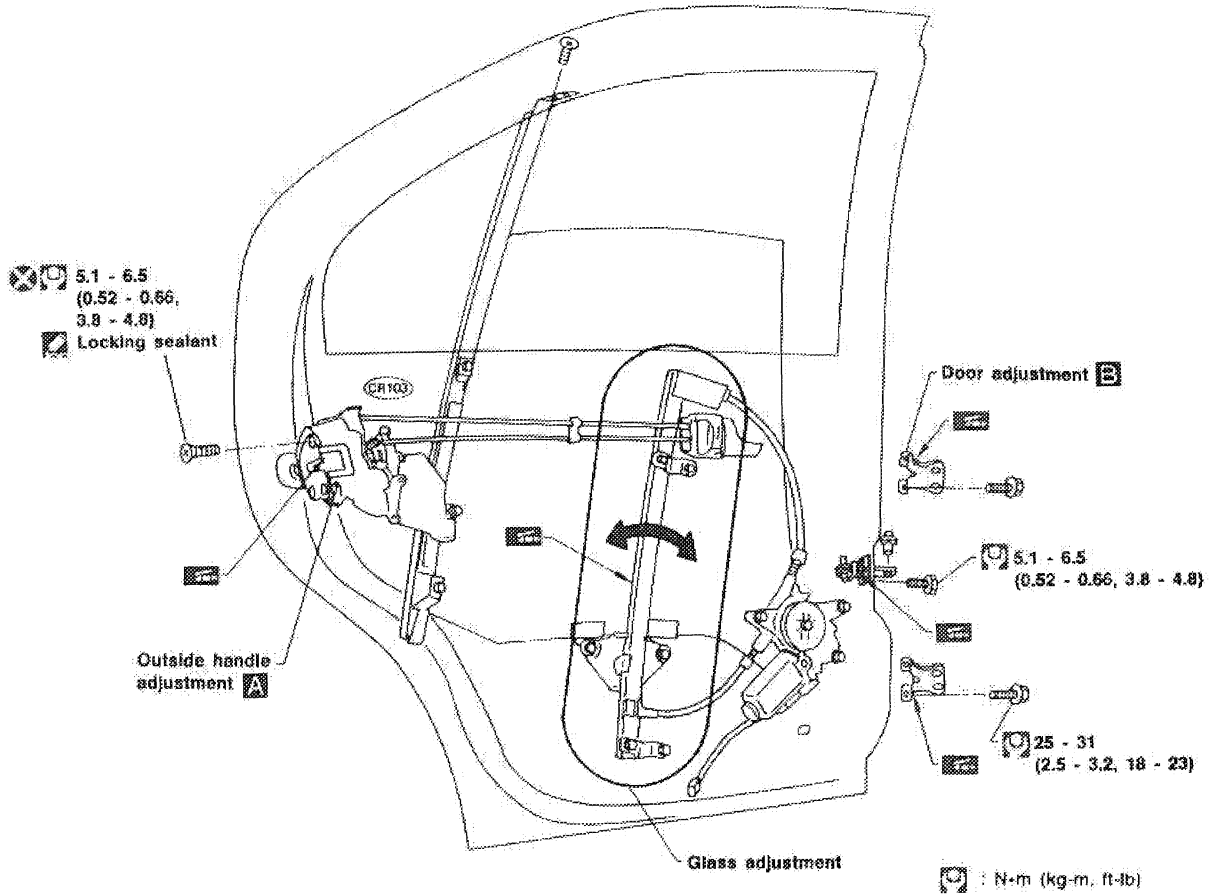


Striker adjustment

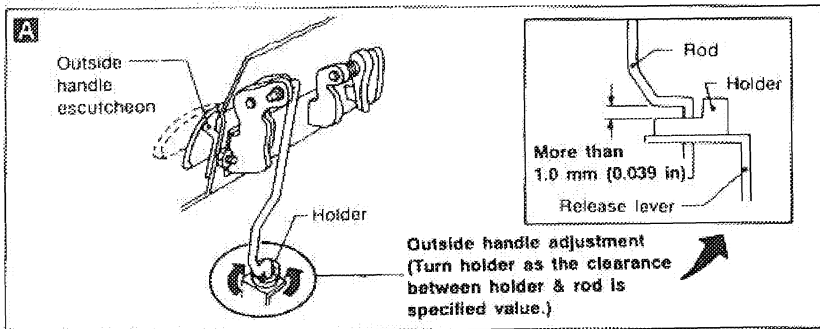


DOOR

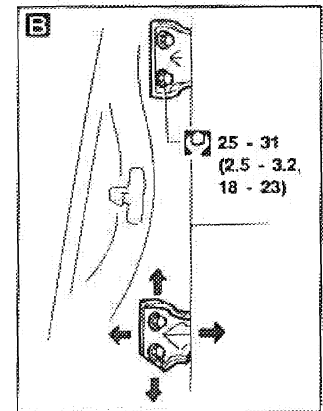
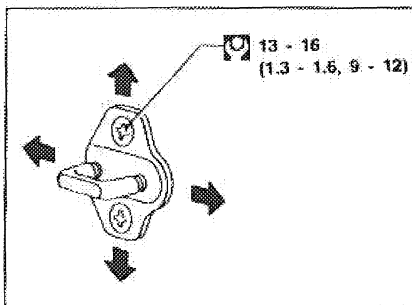
Rear Door



Outside handle adjustment



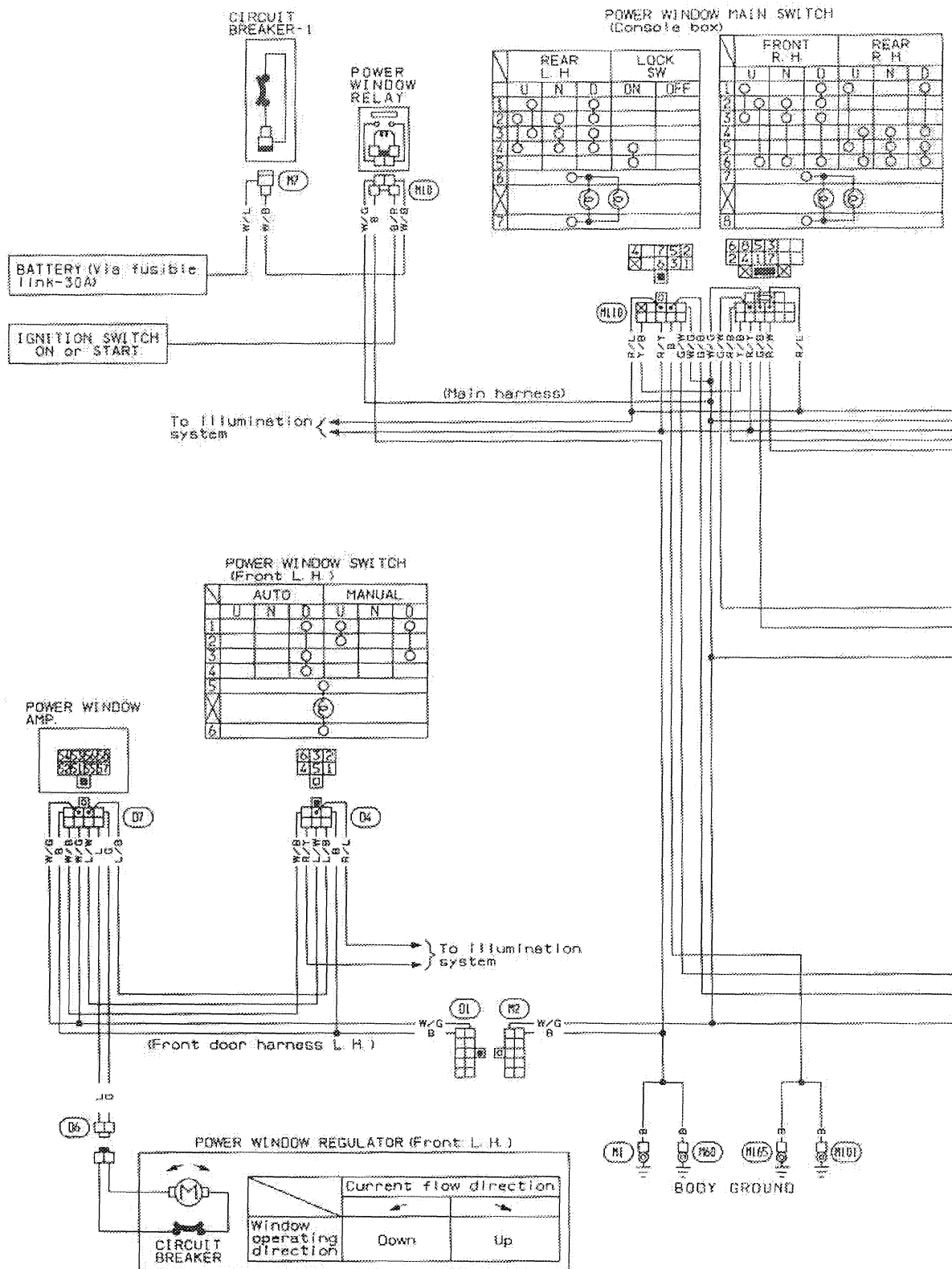
Striker adjustment



DOOR

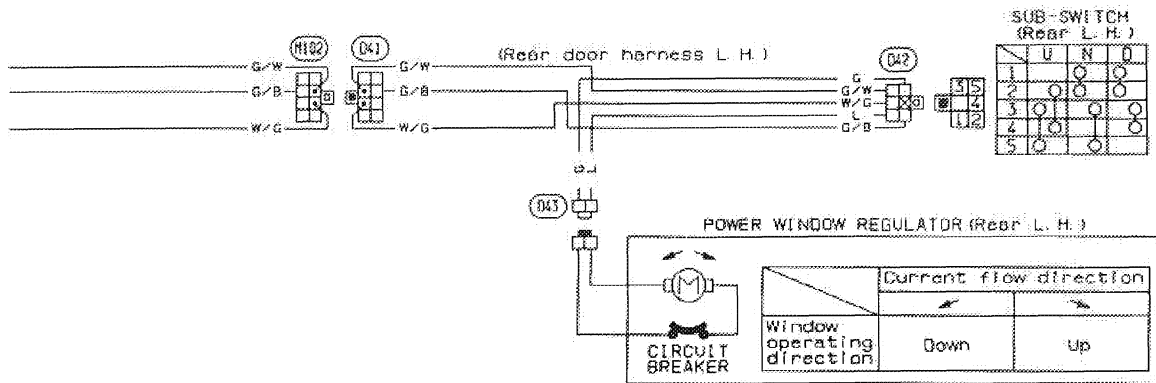
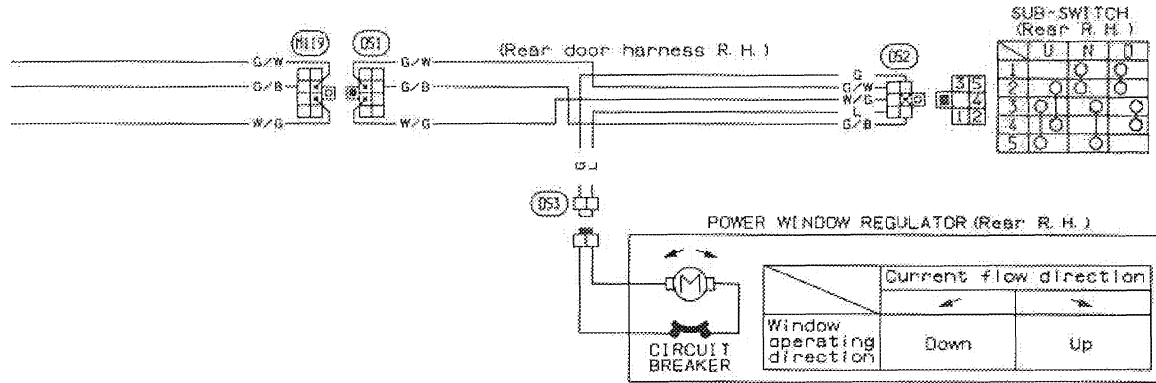
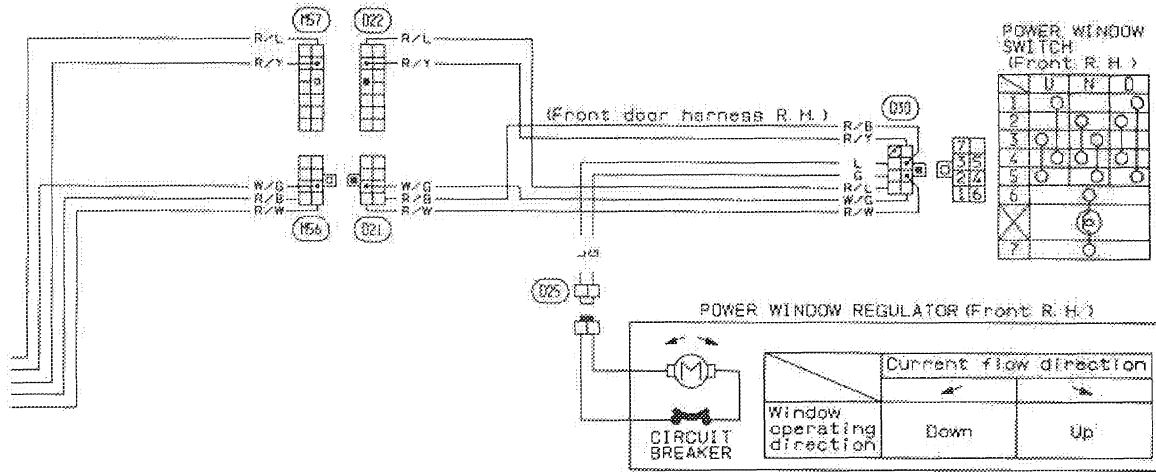
Power Window

WIRING DIAGRAM



DOOR

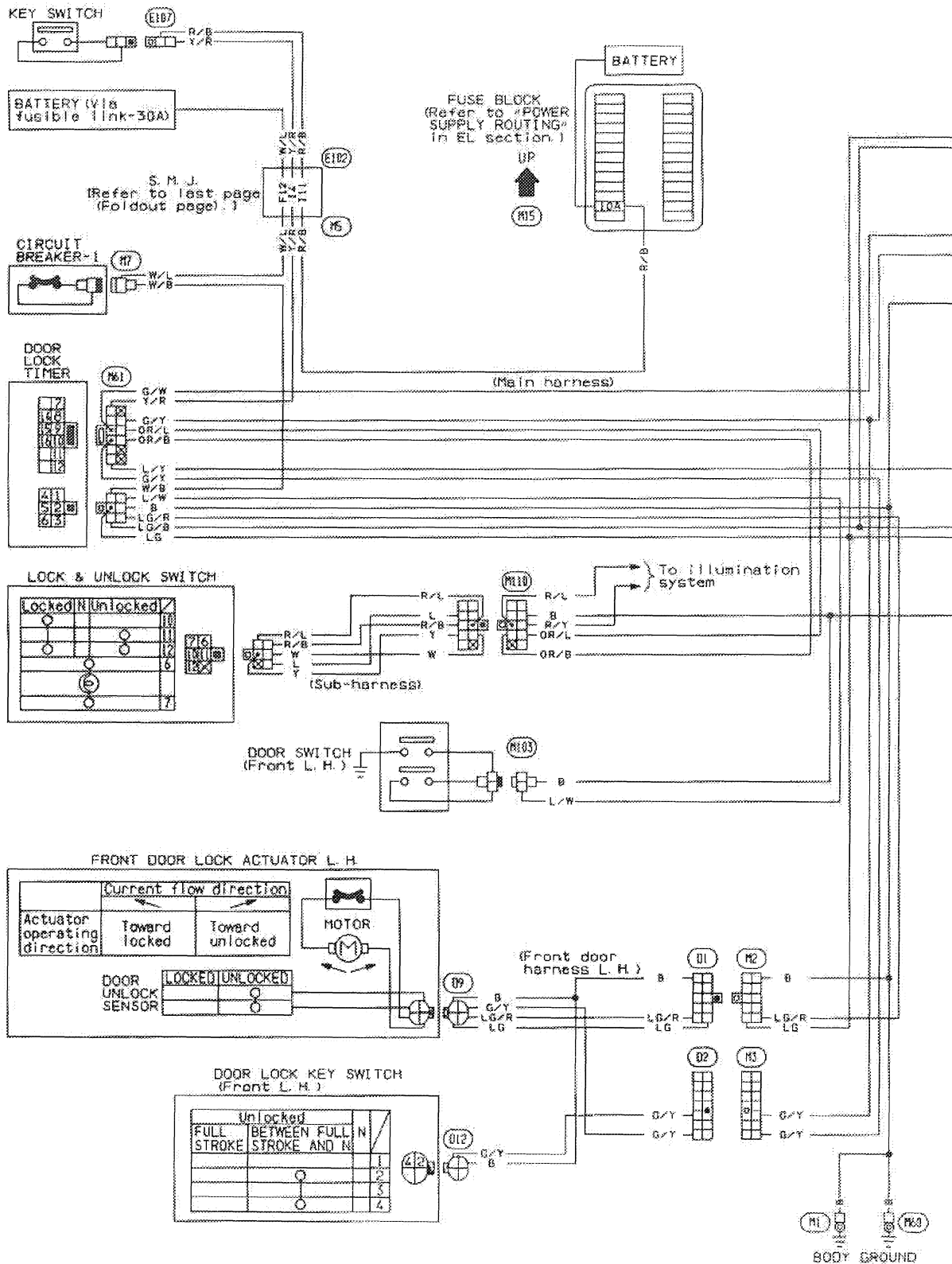
Power Window (Cont'd)



DOOR

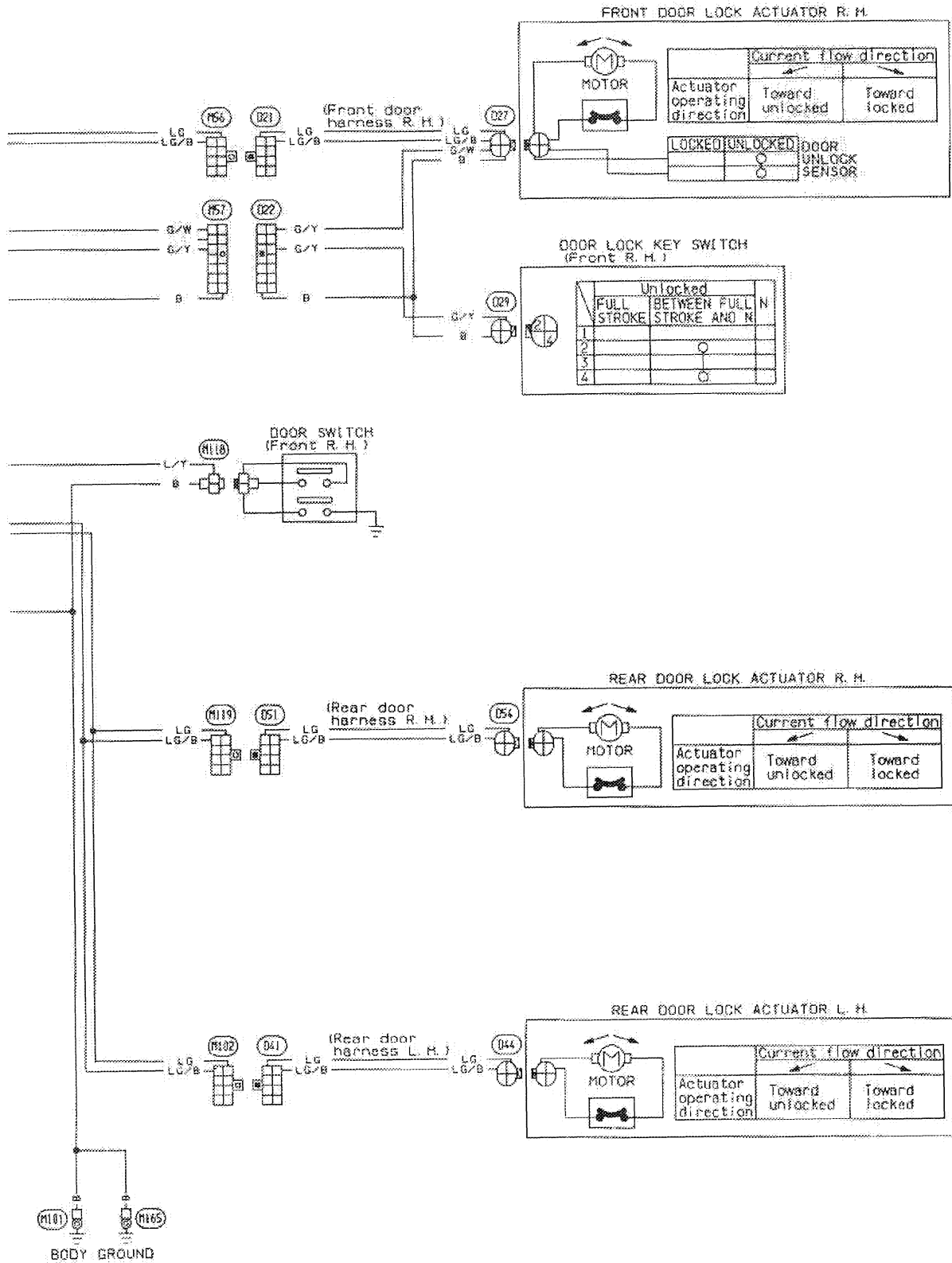
Power Door Lock

WIRING DIAGRAM



DOOR

Power Door Lock (Cont'd)



DOOR

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.

DOOR 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

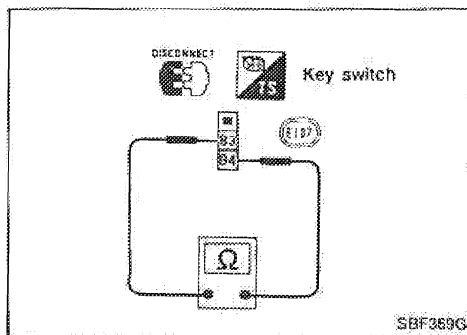
	Connections		Operations	
			Lock knob L.H.	Lock & unlock switch
			Unlock → Lock → Automatically Unlocked	N → Lock → Automatically Unlocked
1	Power source		12V	12V
5	Ground		0V	0V
7	Input signal	Key switch	ON (12V) — Key is in the ignition.	
4		Door switch (Front L.H.)	ON (Ground) — Door is open.	
12		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.

DOOR

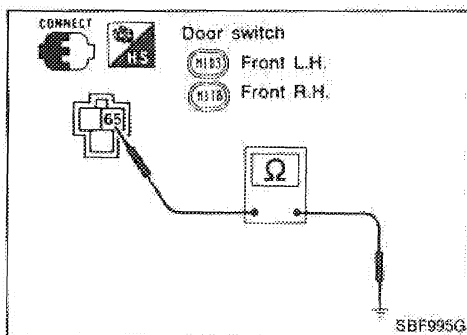
Power Door Lock (Cont'd)

ELECTRICAL COMPONENTS INSPECTION



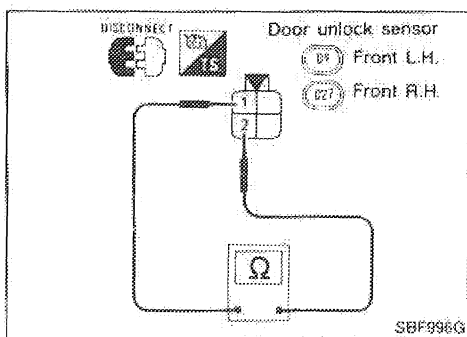
Key switch

Terminals	Condition	Continuity
③ - ④	Key is in the ignition.	Yes
	Key is not in the ignition.	No



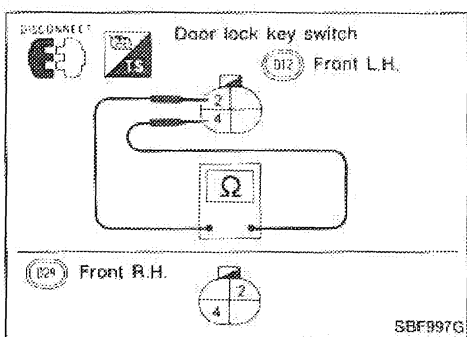
Door switch

Terminals	Condition	Continuity
⑥⑤ - Ground	Door is closed.	No
	Door is open.	Yes



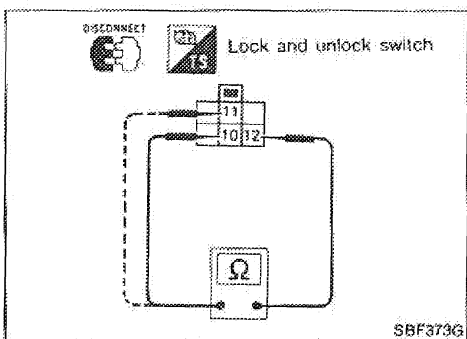
Door unlock sensor

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



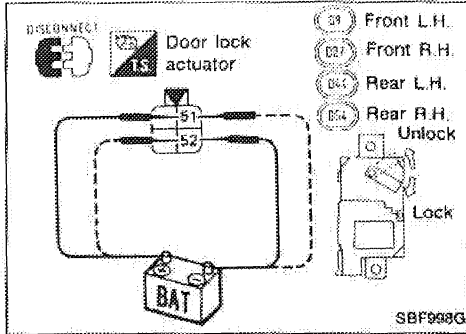
Lock and unlock switch

Terminals	Operation	Continuity
⑩ - ⑫	Lock	Yes
	Neutral and unlock	No
⑪ - ⑫	Unlock	Yes
	Neutral and unlock	No

DOOR

Power Door Lock (Cont'd)

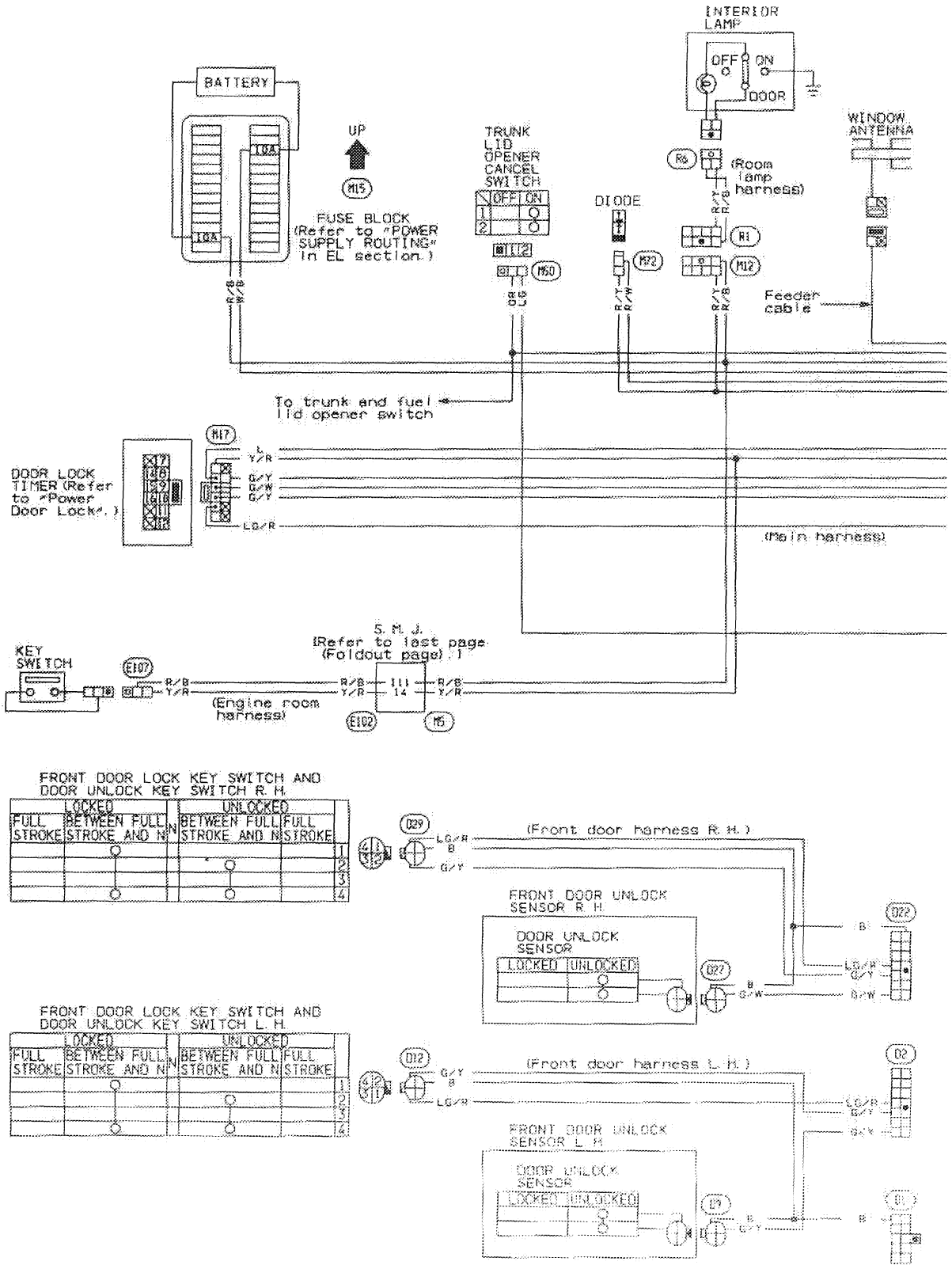
Door lock actuator



Terminals		Operation
⊕	⊖	
(31)	(32)	Lock
(32)	(31)	Unlock

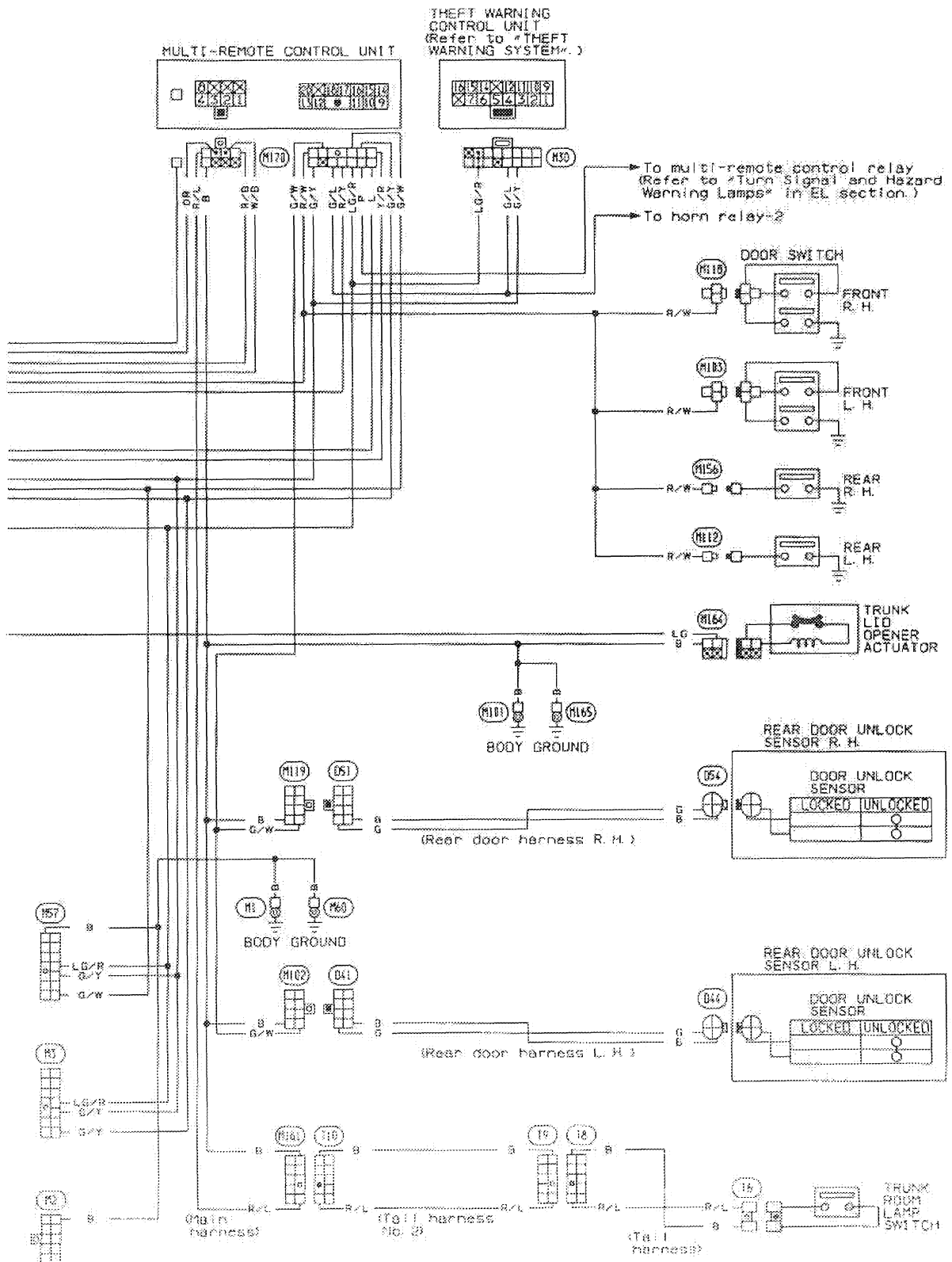
MULTI-REMOTE CONTROL SYSTEM

Wiring Diagram



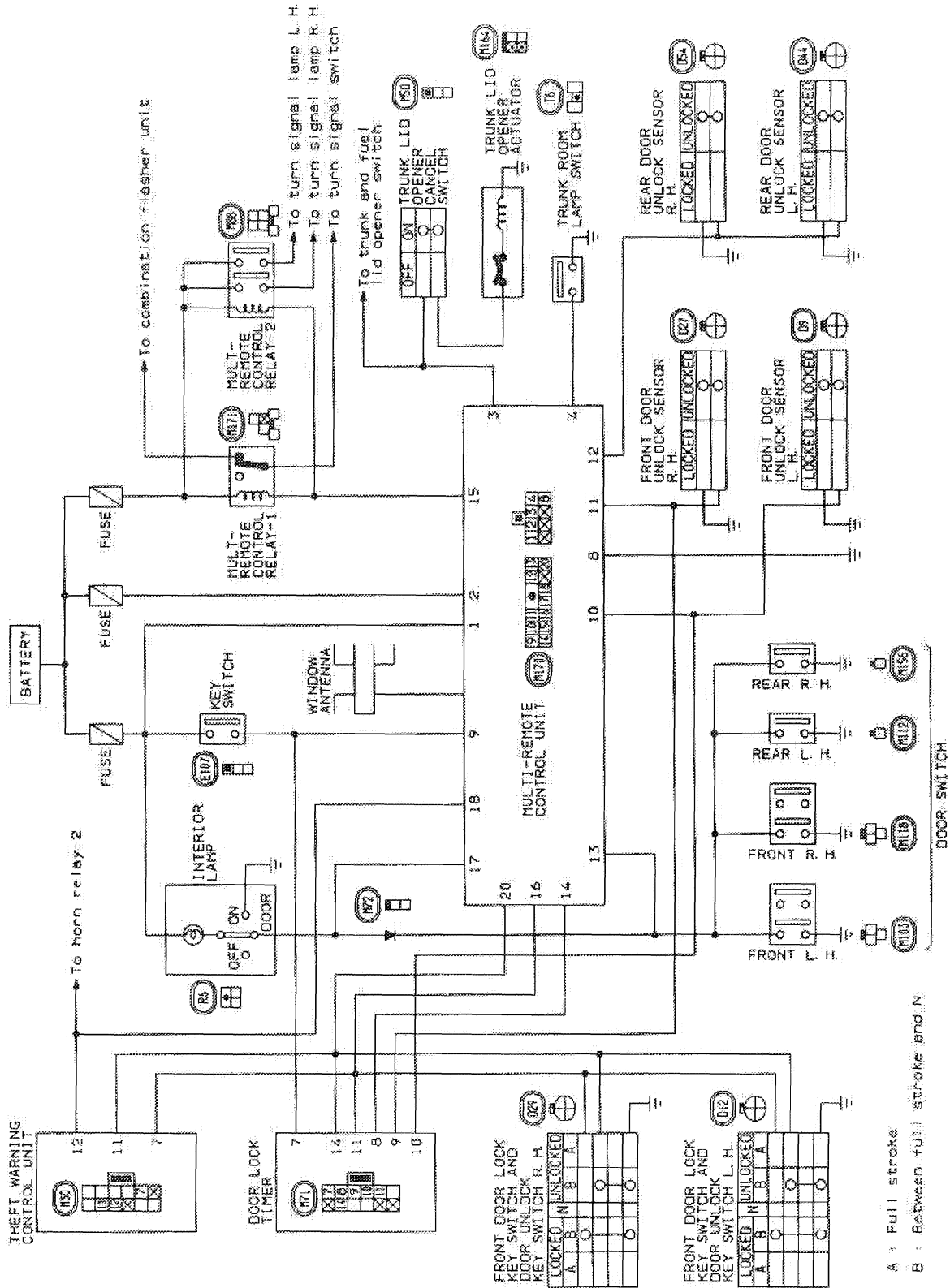
MULTI-REMOTE CONTROL SYSTEM

Wiring Diagram (Cont'd)



MULTI-REMOTE CONTROL SYSTEM

Circuit Diagram for Quick Pinpoint Check

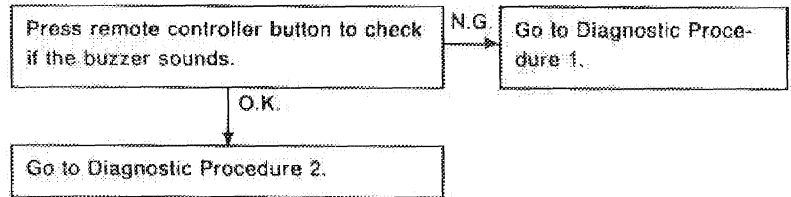


MULTI-REMOTE CONTROL SYSTEM

Trouble Diagnoses Preliminary Inspection

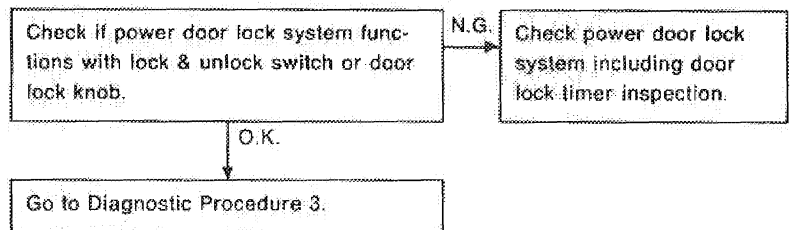
PRELIMINARY INSPECTION PROCEDURE 1

All functions of multi remote control system do not function.



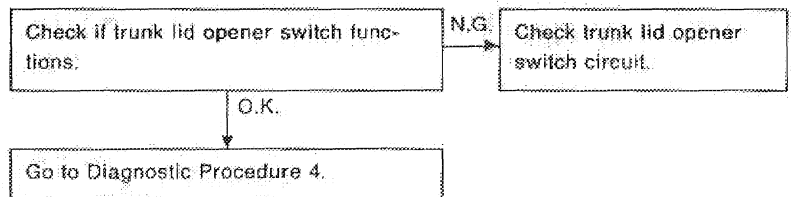
PRELIMINARY INSPECTION PROCEDURE 2

Door lock and unlock do not function.



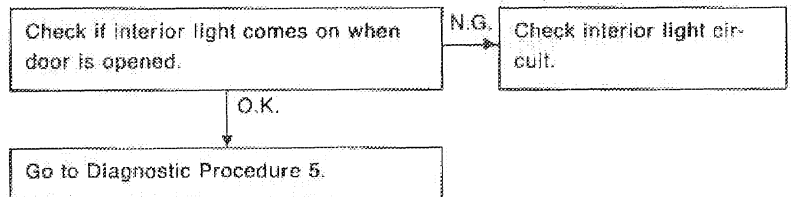
PRELIMINARY INSPECTION PROCEDURE 3

Trunk lid open function does not function.



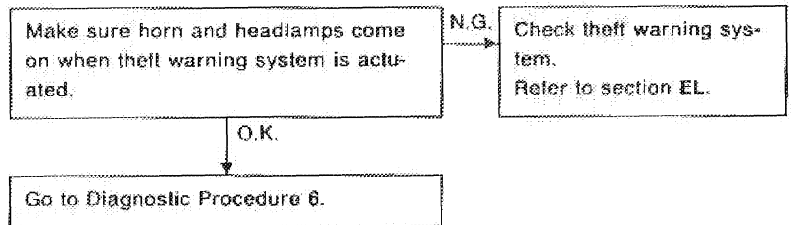
PRELIMINARY INSPECTION PROCEDURE 4

Interior light does not function.



PRELIMINARY INSPECTION PROCEDURE 5

Panic alarm does not function.

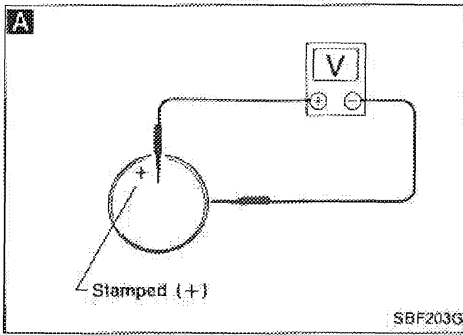


MULTI-REMOTE CONTROL SYSTEM

Trouble Diagnoses

DIAGNOSTIC PROCEDURE 1

Remote controller buzzer does not sound when the button is pressed.



CHECK REMOTE CONTROLLER BATTERY.

Remove battery and measure voltage across battery positive and ground terminals ⊕ and ⊖.

Measuring terminal		Standard value
⊕	⊖	
Battery positive terminal ⊕	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.

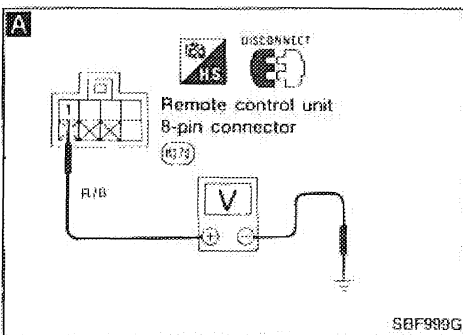
O.K. → Check system operation.

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.

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.

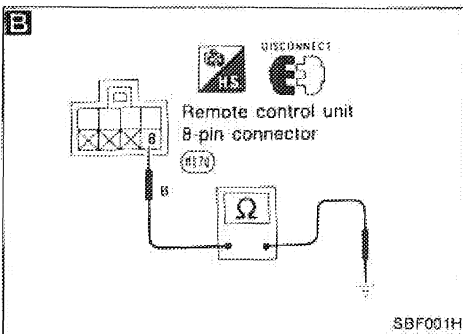
O.K.

- Check continuity between terminal ⑧ and GND.
- Continuity should exist.

N.G. → Check GND harness.

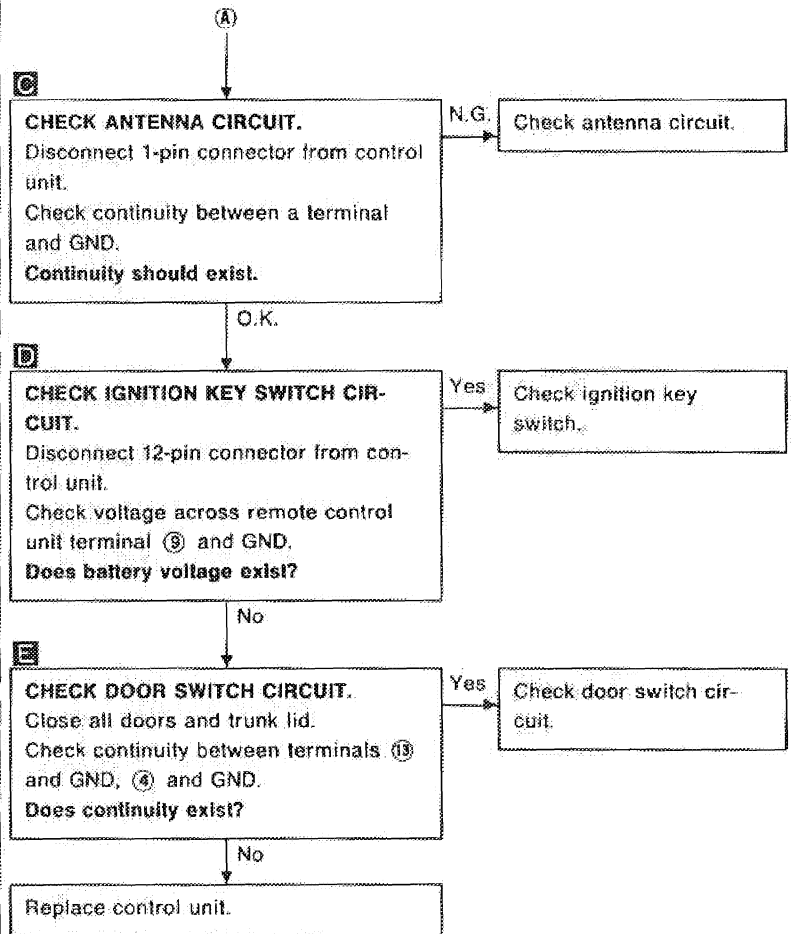
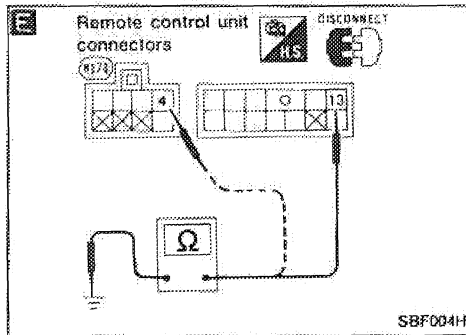
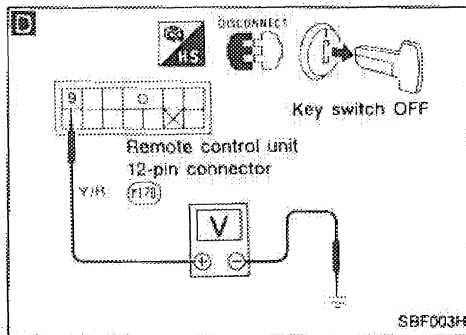
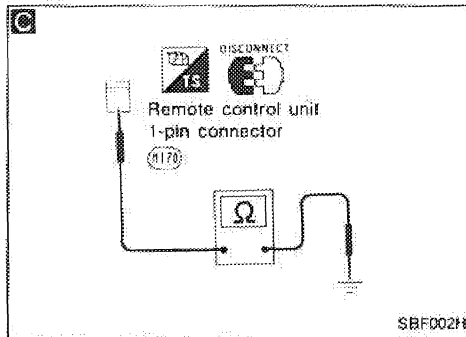
O.K.

Ⓐ



MULTI-REMOTE CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

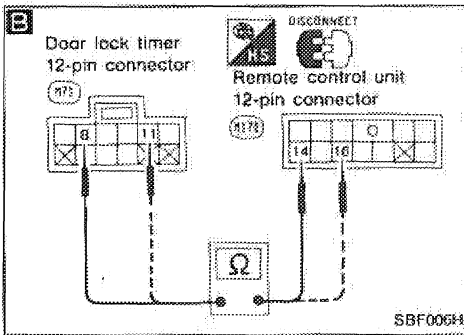
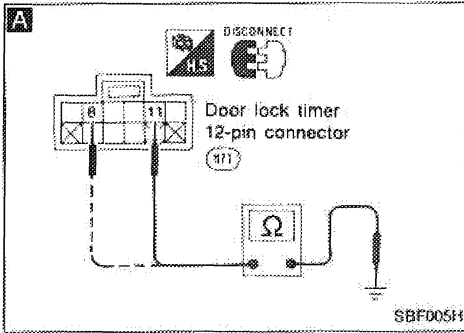


MULTI-REMOTE CONTROL SYSTEM

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. ↓

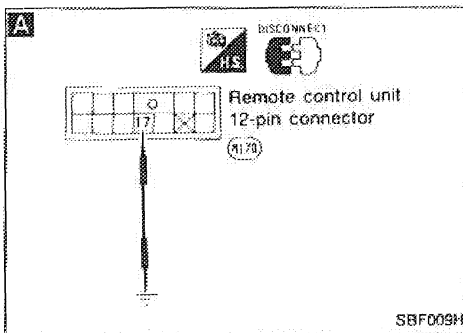
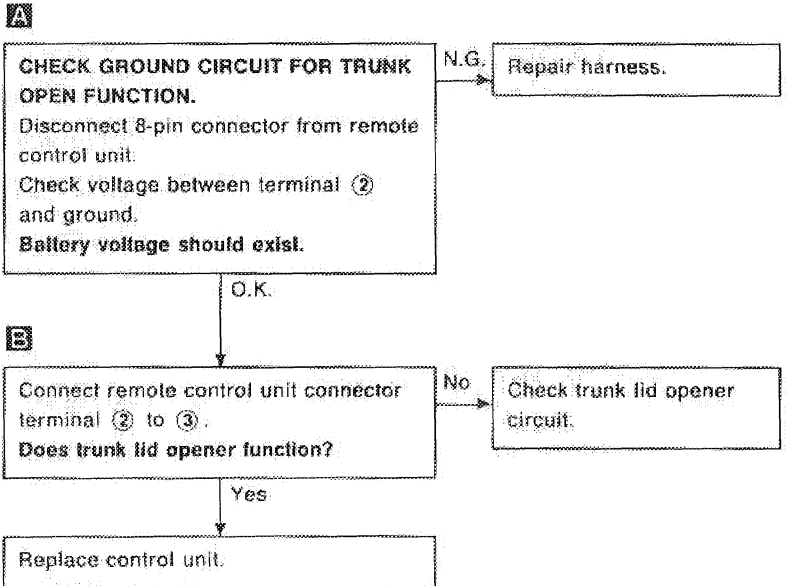
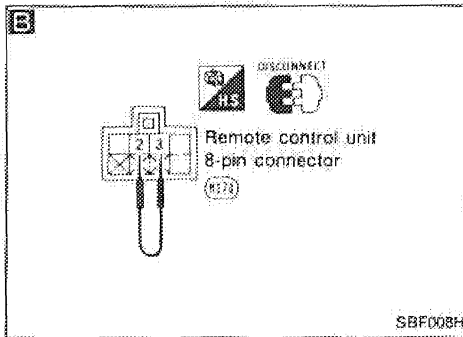
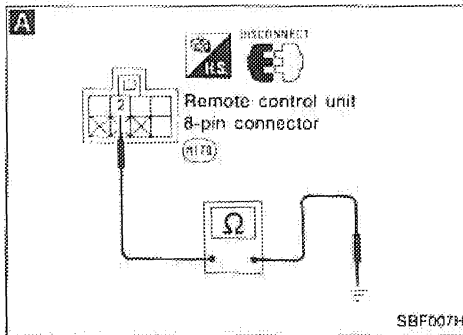
Replace multi remote control unit.

MULTI-REMOTE CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

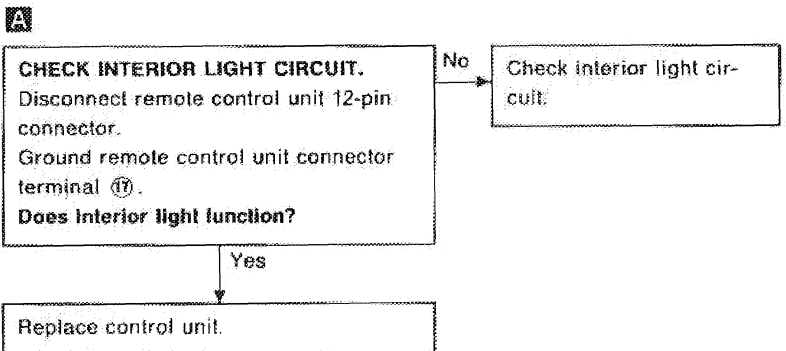
DIAGNOSTIC PROCEDURE 4

Trunk lid open remote control does not function. Everything else does function.



DIAGNOSTIC PROCEDURE 5

Interior light does not function. Everything else does function.

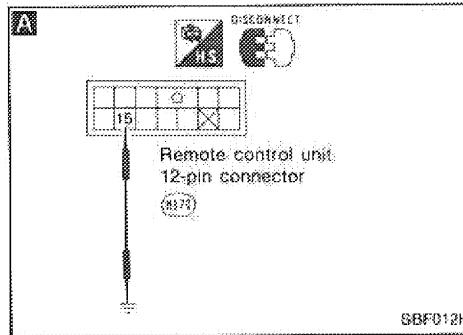
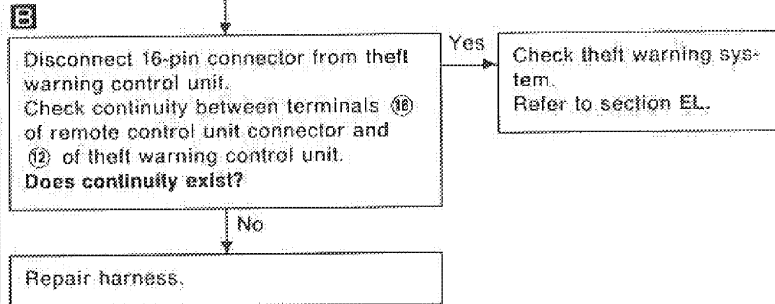
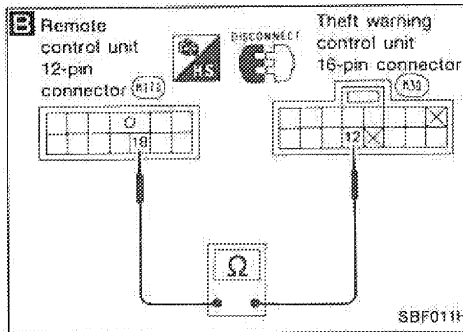
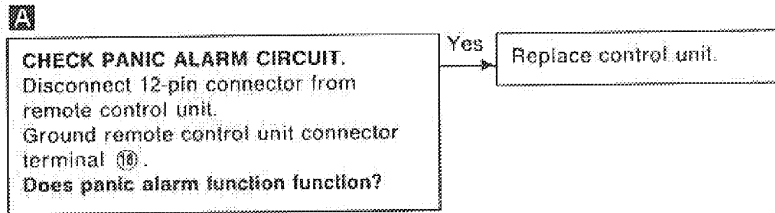
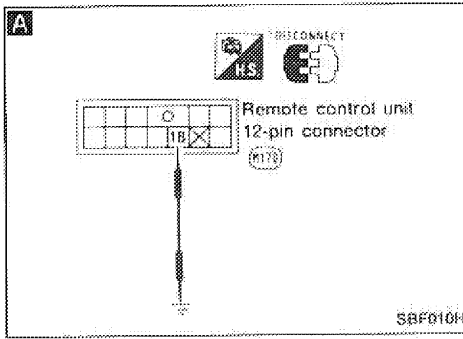


MULTI-REMOTE CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

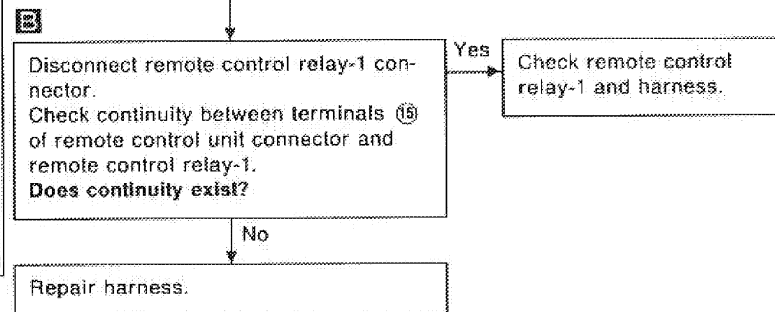
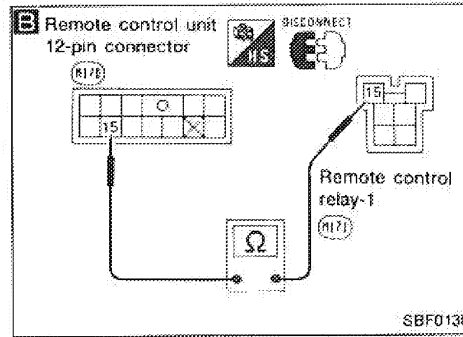
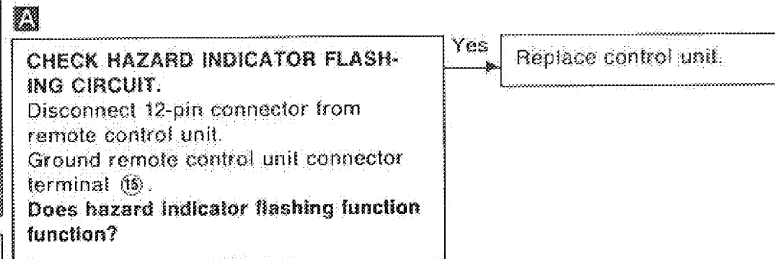
DIAGNOSTIC PROCEDURE 6

Panic alarm function does not function. Everything else does function.



DIAGNOSTIC PROCEDURE 7

Hazard indicator flashing does not function. Everything else does function.

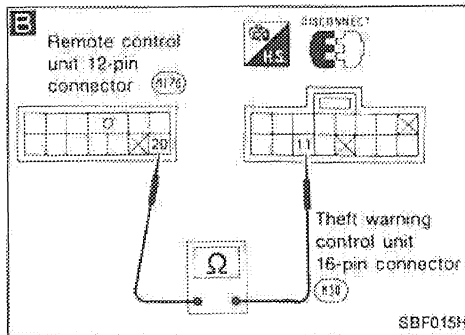
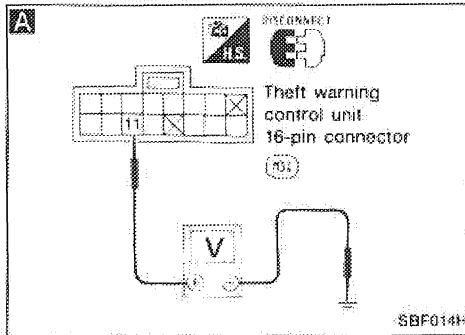


MULTI-REMOTE CONTROL SYSTEM

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.

MULTI-REMOTE CONTROL SYSTEM

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.

INSTRUMENT PANEL

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.

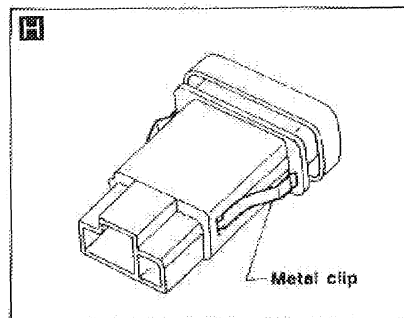
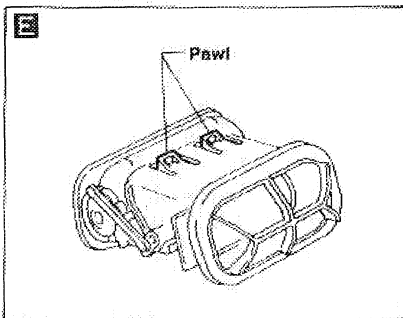
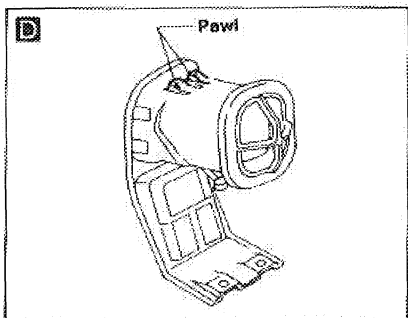
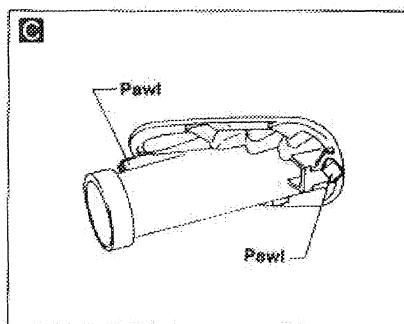
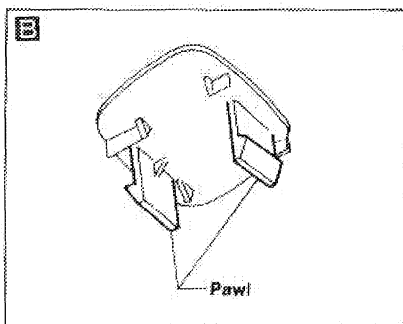
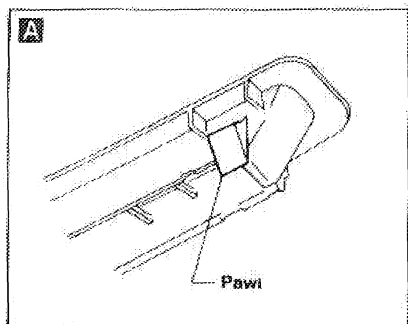
REMOVAL — Instrument panel assembly

Pay attention so as not to scratch the parts (plastic). During installation, fit the ducting parts precisely.

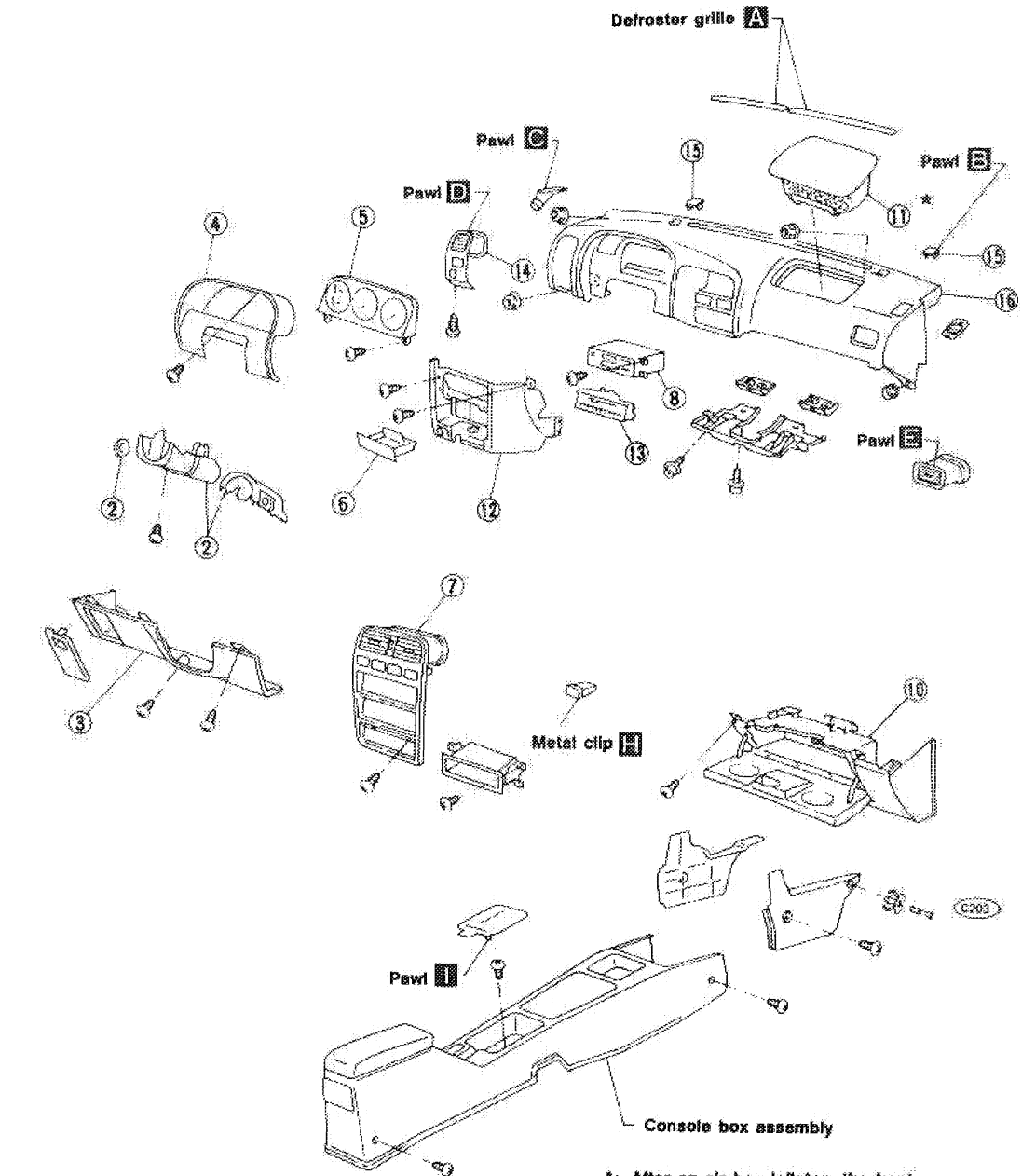
- ① Remove steering wheel. Disengage air bag system in advance.
- ② Remove lower and upper column cover.
- ③ Remove lower instrument panel on driver side.
- ④ Remove cluster lid A.
- ⑤ Remove meters.
- ⑥ Remove ashtray inner case.
- ⑦ Remove cluster lid C.
- ⑧ Remove audio system parts.
- ⑨ Remove front 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

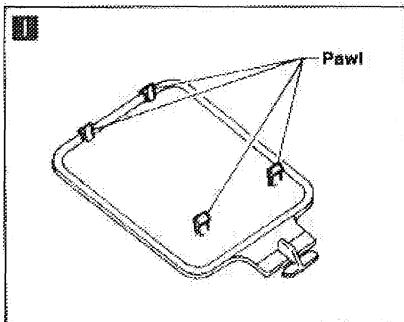
Reverse the procedures described above.



INSTRUMENT PANEL



*: After an air bag inflates, the front instrument panel assembly should be replaced.



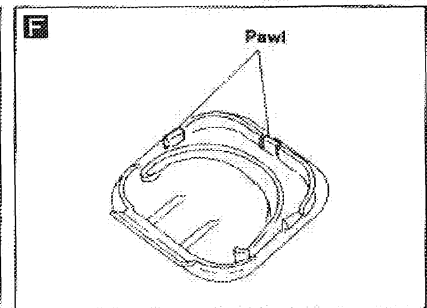
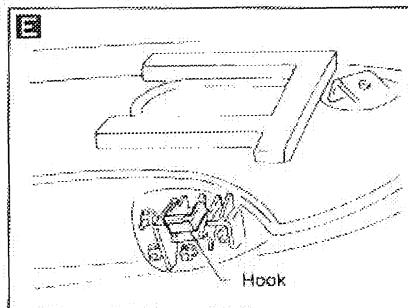
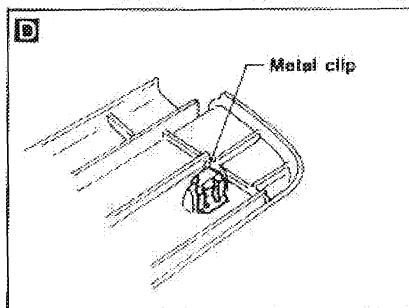
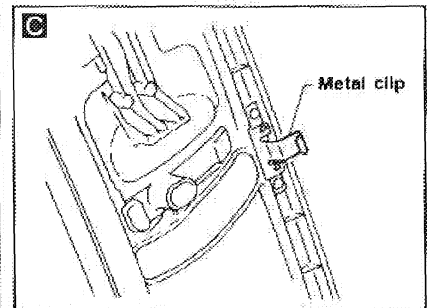
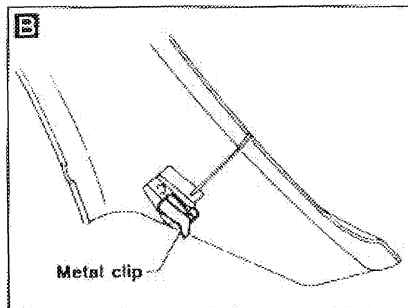
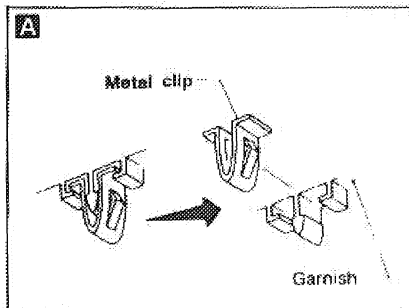
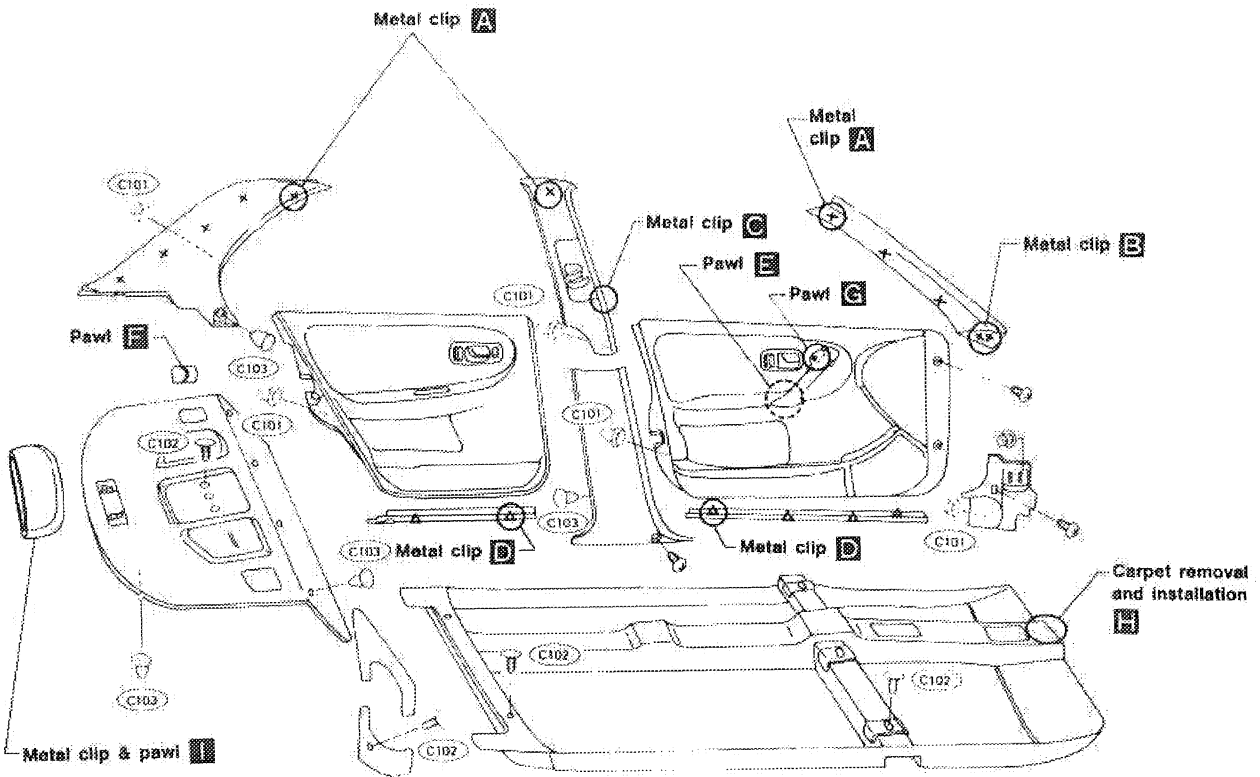
INTERIOR AND EXTERIOR

Interior

SIDE AND FLOOR TRIM — Passenger room

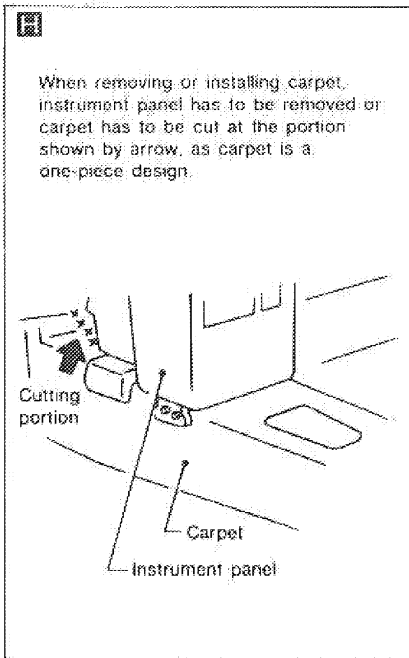
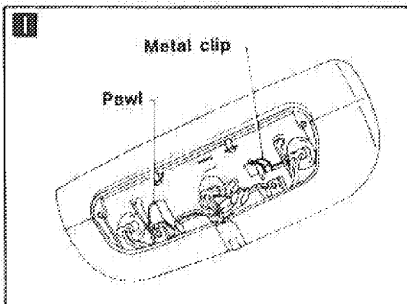
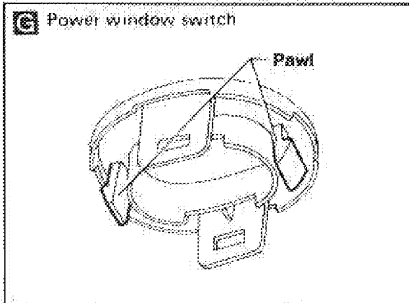
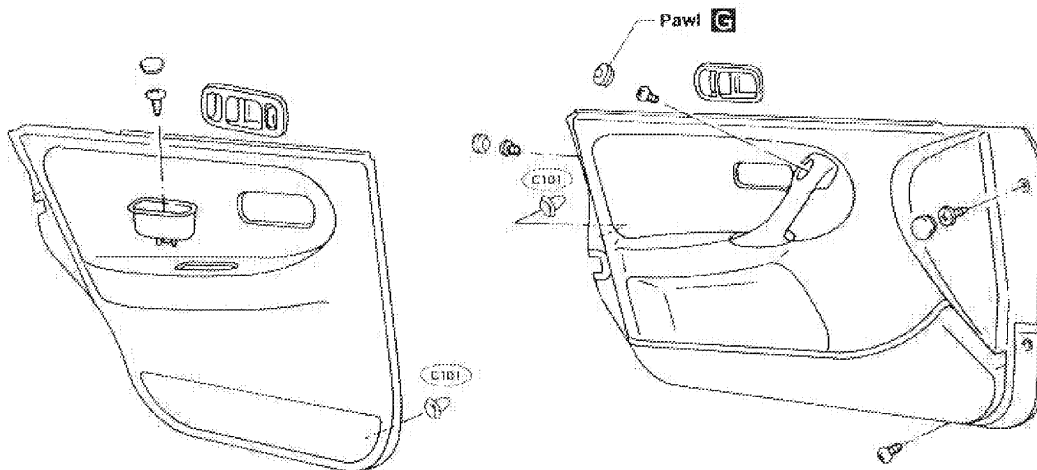
CAUTION:

- 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 **A**.
- Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.



INTERIOR AND EXTERIOR

Interior (Cont'd)



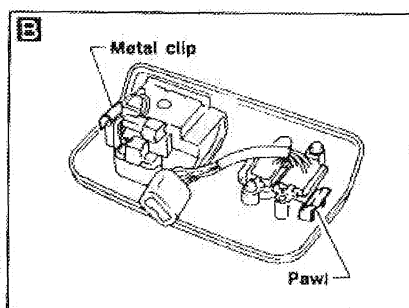
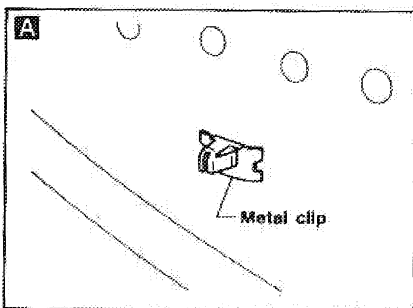
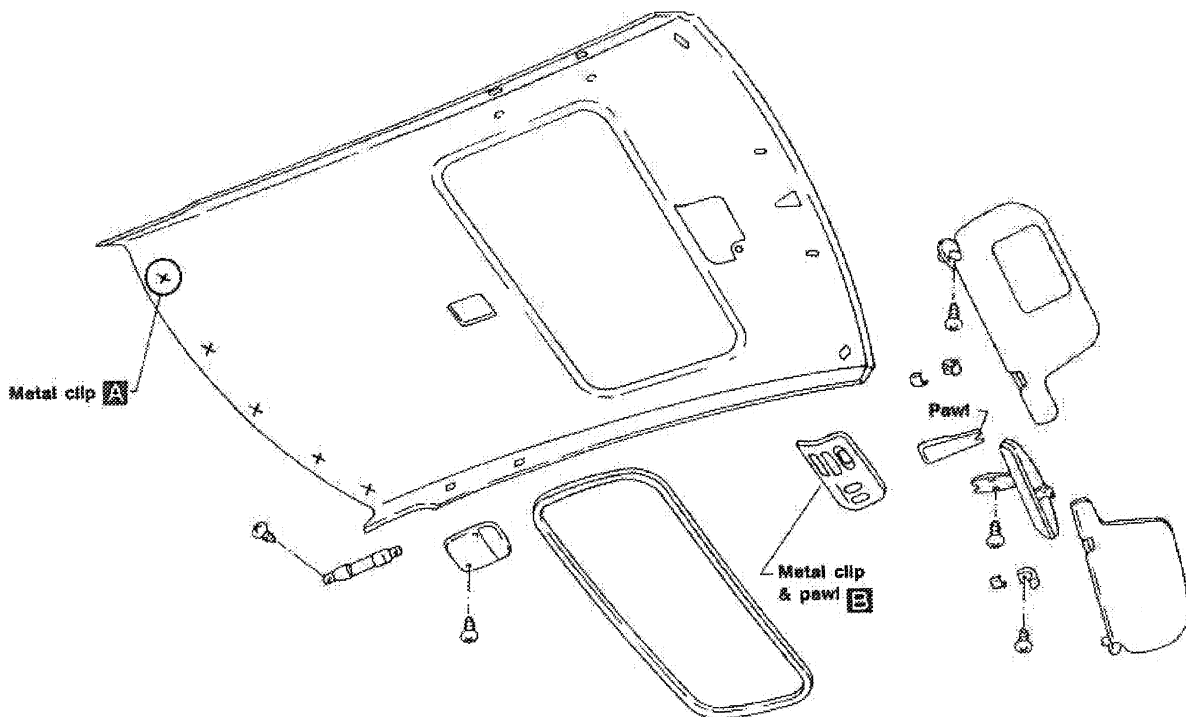
INTERIOR AND EXTERIOR

Interior (Cont'd)

ROOF TRIM

Removal — headlining cloth

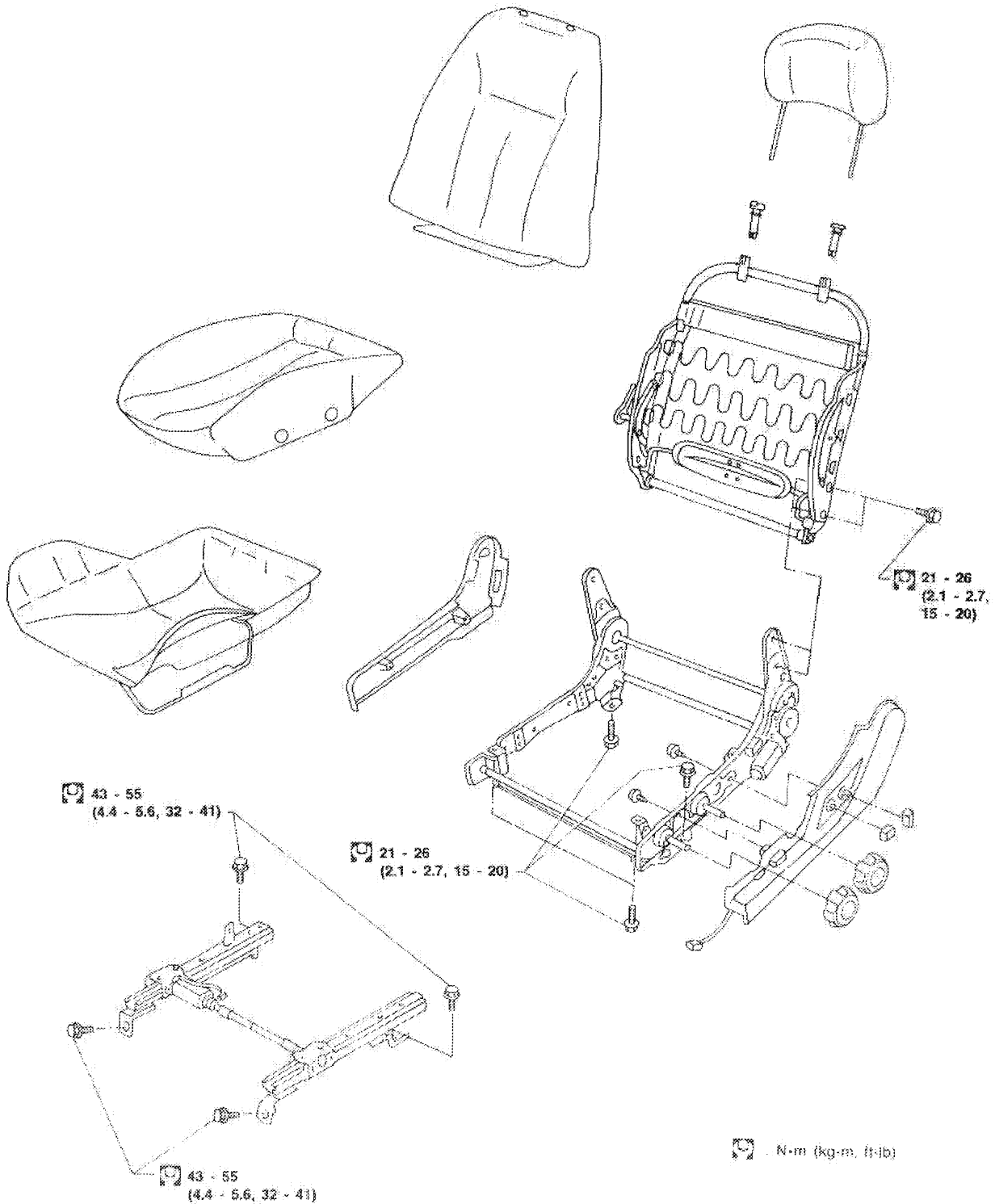
- Fully recline both front seats for easy access. Remove headlining through front passenger door.
- 1. Remove sunvisor, assist straps, room lamps and inside mirror.
- 2. Remove body side welts.
- 3. Remove front pillar garnishes, center pillar garnishes, rear quarter garnishes and roof finishers.
- 4. Remove clips and headlining cloth.



SEAT

- When removing or installing the seat trim, carefully handle it to keep dirt out and avoid damage.

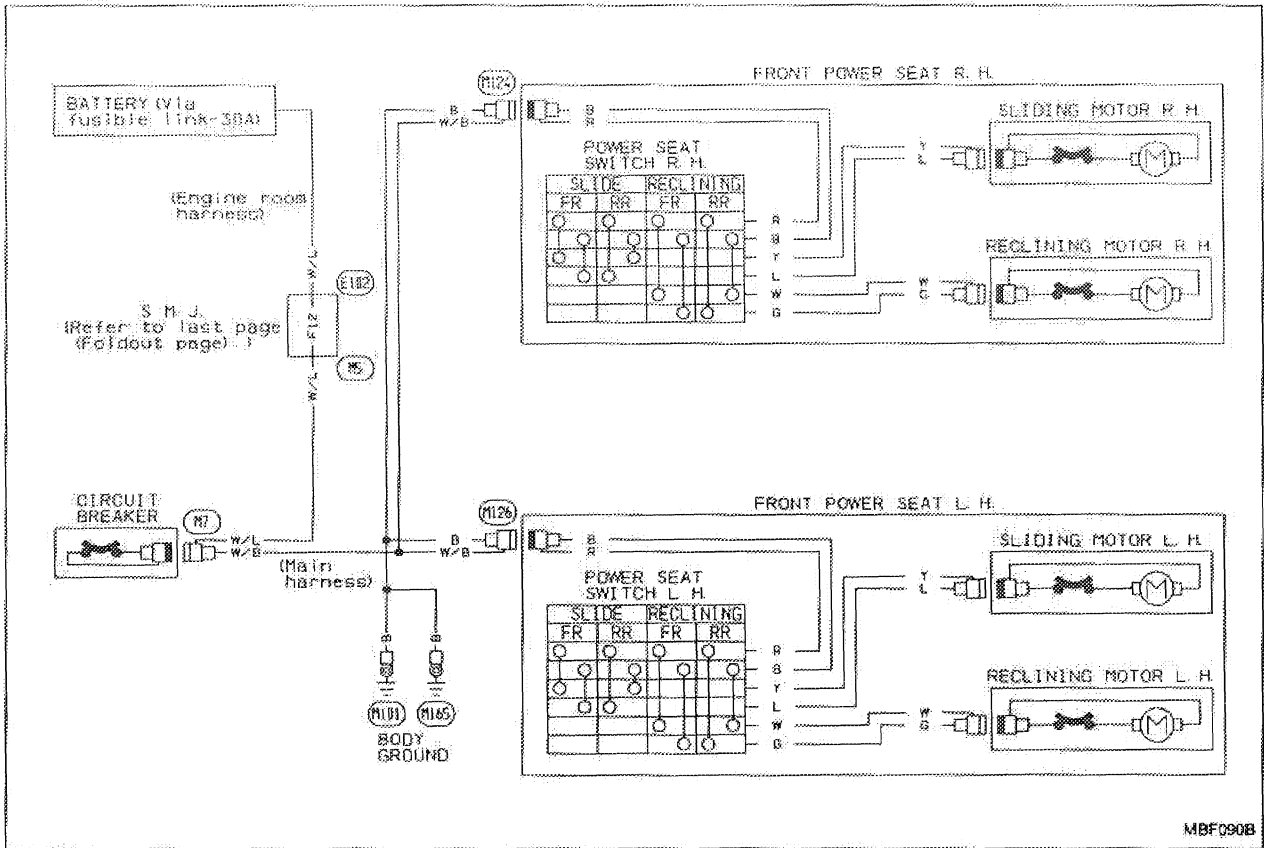
Front Seat



SEAT

Front Seat (Cont'd)

POWER SEAT/WIRING DIAGRAM

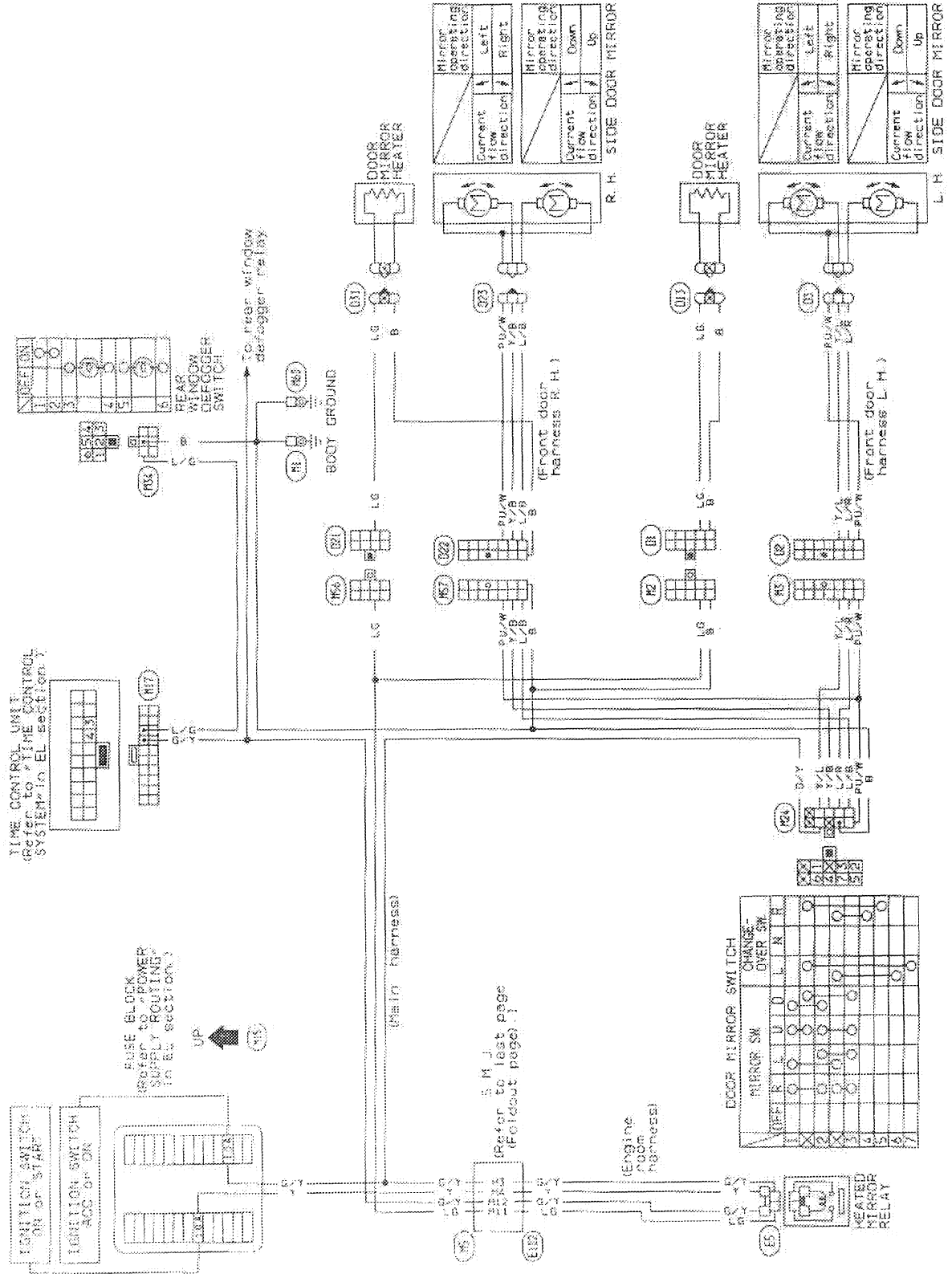


MIRROR

Door Mirror (Cont'd)

WIRING DIAGRAM

With heated mirror

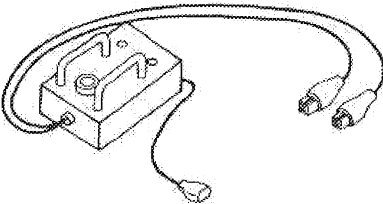


SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

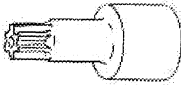

Precautions for SRS "Air Bag" and "Seat Belt Pre-tensioner" Service

- 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

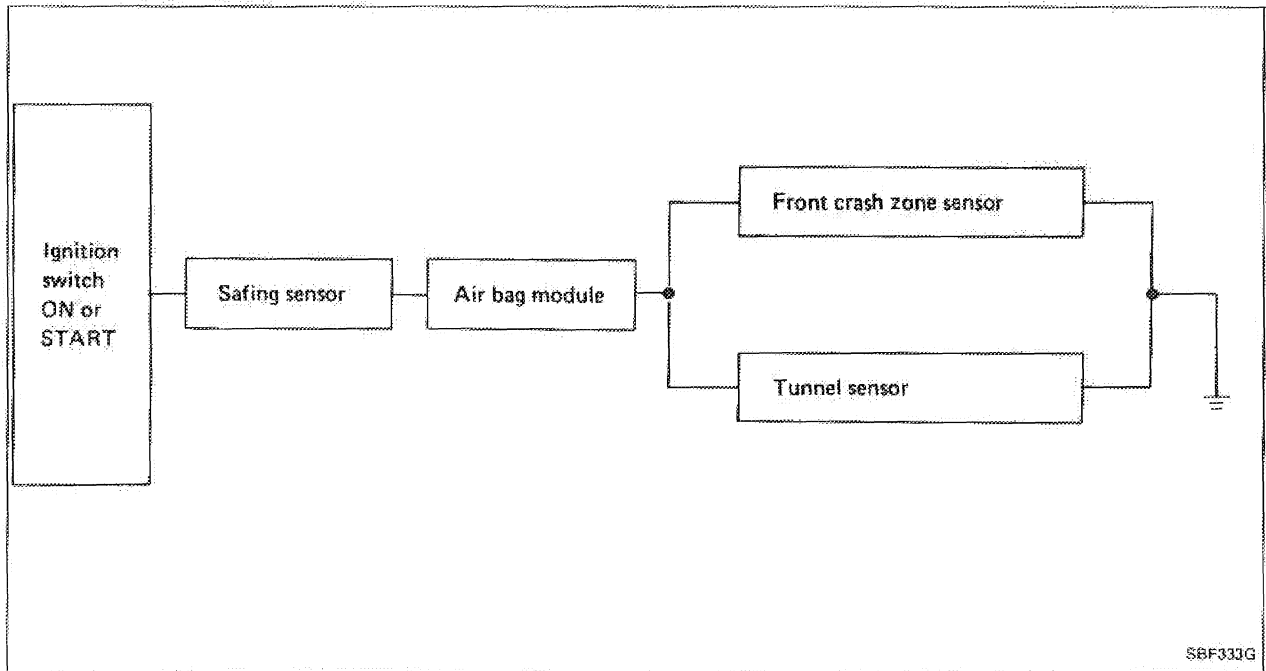
- When laying aside a single pre-tensioner (belt assembly), make sure cylinder tip does not point towards a person. Always place pre-tensioner in a box if possible. (If pre-tensioner should go off accidentally, rubber cap will jump out of cylinder tip, blowing out high temperature gas.)

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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

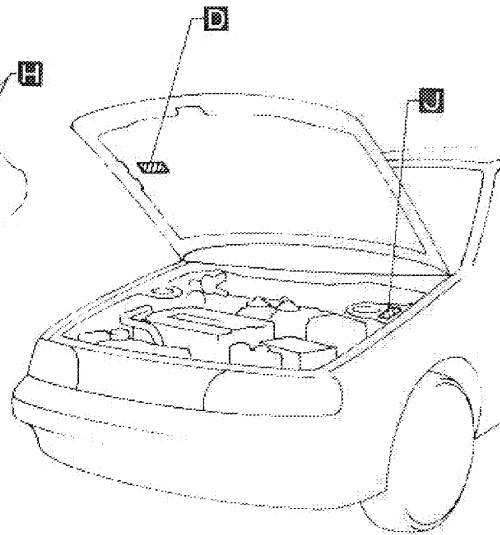
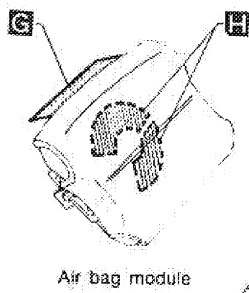
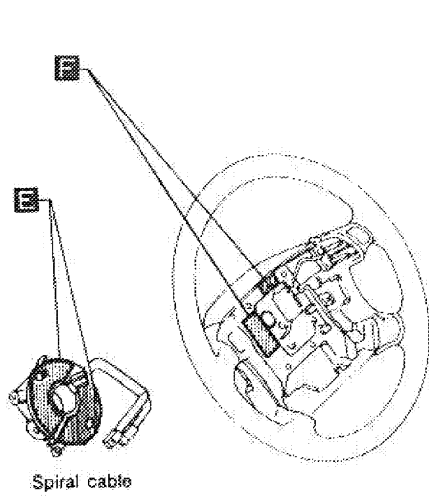
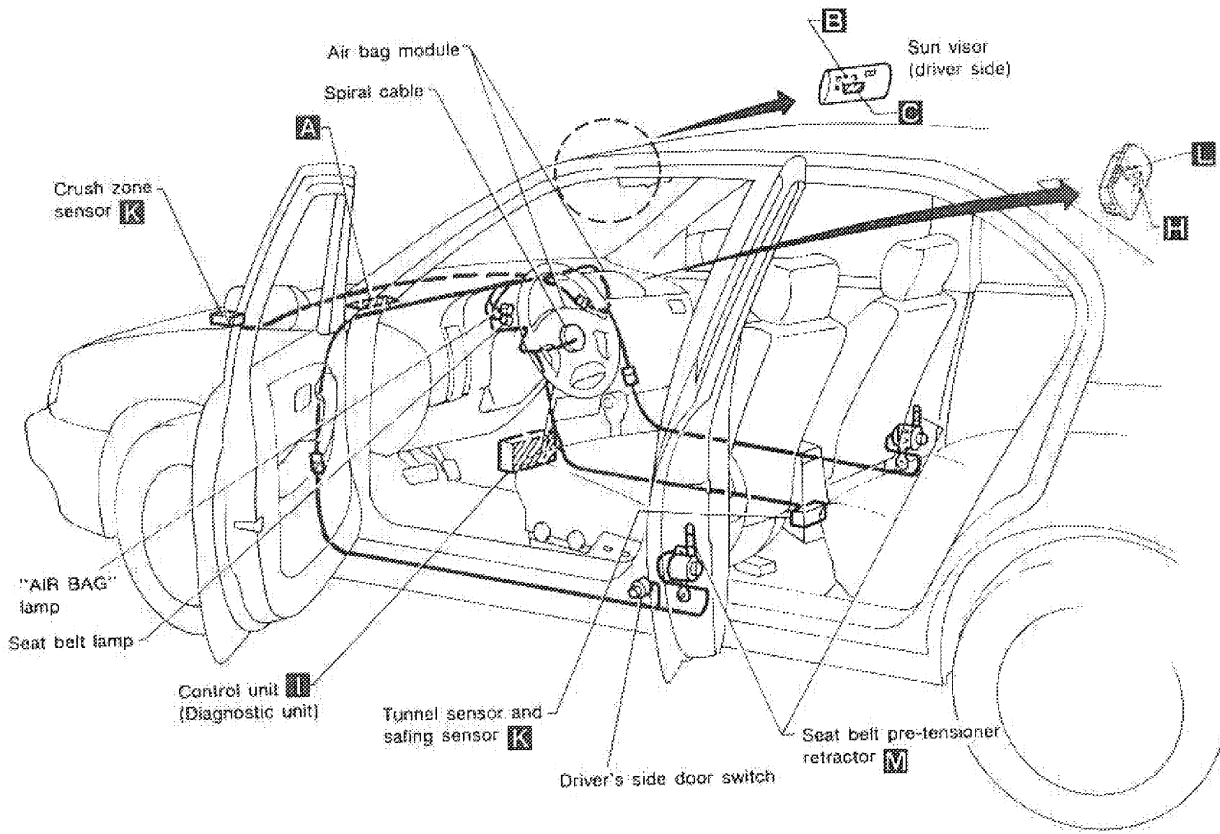


Self-diagnosis

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.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

SRS Component Parts Location



SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

Caution Labels (Cont'd)

C

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.

D

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.

E

CAUTION SRS AIRBAG

- TO AVOID DAMAGING THE S.R.S. SPIRAL CABLE, REMOVE THE STEERING WHEEL BEFORE REMOVING THE STEERING LOWER JOINT.

F

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.

G

WARNING

SRS AIRBAG

- DO NOT DISASSEMBLE OR TAMPER.
- DISMANTLING AND INSTALLATION SHOULD ONLY BE PERFORMED BY TRAINED PERSONNEL.

H

WARNING

SRS AIRBAG

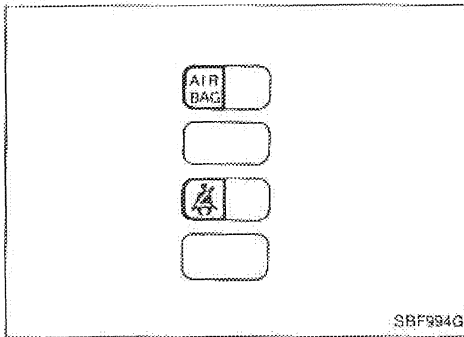
- THIS AIRBAG MODULE CANNOT BE REPAIRED. SEE SERVICE MANUAL FOR INSTRUCTIONS (ON DIAGNOSIS AND REPLACEMENT).
- DO NOT DIAGNOSE ELECTRICALLY POWERED TEST EQUIPMENT OR PROBING DEVICES.
- TAMPERING OR MISHANDLING CAN RESULT IN PERSONAL INJURY.
- STORE THE REMOVED AIRBAG MODULE WITH THE PAD OR COVER SURFACE UP. (REFER TO SERVICE MANUAL FOR SPECIAL HANDLING OR STORAGE.)

I

DANGER

- DO NOT REMOVE, IMPACT OR DISASSEMBLE.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)



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:

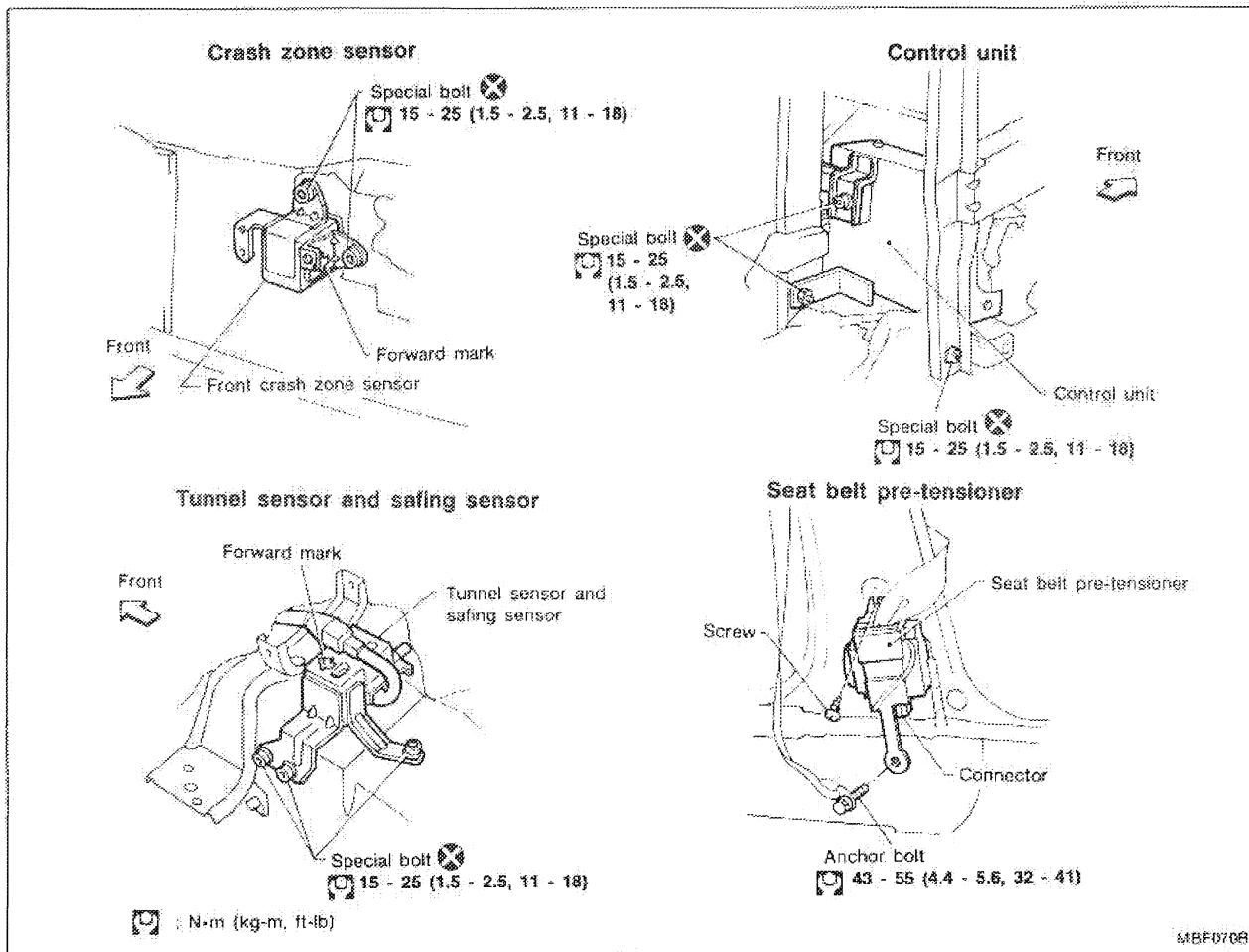
Replace previously used screws with new ones.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

Removal and Installation — Control Unit, Sensors and Seat Belt Pre-tensioner

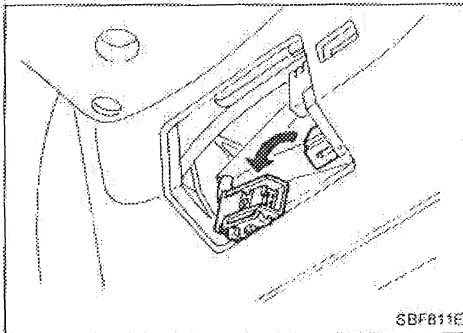
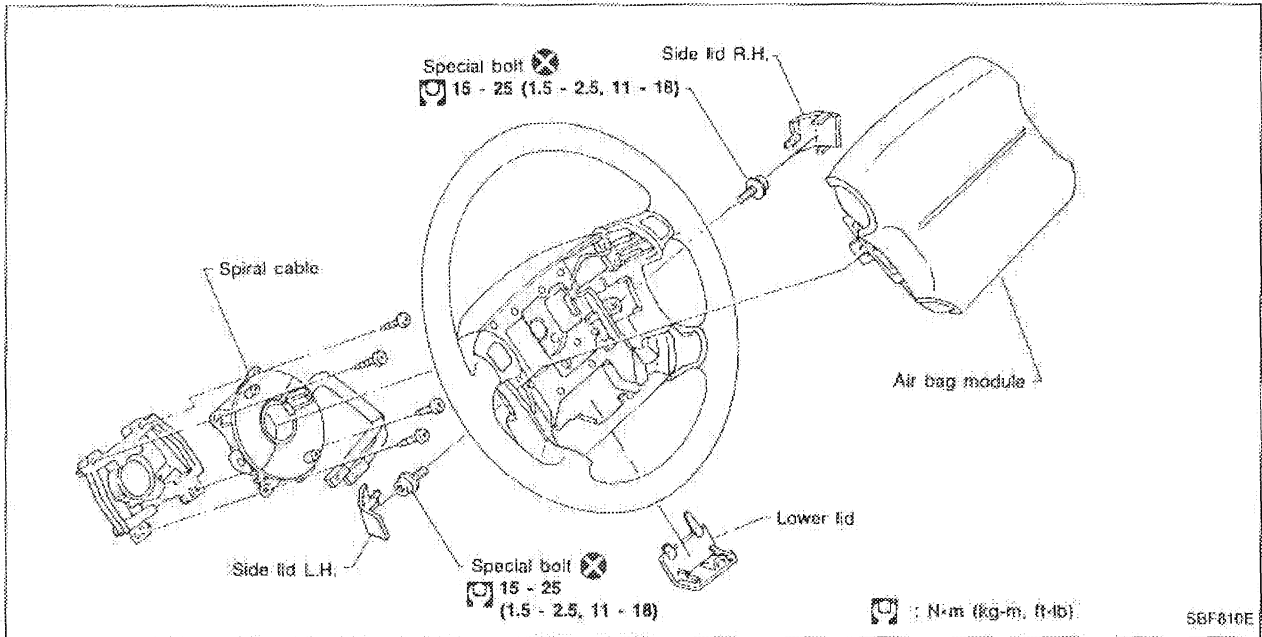
CAUTION:

- 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.



SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

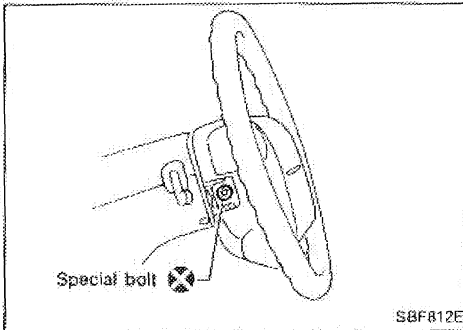
Removal — Air Bag Module and Spiral Cable



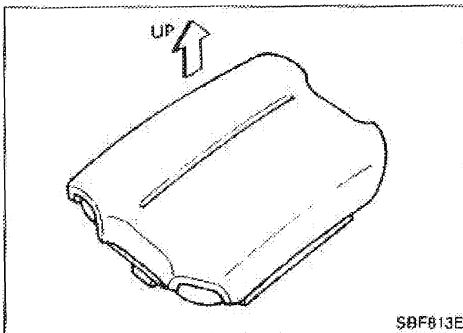
CAUTION:

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.

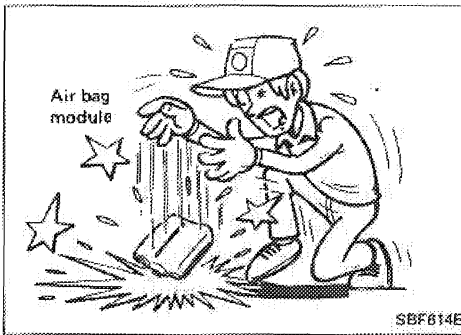


CAUTION:

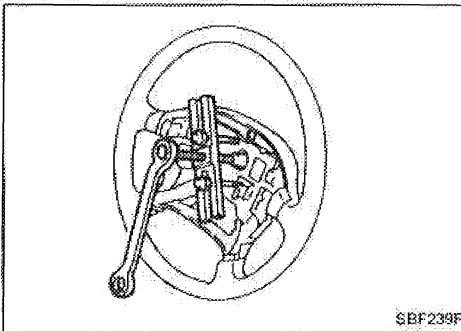
- Always place air bag module with pad side facing upward.
- Do not attempt to disassemble air bag module.
- The special bolts are coated with bonding agent. Discard old ones after removal; replace with new ones.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

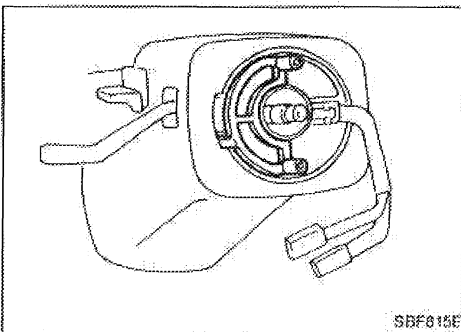
Removal — Air Bag Module and Spiral Cable (Cont'd)



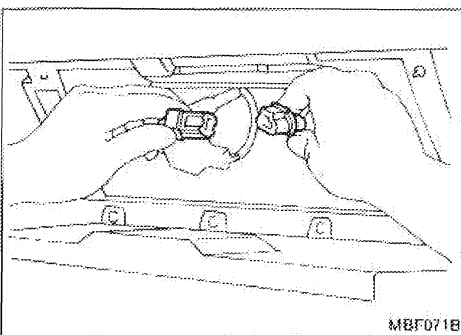
- Do not drop or impact air bag module. If any portion is deformed or cracked, replace the module.
- Do not expose the air bag module to temperatures exceeding 100°C (212°F).
- Do not allow oil, grease or water to come in contact with the air bag module.



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.

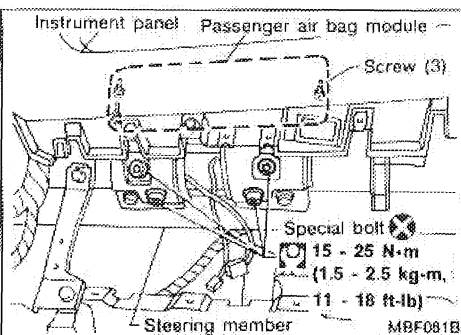


Removal — Front Passenger Air Bag Module

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.



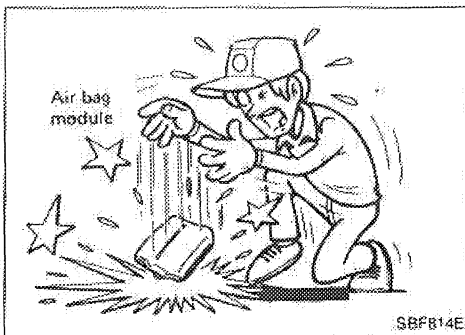
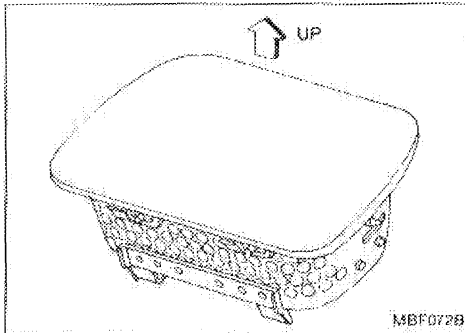
3. Remove cluster lid C.
4. Remove audio system parts.
5. Remove lower side of instrument panel (including glove box and lid).
6. Remove two special bolts (one on each side of front passenger air bag module) and four screws securing air bag module to instrument panel, then remove air bag module.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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.

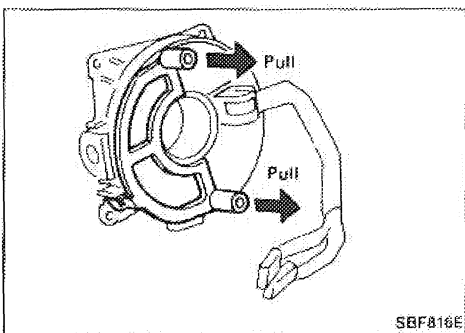


- Do not drop or impact air bag module. If any portion is deformed or cracked, replace the module.
- Do not expose the air bag module to temperatures exceeding 100°C (212°F).
- Do not allow oil, grease or water to come in contact with the air bag module.

Installation — Air Bag Module and Spiral Cable

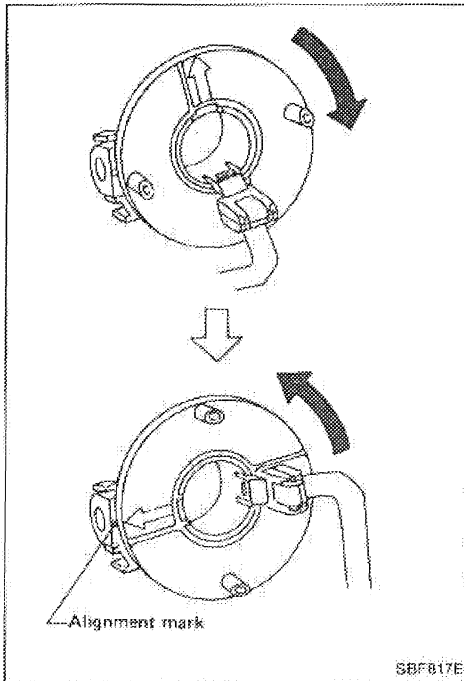
1. Connect spiral cable connector and tighten with screws. Install steering column cover.

2. Remove stopper by pulling two pin guides:

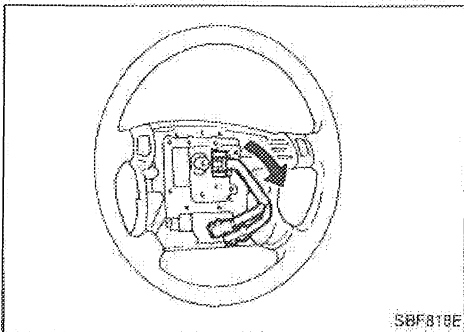


SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

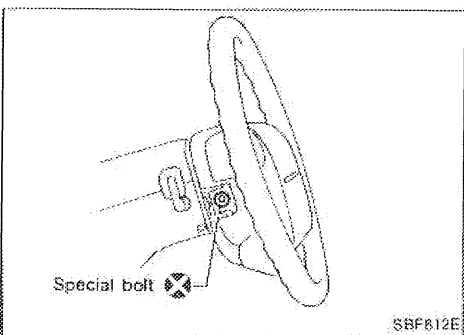
Installation — Air Bag Module and Spiral Cable (Cont'd)



- 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.



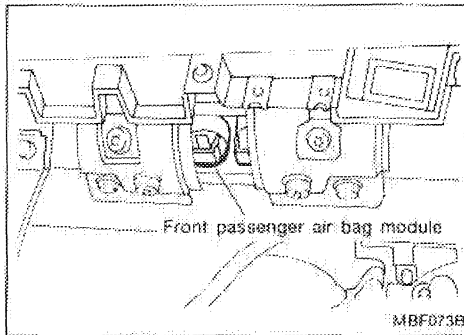
3. Install steering wheel setting spiral cable pin guides, and pull spiral cable through.
4. Connect horn connector and engage spiral cable with pawls in steering wheel.
5. Tighten nuts.



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.)

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)



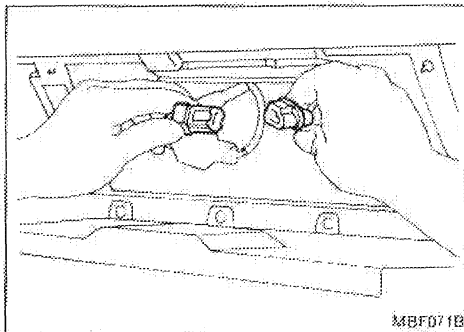
Installation — Front Passenger Air Bag Module

1. Install air bag module to steering member and instrument panel.

CAUTION:

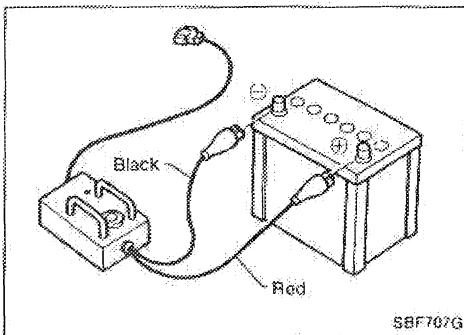
Make sure harness is not caught between rear of air bag module and steering member.

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.



Scraping Air Bag and Seat Belt Pre-tensioners

Before scraping 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.

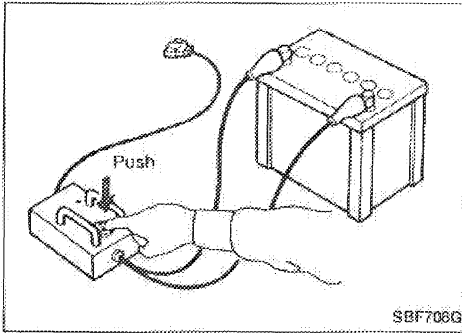
- Wait 10 to 12 minutes after the vehicle battery is disconnected before proceeding.
- Connect deployment tool to the battery.

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.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

Scrapping Air Bag and Seat Belt Pre-tensioners (Cont'd)



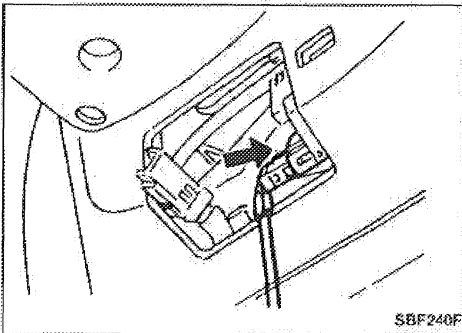
DEPLOYMENT TOOL CHECK

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

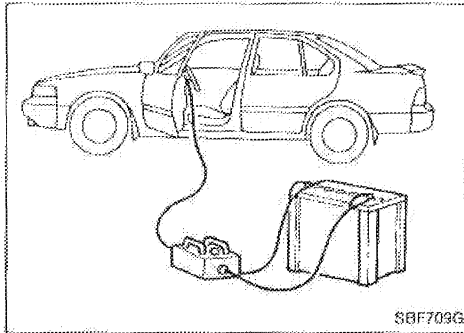
- Disconnect the prepared battery cable.
- Also disconnect the vehicle battery ground cable and wait 10 minutes.
- Disconnect air bag module and seat belt pre-tensioner connector.
- Connect deployment tool connector to air bag module or seat belt pre-tensioner.
For front passenger air bag and seat belt 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.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)



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:

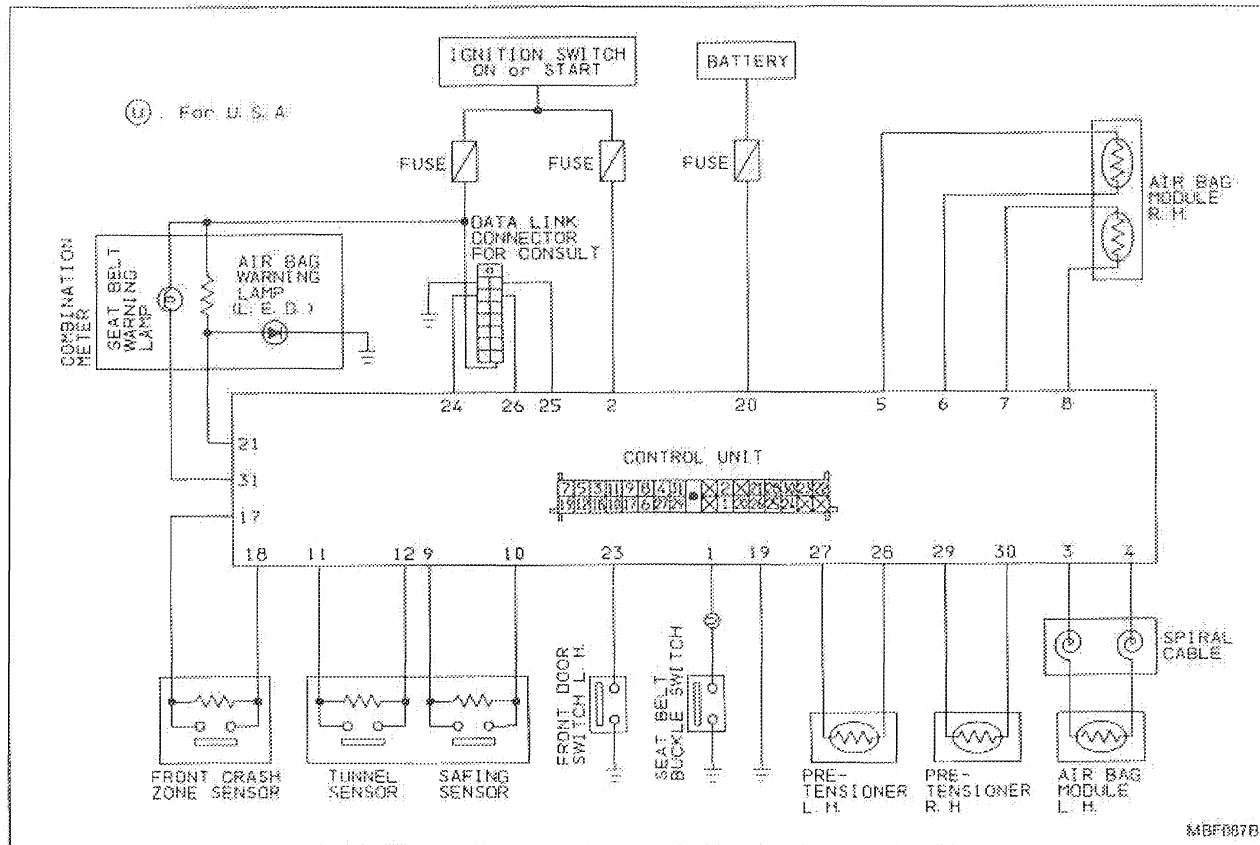
- When deploying air bag, ensure vehicle is empty.
- No poisonous gas is produced upon air bag deployment. However, be careful not to inhale gas since it irritates throat and can cause choking.
- Due to heat, leave air bag module unattended for more than 30 minutes and leave seat belt pre-tensioner unattended 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.

TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)

Contents

Schematic	BF-48
Wiring Diagram	BF-49
Self-diagnosis	
USING CONSULT	BF-50
USING THE WARNING LAMP	BF-53
Diagnostic Procedure 1	BF-56
SYMPTOM: Warning lamp flashes.	
Diagnostic Procedure 2	BF-56
SYMPTOM: Warning lamp does not come on.	
Diagnostic Procedure 3	BF-57
SYMPTOM: Warning lamp does not go off.	
Collision Diagnosis	BF-58

Schematic

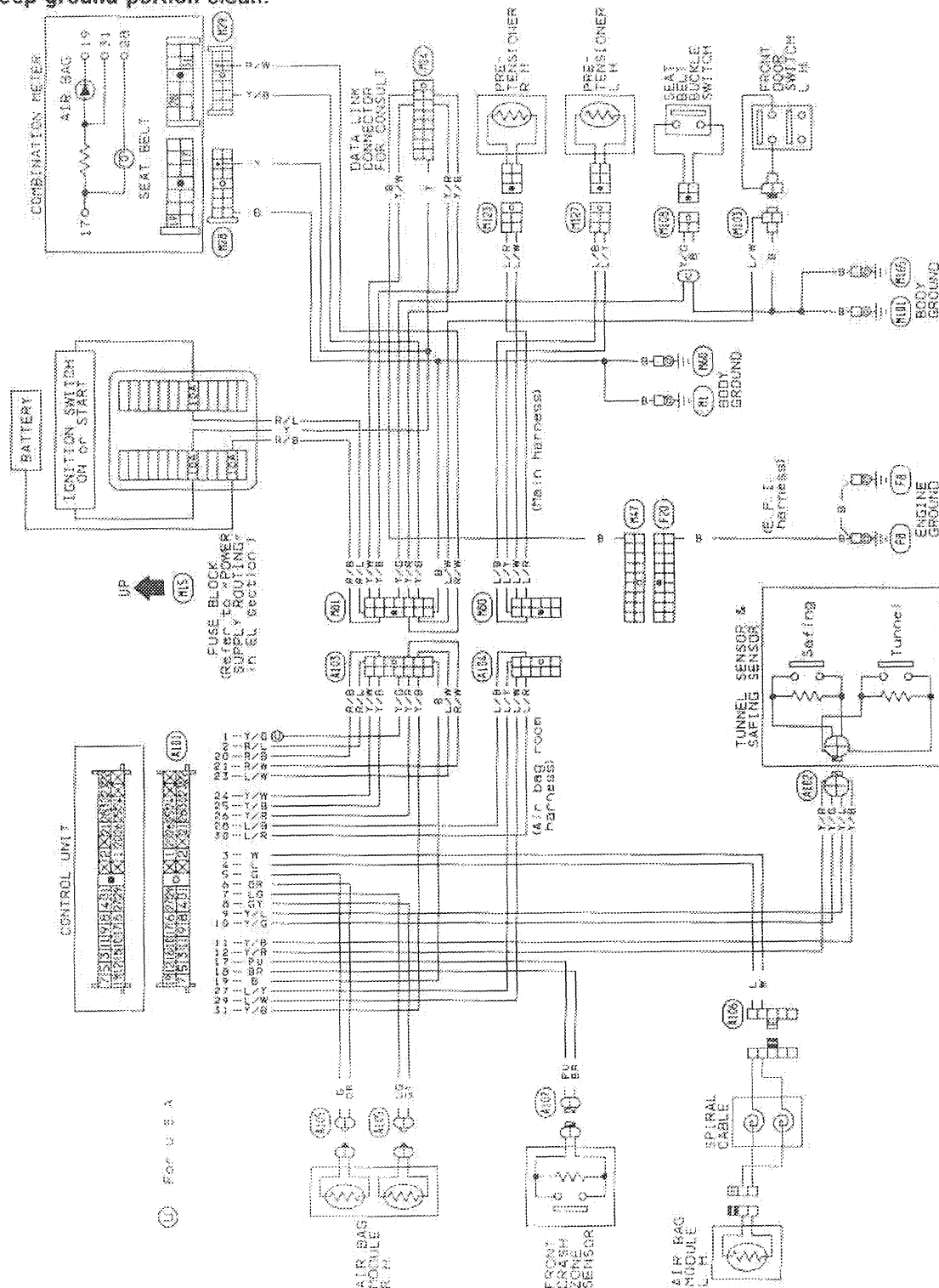


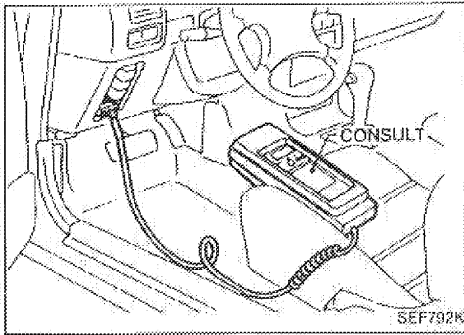
TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)

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.



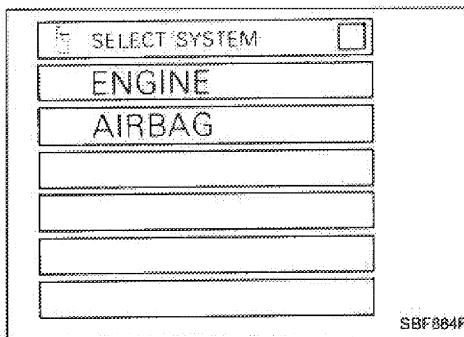


Self-diagnosis

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.



TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)

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.	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 [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.	

TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)
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)
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.	3. Replace the control unit. 4. Replace the main harness.
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.)
DRIVE PRE-TENSION [GND-SHORT]	The circuit for the driver's pre-tensioner is shorted to ground.	3. Replace the control unit. 4. Replace the main harness.
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.)
ASSIST PRE-TENSION [GND-SHORT]	The circuit for the front passenger pre-tensioner is shorted to ground.	3. Replace the control unit. 4. Replace the main harness.
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.

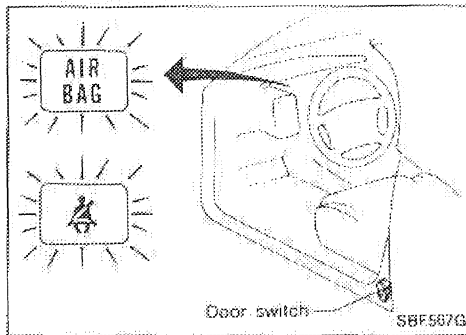
TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)

Self-diagnosis (Cont'd)

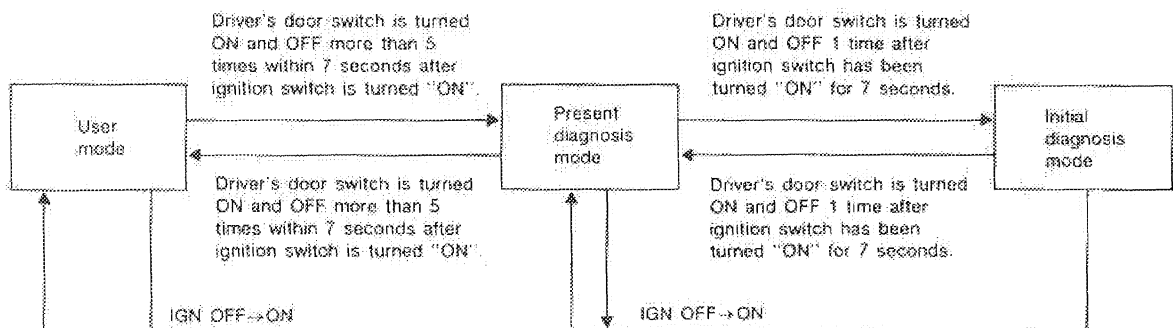
USING THE WARNING LAMP

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:



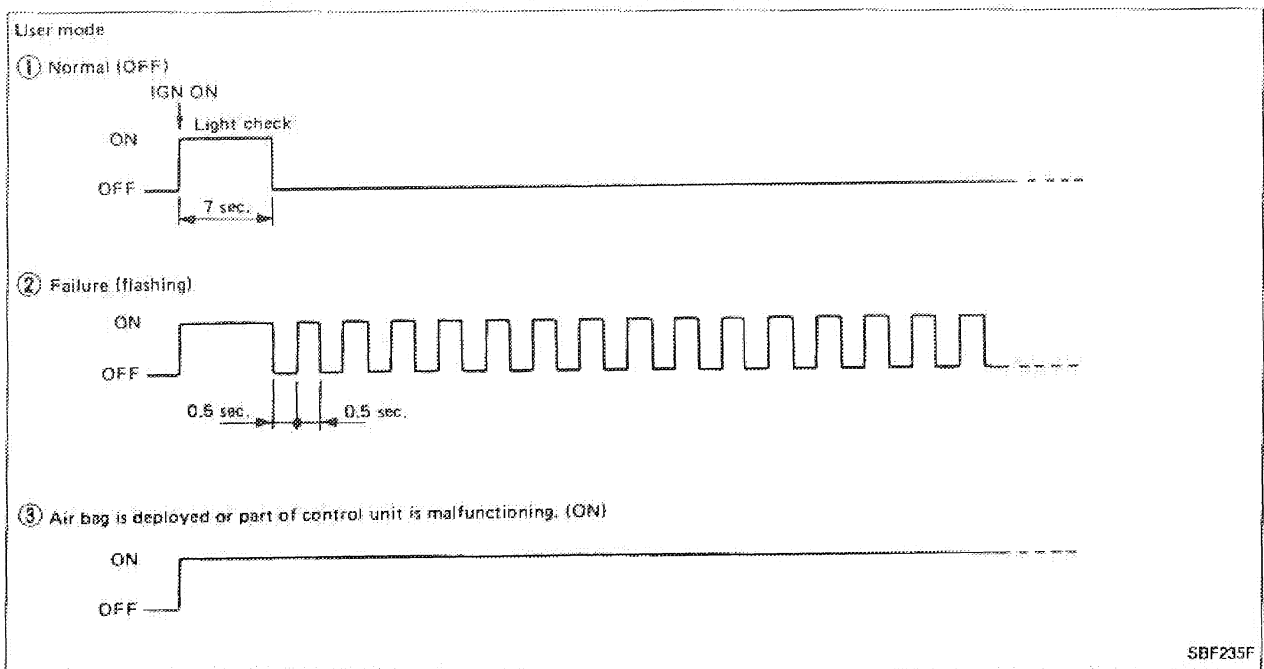
How to alternate self-diagnosis



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.

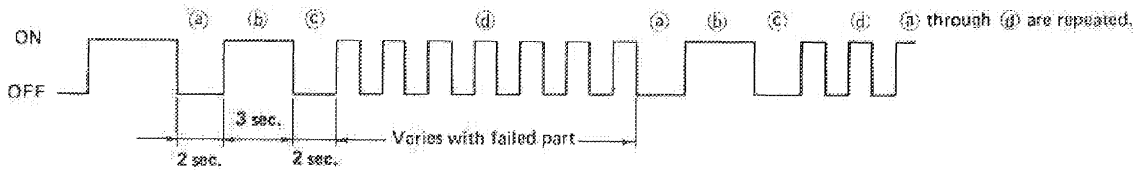


TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)

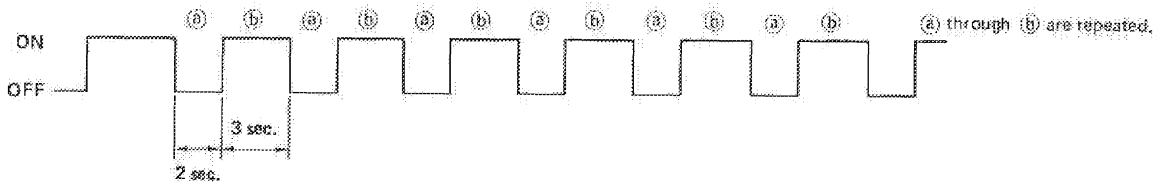
Self-diagnosis (Cont'd)

Present diagnosis mode (self-diagnosis result 1)

(b) Start signal; Start signal identifies display modes.



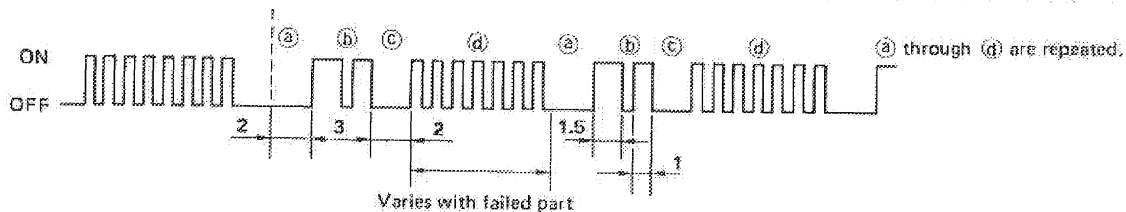
• No failure (or intermittent failure/repair completion)



SBF235F

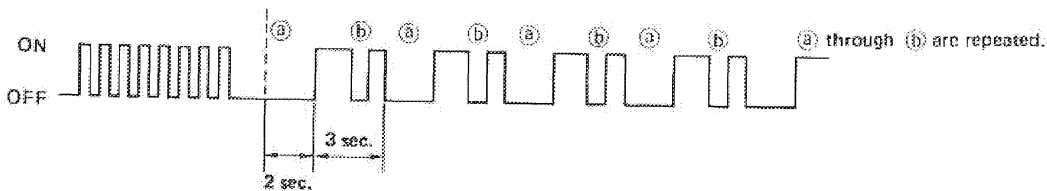
Initial diagnosis mode (self-diagnosis result 2)

(b) 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 (a). Refer to Table on next page for failed parts.

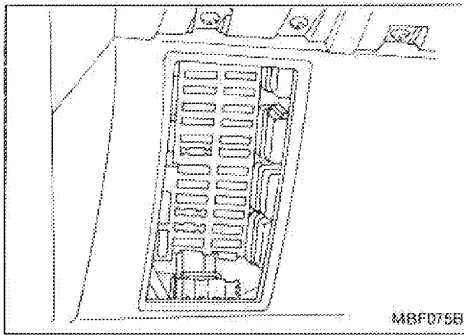
TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)

Self-diagnosis (Cont'd)

Warning lamp flashing times and repair

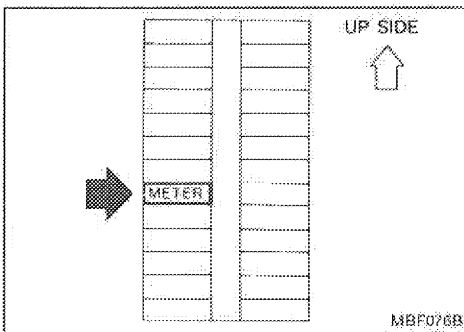
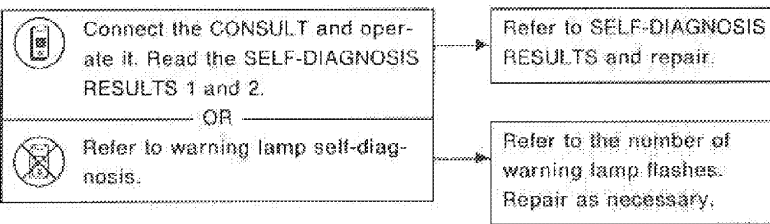
Flash code (①) (# of flashes)	Explanation	Repair order * Recheck SRS at each replacement.
0	Normal. The SRS "Air Bag" is in good order.	---
1	The circuit for the safing sensor is out of order.	<ol style="list-style-type: none"> 1. Visually check the wiring harness connections. 2. Replace the safing sensor. (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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.

TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)



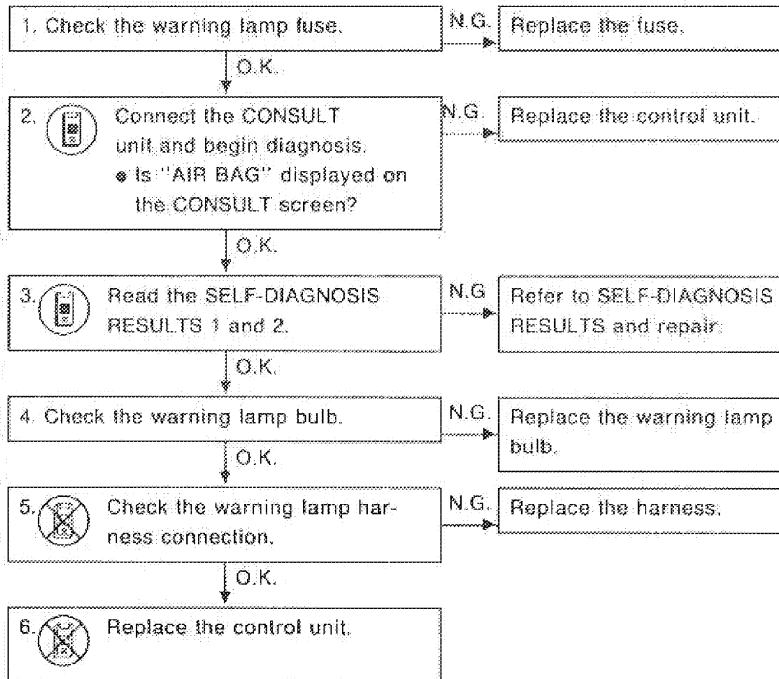
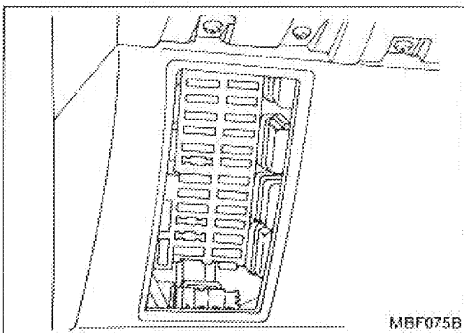
Diagnostic Procedure 1

SYMPTOM: Warning lamp flashes.

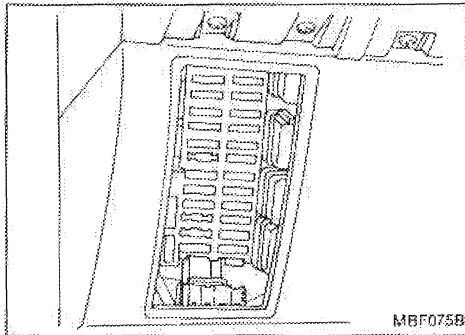
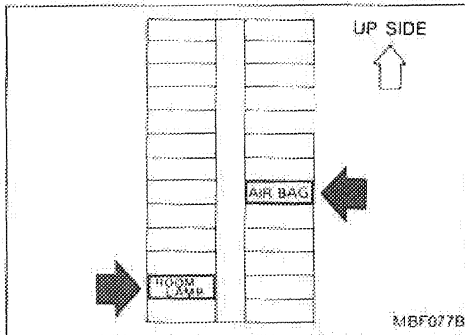


Diagnostic Procedure 2

SYMPTOM: Warning lamp does not come on.

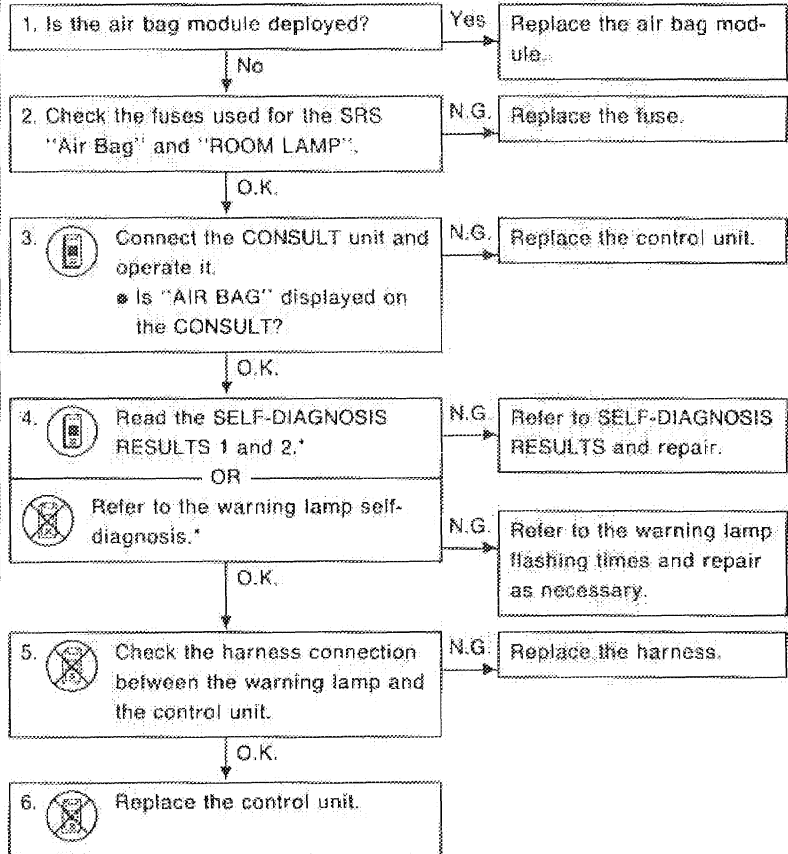


TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)



Diagnostic Procedure 3

SYMPTOM: Warning lamp does not go off.



* Recheck SRS after each replacement.

TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)

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.	

TROUBLE DIAGNOSES — Supplemental Restraint System (SRS)

Collision Diagnosis (Cont'd)

Part	Air bag deployed	Air bag did NOT deploy
Spiral cable		<ol style="list-style-type: none">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		<ol style="list-style-type: none">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".

PRECAUTIONS

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.

PRECAUTIONS

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

AIR CONDITIONER		
	REFRIGERANT	COMPRESSOR LUBRICANT
TYPE (PART NO.)	R134a	⚠
AMOUNT	⚠	⚠

CAUTION PRECAUTION

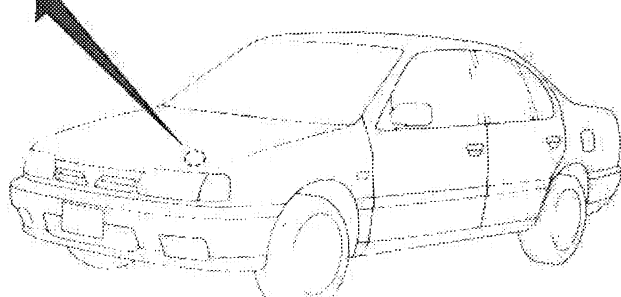
- REFRIGERANT UNDER HIGH PRESSURE
- SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL
- IMPROPER SERVICE METHODS MAY CAUSE PERSONAL INJURY
- CONSULT SERVICE MANUAL
- THIS AIR CONDITIONER SYSTEM COMPLIES WITH SAE J 639

NISSAN NORTH CO., LTD. JAPAN

⚠ : Lubricant type and service part number

⚠ : Amount of lubricant

⚠ : Amount of refrigerant



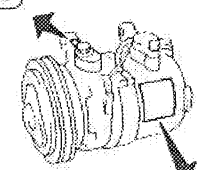
RHA084D

PARTS IDENTIFICATION

1. Compressor label

R134a label

R134a用
USE FOR R134a



CALSONIC

TYPE DKV-14C

PART NO. _____

SERIAL NO. _____

REFRIG. R-134a

DL 04-PR

200cm³ (200cc)

(NISSAN PART No. KI1400-PAGRD)

MIN. TEST PRESSURE

LOW SIDE 1.0MPa (15kgf/cm²)

HIGH SIDE 3.0MPa (30kgf/cm²)

SFC ZEXEL CORPORATION
MADE IN JAPAN

2. Other component parts label

R134a label

R134a用
USE FOR R134a

R134a用

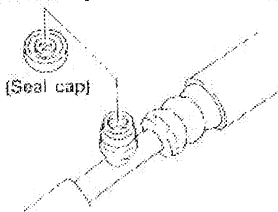
USE FOR

R134a

Base color: Light blue

Part name	Identification
1. Compressor	R134a label or Compressor label
2. Cooling unit	R134a label
3. Expansion valve	Stamps
4. Condenser	R134a label
5. Liquid tank	R134a label
6. Hose or pipe	R134a label

3. Service valves (suction/discharge)



(Seal cap)

The service valves are specially designed for the HFC-134a (R-134a) system. Those for the CFC-12 (R-12) system are different in size and configuration. Refer to "PREPARATION".

RHA254D

PRECAUTIONS

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

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:

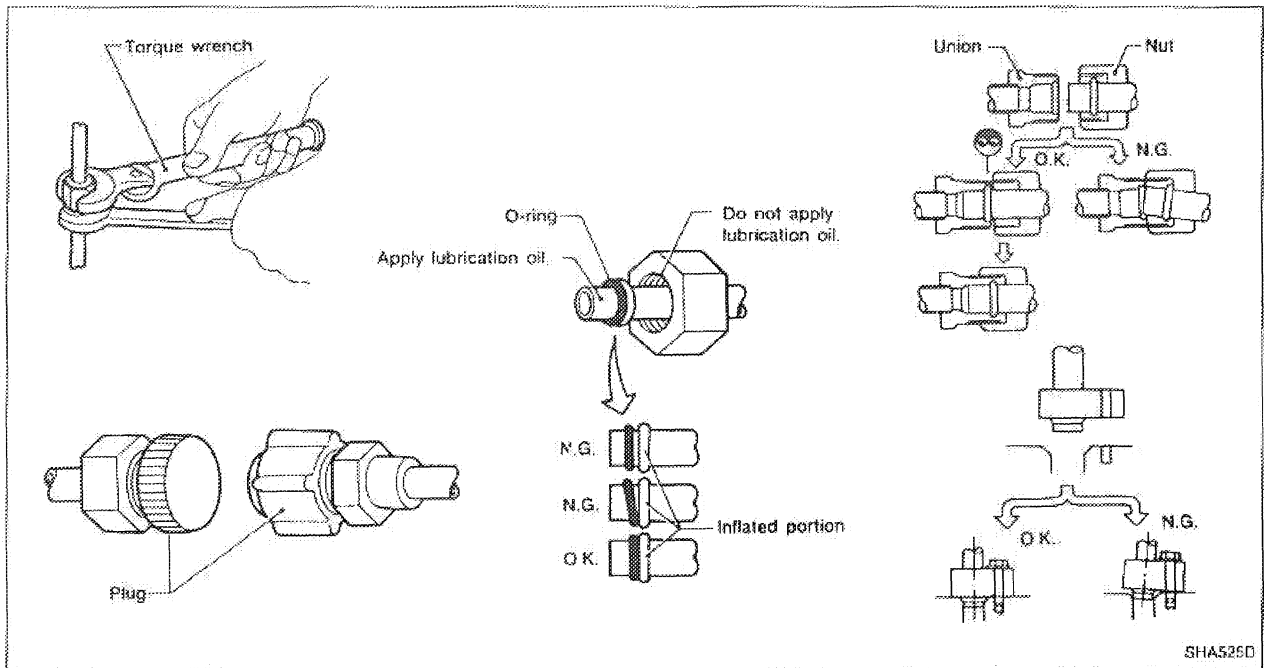
When replacing or cleaning refrigerant cycle components, observe the following.

- 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

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.

DESCRIPTION — Refrigeration System

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.

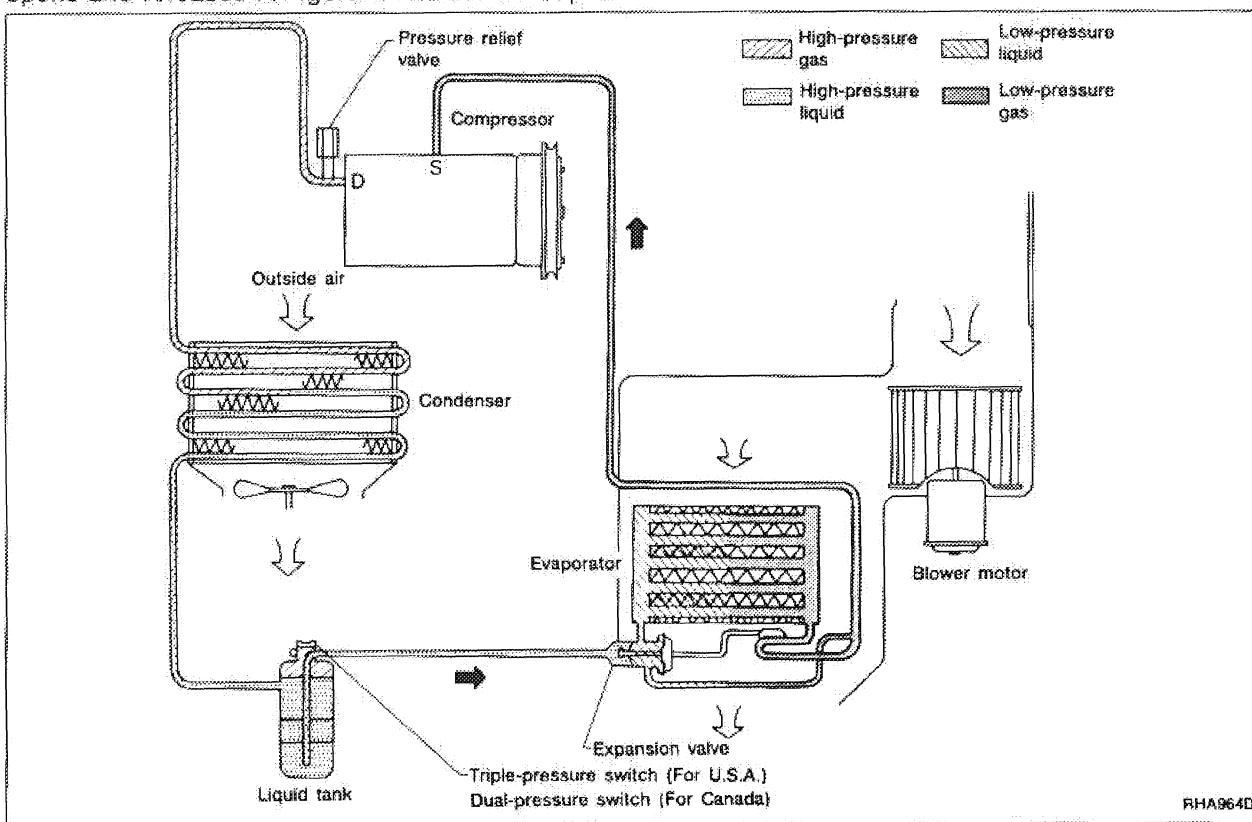
REFRIGERANT SYSTEM PROTECTION

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)

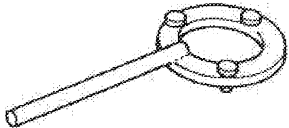
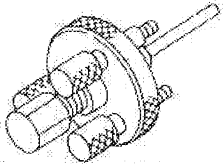
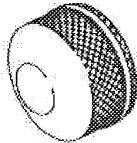
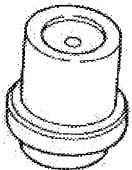
Pressure relief valve

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/cm², 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



PREPARATION

Special Service Tools

Tool number (Kent-Moore No.) Tool name	Description
KV99231260 (J-38874) Clutch disc wrench	 A long-handled wrench with a circular head that fits around a clutch disc. The head has four small protrusions for grip. <p>Removing shaft nut and clutch disc</p>
KV99232340 (J-38874) Clutch disc puller	 A mechanical puller tool with a central threaded rod and a circular base with four adjustable arms. <p>Removing clutch disc</p>
KV99234330 (J-39024) Pulley installer	 A circular, textured pulley with a central hole and a raised outer rim. <p>Installing pulley</p>
KV99233130 (J-39023) Center pulley puller	 A cylindrical puller tool with a central hole and a wider base. <p>Removing pulley</p>

PREPARATION



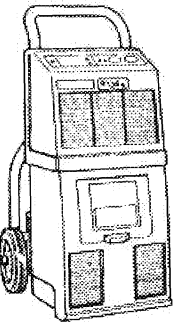
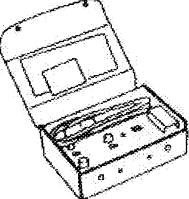
HFC-134a (R-134a) Service Tools and Equipment

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.



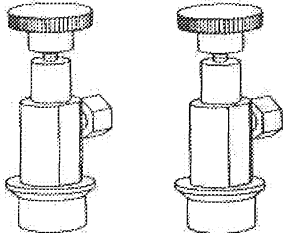

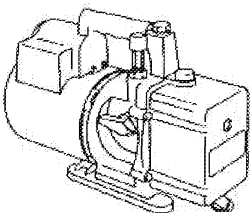
To prevent the mixing of refrigerants/lubrication oils, refrigerant container fittings, service hose fittings, and service equipment fittings (equipment which handles refrigerant and/or lubrication oil) are different between CFC-12 (R-12) and HFC-134a (R-134a).

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		Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container: 1/2"-16 ACME
KLH00-PAGRO (—) Nissan A/C System Oil Type R		Type: Poly alkylene glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotor plate (piston) compressors (Nis- san only) Lubricity: 40 ml (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-NI) Recovery/Recycling equipment (ACR4)		Function: Refrigerant Recovery and Recycling and Recharging
(J-39400) Electrical leak detector		Power supply: • DC 12 V (Cigarette lighter)

PREPARATION

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)	 <p style="text-align: right; font-size: small;">RHA262D</p>	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)	 <p style="text-align: right; font-size: small;">RHA263D</p>	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)	 <p style="text-align: right; font-size: small;">RHA264D</p>	Hose fitting to service hose: ● M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale	 <p style="text-align: right; font-size: small;">RHA265D</p>	For measuring of refrigerant Fitting size: Thread size ● 1/2"-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)	 <p style="text-align: right; font-size: small;">RHA266D</p>	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size ● 1/2"-16 ACME

PREPARATION

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.

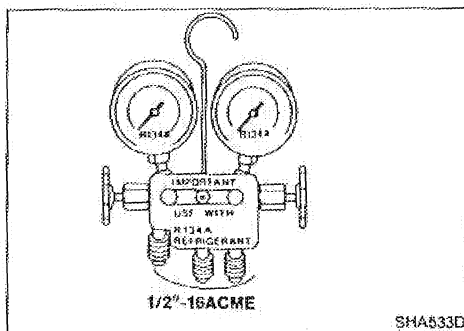
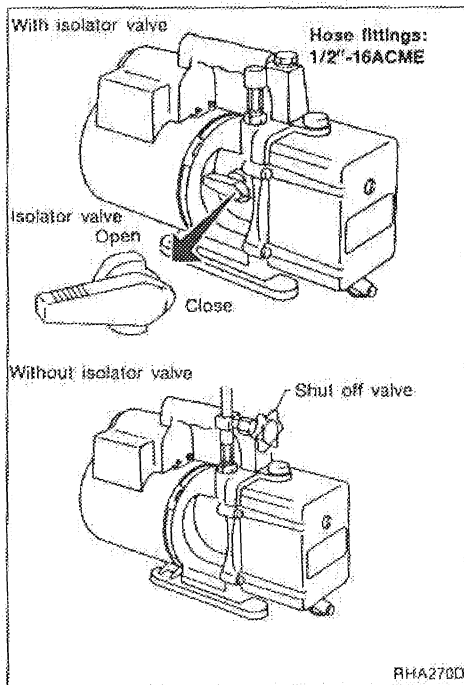
VACUUM PUMP

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

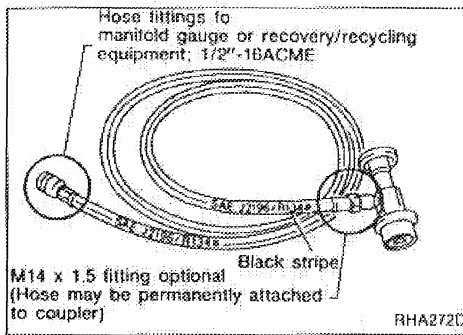
Be certain that the gauge face indicates R-134a or 134a. Be certain that the manifold gauge set has the 1/2"-16 ACME threaded connections for service hoses, and that no refrigerants other than HFC-134a (R-134a) (along with only specified lubrication oils) have been used with the manifold gauge set.

PREPARATION

Precautions for Service Equipment (Cont'd)

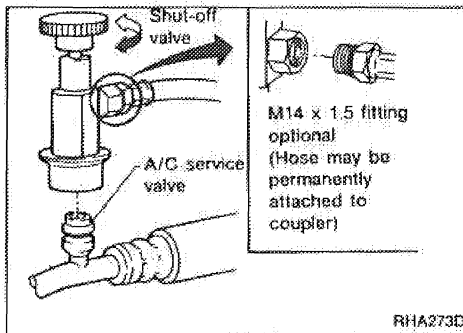
SERVICE HOSES

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

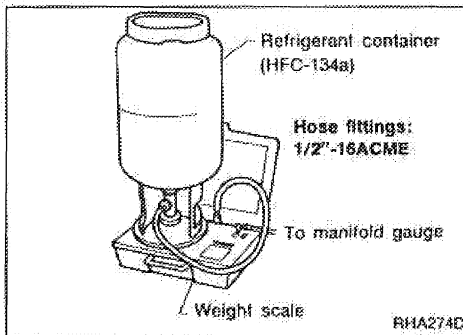
Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. Although the HFC-134a (R-134a) couplers will not secure on to the CFC-12 (R-12) system, CFC-12 (R-12) refrigerant and lubrication oil will be discharged into the HFC-134a (R-134a) coupler, causing contamination.



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.

SERVICE PROCEDURES

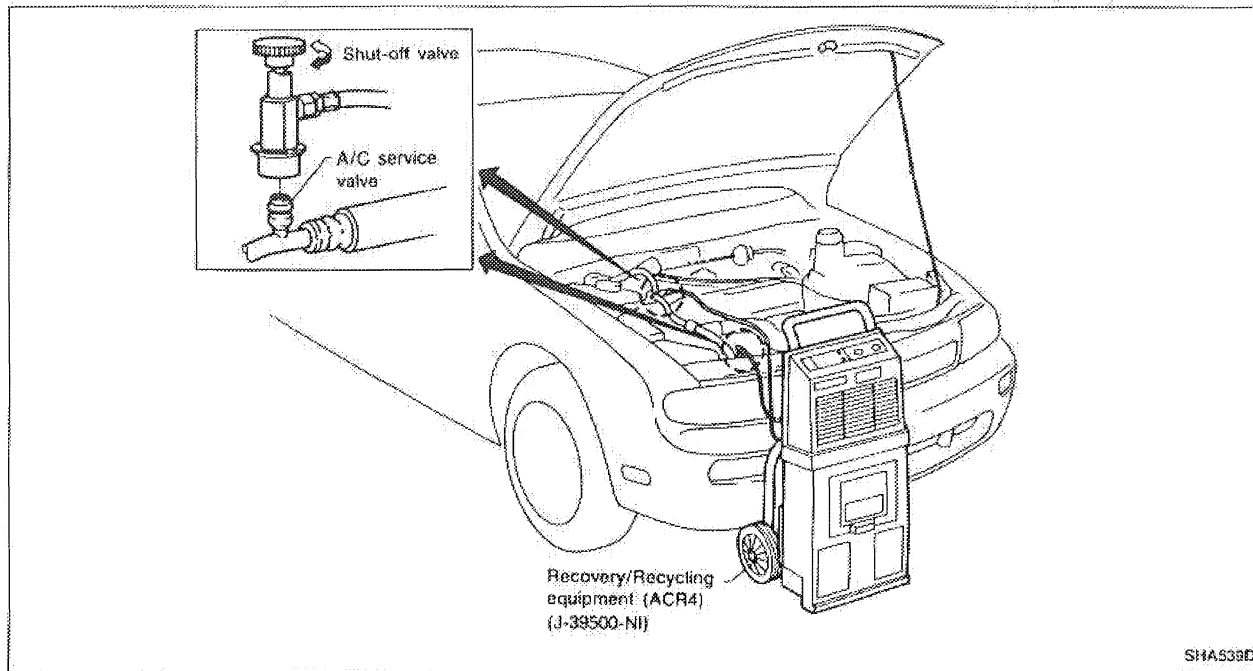
HFC-134a (R-134a) Service Procedure

SETTING OF SERVICE TOOLS AND EQUIPMENT

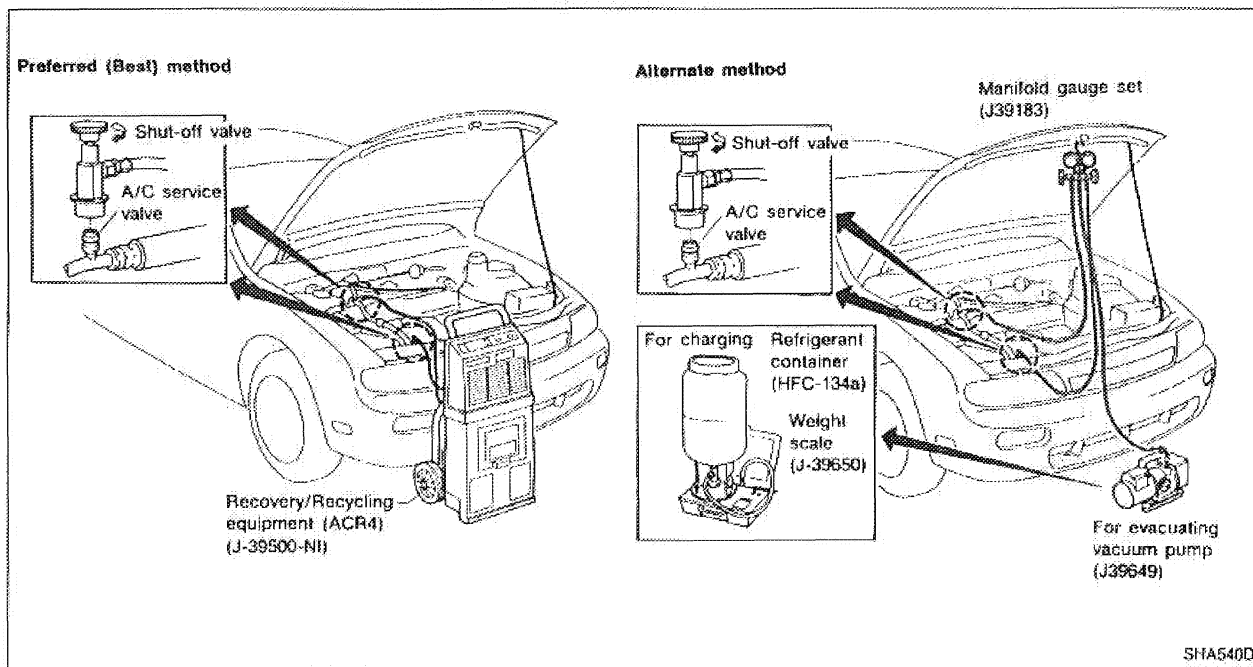
DISCHARGING REFRIGERANT

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.



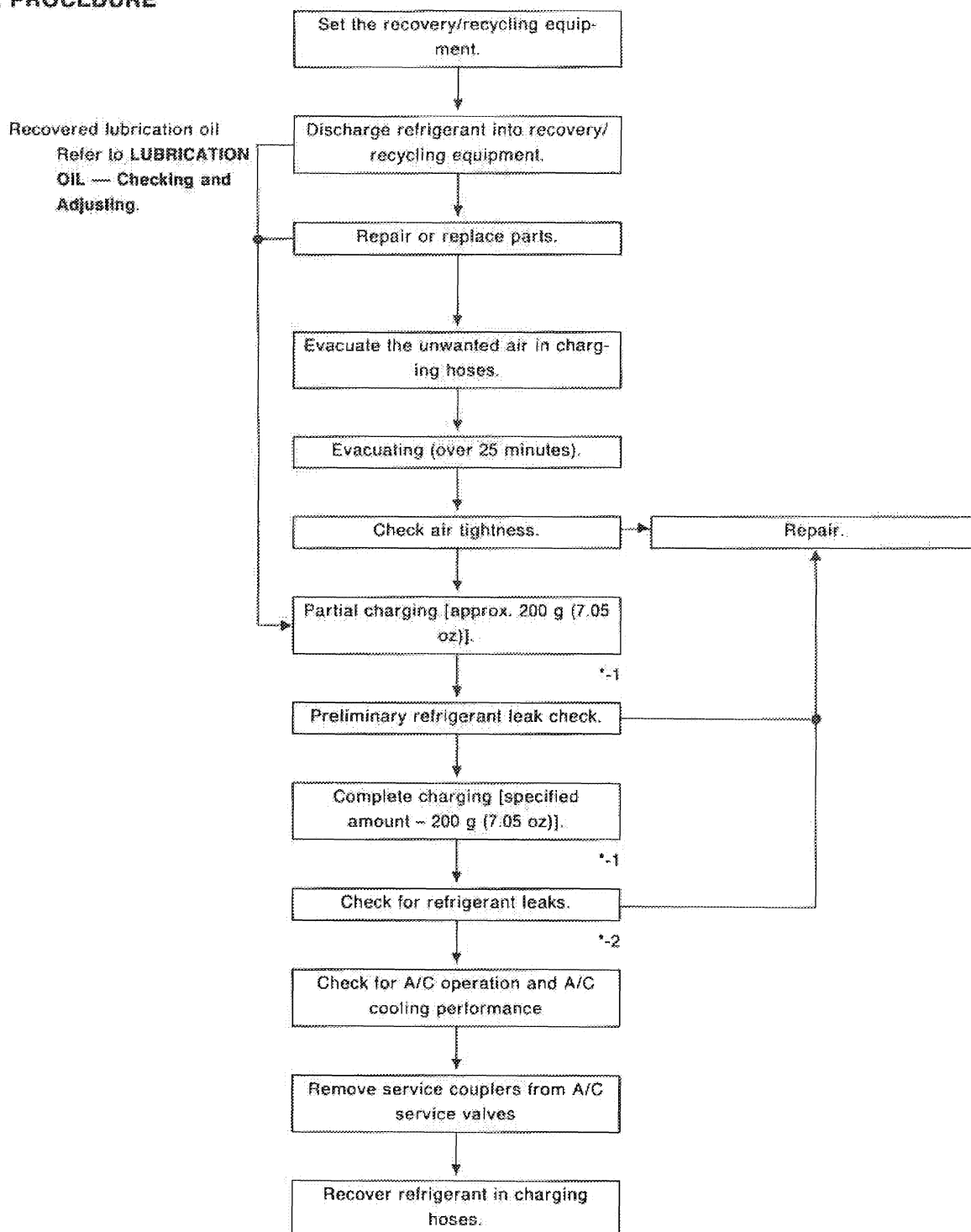
EVACUATING SYSTEM AND CHARGING REFRIGERANT



SERVICE PROCEDURES

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 it off.
Service valve caps must be attached to valves (to prevent leakage).

LUBRICATION OIL — Checking and Adjusting

Lubrication Oil

Name: Nissan A/C System Oil Type R

Part number: KLH00-PAGR0

Maintenance of Oil Quantity in Compressor

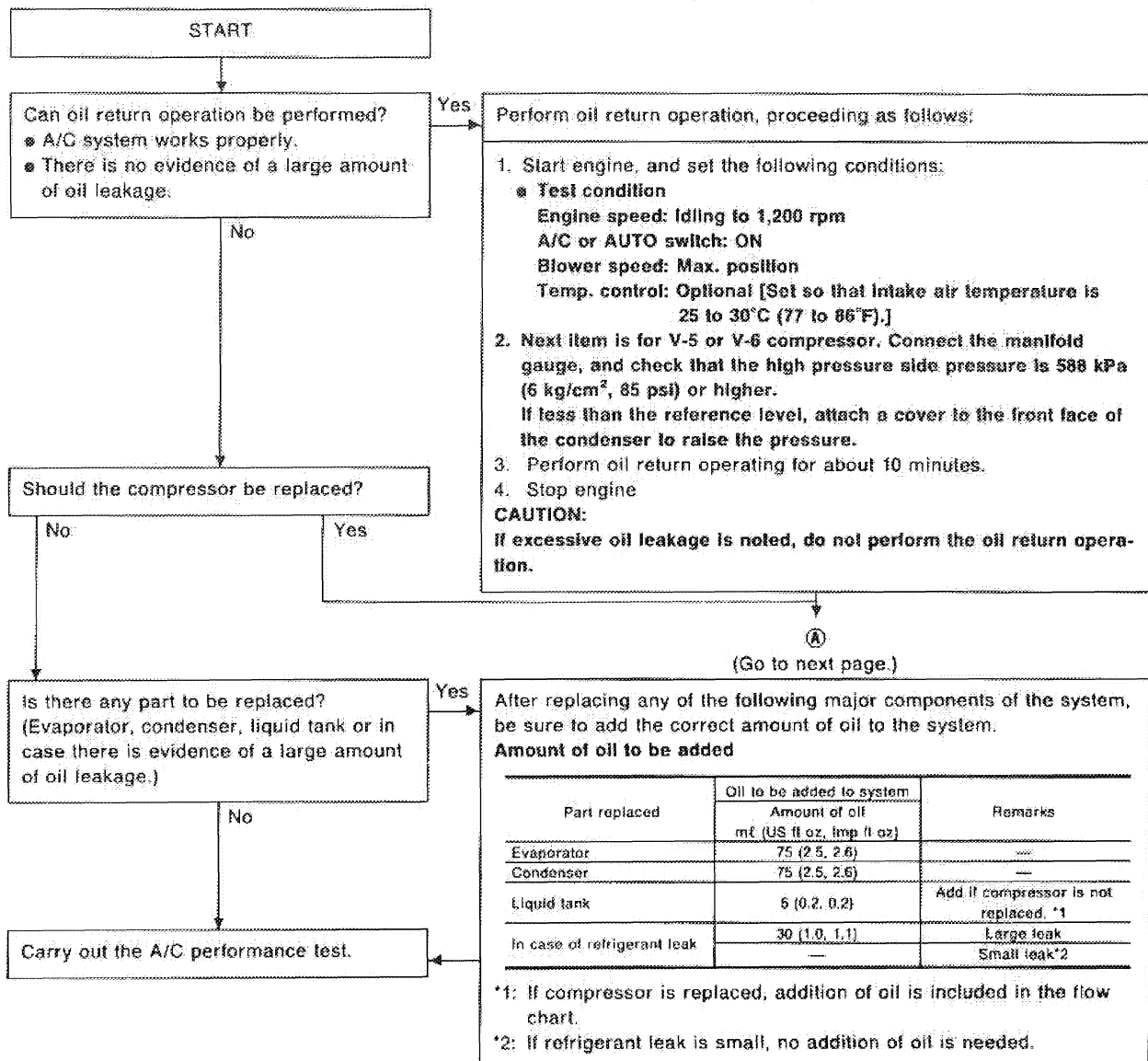
The oil used to lubricate the compressor circulates through the system with the refrigerant. Whenever any component of the system is replaced or a large amount of gas leakage occurs, add oil to the compressor to maintain the specified amount.

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.



LUBRICATION OIL — Checking and Adjusting

Checking and Adjusting (Cont'd)

A

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.

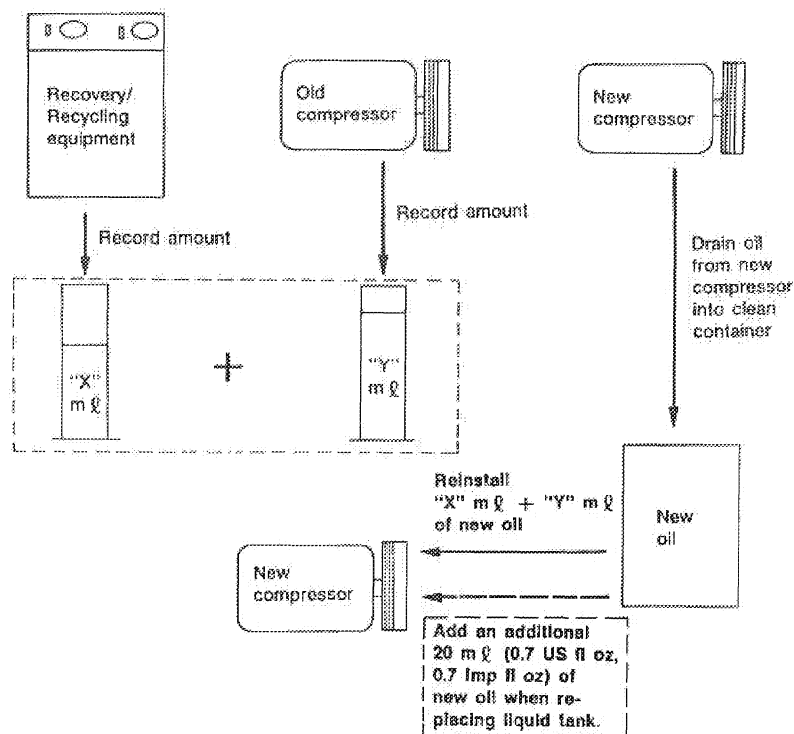
V-5 or V-6 compressor: 18 - 19 N·m (1.8 - 1.9 kg·m, 13 - 14 ft·lb)

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.

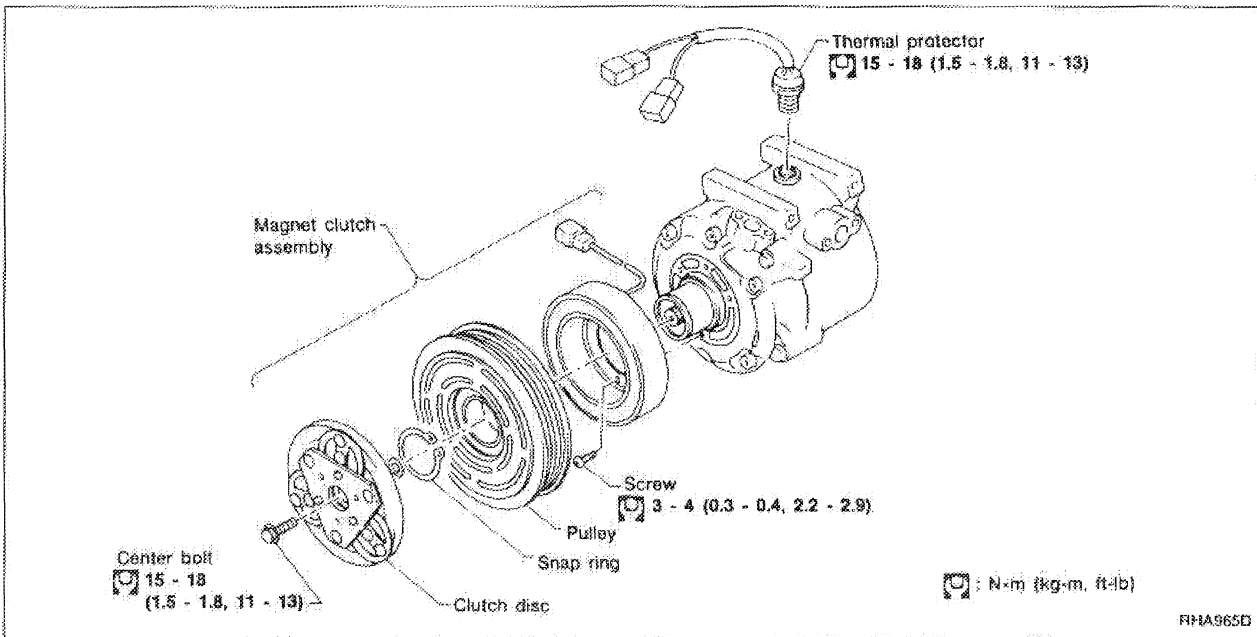
Do not add this 5 mℓ (0.2 US fl oz, 0.2 imp fl oz) of oil if only replacing the compressor.

Oil adjusting procedure for compressor replacement



RHA065D

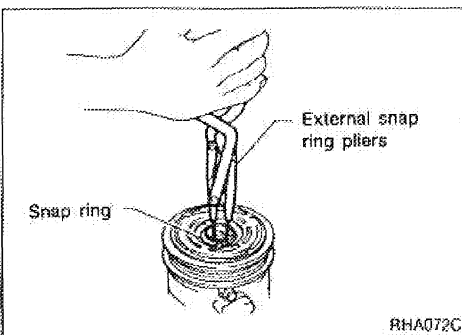
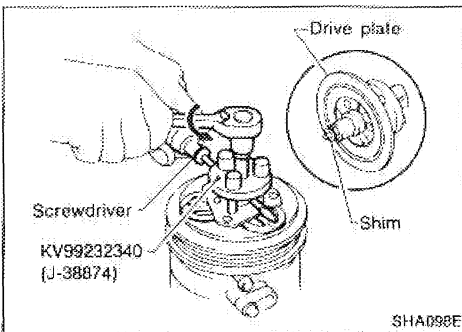
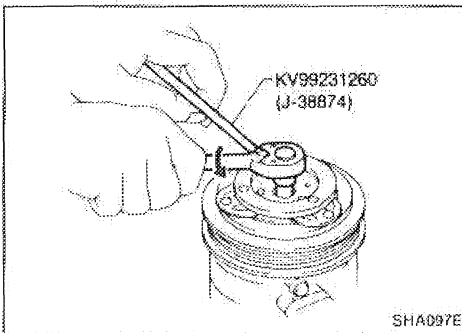
COMPRESSOR — Model DKV-14C (ZEXEL make)



Compressor Clutch

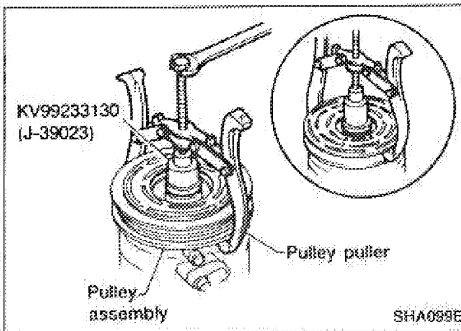
REMOVAL

- 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 — Model DKV-14C (ZEXEL make)

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.

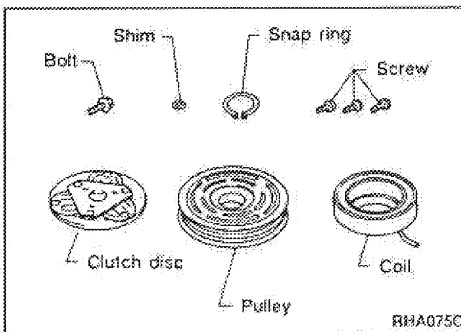
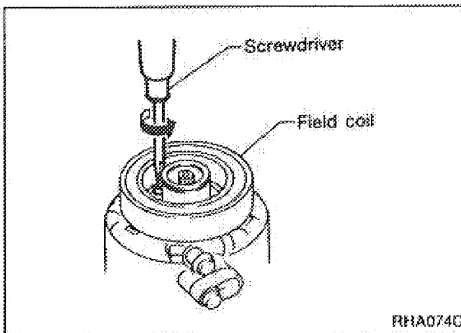
For pressed pulleys

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.

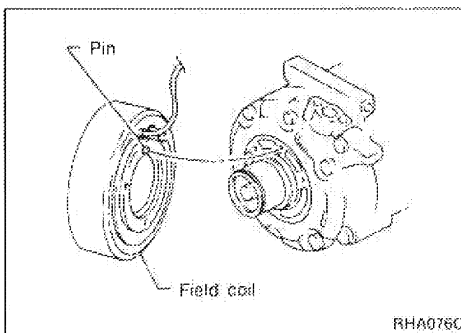


INSPECTION

Clutch disc : If the contact surface shows signs of damage due to excessive heat, the clutch disc and pulley should be replaced.

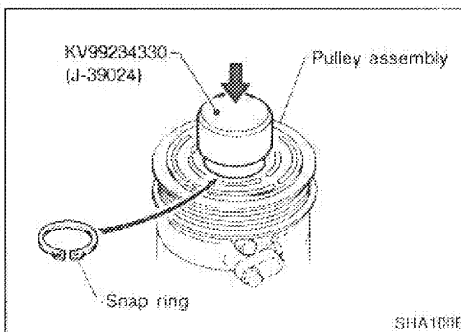
Pulley : Check the appearance of the pulley assembly. If the contact surface of the pulley shows signs of excessive grooving due to slippage, both the pulley and clutch disc should be replaced. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.

Coil : Check coil for loose connection or cracked insulation.



INSTALLATION

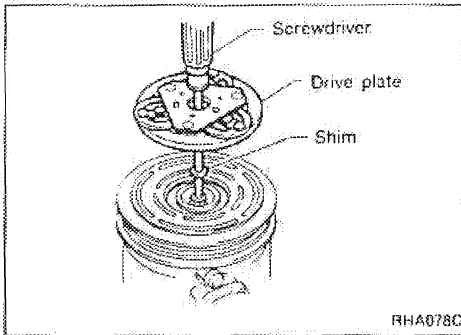
- Install the field coil.
Be sure to align the coil's pin with the hole in the compressor's front head.
- Install the field coil harness clip using a screwdriver.



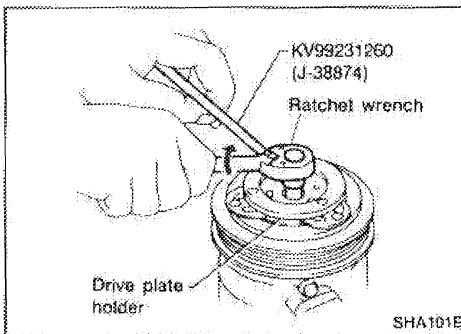
- Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.

COMPRESSOR — Model DKV-14C (ZEXEL make)

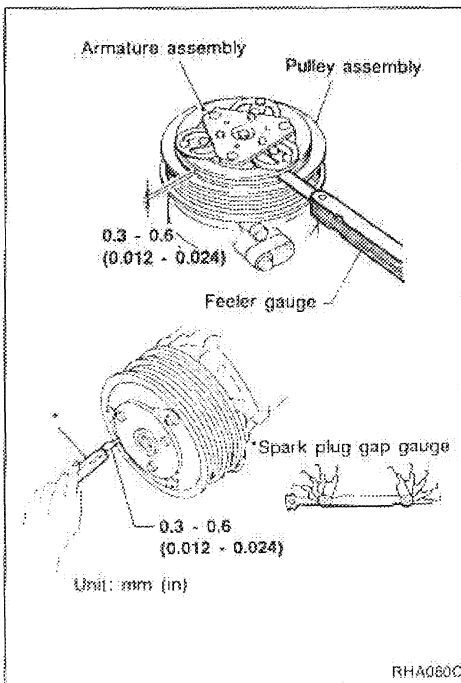
Compressor Clutch (Cont'd)



- Install the drive plate on the drive shaft, together with the original shim(s). Press the drive plate down by hand.



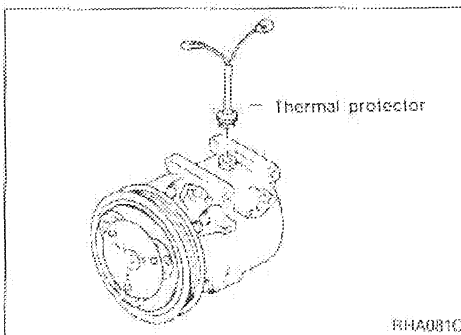
- Using the holder to prevent drive plate rotation, tighten the bolt to 12 to 15 N·m (1.2 to 1.5 kg-m, 9 to 11 ft-lb) torque. After tightening the bolt, check that the pulley rotates smoothly.



- 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.

DIAGNOSES — Overall System

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

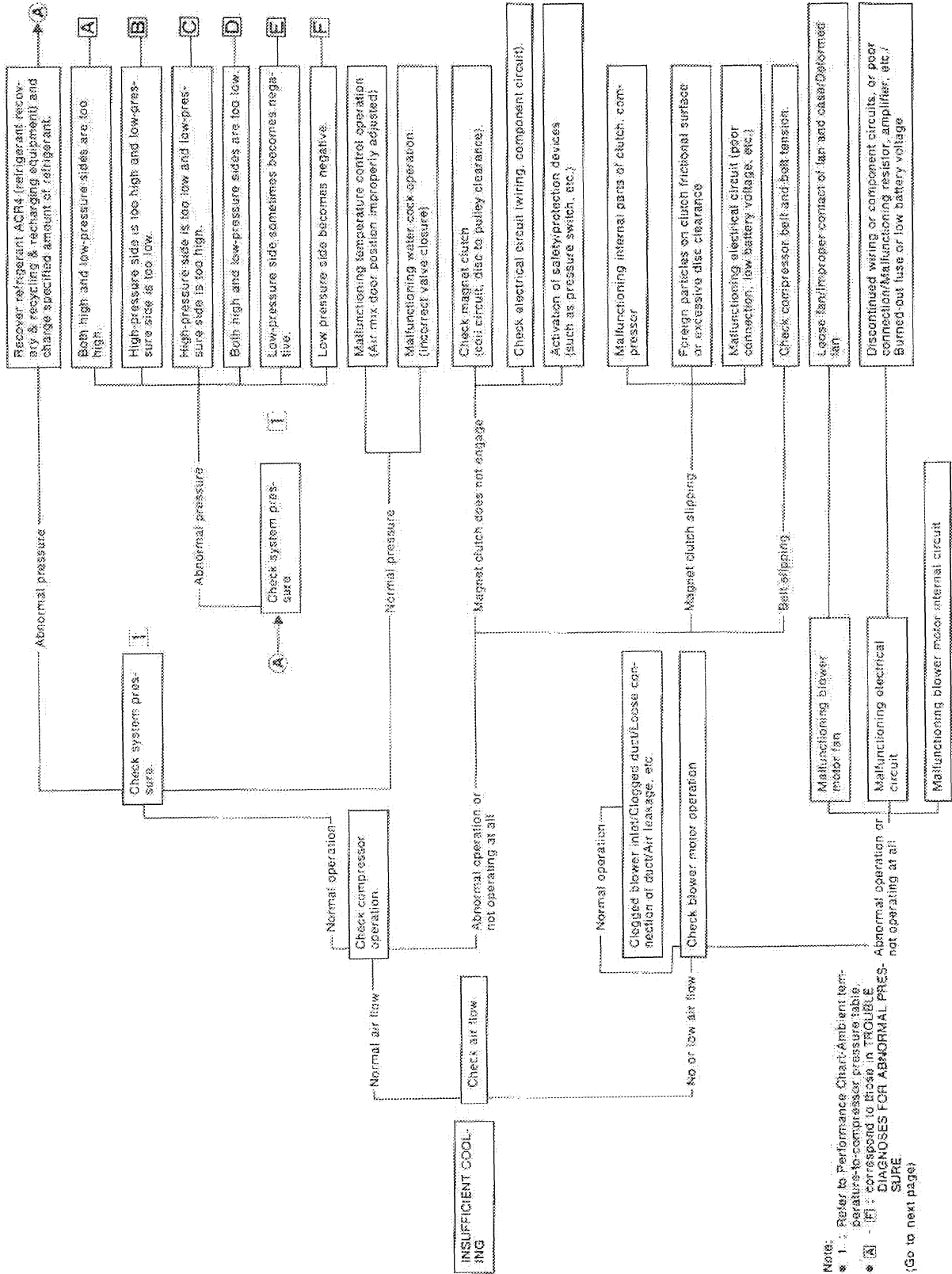
Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	7.8 - 10.4 (46 - 51)
	30 (86)	11.8 - 15.0 (53 - 59)
	35 (95)	15.8 - 19.4 (60 - 67)
60 - 70	25 (77)	10.4 - 13.0 (51 - 55)
	30 (86)	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/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	25 (77)	941 - 1,138 (9.8 - 11.6, 137 - 165)	187 - 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)

DIAGNOSES — Overall System

Performance Test Diagnoses INSUFFICIENT COOLING



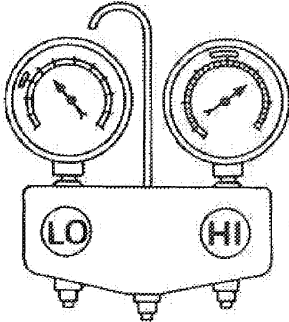
Note:
 * [I] : Refer to Performance Chart/Ambient temperature-to-compressor pressure table.
 * [A] - [F] : correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE (Go to next page)

DIAGNOSES — Overall System

Performance Test Diagnoses (Cont'd)

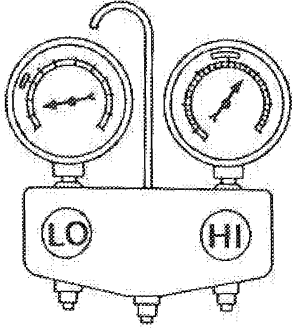
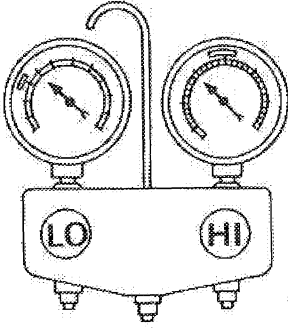
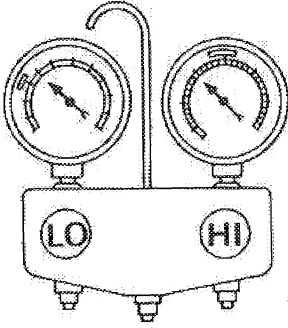
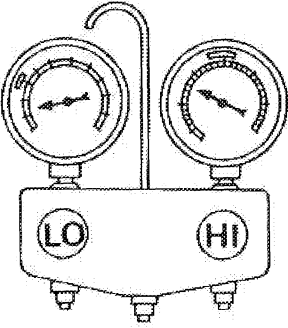
TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE

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
<p>Both high and low-pressure sides are too high.</p> <p>A</p>  <p style="text-align: center;">AC359A</p>	<ul style="list-style-type: none"> ● Pressure is reduced soon after water is splashed on condenser. 	<p>Excessive refrigerant charge in refrigeration cycle</p>	<p>Reduce refrigerant until specified pressure is obtained.</p>
	<p>Air suction by radiator or condenser fan is insufficient.</p>	<p>Insufficient condenser cooling performance</p> <p style="text-align: center;">↓</p> <p>① Condenser fins are clogged. ② Improper rotation of radiator fan or condenser fan</p>	<ul style="list-style-type: none"> ● Clean condenser. ● Check and repair radiator or condenser fan as necessary.
	<ul style="list-style-type: none"> ● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	<p>Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.)</p> <p style="text-align: center;">↓</p> <p>Air in refrigeration cycle</p>	<p>Evacuate repeatedly and recharge system.</p>
	<p>Engine tends to overheat.</p>	<p>Engine cooling systems malfunction.</p>	<p>Check and repair each engine cooling system.</p>
	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● Excessive liquid refrigerant on low-pressure side ● Excessive refrigerant discharge flow ● Expansion valve is open a little compared with the specification. <p style="text-align: center;">↓</p> <p>① Improper thermal valve installation ② Improper expansion valve adjustment</p>	<p>Replace expansion valve.</p>

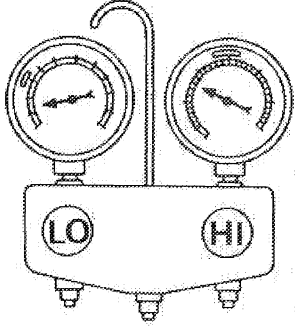
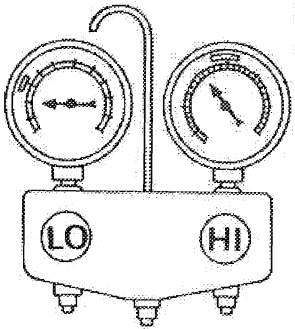
DIAGNOSES — Overall System

Performance Test Diagnoses (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too high and low-pressure side is too low.</p> <p>B</p>  <p style="text-align: center;">AC360A</p>	<p>Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.</p>	<p>High-pressure tube or parts located between compressor and condenser are clogged or crushed.</p>	<ul style="list-style-type: none"> ● Check and repair or replace malfunctioning parts. ● Check compressor oil for contamination.
<p>High-pressure side is too low and low-pressure side is too high.</p> <p>C</p>  <p style="text-align: center;">AC356A</p>	<p>High and low-pressure sides become equal soon after compressor operation stops.</p>	<p>Compressor pressure operation is improper.</p> <p style="text-align: center;">↓</p> <p>Damaged inside compressor packings</p>	<p>Replace compressor.</p>
<p>High-pressure side is too low and low-pressure side is too high.</p> <p>C</p>  <p style="text-align: center;">AC356A</p>	<p>No temperature difference between high and low-pressure sides</p>	<p>Compressor discharge capacity does not change. (Compressor stroke is set at maximum.)</p>	<p>Replace compressor.</p>
<p>Both high- and low-pressure sides are too low.</p> <p>D</p>  <p style="text-align: center;">AC353A</p>	<ul style="list-style-type: none"> ● 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. ● 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 	<p>Liquid tank inside is clogged a little.</p> <p>High-pressure pipe located between receiver drier and expansion valve is clogged.</p>	<ul style="list-style-type: none"> ● Replace liquid tank. ● Check compressor oil for contamination. ● Check and repair malfunctioning parts. ● Check compressor oil for contamination.

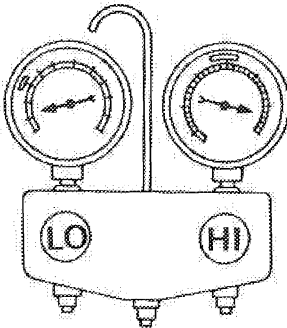
DIAGNOSES — Overall System

Performance Test Diagnoses (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too low.</p> <p>D</p>  <p style="text-align: center;">AC353A</p>	<p>There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.</p>	<p>Expansion valve closes a little compared with the specification.</p> <p style="text-align: center;">↓</p> <p>① Improper expansion valve adjustment ② Malfunctioning thermal valve ③ Outlet and inlet may be clogged.</p>	<ul style="list-style-type: none"> ● Remove foreign particles by using compressed air. ● Check compressor oil for contamination.
	<p>Areas near low-pressure pipe connection and service valve are extremely cold as compared with areas near expansion valve outlet and evaporator.</p>	<p>Low-pressure pipe is clogged or crushed.</p>	<ul style="list-style-type: none"> ● Check and repair malfunctioning parts. ● Check compressor oil for contamination.
	<p>Air flow volume is not enough or is too low.</p>	<p>Evaporator is frozen.</p> <p style="text-align: center;">↓</p> <p>Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)</p>	<p>Replace compressor.</p>
<p>Low-pressure side sometimes becomes negative.</p> <p>E</p>  <p style="text-align: center;">AC354A</p>	<ul style="list-style-type: none"> ● 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. 	<p>Refrigerant does not discharge cyclically.</p> <p style="text-align: center;">↓</p> <p>Moisture is frozen at expansion valve outlet and inlet.</p> <p style="text-align: center;">↓</p> <p>Water is mixed with refrigerant.</p>	<ul style="list-style-type: none"> ● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.

DIAGNOSES — Overall System

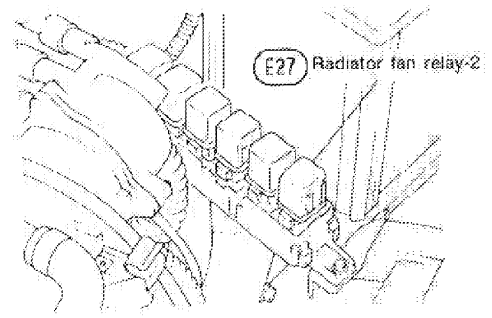
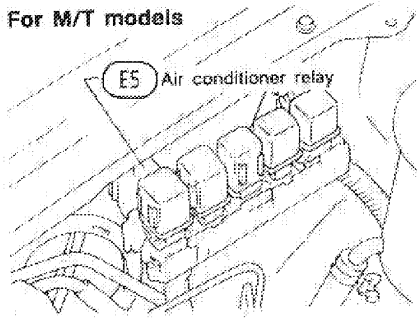
Performance Test Diagnoses (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side becomes negative.</p> <p>☐</p>  <p style="text-align: right;">AC362A</p>	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow.</p> <p style="text-align: center;">↓</p> <p>Expansion valve or liquid tank is frosted.</p>	<p>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.</p> <ul style="list-style-type: none"> ● 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.

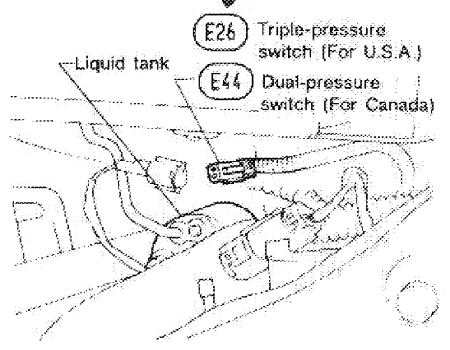
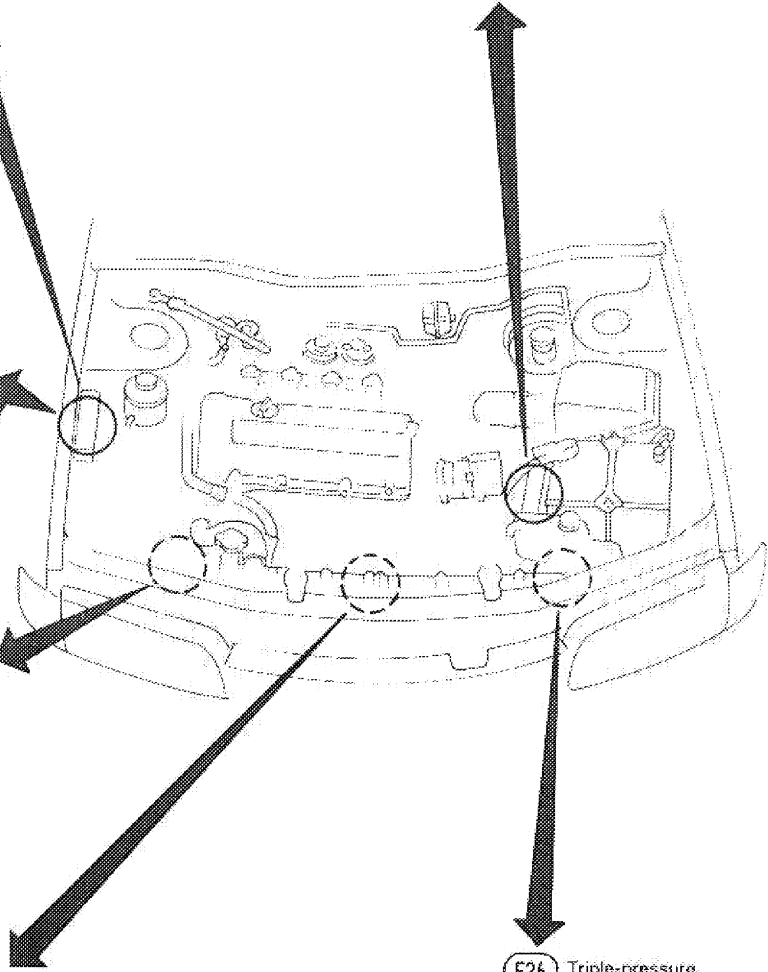
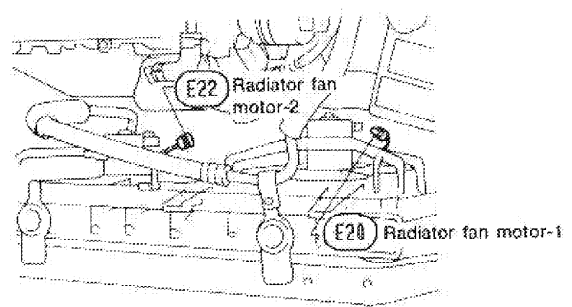
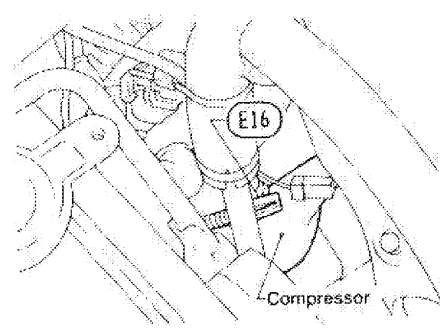
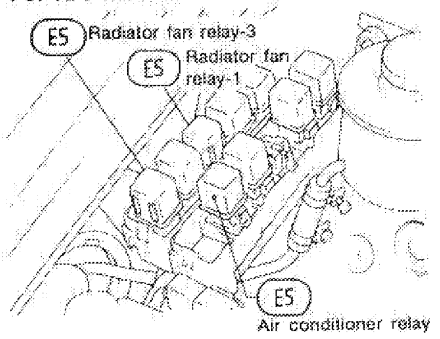
TROUBLE DIAGNOSES

Harness Layout for A/C System

For M/T models



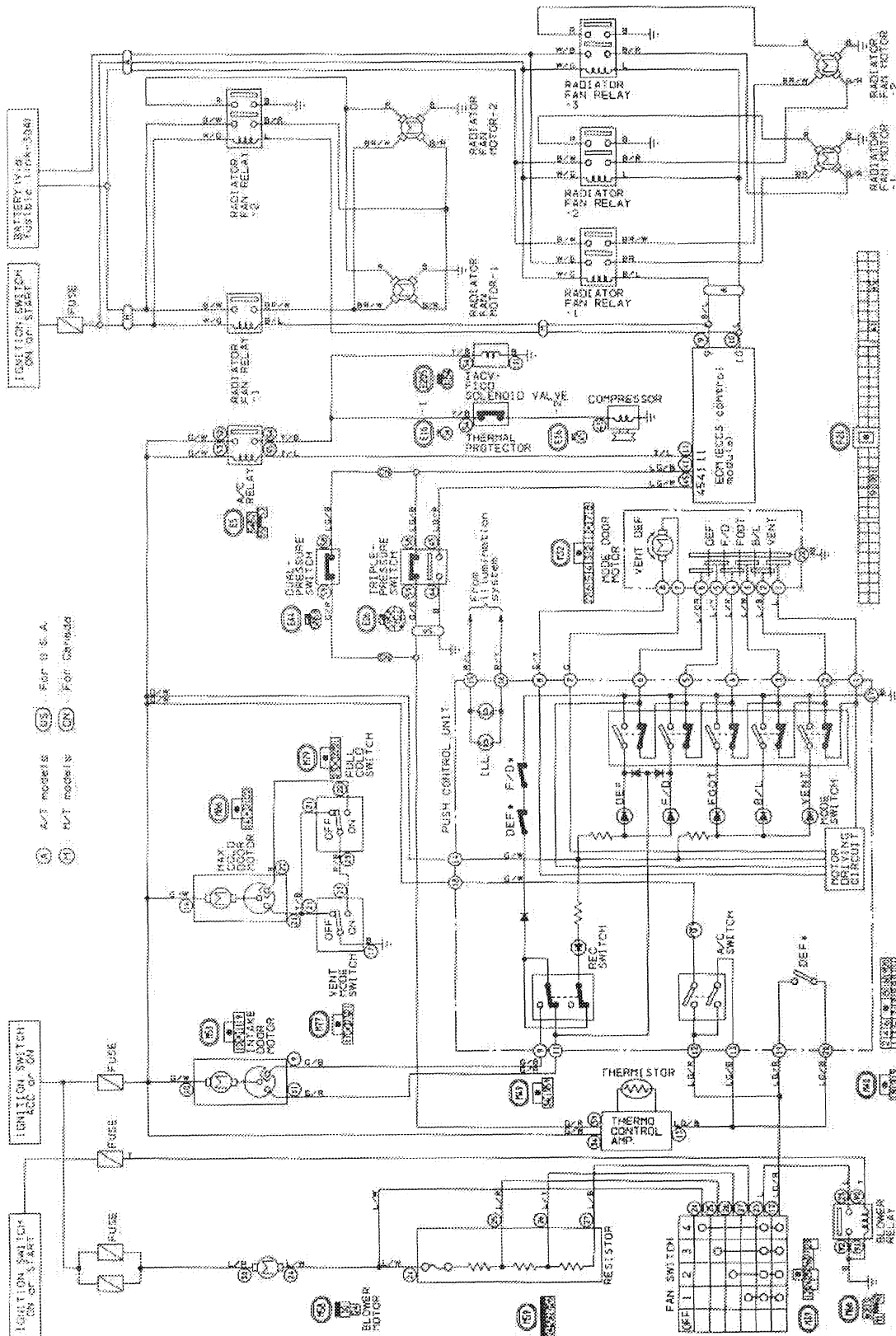
For A/T models



31HA885D

TROUBLE DIAGNOSES

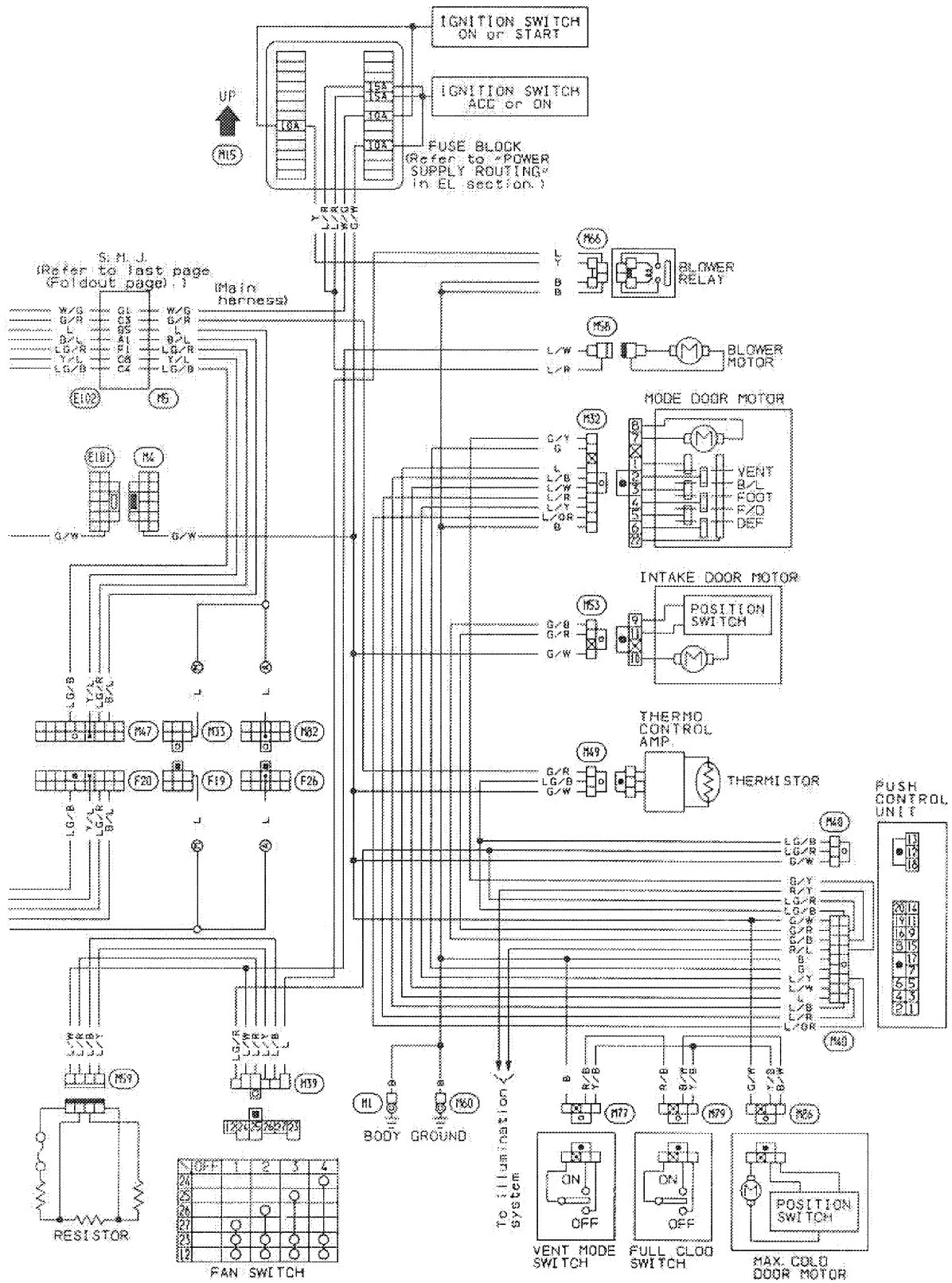
Circuit Diagram for Quick Pinpoint Check



- 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.

TROUBLE DIAGNOSES

Wiring Diagram (Cont'd)

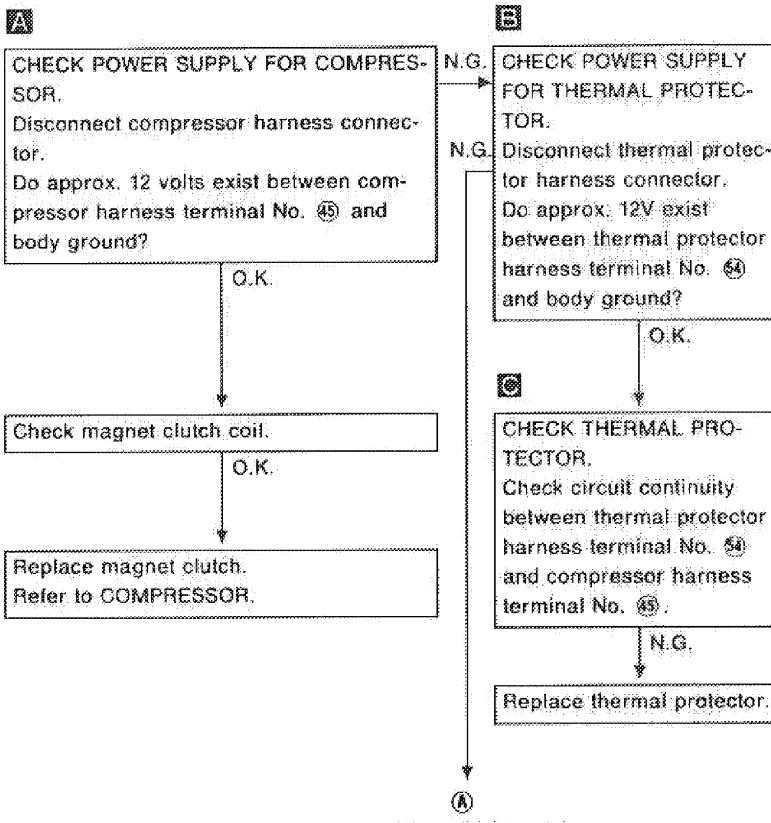
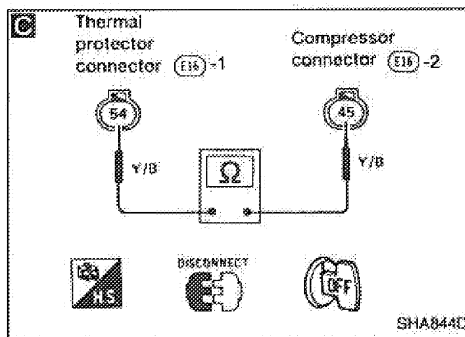
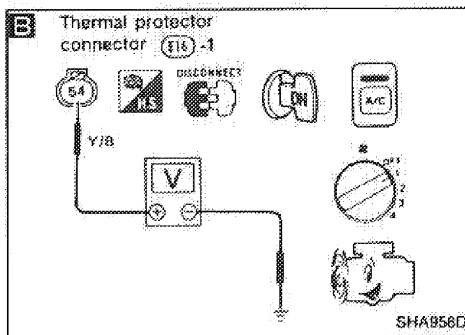
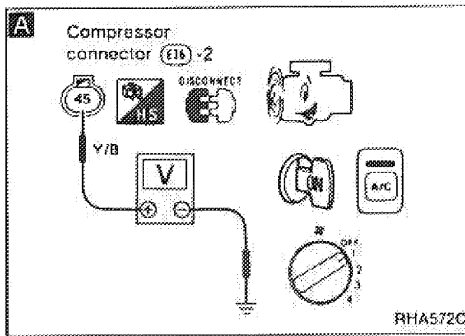


TROUBLE DIAGNOSES

Diagnostic Procedure 4

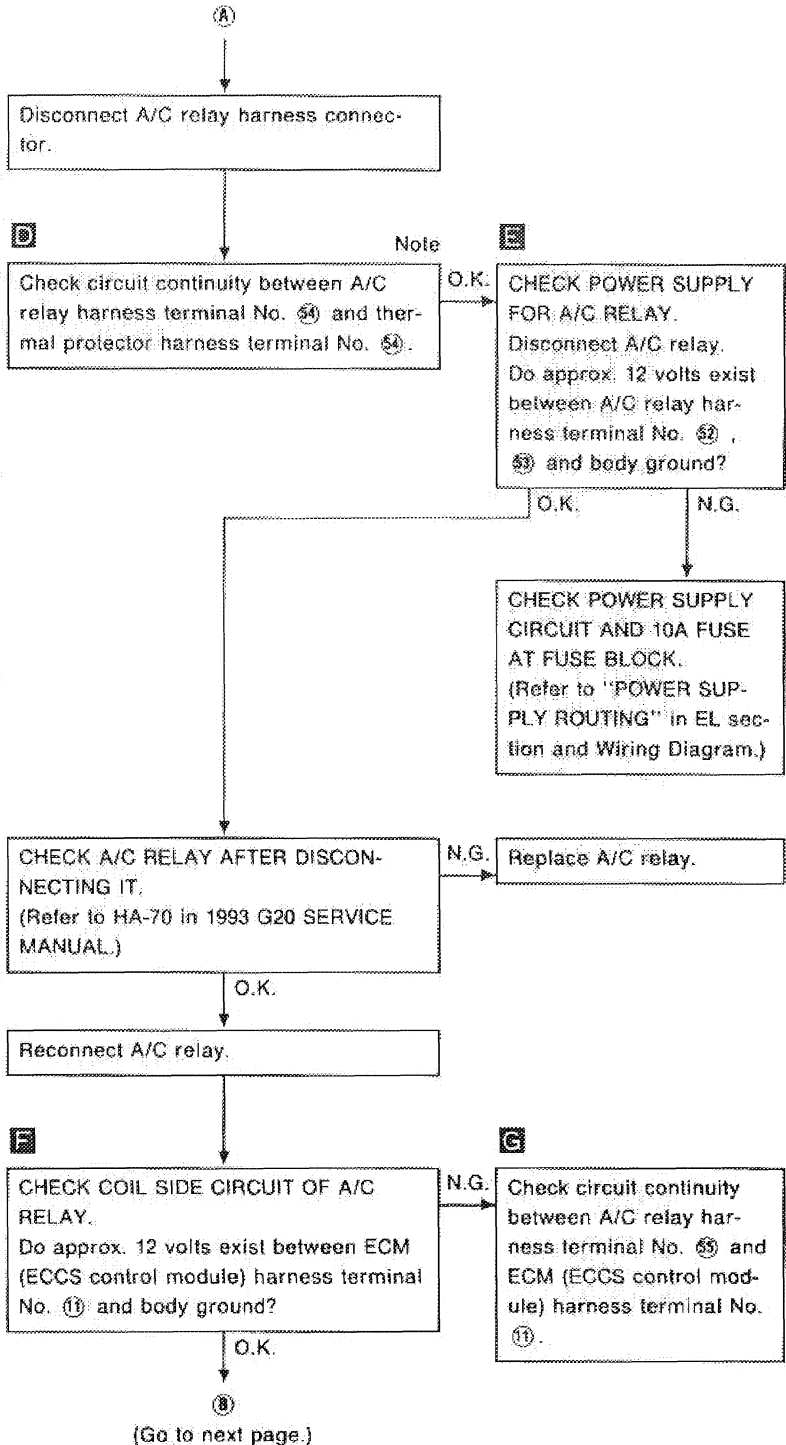
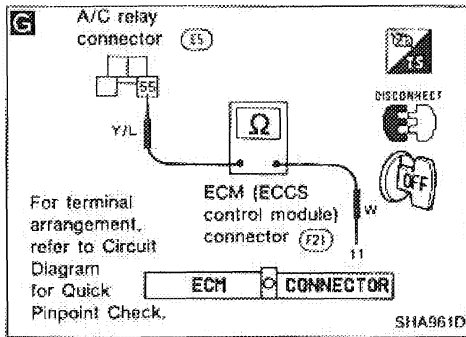
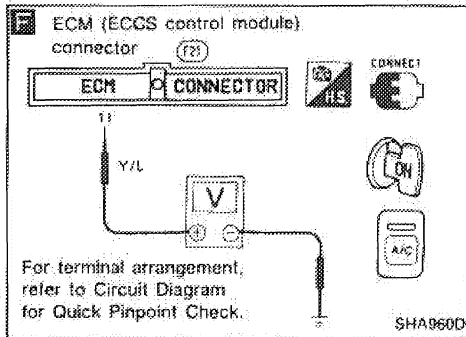
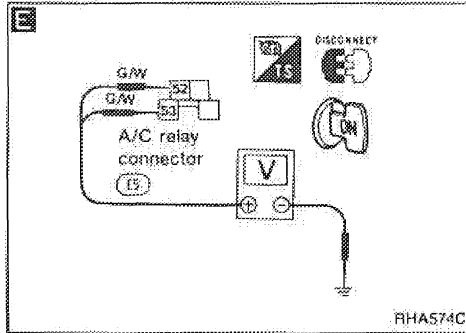
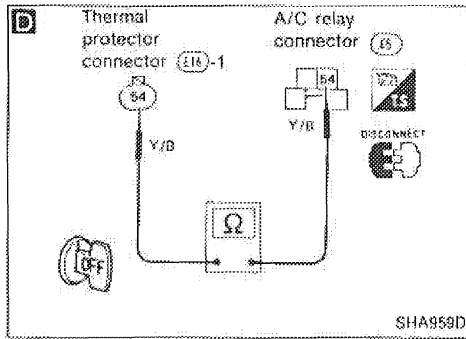
SYMPTOM: Magnet clutch does not operate when A/C switch and fan switch are ON.

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



TROUBLE DIAGNOSES

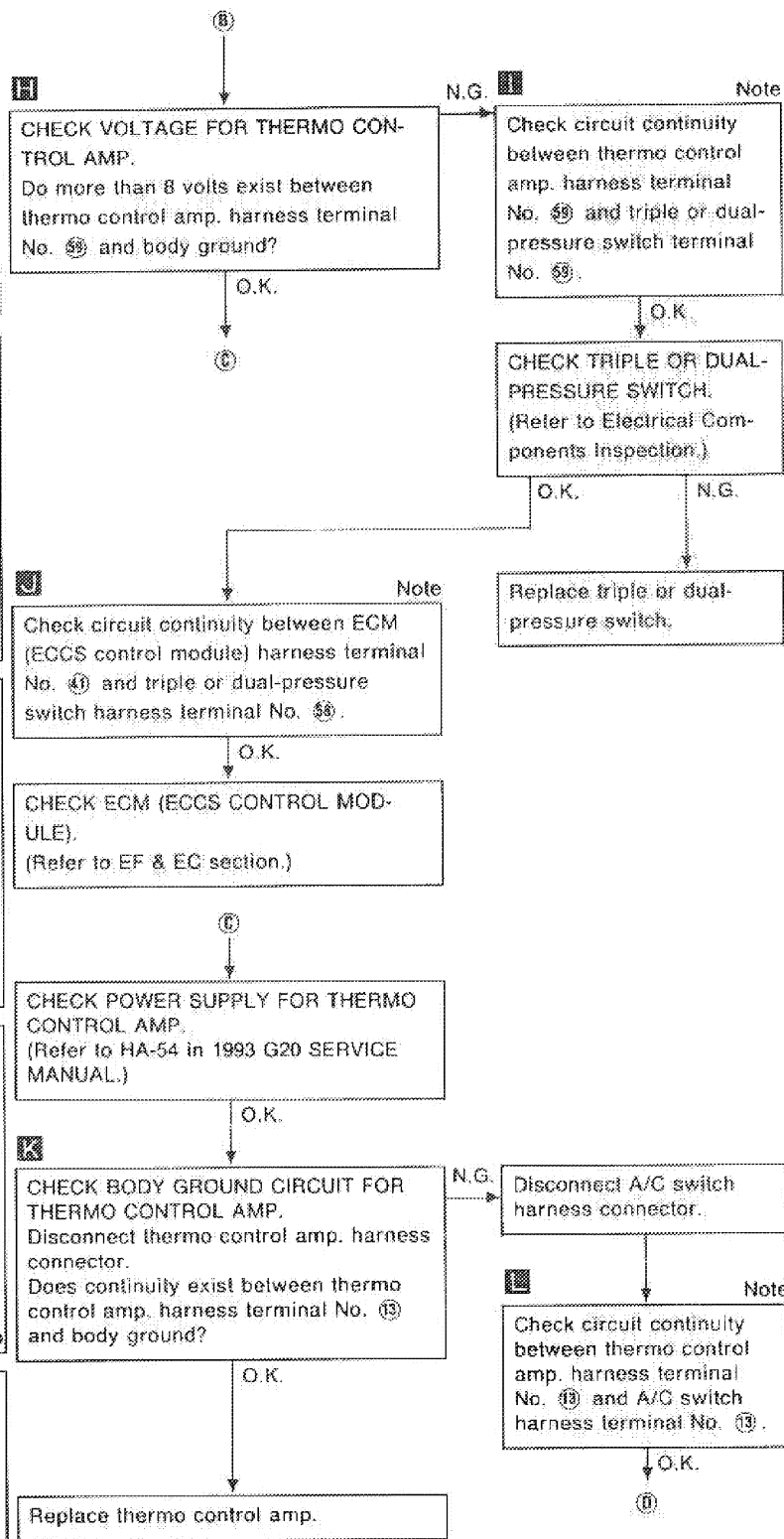
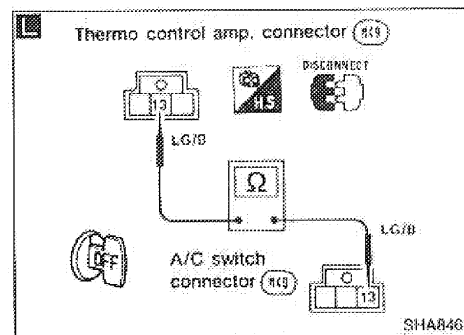
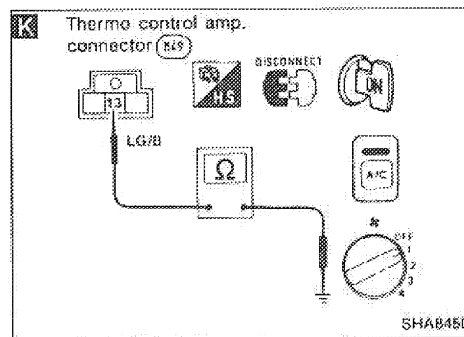
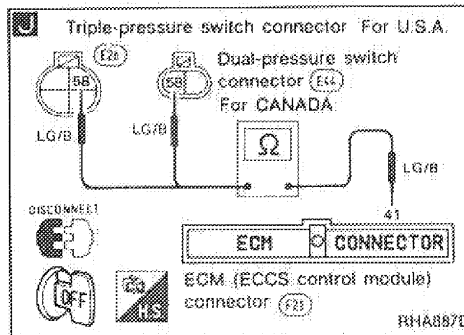
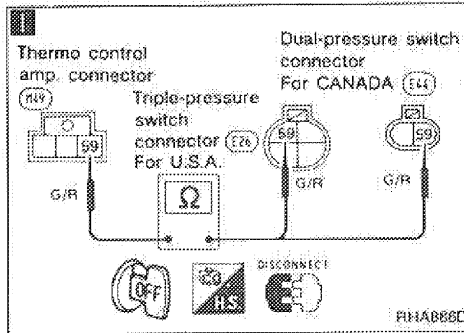
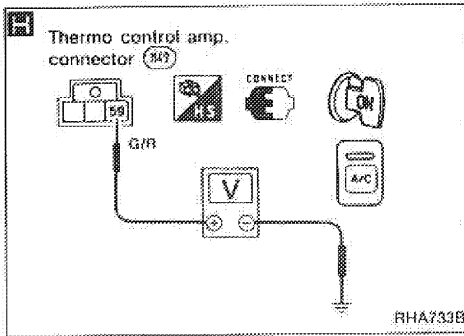
Diagnostic Procedure 4 (Cont'd)



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

TROUBLE DIAGNOSES

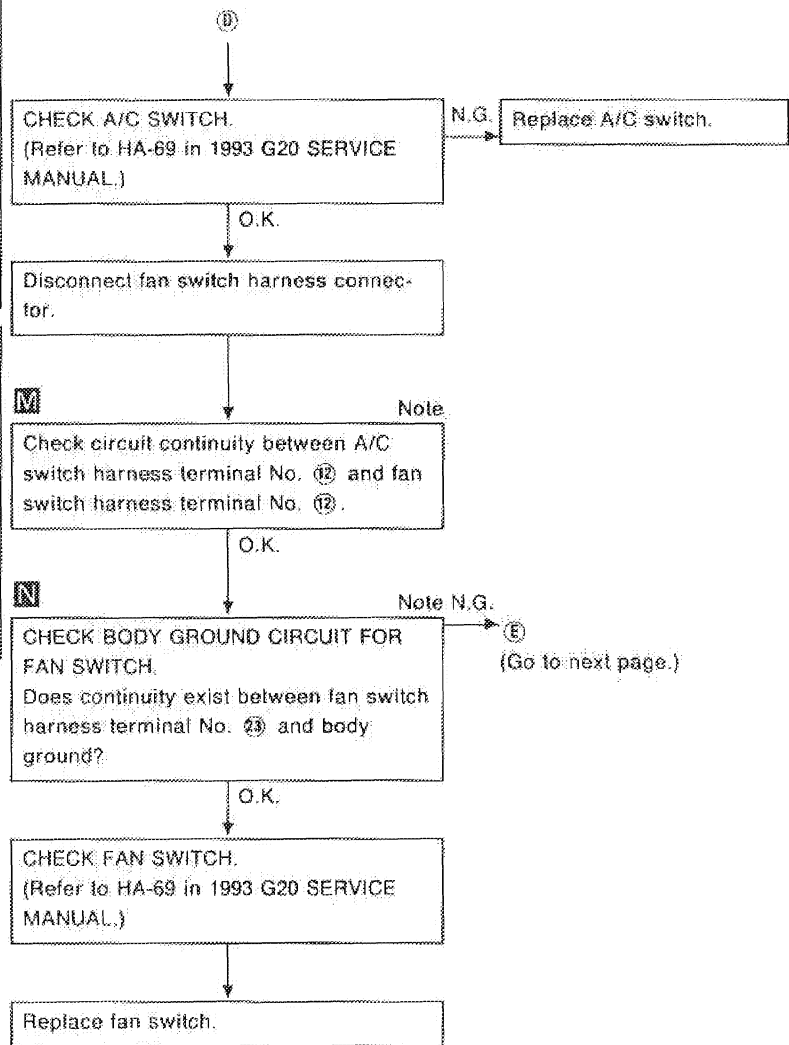
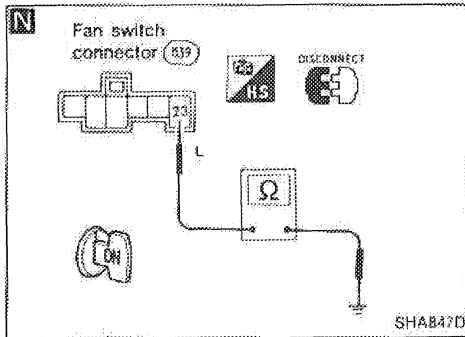
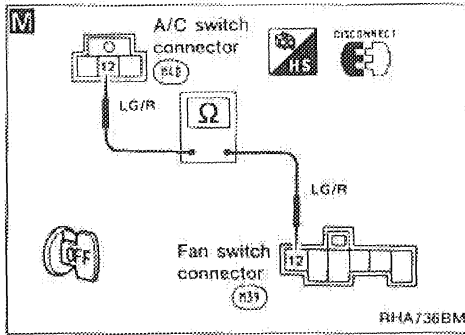
Diagnostic Procedure 4 (Cont'd)



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

TROUBLE DIAGNOSES

Diagnostic Procedure 4 (Cont'd)

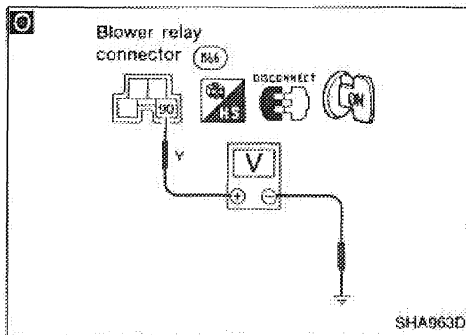


Note:

If the result is N.G. after checking circuit continuity, repair harness or connector.

TROUBLE DIAGNOSES

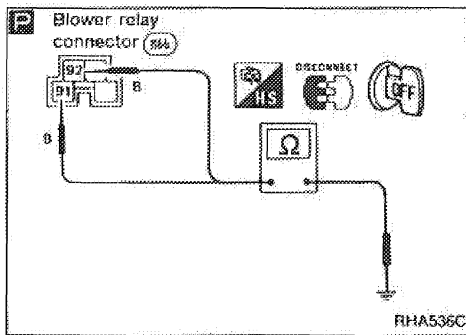
Diagnostic Procedure 4 (Cont'd)



E

Q CHECK POWER SUPPLY FOR BLOWER RELAY.
Disconnect blower relay harness connector.
Do approx. 12 volts exist between blower relay harness terminal No. ⑧ and body ground?

N.G. Check 10A fuse at fuse block.
(Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

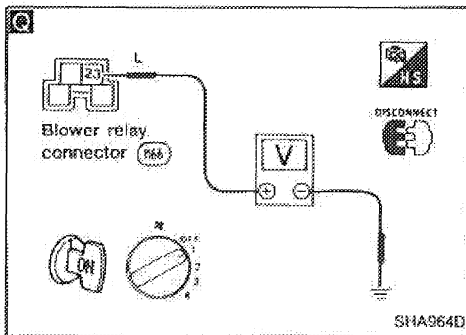


P Check circuit continuity between blower relay harness terminal No. ①, ② and body ground.

Note

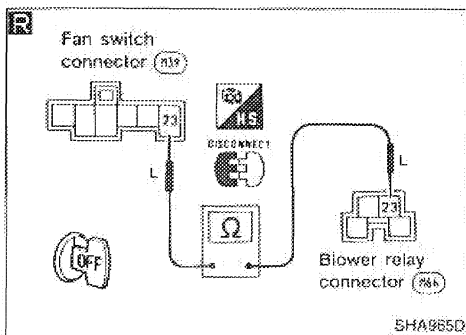
O.K.

Reconnect fan switch harness connector.



Q CHECK FAN SWITCH CIRCUIT BETWEEN FAN SWITCH AND BLOWER RELAY.
Do approx. 12 volts exist between blower relay harness terminal No. ③ and body ground?

N.G. Disconnect fan switch harness connector.



R CHECK BLOWER RELAY AFTER DISCONNECTING IT.
(Refer to HA-70 in 1993 G20 SERVICE MANUAL.)

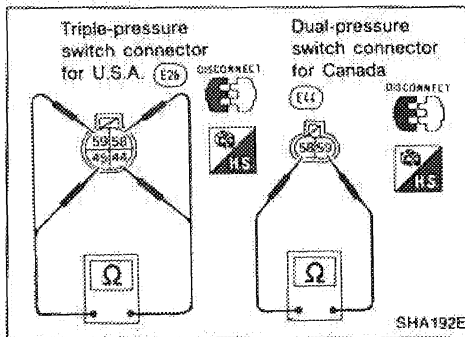
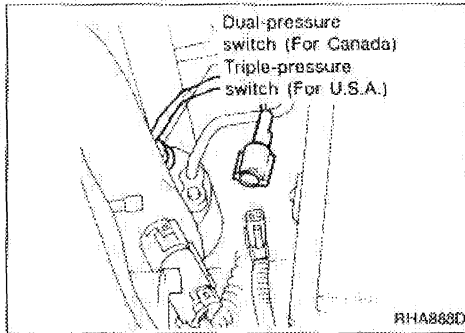
Note
Check circuit continuity between fan switch harness terminal No. ③ and blower relay harness terminal No. ③.

N.G.

Replace blower relay.

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

TROUBLE DIAGNOSES



Electrical Components Inspection

TRIPLE-PRESSURE SWITCH (For U.S.A.)

	Terminals	ON kPa (kg/cm ² , psi)	OFF kPa (kg/cm ² , psi)
Low-pressure side	53 - 58	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*	43 - 44	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	58 - 58	Decreasing to 1,667 - 2,452 (17 - 25, 242 - 356)	Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)

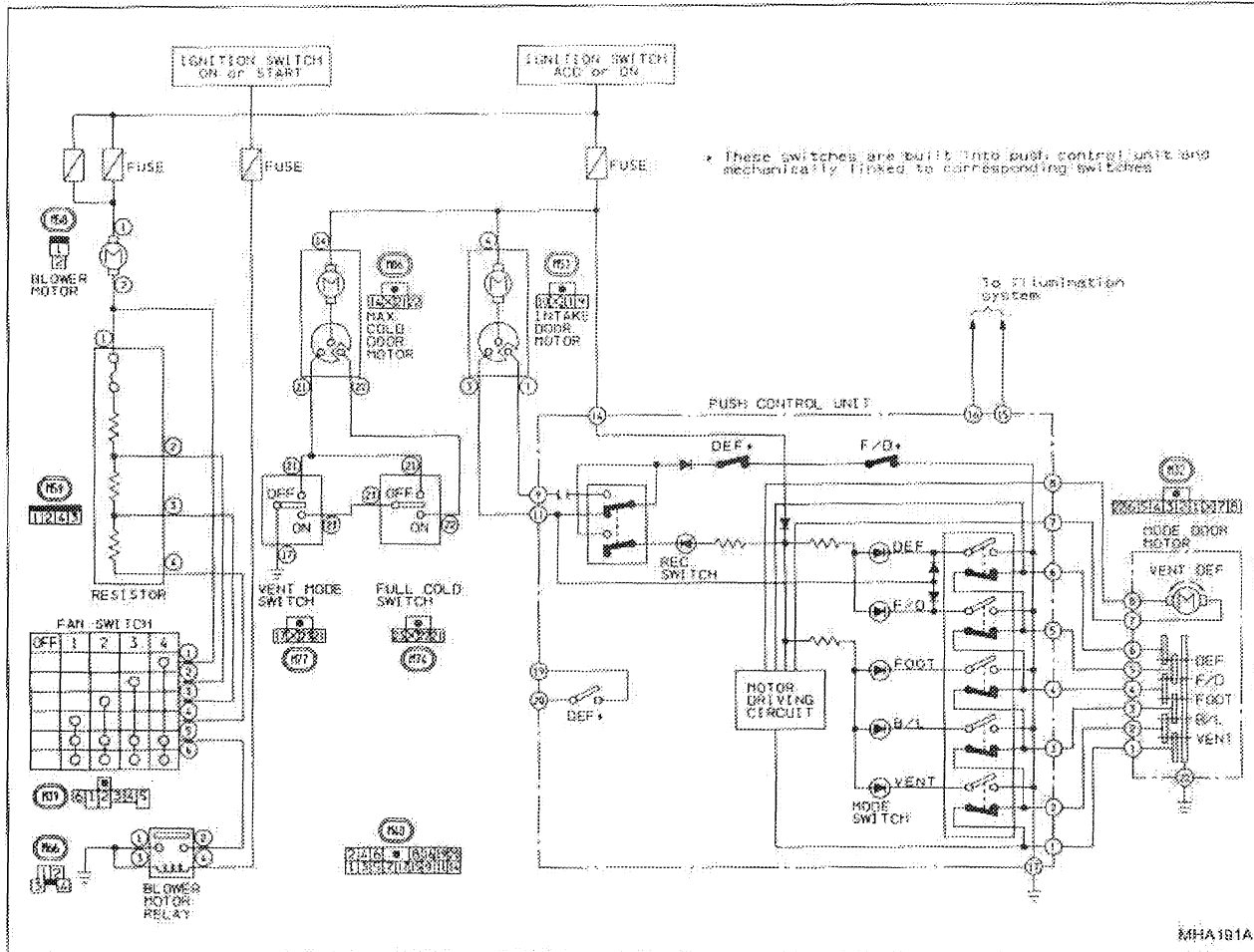
* For radiator fan motor operation.

DUAL-PRESSURE SWITCH (For Canada)

	ON kPa (kg/cm ² , psi)	OFF kPa (kg/cm ² , 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)

SYSTEM DESCRIPTION — Push Control

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	<input type="radio"/>								—	ON*1
Mode		<input type="radio"/>						Refer to "Air Flow". (See page HA-7 in 1993 G20 SERVICE MANUAL.)	—	—
			<input type="radio"/>						—	—
				<input type="radio"/>					FRE	—
						<input type="radio"/>			FRE	ON*1
							<input type="radio"/>	REC*2	—	

*1: Compressor is operated by thermo control amp.

*2: Depending on mode switch position

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

General Specifications

COMPRESSOR

Model	DKV-14C
Type	Vane rotary
Displacement cm ³ (cu in)/Rev	146 (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)	0.70 - 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
AUTOMATIC TRANSAXLE CONTROL SYSTEM, SHIFT LOCK SYSTEM	AT SECTION
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

PRECAUTION

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

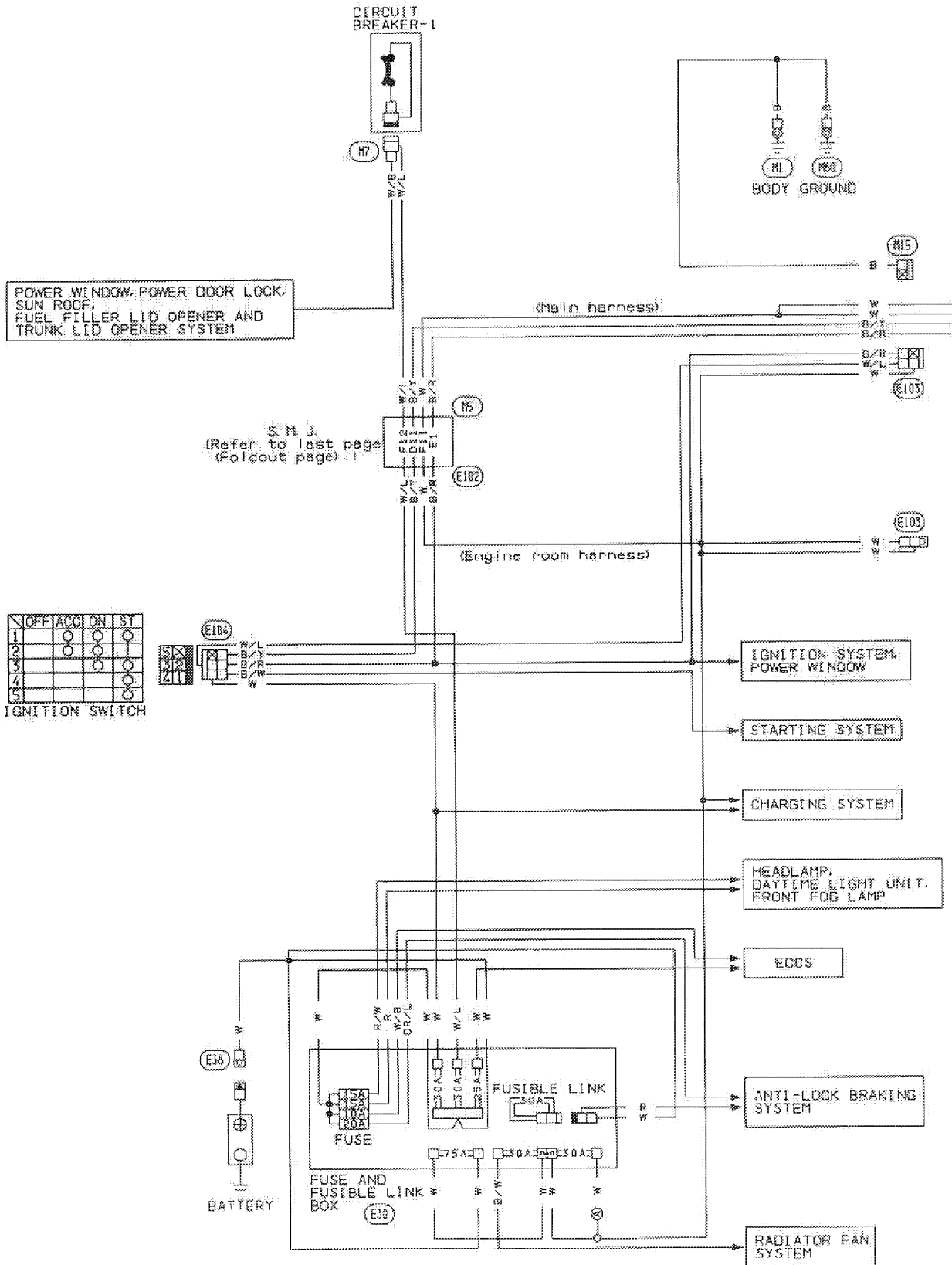
The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner" help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel 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.

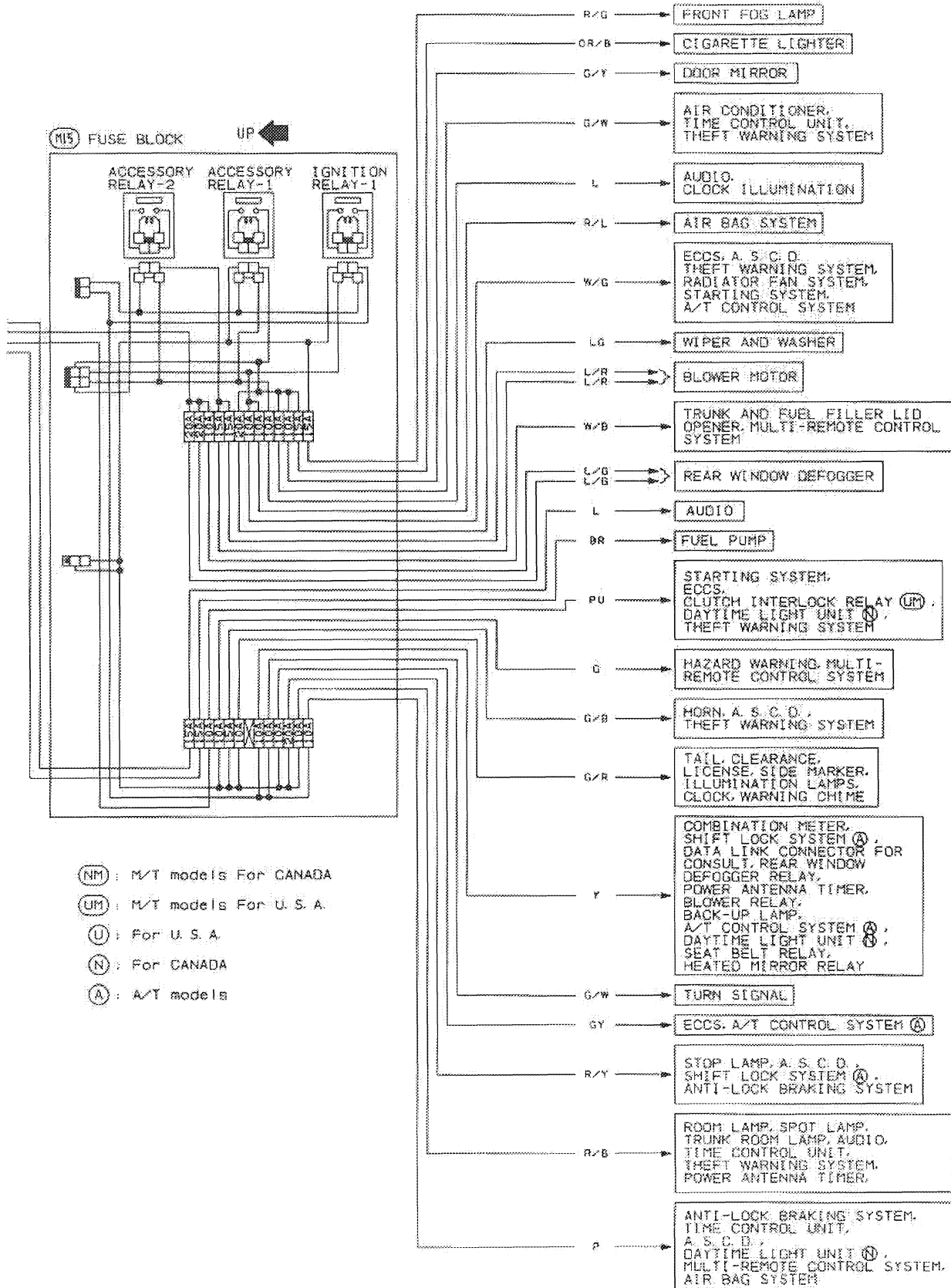
POWER SUPPLY ROUTING

Wiring Diagram



POWER SUPPLY ROUTING

Wiring Diagram (Cont'd)



MEL181C

BATTERY

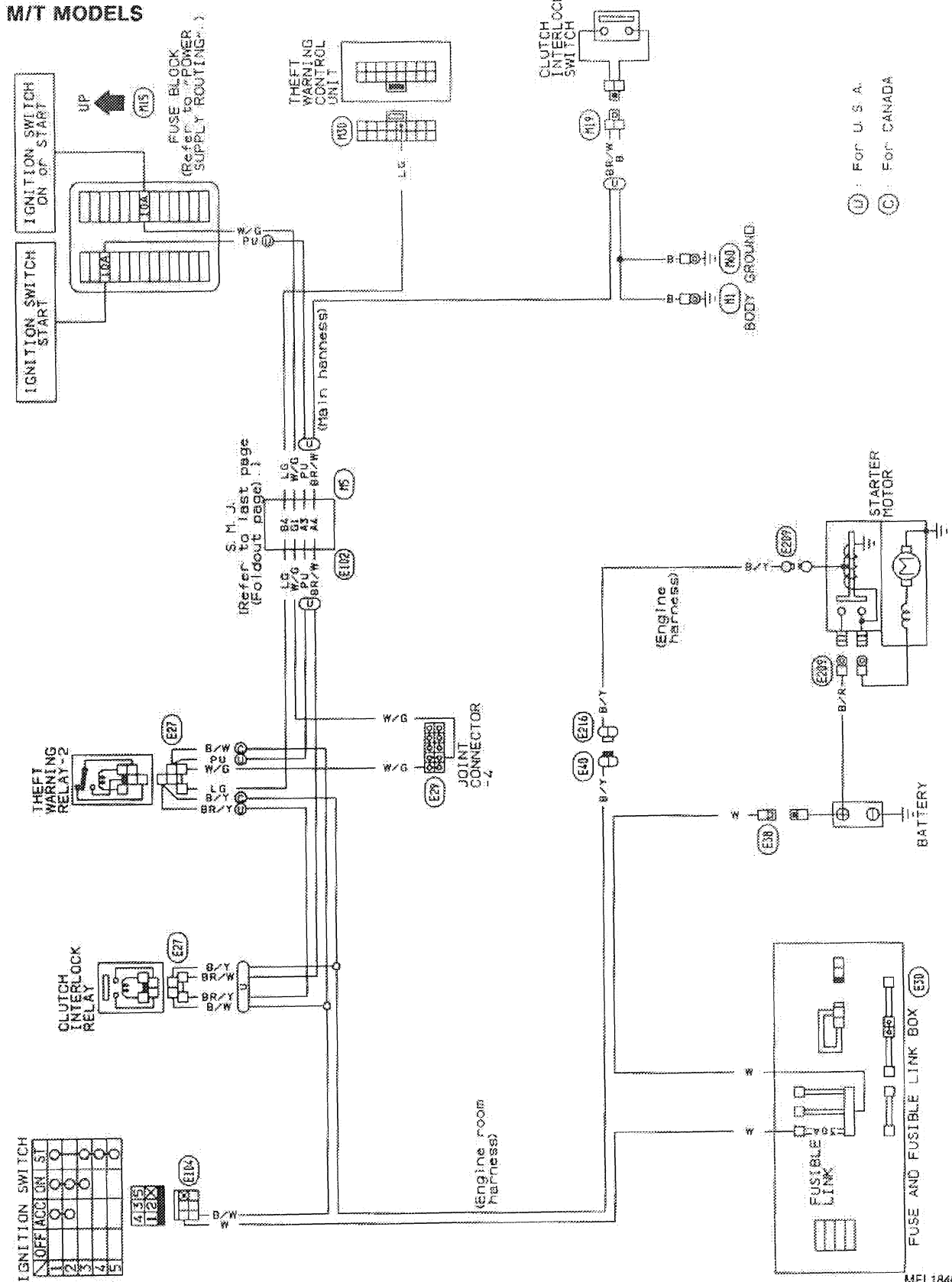
Service Data and Specifications (S.D.S.)

Type		80D26L
Capacity	V-AH	12-65
Cold cranking current (For reference value)	A	582

STARTING SYSTEM

Wiring Diagram

M/T MODELS

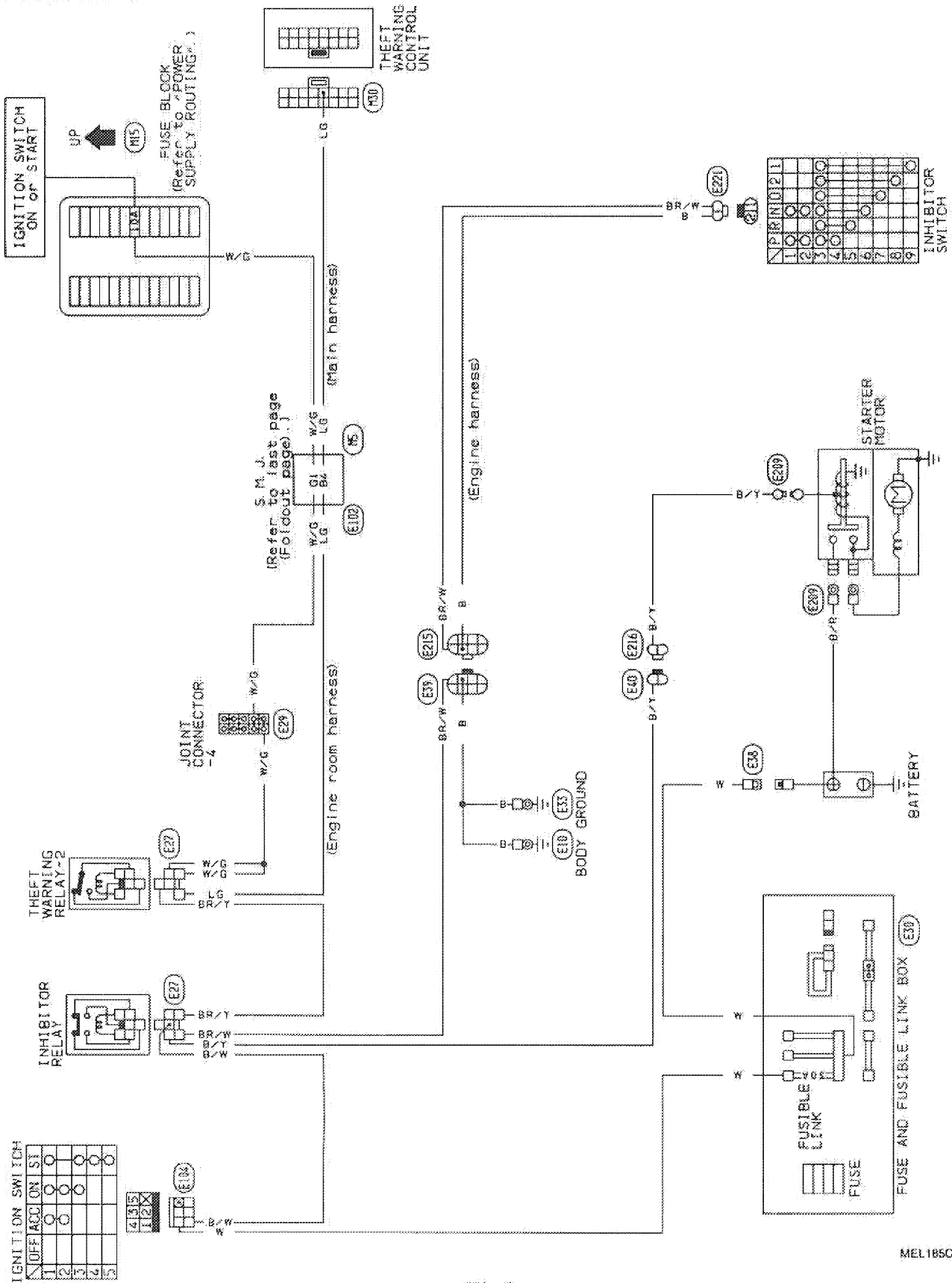


U : For U. S. A.
C : For CANADA

STARTING SYSTEM

Wiring Diagram (Cont'd)

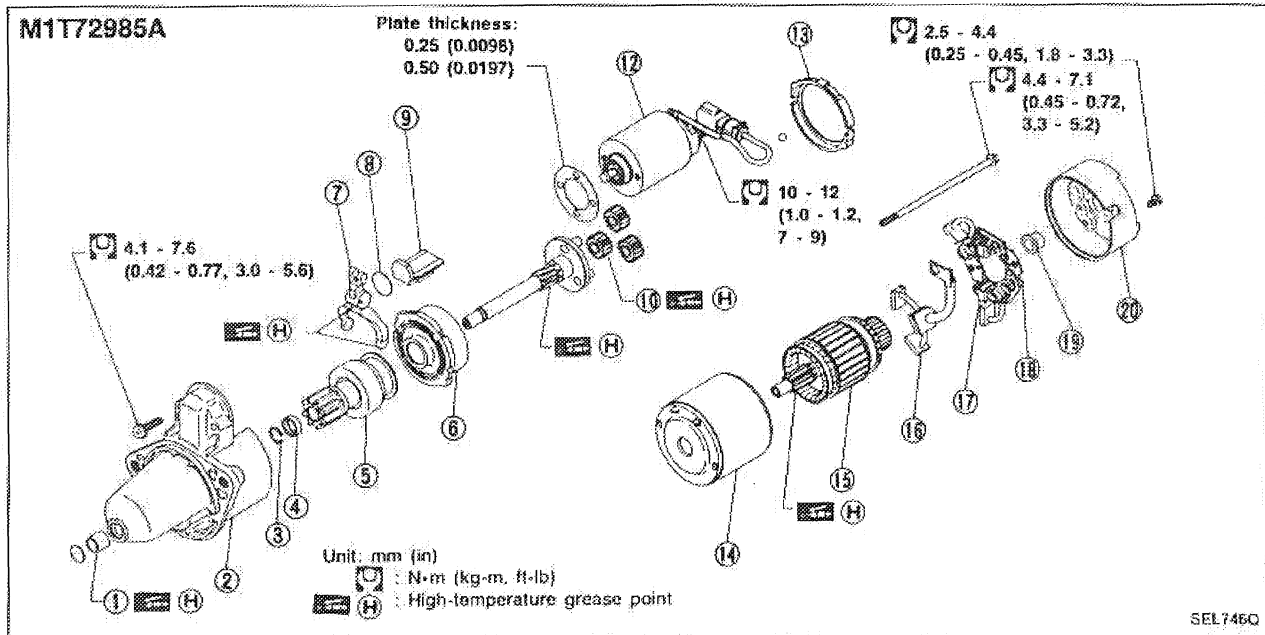
A/T MODELS



MEL185C

STARTING SYSTEM

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

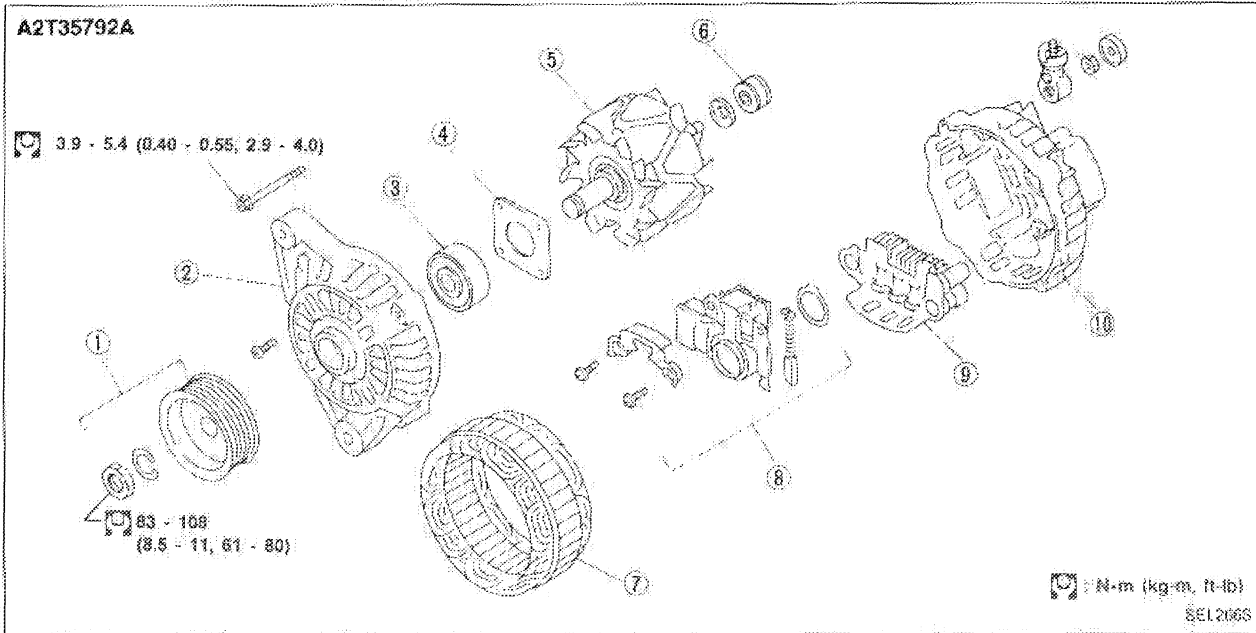
Service Data and Specifications (S.D.S.)

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 "f" in height of pinion assembly	mm (in)	—
Clearance of bearing metal and armature shaft	mm (in)	Less than 0.2 (0.008)
Clearance "f" between pinion front edge and pinion stopper	mm (in)	0.5 - 2.0 (0.020 - 0.079)

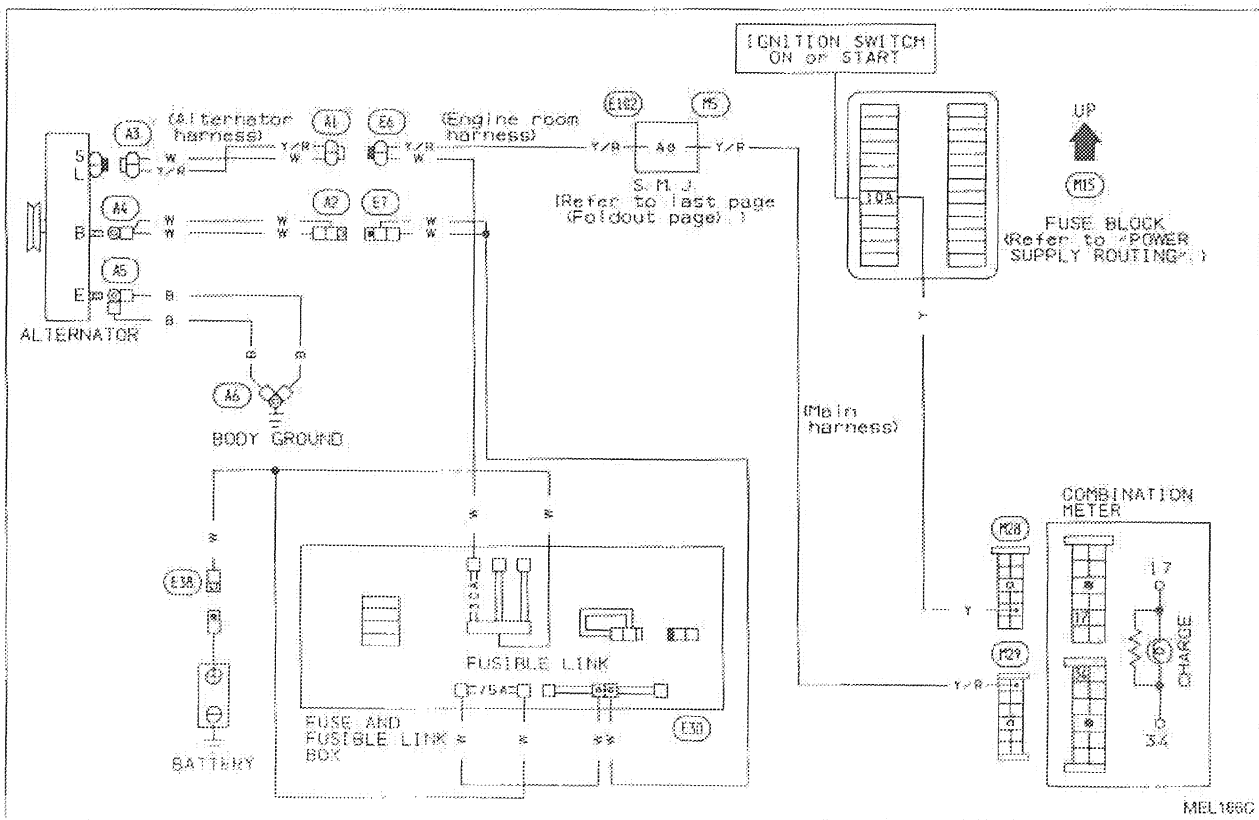
CHARGING SYSTEM

Construction



- | | | |
|--------------------|----------------|------------------------|
| ① Pulley assembly | ⑤ Rotor | ⑧ IC voltage regulator |
| ② Front cover | ⑥ Rear bearing | ⑨ Diode assembly |
| ③ Front bearing | ⑦ Stator | ⑩ Rear cover |
| ④ Bearing retainer | | |

Wiring Diagram



CHARGING SYSTEM

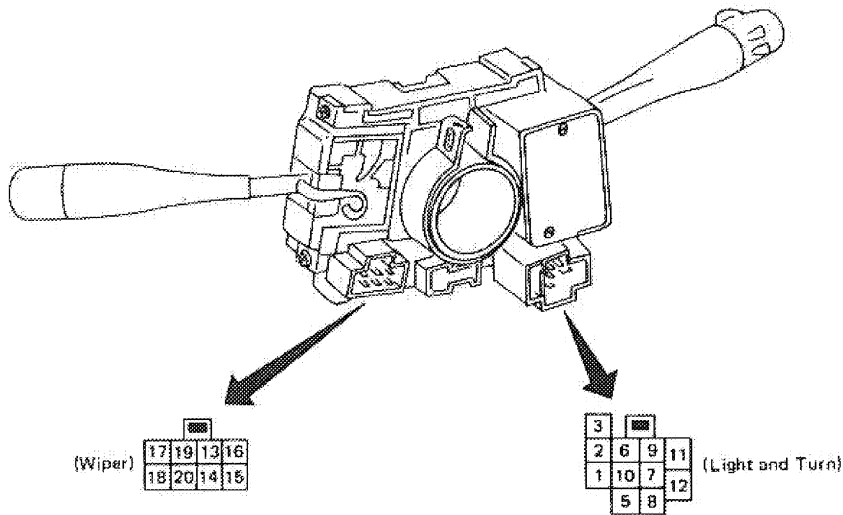
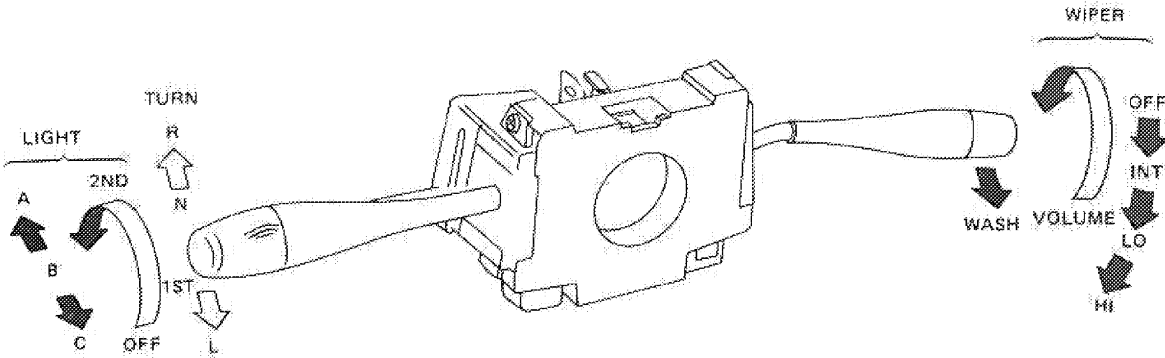
Service Data and Specifications (S.D.S.)

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

Combination Switch/Check

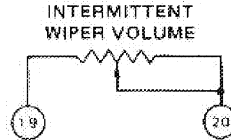


LIGHTING SWITCH

	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					○

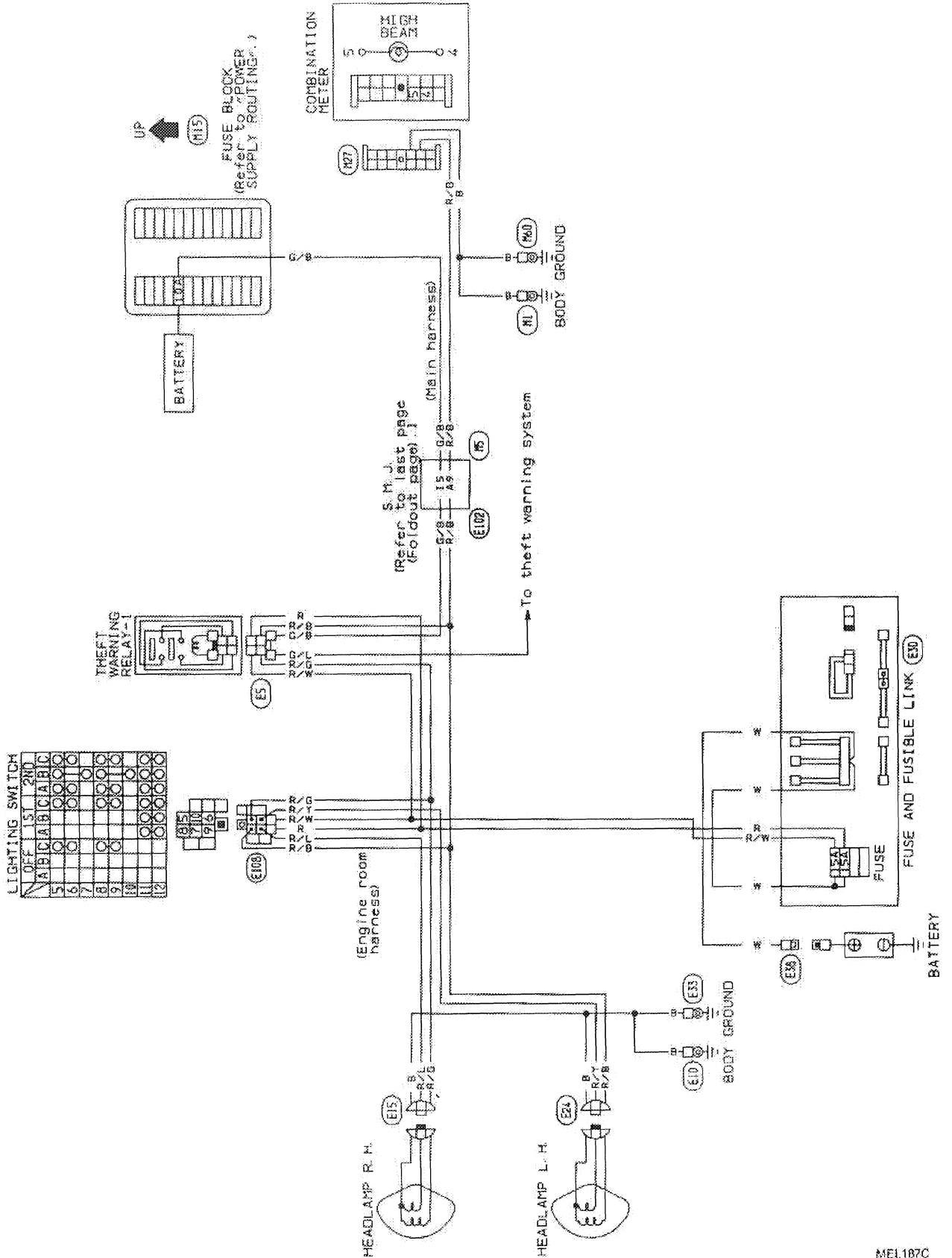


TURN SIGNAL SWITCH

	R	N	L
	1	○	
2	○		
3			○

HEADLAMP — Without Daytime Light System —

Wiring Diagram



HEADLAMP — Daytime Light System —

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	Δ*	Δ*	O	Δ*	Δ*	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

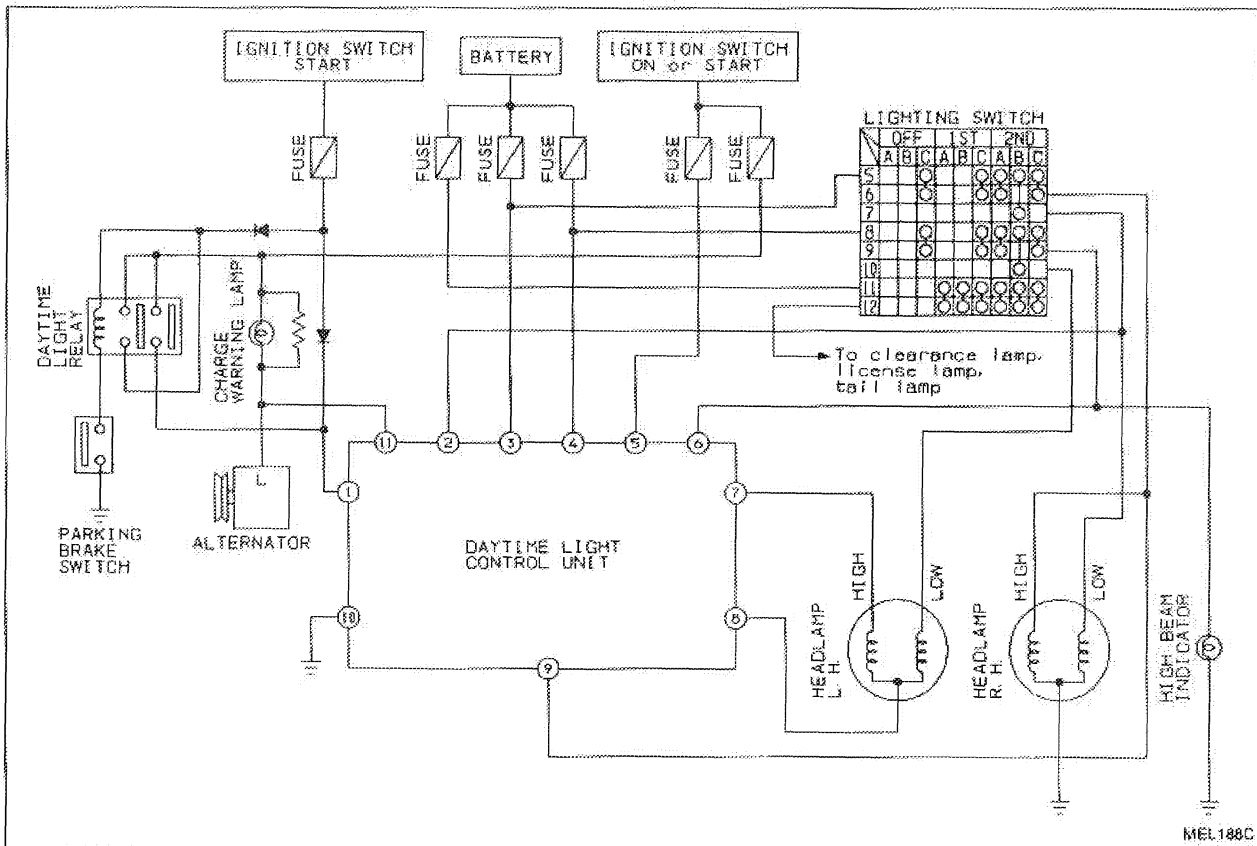
O : Lamp "ON"

X : Lamp "OFF"

Δ : Lamp dims.

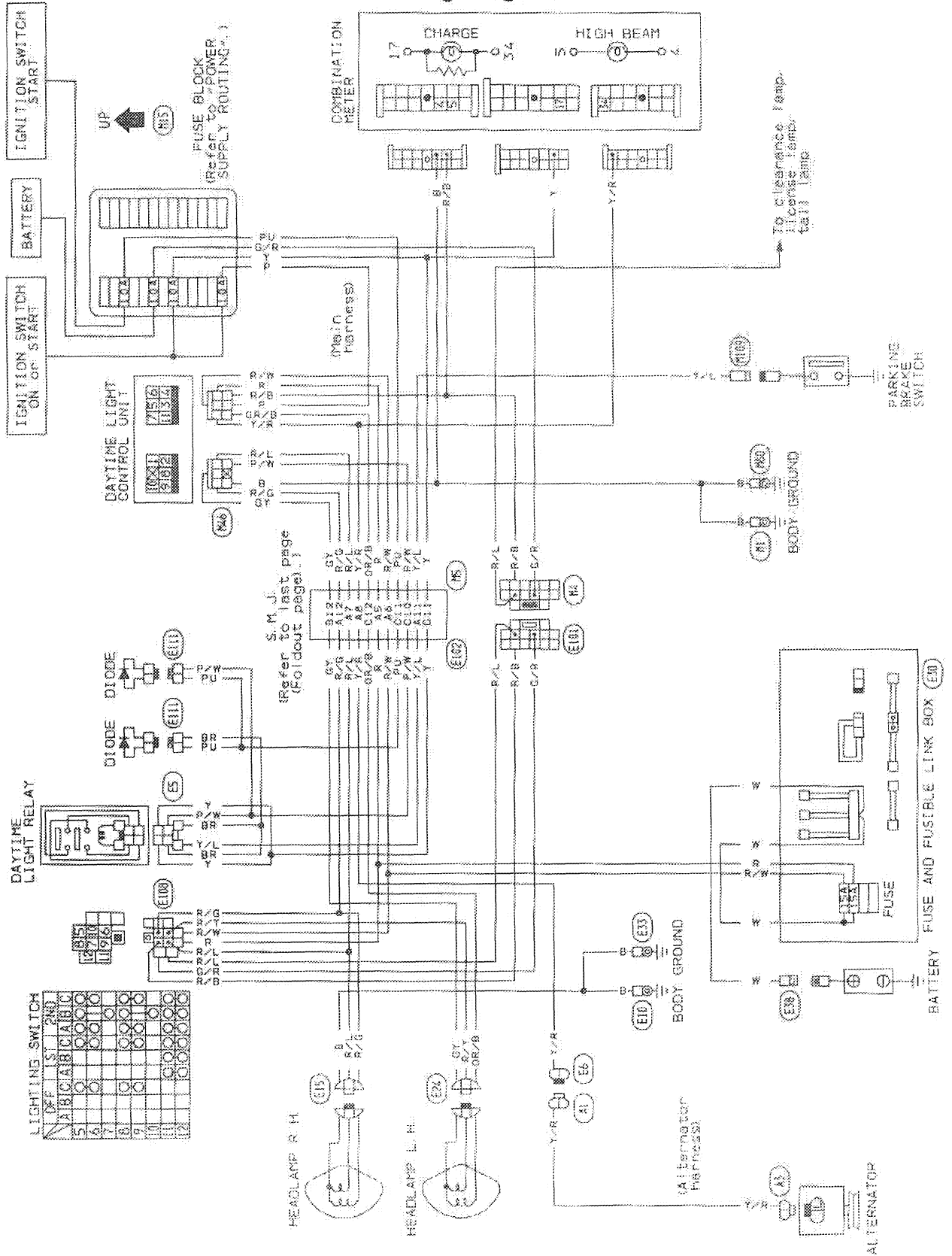
* : When starting the engine with the parking brake released, the daytime lamp will come ON.
 When starting the engine with the parking brake pulled, the daytime lamp will not come ON.

Schematic



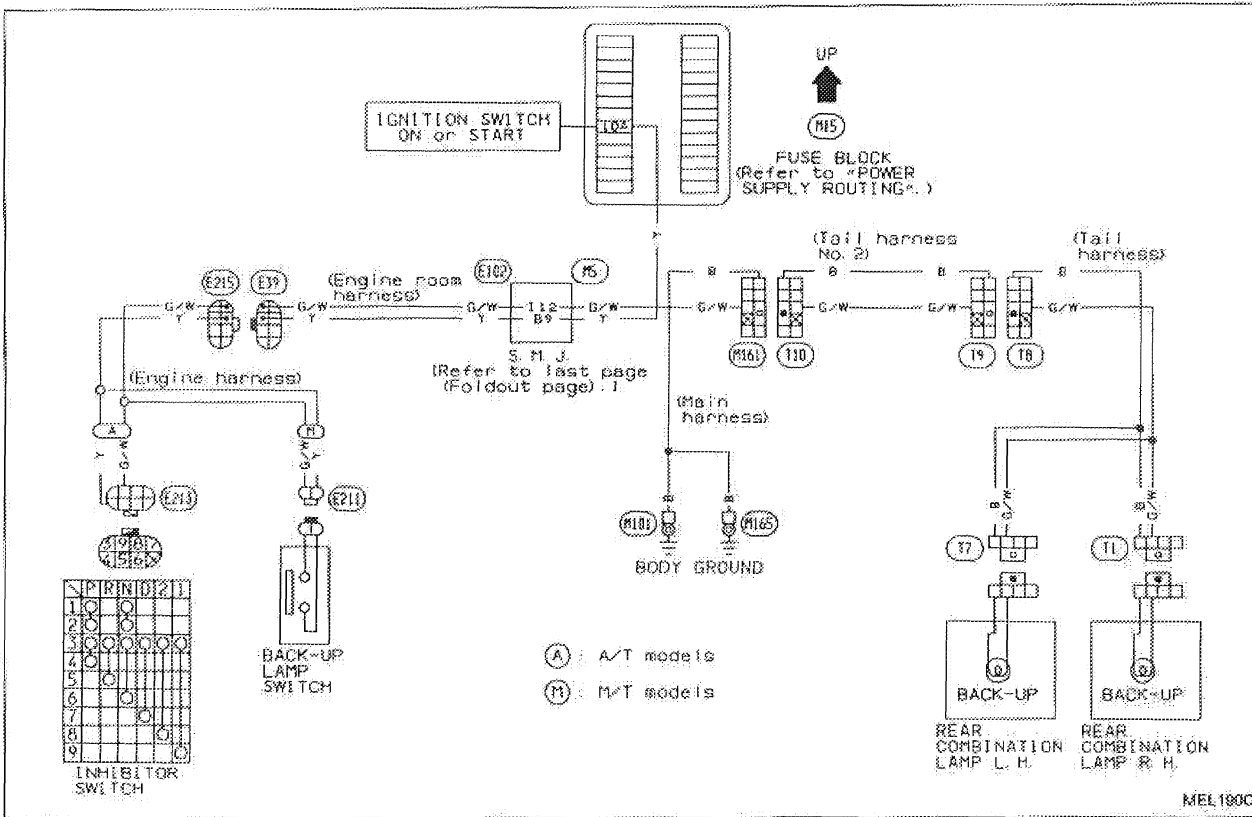
HEADLAMP — Daytime Light System —

Wiring Diagram

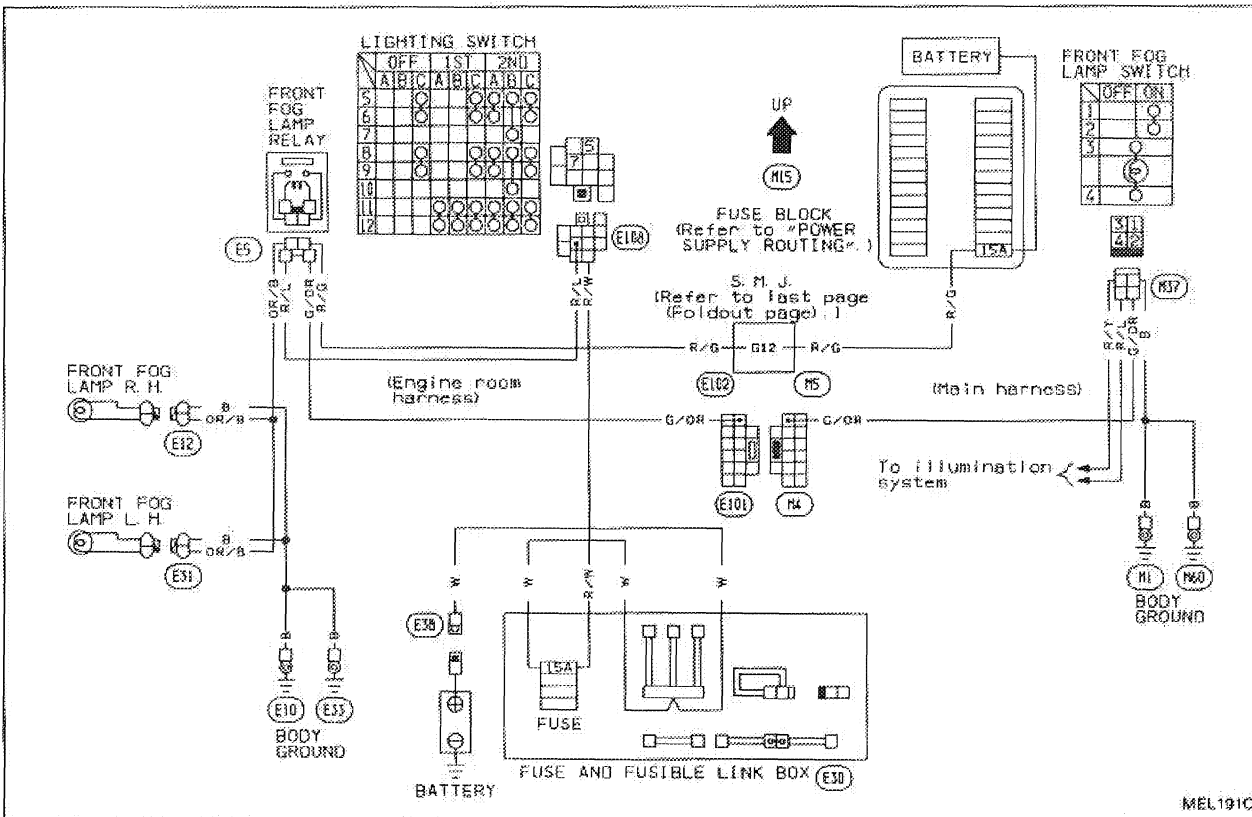


EXTERIOR LAMP

Back-up Lamp/Wiring Diagram

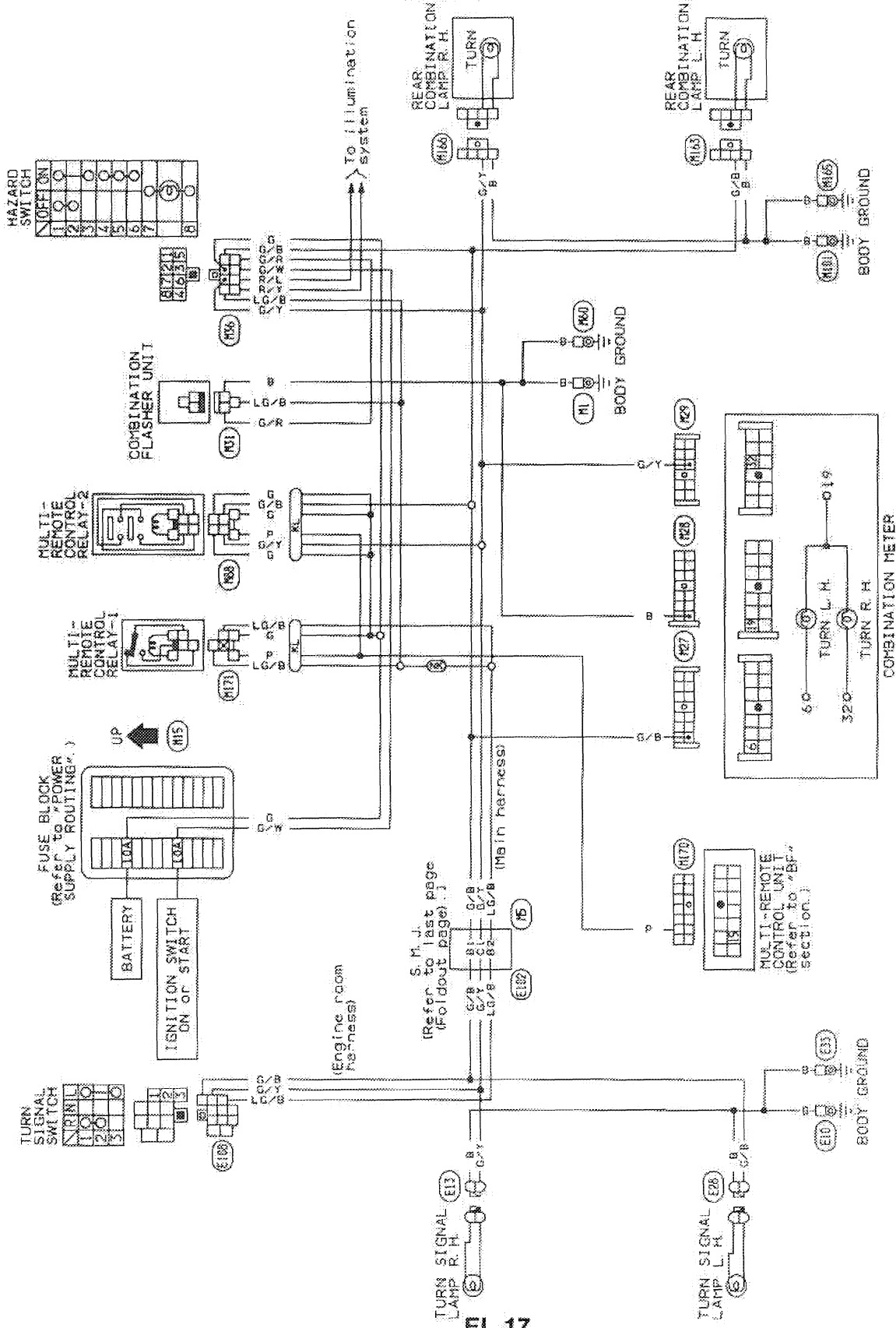


Front Fog Lamp/Wiring Diagram



EXTERIOR LAMP

Turn Signal and Hazard Warning Lamps/Wiring Diagram

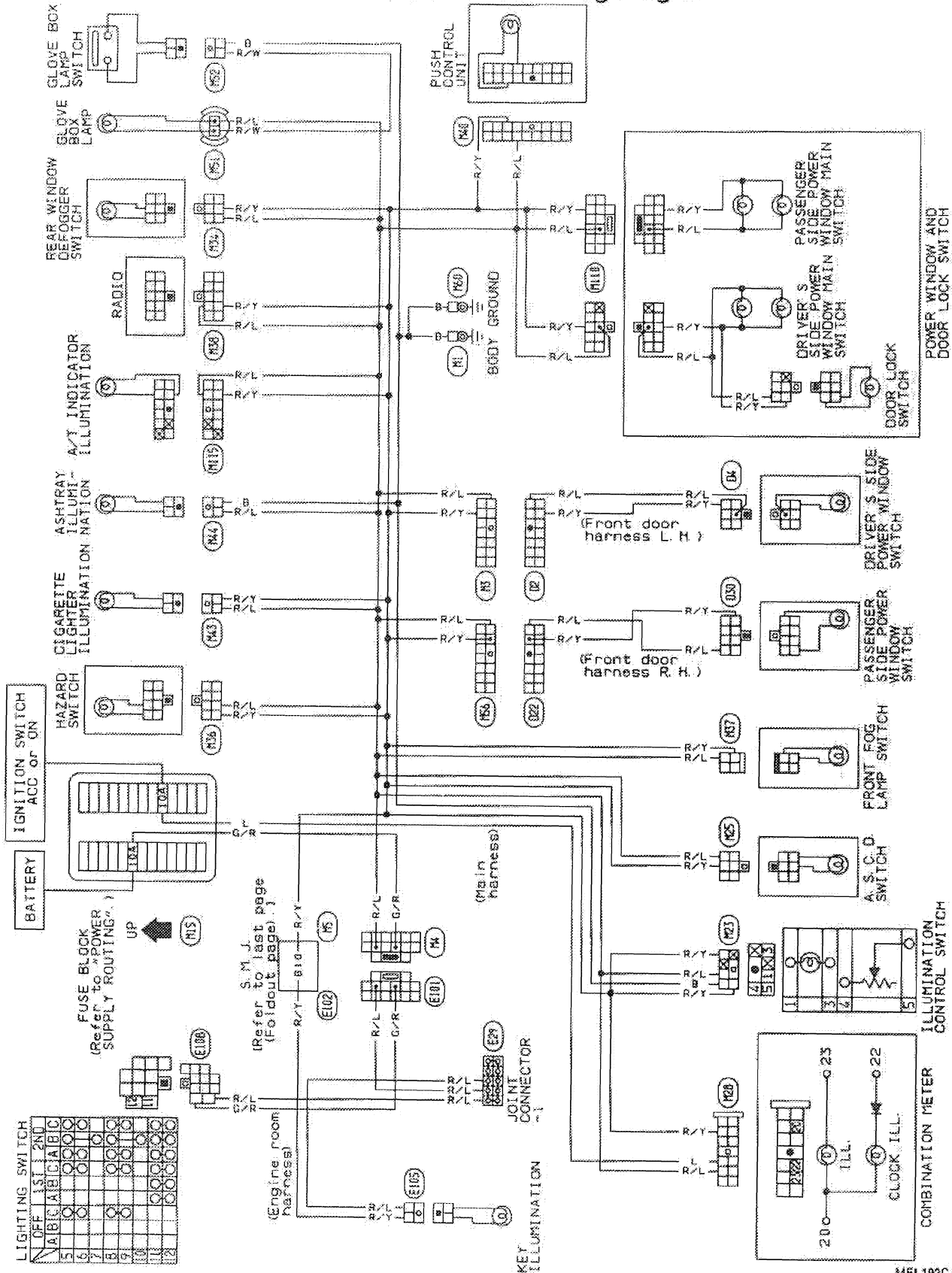


(KL) : Models with multi-remote control system
 (NK) : Models without multi-remote control system

S. M. J.
 (Refer to last page
 (foldout page).)

INTERIOR LAMP

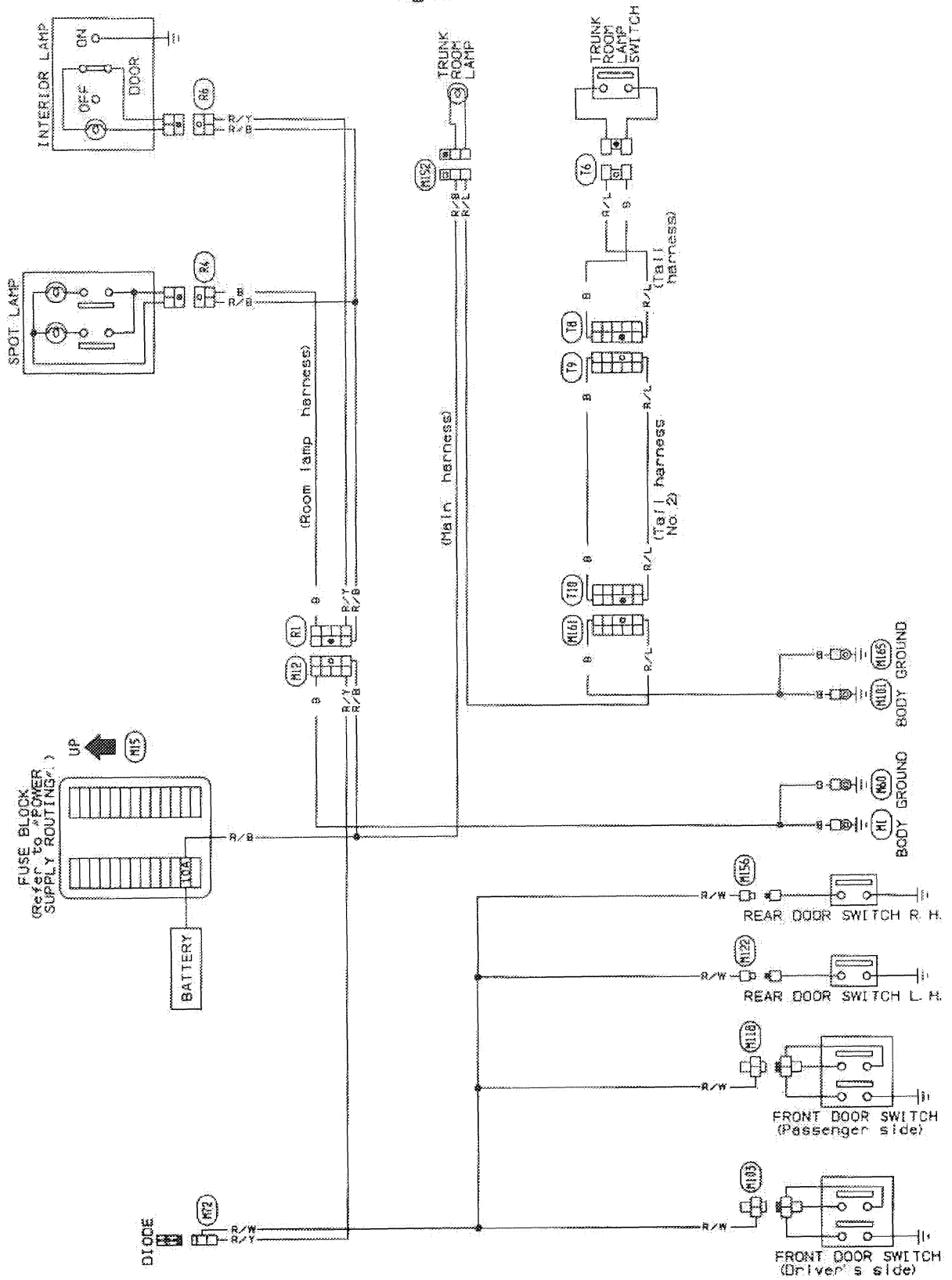
Illumination/Wiring Diagram



MEL192C

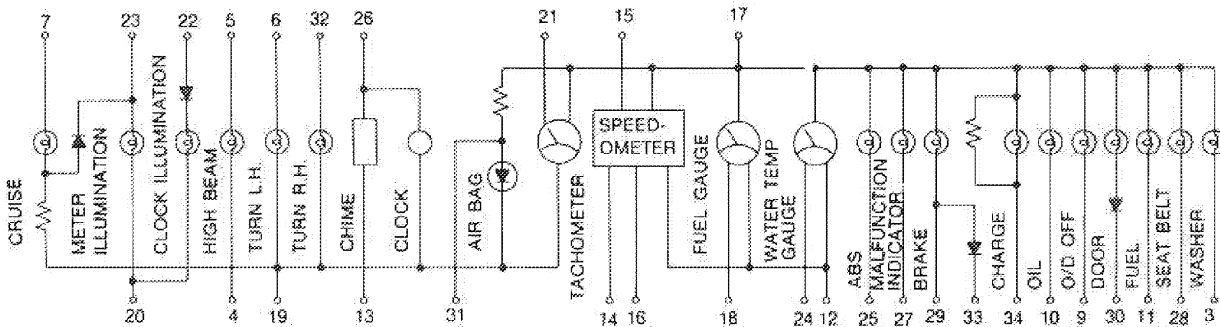
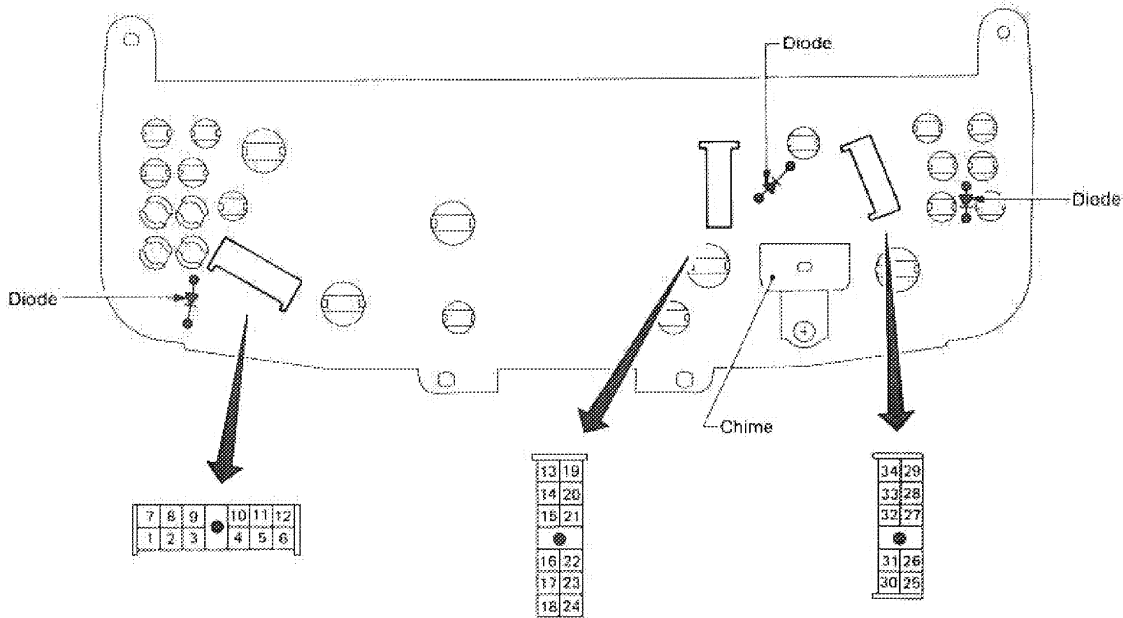
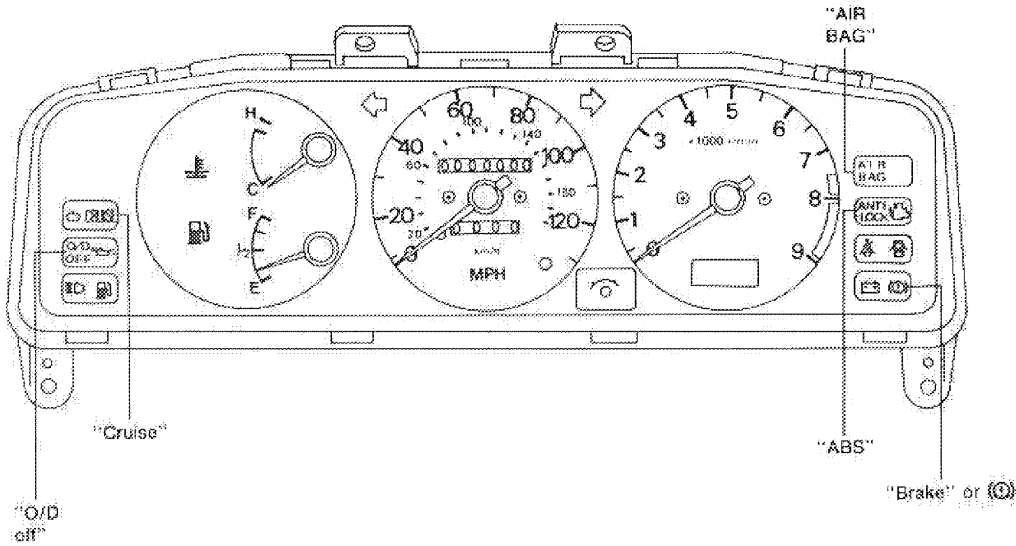
INTERIOR LAMP

Interior, Spot and Trunk Room Lamps/Wiring Diagram



METER AND GAUGES

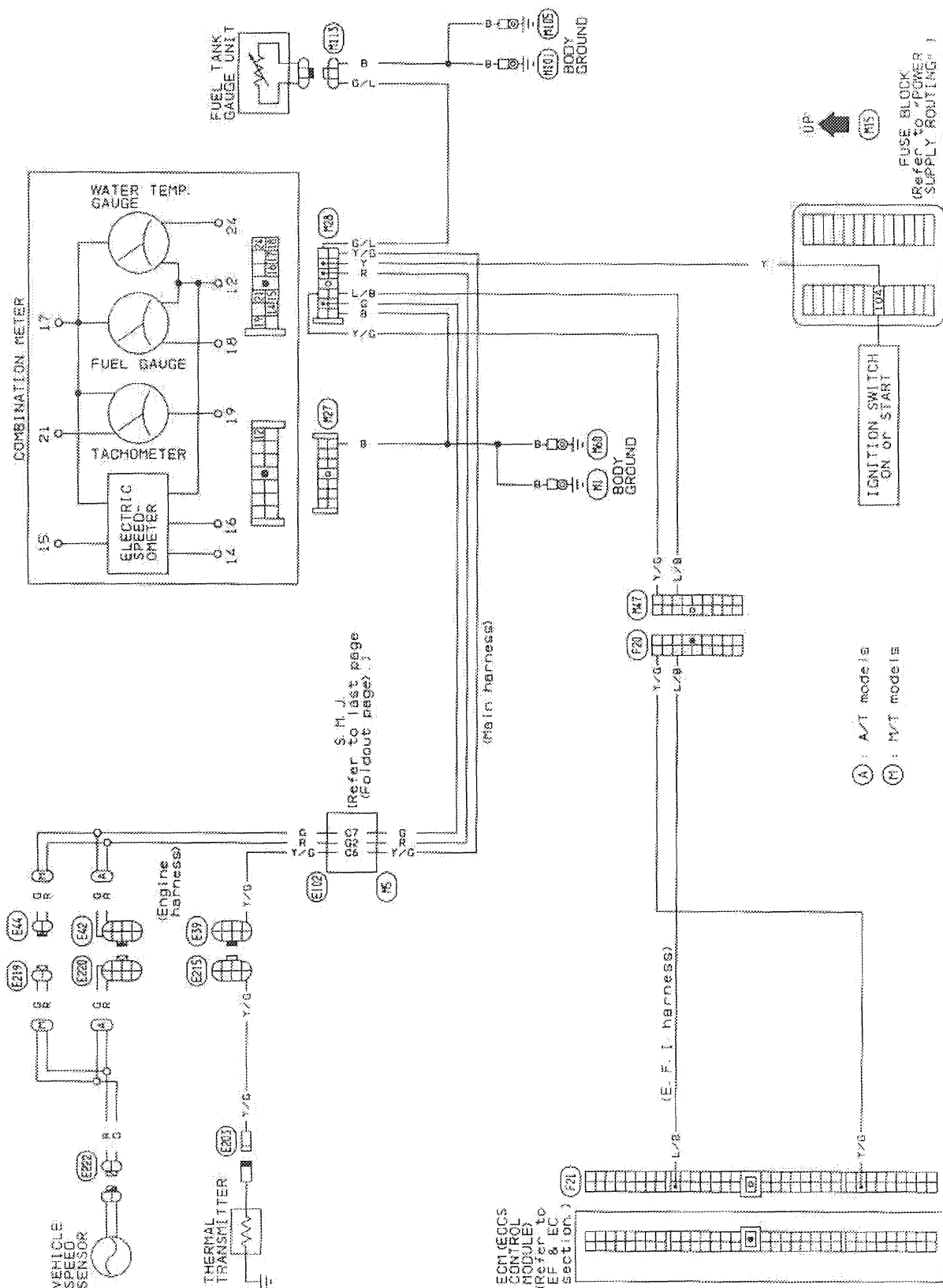
Combination Meter



MEL208C

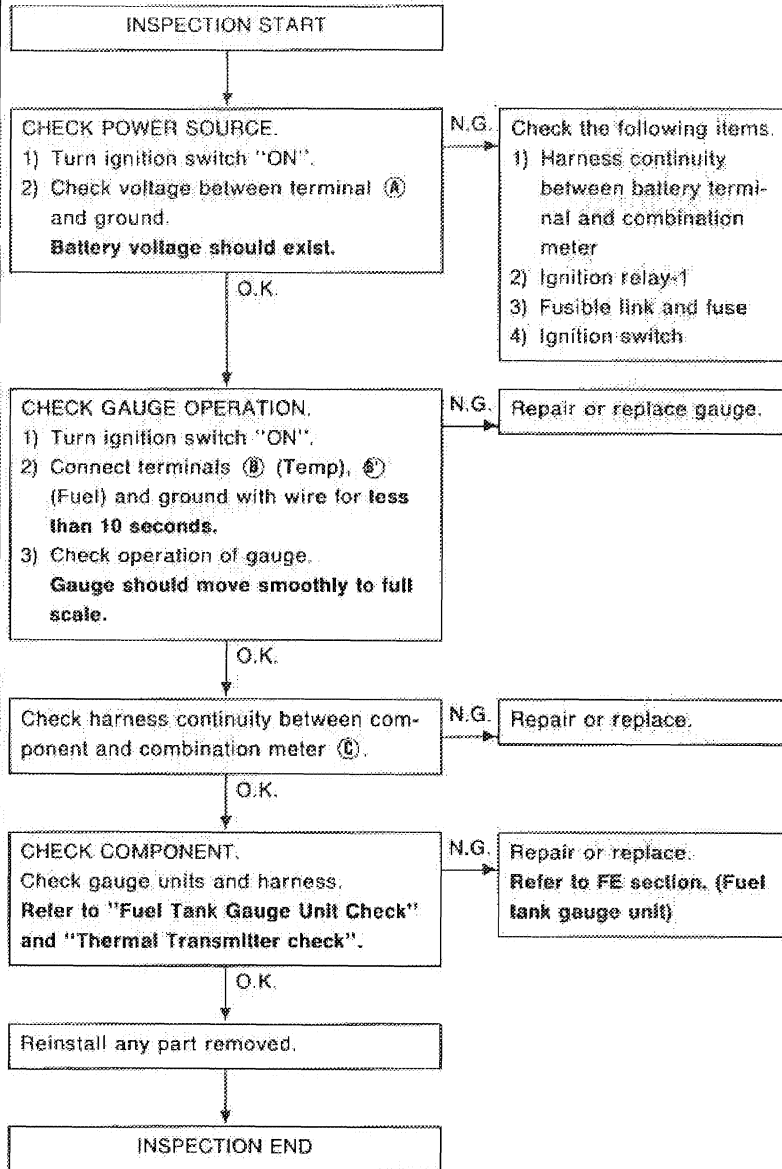
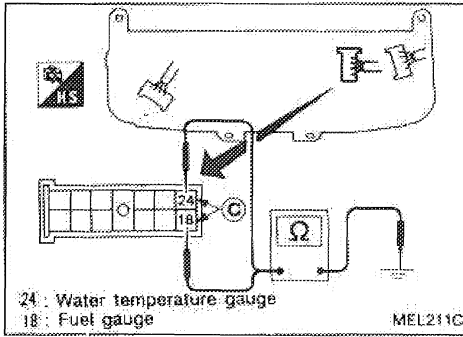
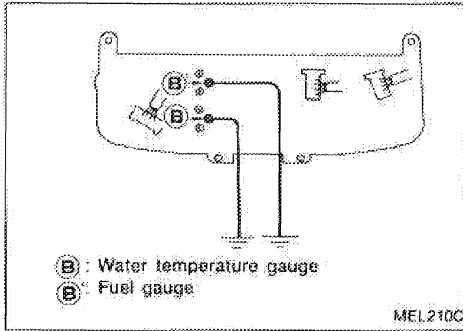
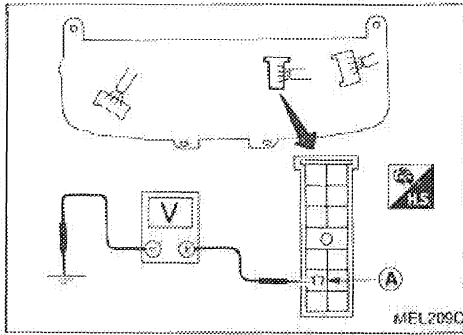
METER AND GAUGES

Speedometer, Tachometer, Temp., Oil and Fuel Gauges/Wiring Diagram

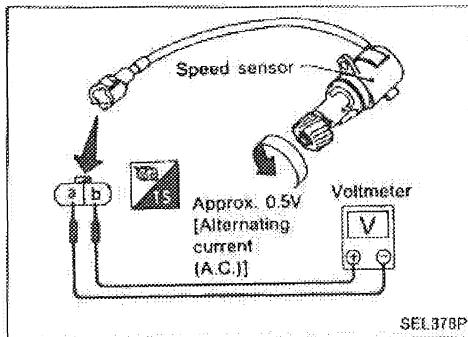


METER AND GAUGES

Inspection/Fuel Gauge and Water Temperature Gauge



METER AND GAUGES

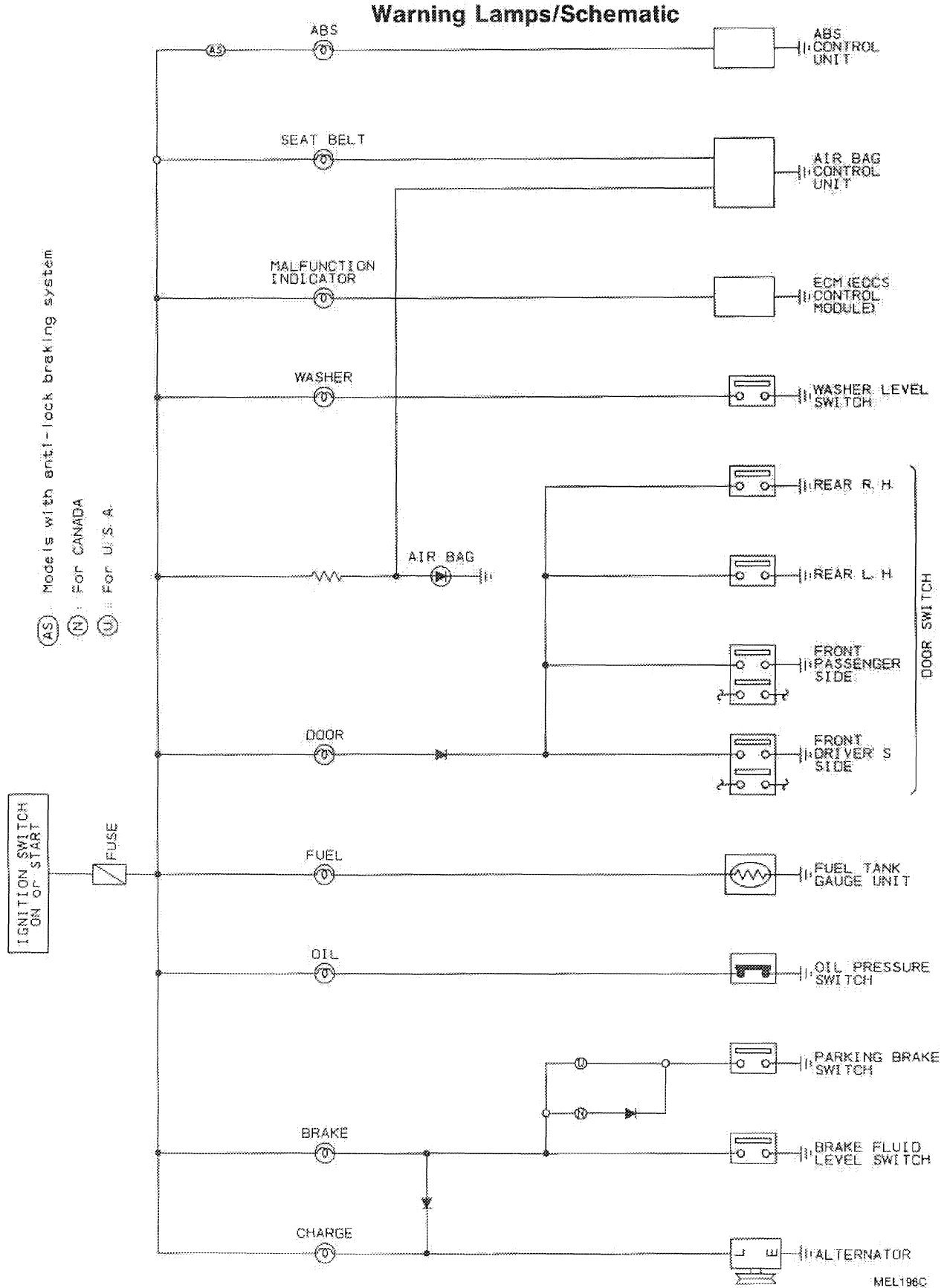


Speed Sensor Signal Check

1. Remove speed sensor from transaxle.
2. Turn speedometer pinion quickly and measure voltage across **a** and **b**.

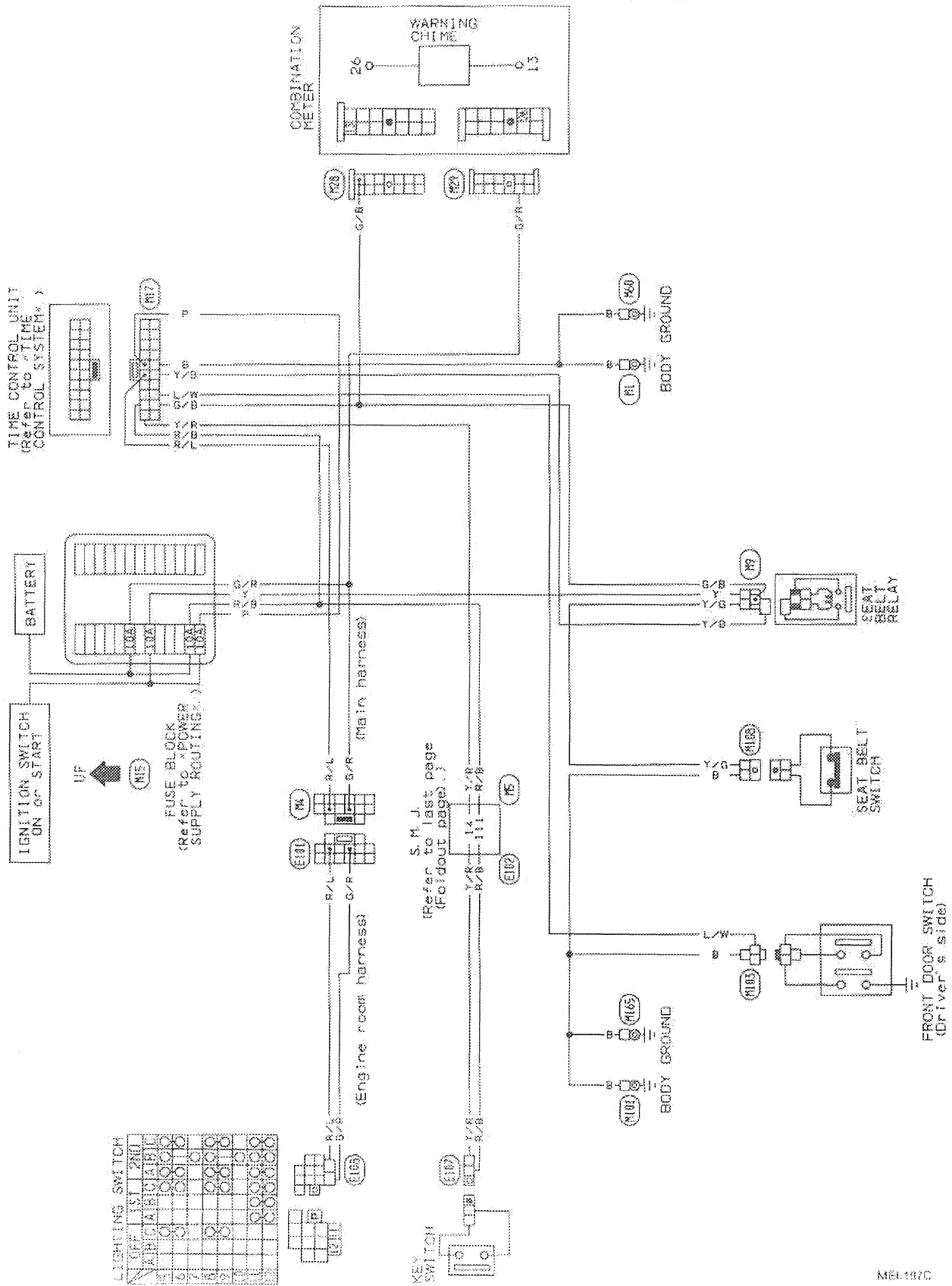
WARNING LAMPS AND CHIME

Warning Lamps/Schematic

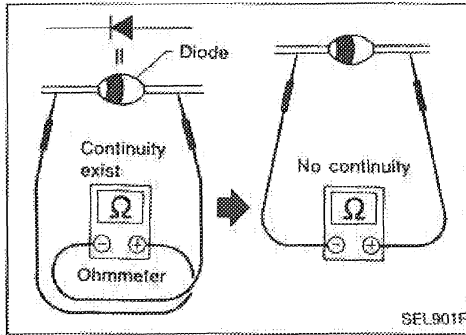


WARNING LAMPS AND CHIME

Warning Chime/Wiring Diagram



WARNING LAMPS AND CHIME

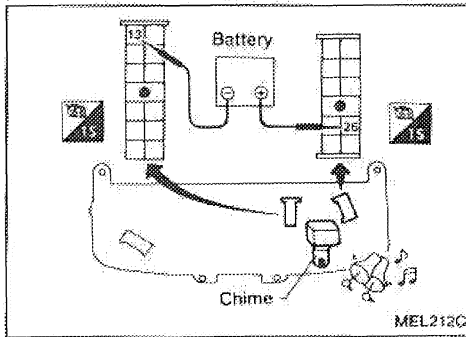


Diode Check

- 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

TIME CONTROL SYSTEM

Description

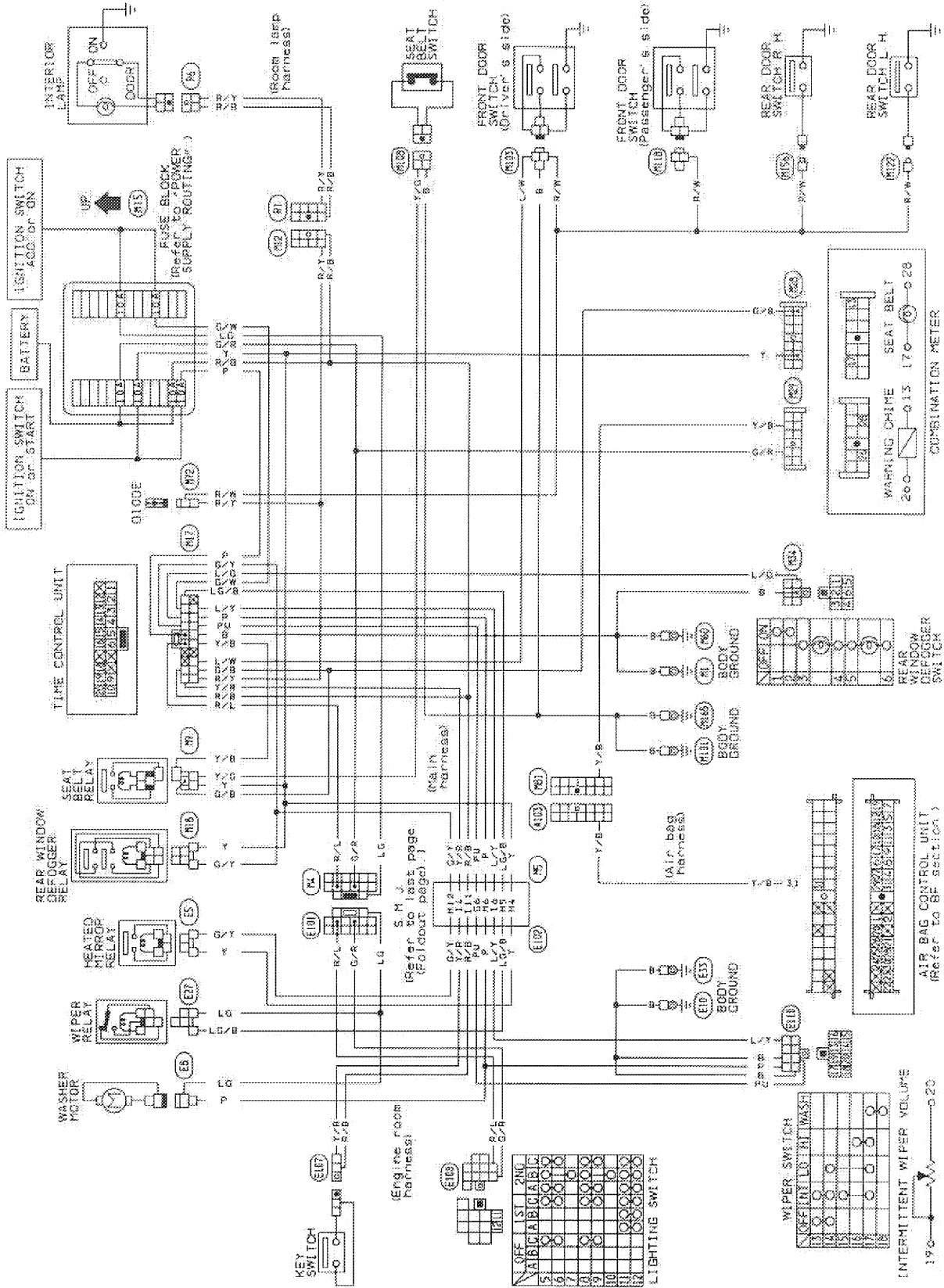
FUNCTION

- 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.

TIME CONTROL SYSTEM

Wiring Diagram



TIME CONTROL SYSTEM

Trouble Diagnoses

SYMPTOM CHART

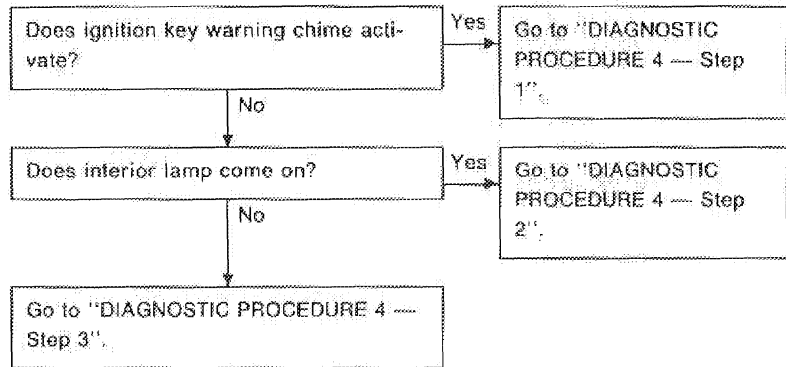
PROCEDURE		Preliminary Check			Main Power Supply and Ground Circuit Check	Diagnostic Procedure								
		EL-31	EL-31	EL-31		EL-32	EL-34	EL-35	EL-36	EL-36	EL-37	EL-38	EL-39	EL-40
REFERENCE PAGE														
SYMPTOM		Procedure 1	Procedure 2	Procedure 3	Main power supply and Ground circuit	Diagnostic Procedure 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.				<input type="checkbox"/>	<input type="checkbox"/>								
	Intermittent time of wiper cannot be adjusted.						<input type="checkbox"/>							
	Wiper and washer activate individually but not in combination.							<input type="checkbox"/>						
Warning	Light warning chime does not activate.	<input type="checkbox"/>			<input type="checkbox"/>				<input type="checkbox"/>					
	Ignition key warning chime does not activate.		<input type="checkbox"/>		<input type="checkbox"/>					<input type="checkbox"/>				
	Seat belt warning chime does not activate.			<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
Rear defogger	Rear defogger does not activate, or go off after activating.				<input type="checkbox"/>							<input type="checkbox"/>		
Illumination	Interior lamp does not fade out after driver's door is closed.				<input type="checkbox"/>								<input type="checkbox"/>	

TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd) PRELIMINARY CHECK

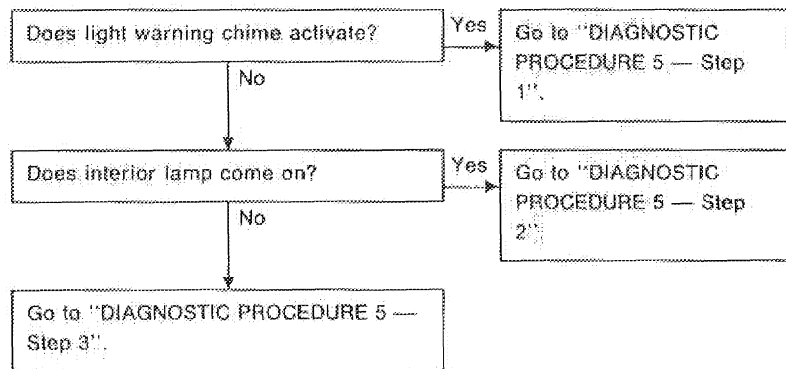
Preliminary check 1

- Light warning chime does not activate.



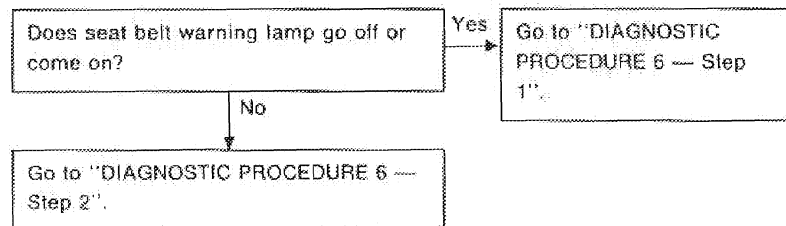
Preliminary check 2

- Ignition key warning chime does not activate.



Preliminary check 3

- Seat belt warning chime does not activate.

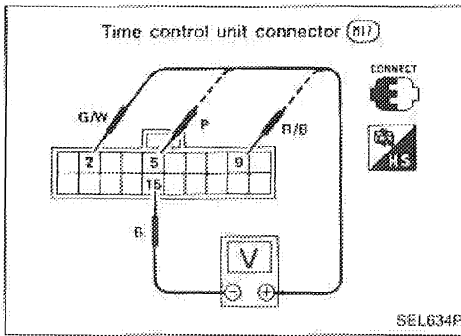


TIME CONTROL SYSTEM

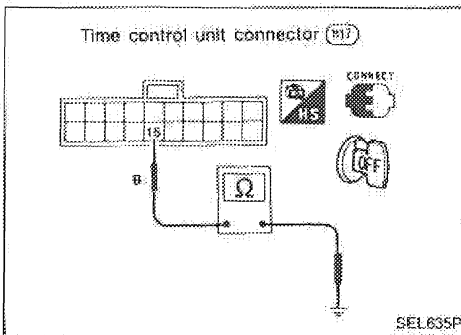
Trouble Diagnoses (Cont'd)

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



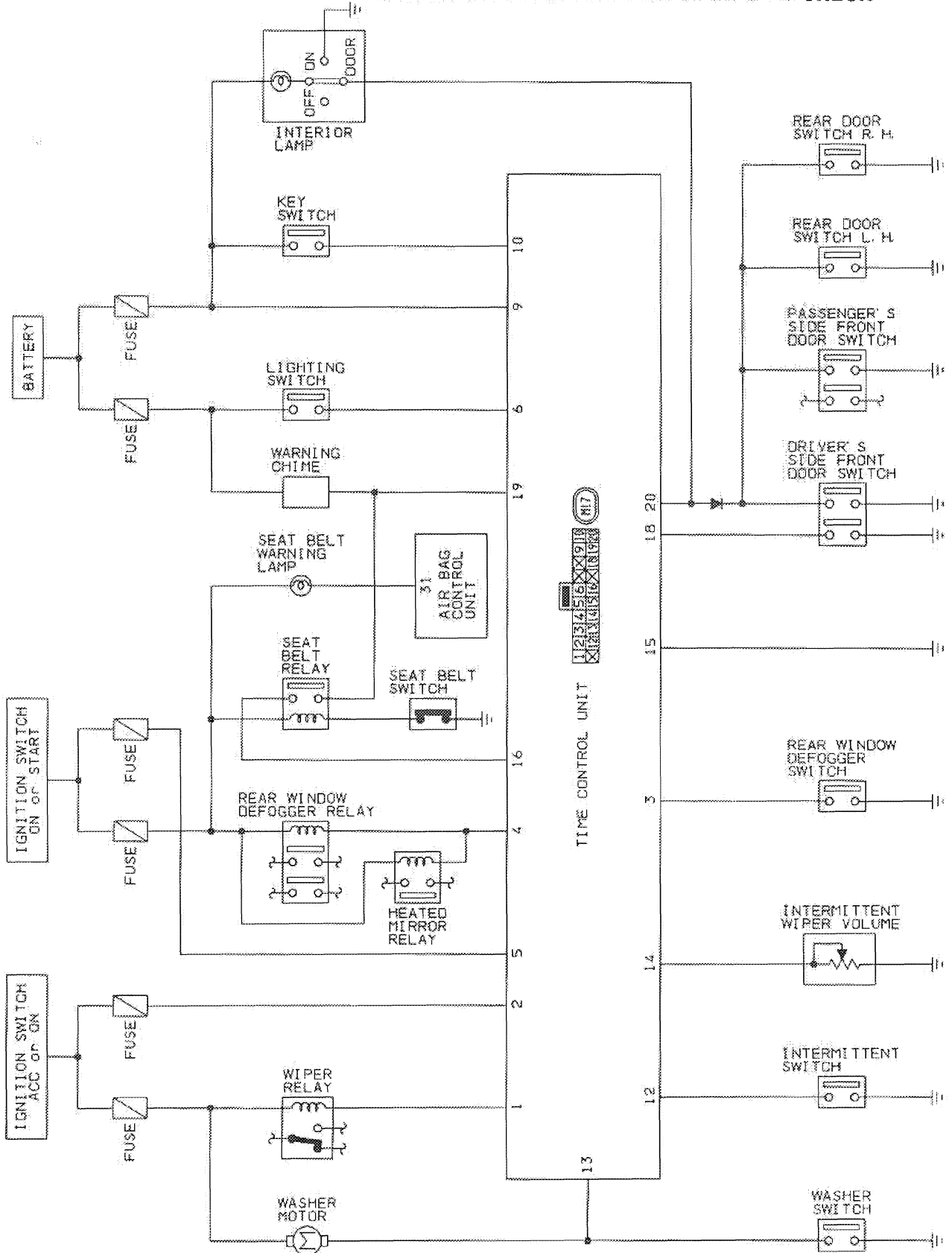
Ground circuit

Terminals	Continuity
⑮ - Ground	Yes

TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

CIRCUIT DIAGRAM FOR QUICK PINPOINT CHECK

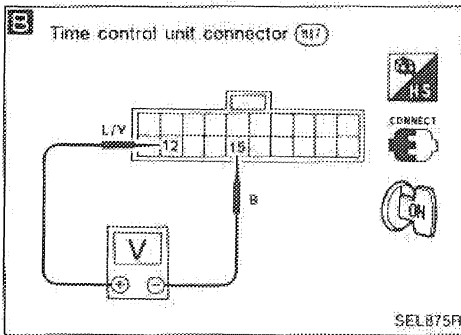
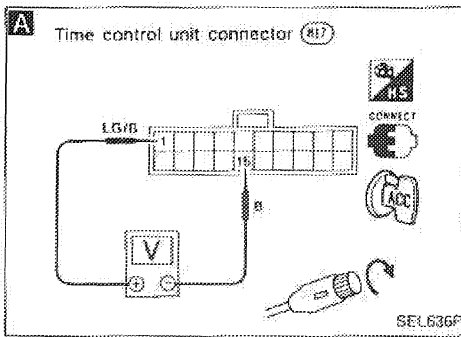


TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 1

SYMPTOM: Intermittent wiper does not operate.



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".

N.G. → Replace wiper relay.

O.K. → Check wiper relay circuit.

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.

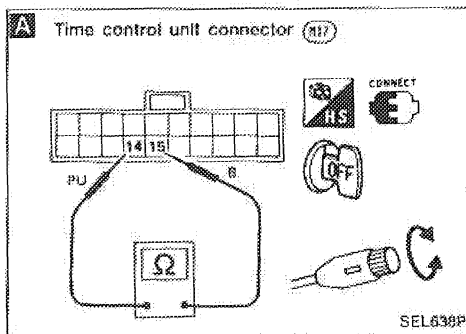
O.K. → Replace control unit.

TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 2

SYMPTOM: Intermittent time of wiper cannot be adjusted.



A

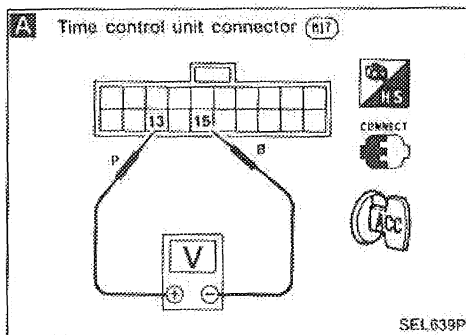
INTERMITTENT WIPER VOLUME INPUT SIGNAL CHECK
 Measure resistance between control unit harness terminals (14) and (15) while turning intermittent wiper volume.

Position of wiper knob	Resistance [Ω]
S	0
L	Approx. 1 k

N.G.

Check intermittent wiper volume.
 Check harness continuity between T.C.U. and wiper switch.

O.K. → Replace control unit.



DIAGNOSTIC PROCEDURE 3

SYMPTOM: Wiper and washer activate individually but not in combination.

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

O.K.

B

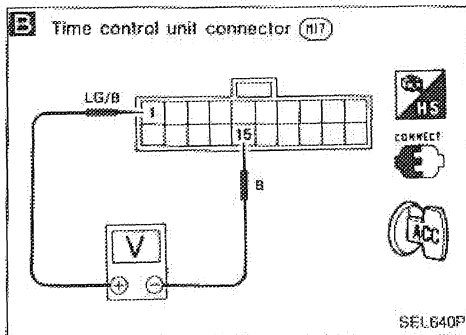
WIPER RELAY OUTPUT SIGNAL CHECK
 Measure voltage between control unit harness terminals (1) and (15) after operating washer switch.
0V for approx. 3 seconds after washer has operated.

O.K.

Replace wiper relay.

N.G. → Check harness continuity between T.C.U. and washer switch.

N.G. → Replace control unit.



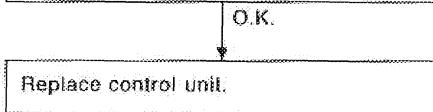
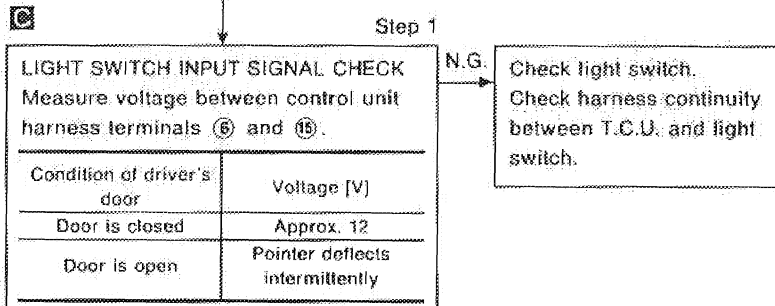
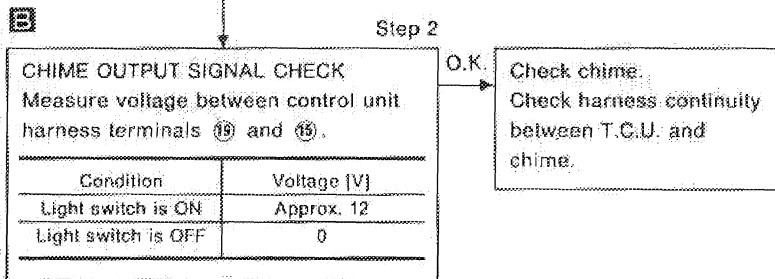
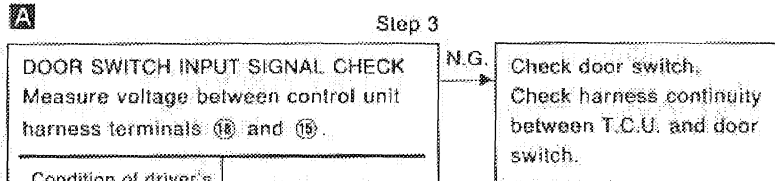
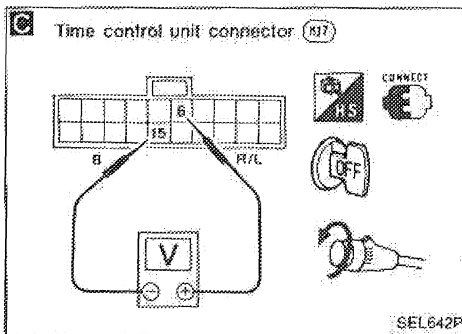
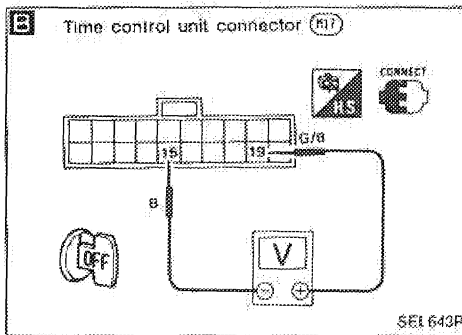
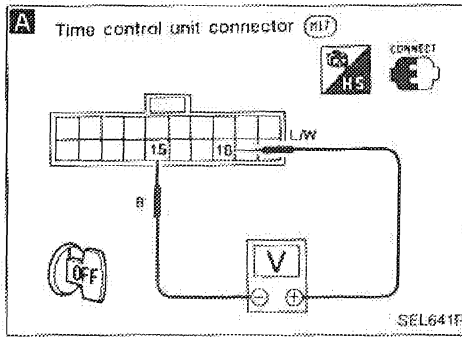
TIME CONTROL SYSTEM

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.



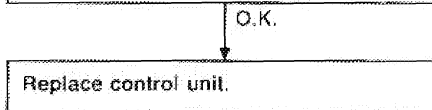
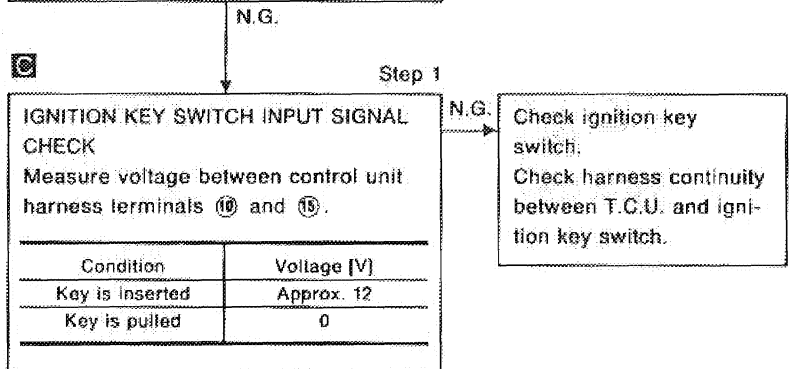
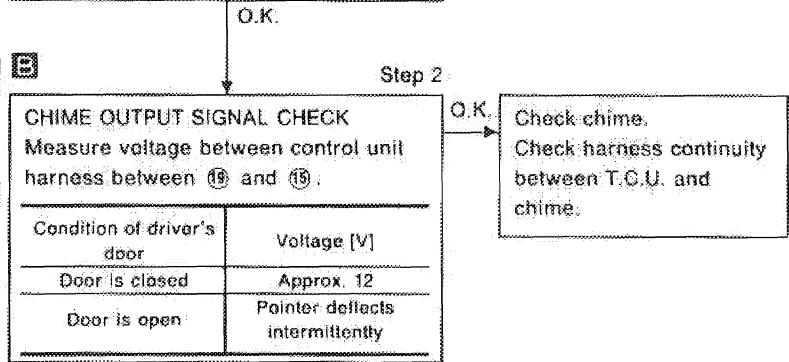
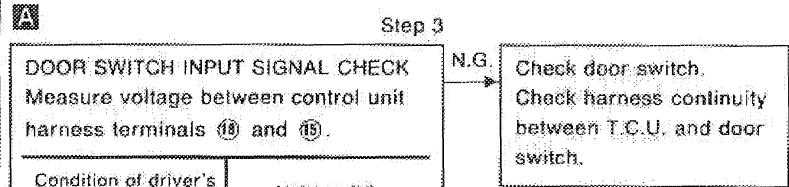
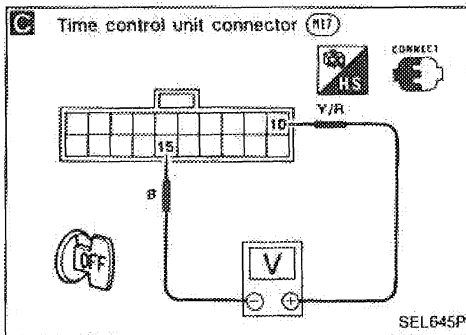
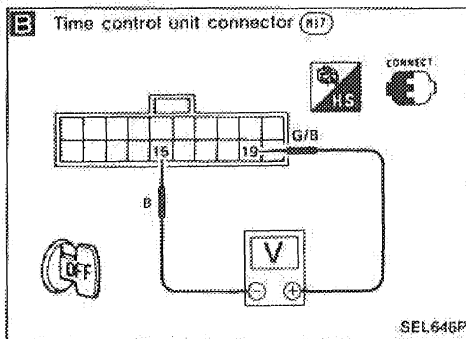
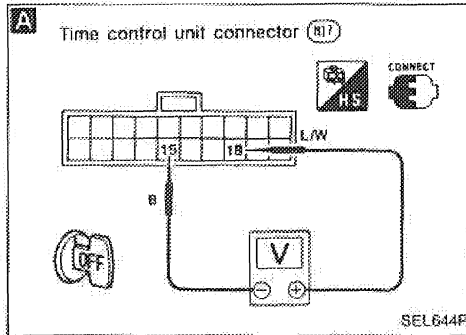
TIME CONTROL SYSTEM

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.



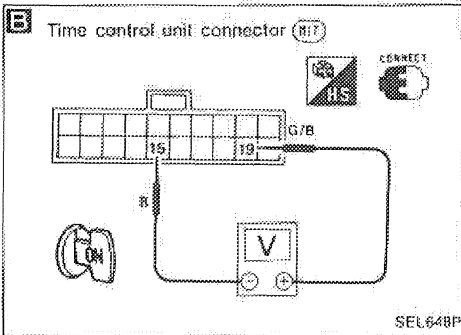
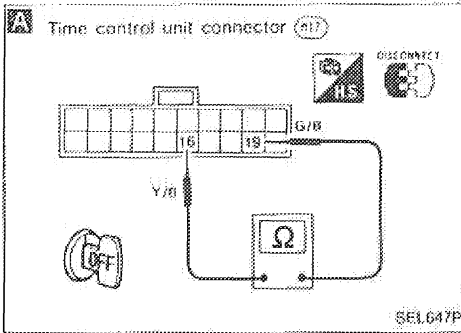
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

SYMPTOM: Seal belt warning chime does not activate.

- Perform "PRELIMINARY CHECK — Procedure 3" before referring to the following flow chart.



A Step 2

SEAT BELT SWITCH INPUT SIGNAL CHECK
Check continuity between control unit harness terminals (18) 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.

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 (18) and (19).

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.

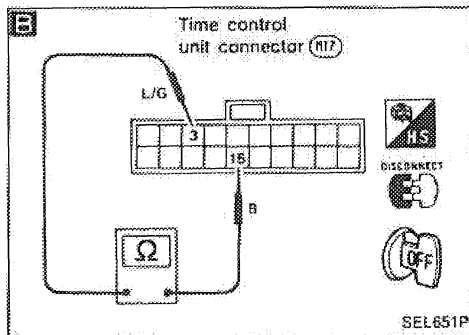
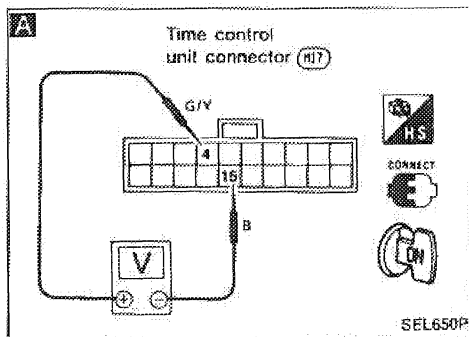
N.G. → Replace control unit.

TIME CONTROL SYSTEM

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.

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.

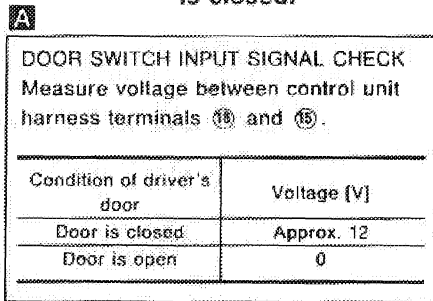
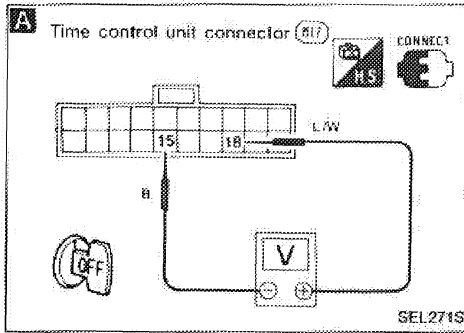
O.K. → Replace control unit.

TIME CONTROL SYSTEM

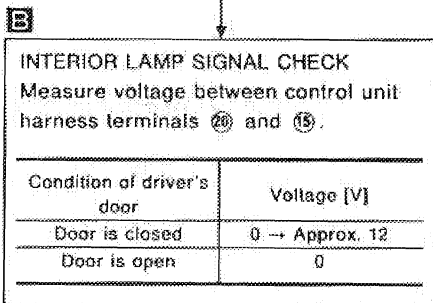
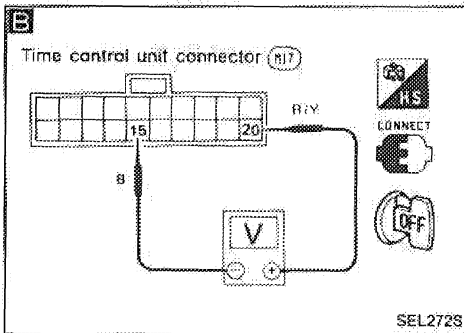
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 8

SYMPTOM: Interior lamp does not fade out after driver's door is closed.



N.G. → Check door switch. Check harness continuity between T.C.U. and door switch.

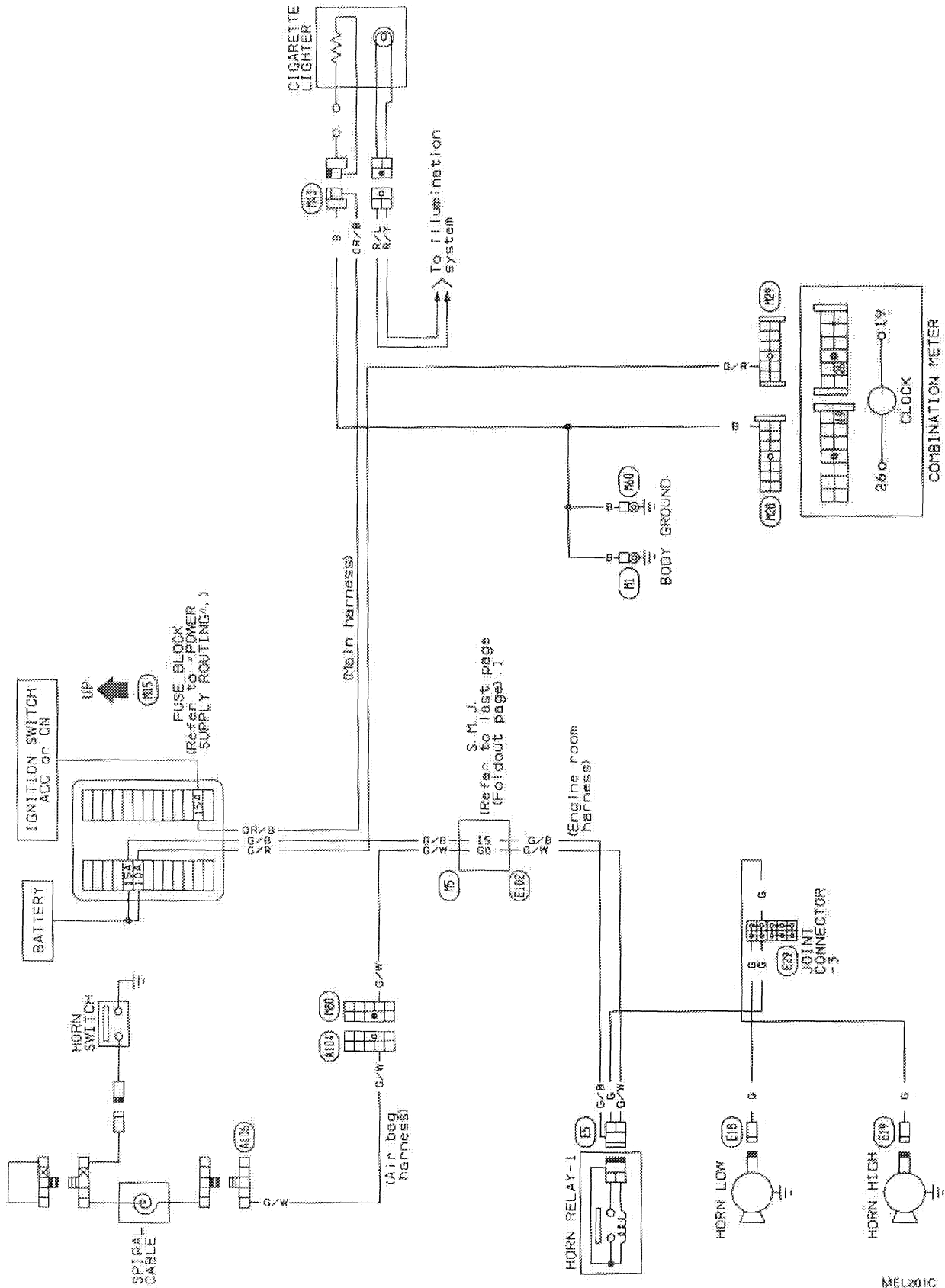


O.K. → Check interior lamp and harness between T.C.U. and interior lamp.

N.G. → Replace T.C.U.

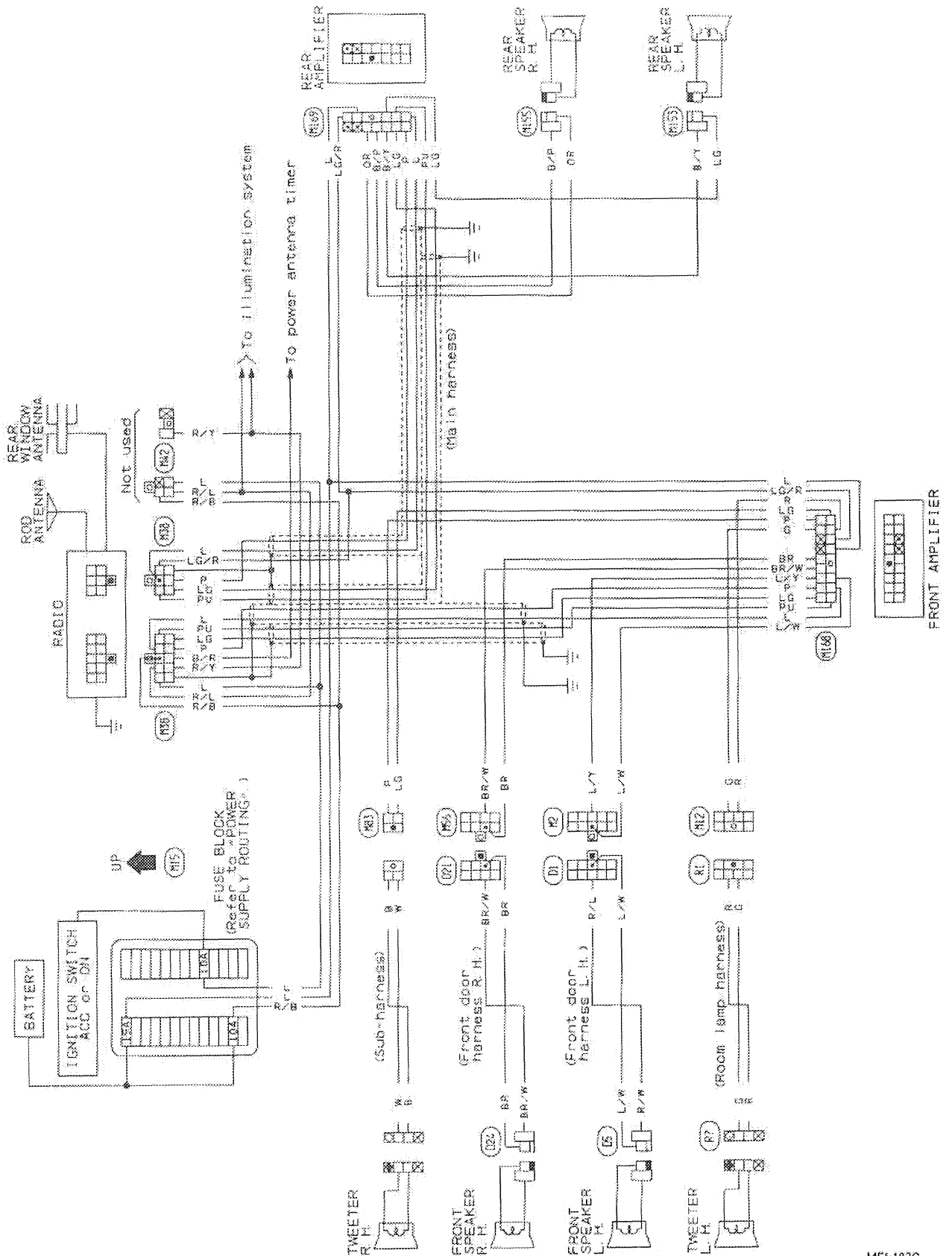
HORN, CIGARETTE LIGHTER AND CLOCK

Wiring Diagram



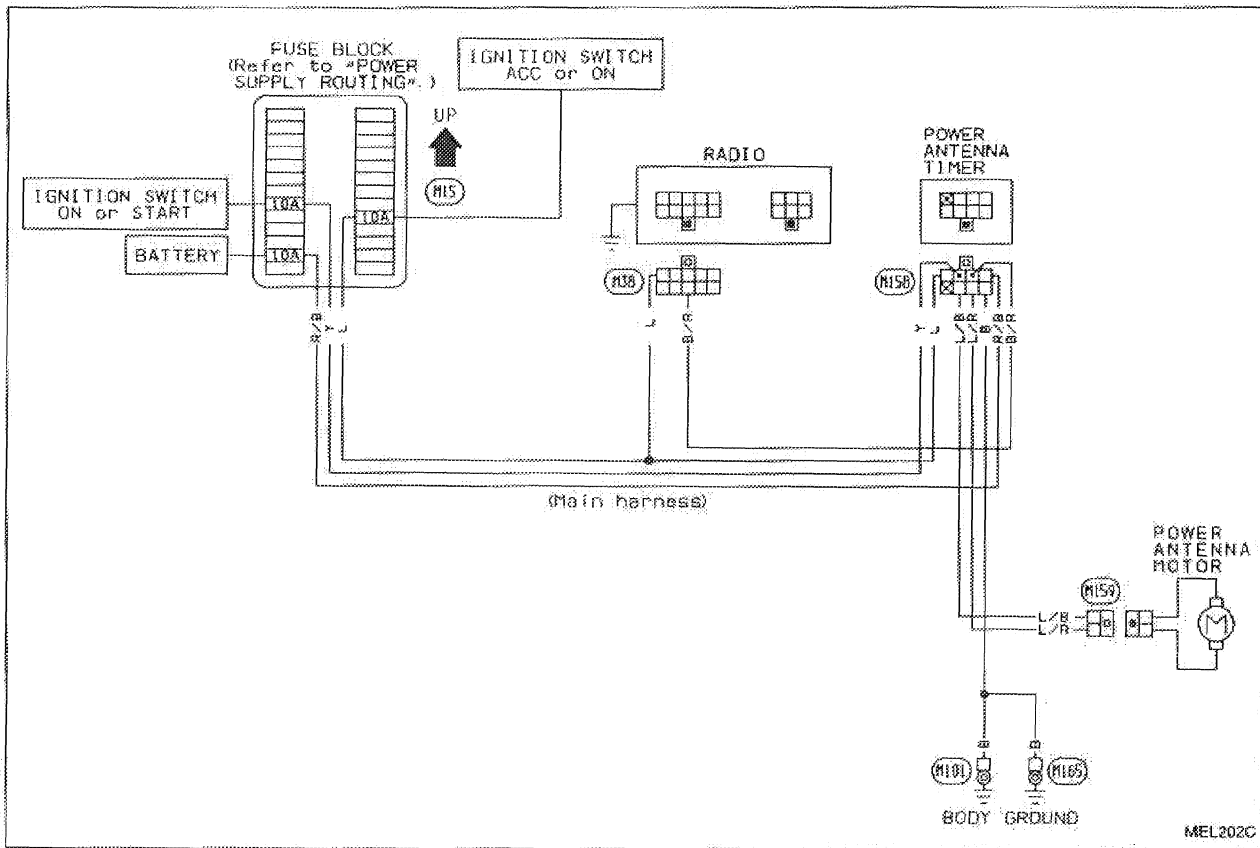
AUDIO AND POWER ANTENNA

Audio/Wiring Diagram



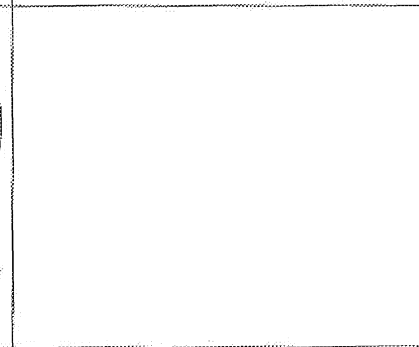
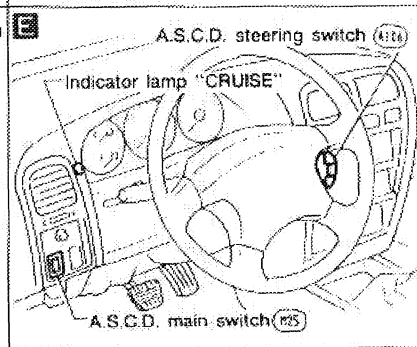
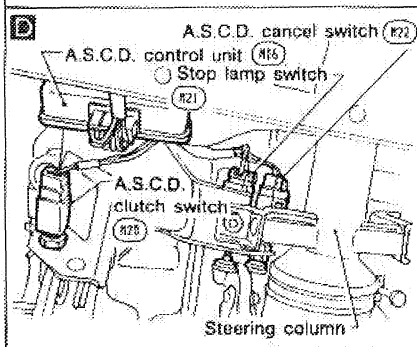
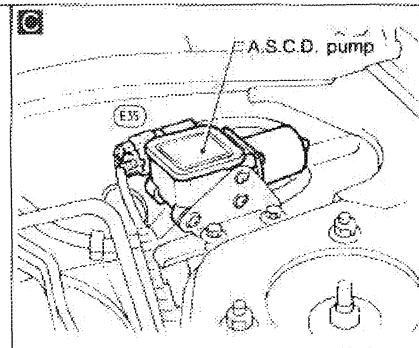
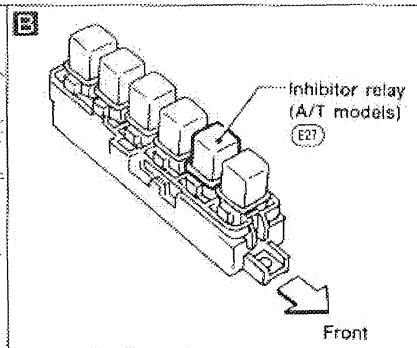
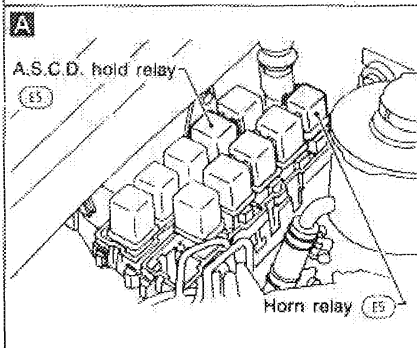
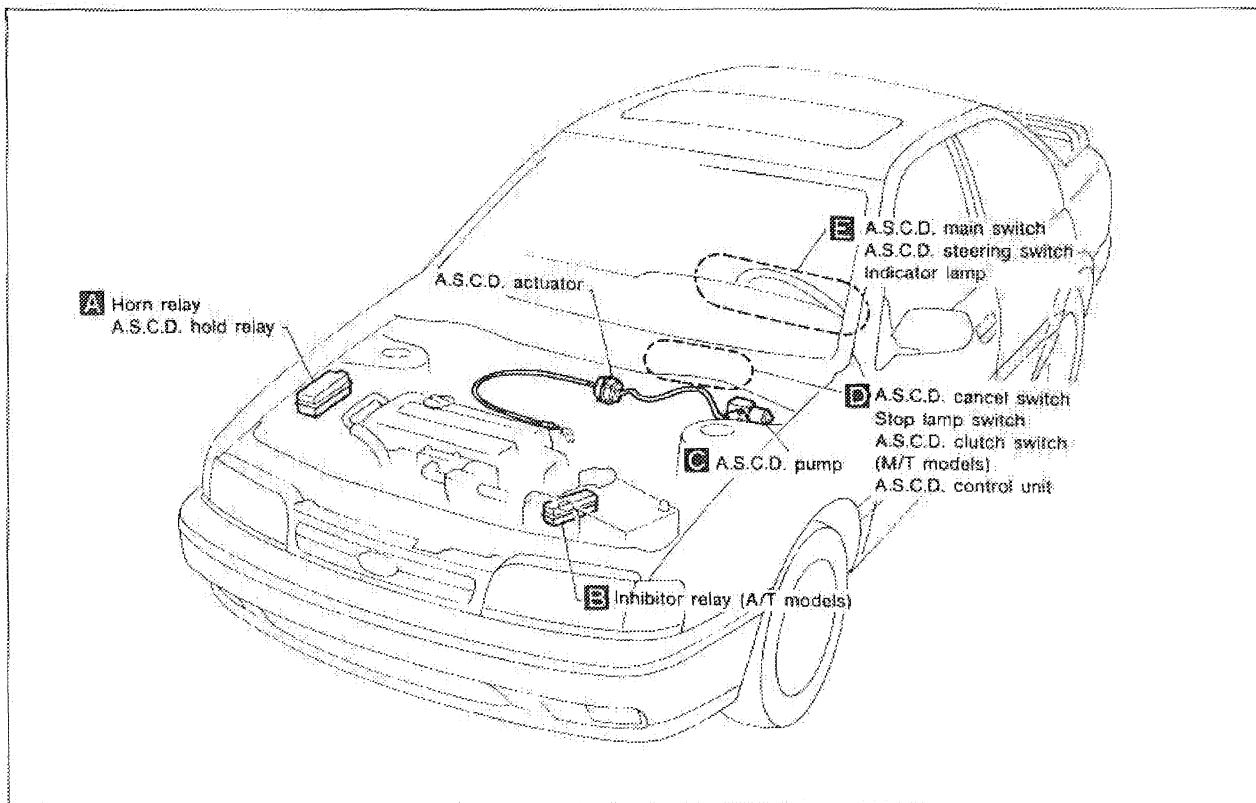
AUDIO AND POWER ANTENNA

Power Antenna/Wiring Diagram



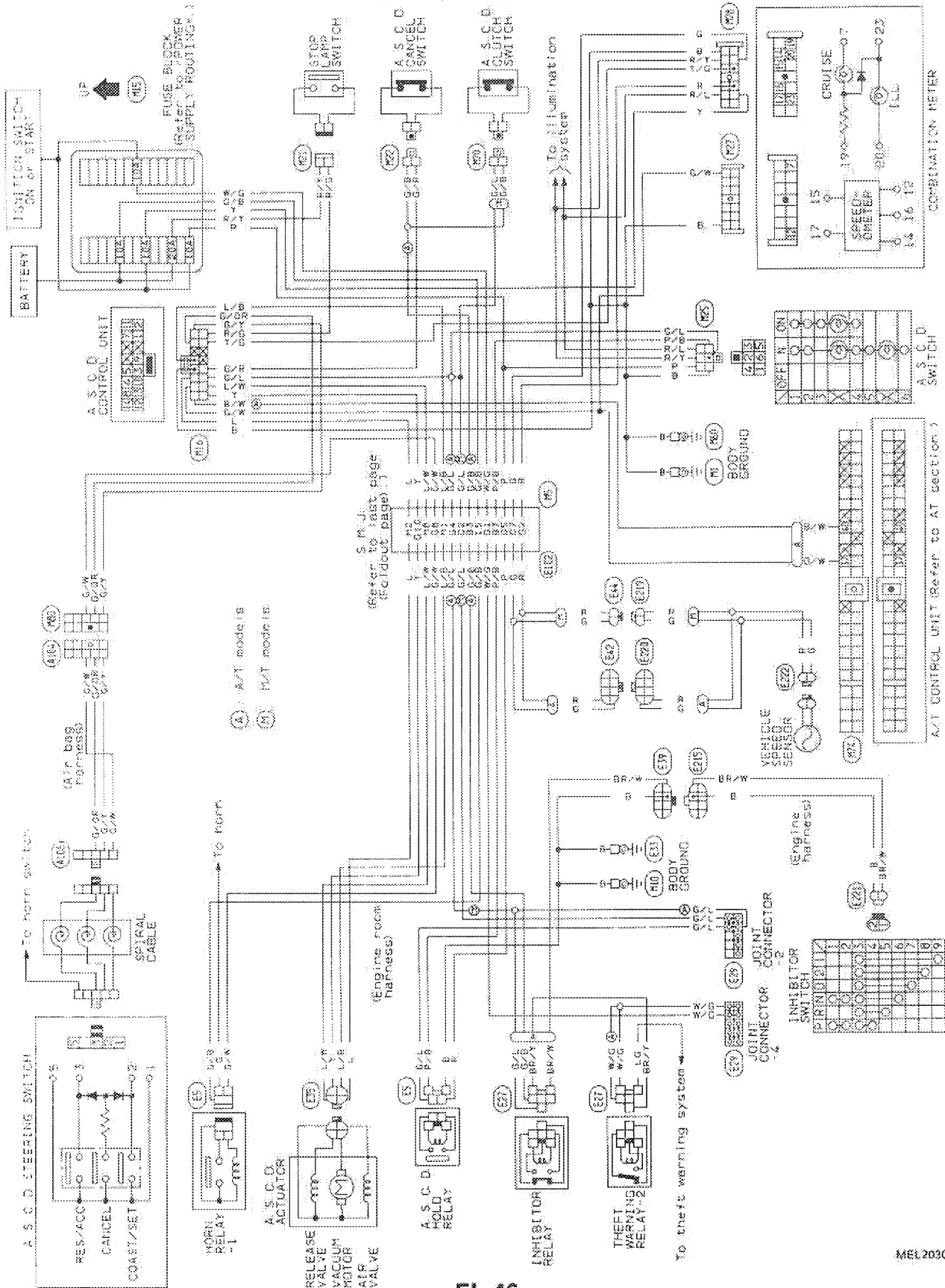
AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Component Parts and Harness Connector Location



AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Wiring Diagram



AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses

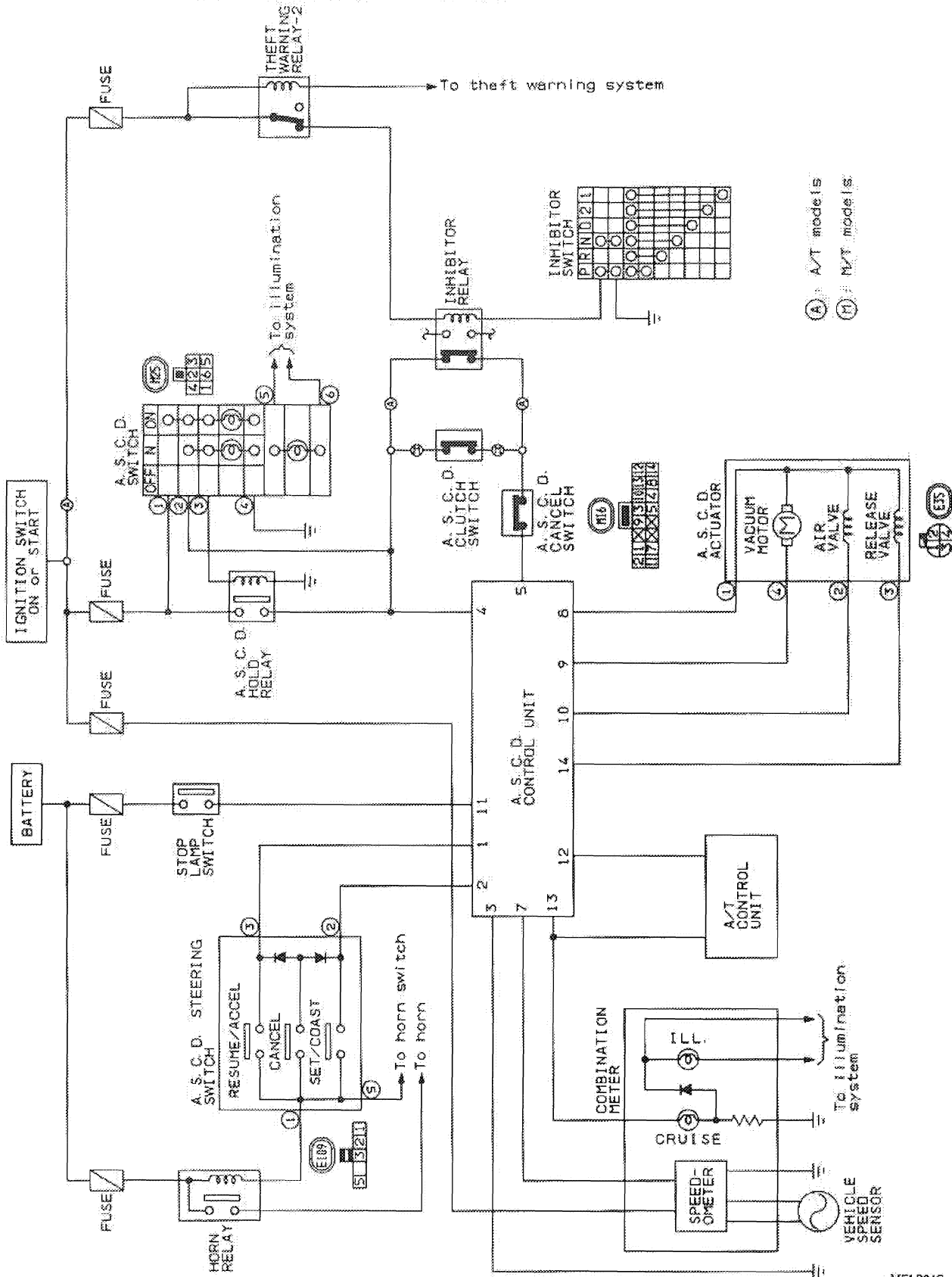
SYMPTOM CHART

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	
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.	<input type="radio"/>									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engine hunts		<input type="radio"/>							<input type="radio"/>	<input type="radio"/>						
Large difference between set speed and actual vehicle speed.			<input type="radio"/>						<input type="radio"/>	<input type="radio"/>						
Deceleration is greatest immediately after A.S.C.D. has been set.				<input type="radio"/>					<input type="radio"/>	<input type="radio"/>						
ACCEL switch will not operate.	<input type="radio"/>				<input type="radio"/>							<input type="radio"/>				
RESUME switch will not operate.	<input type="radio"/>					<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Set speed cannot be cancelled.							<input type="radio"/>		<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>		
"CRUISE" indicator lamp blinks.								<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>			

AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses (Cont'd)

CIRCUIT DIAGRAM FOR QUICK PINPOINT CHECK

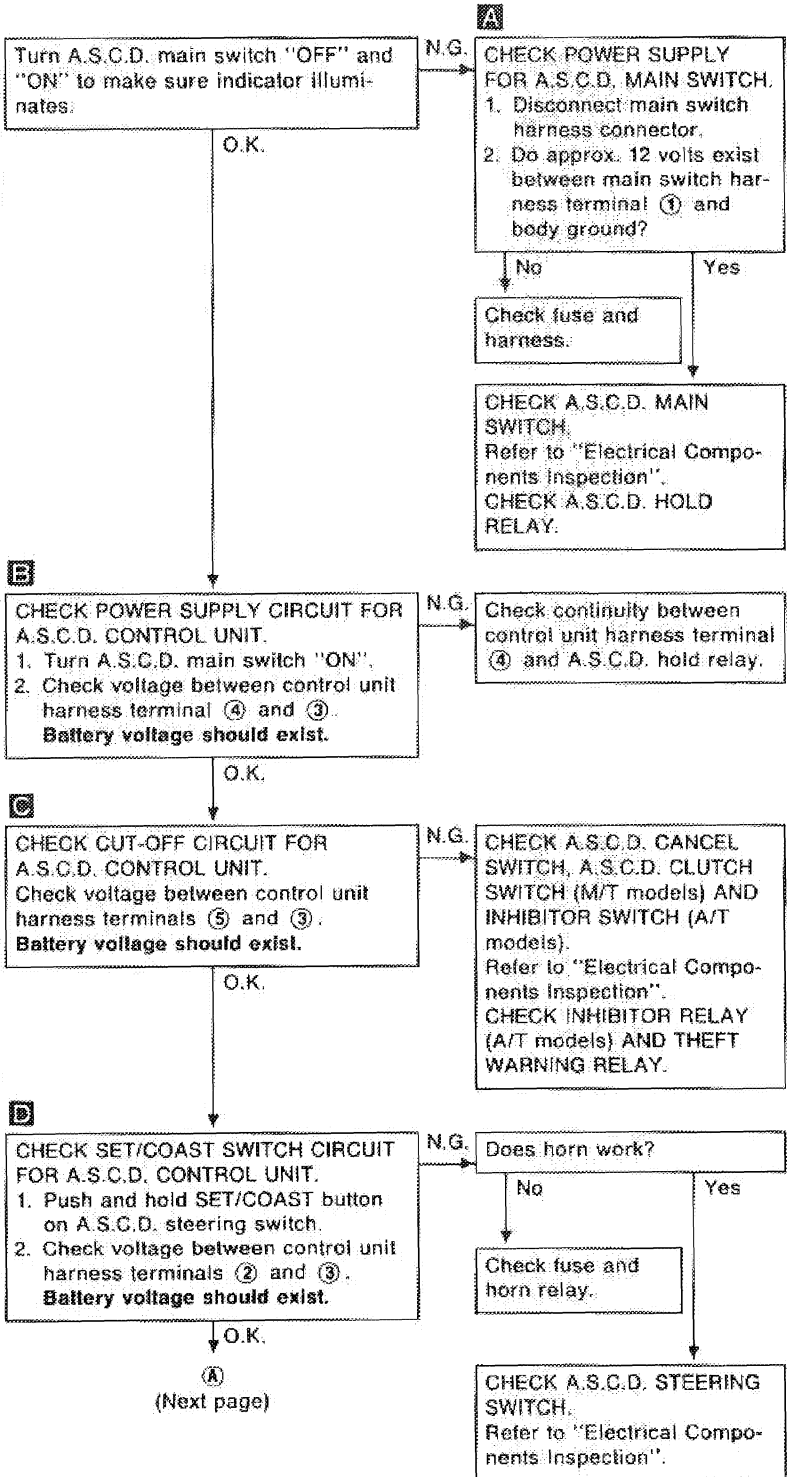
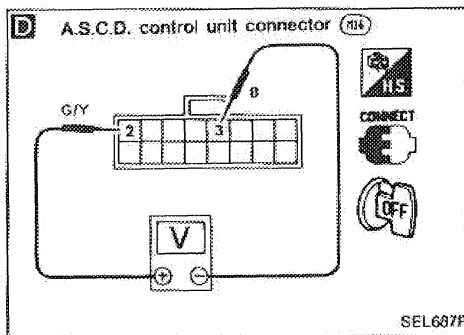
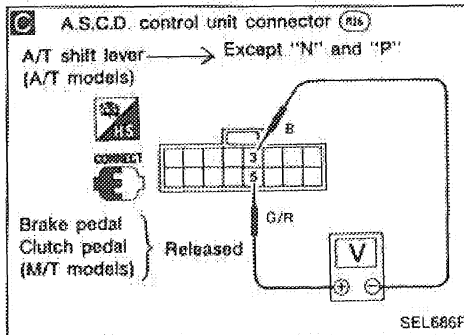
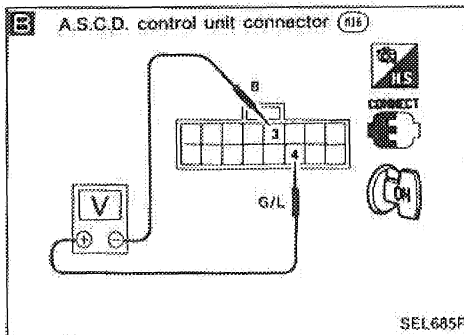
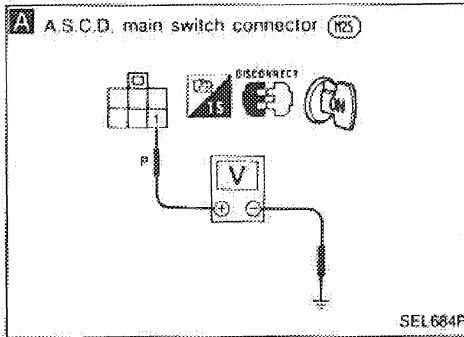


AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 1

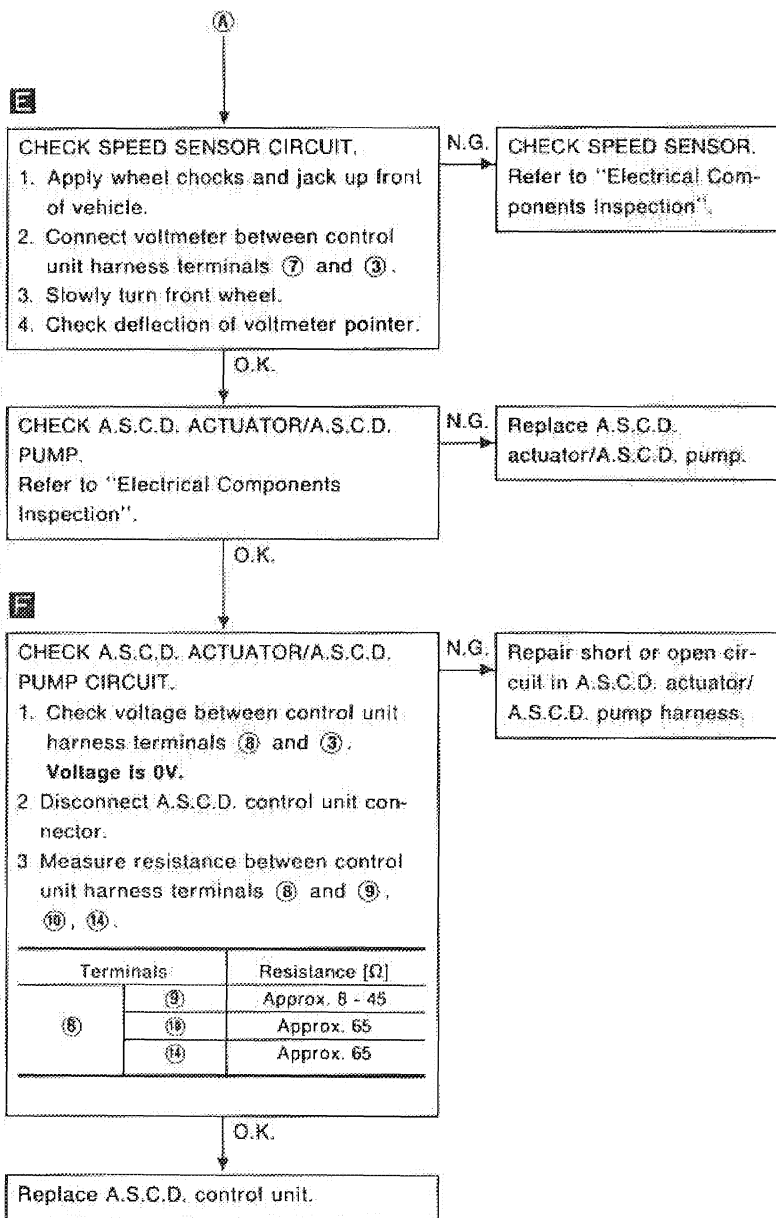
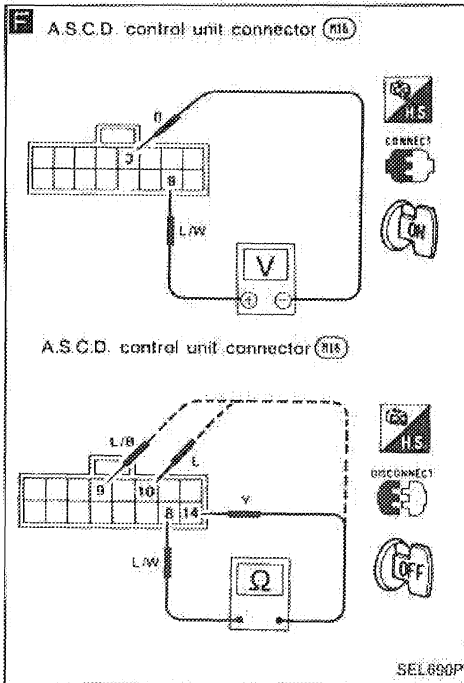
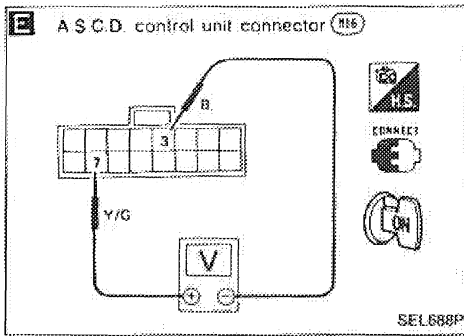
SYMPTOM: A.S.C.D. control cannot be set.



(A)
(Next page)

AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses (Cont'd)

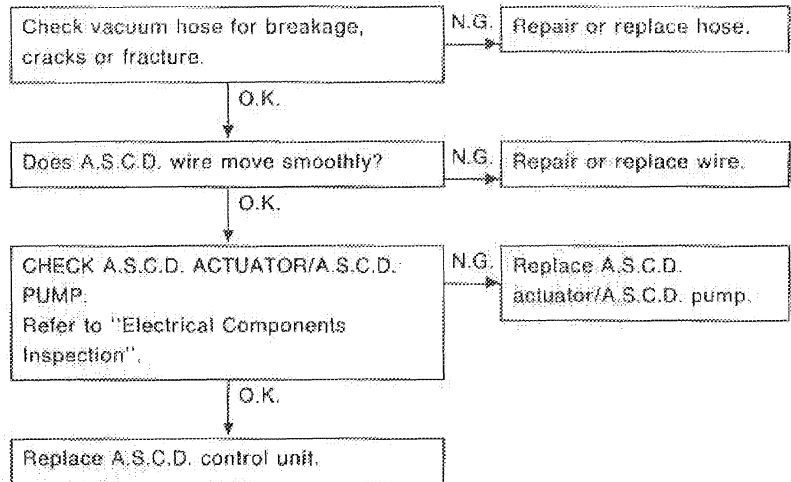


AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses (Cont'd)

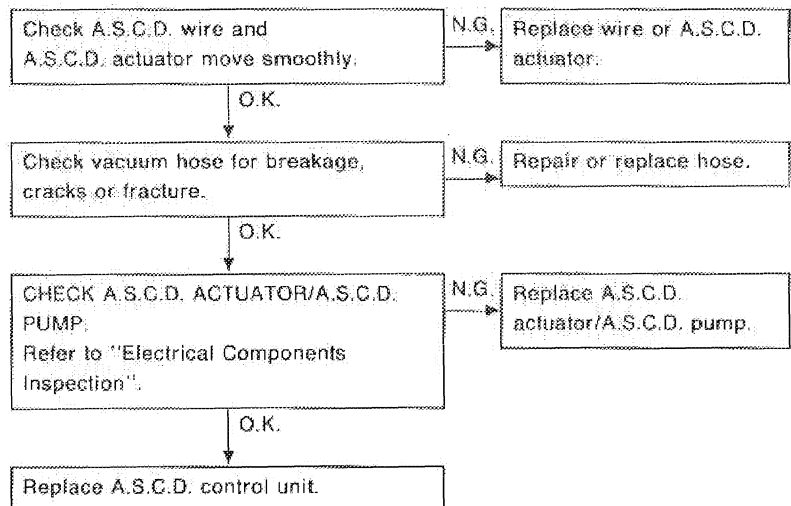
DIAGNOSTIC PROCEDURE 2

SYMPTOM: Engine hunts.



DIAGNOSTIC PROCEDURE 3

SYMPTOM: Large difference between set vehicle speed and actual speed.

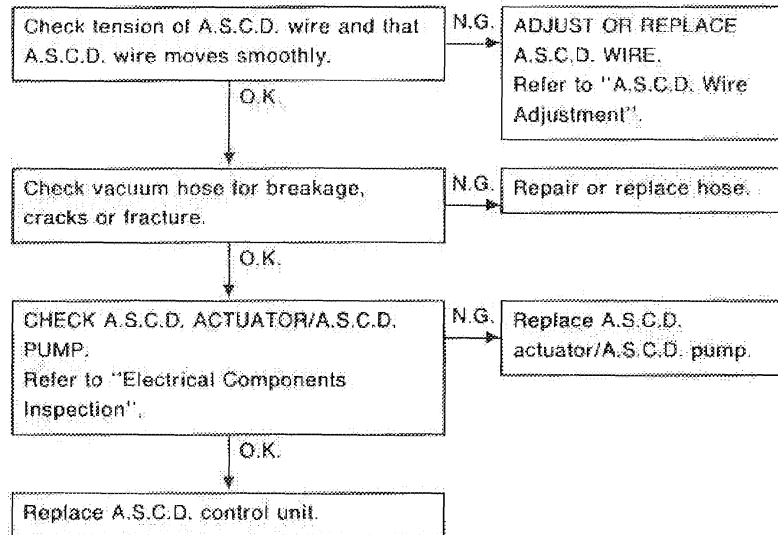


AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 4

SYMPTOM: Deceleration is greatest immediately after A.S.C.D. has been set.

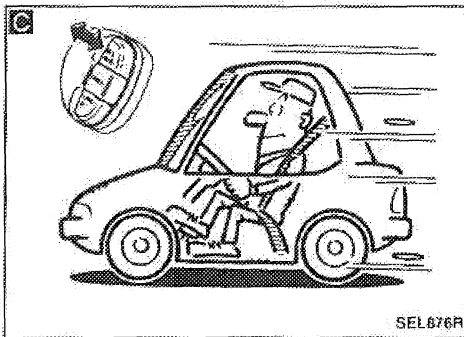
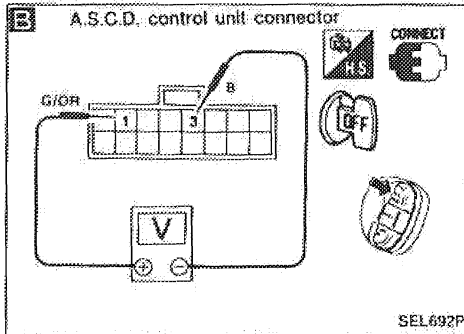
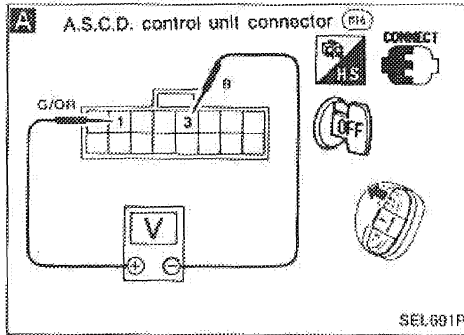


AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

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. → 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 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

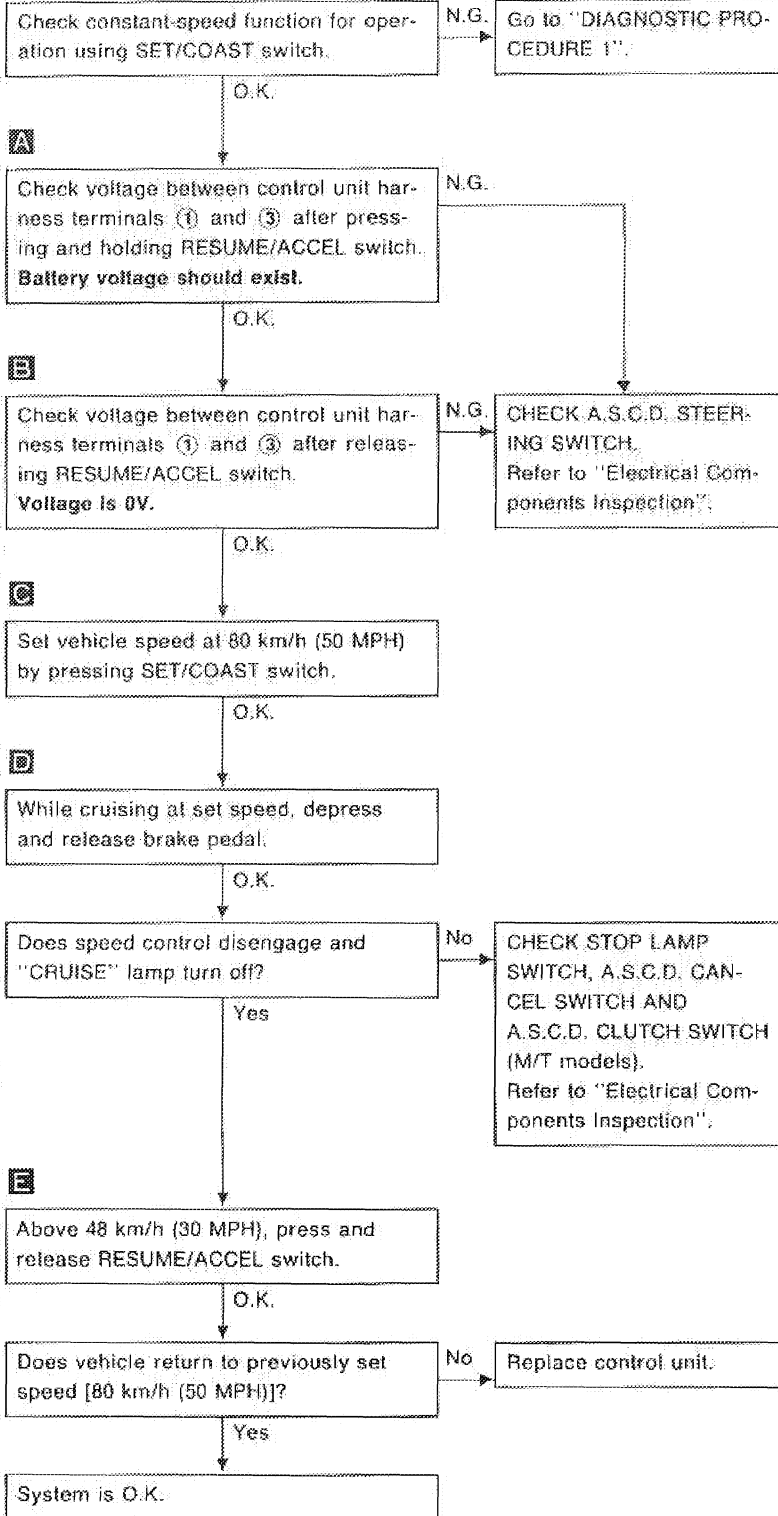
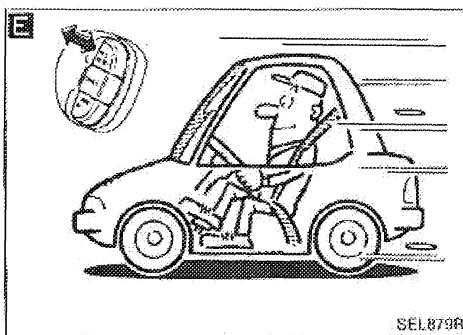
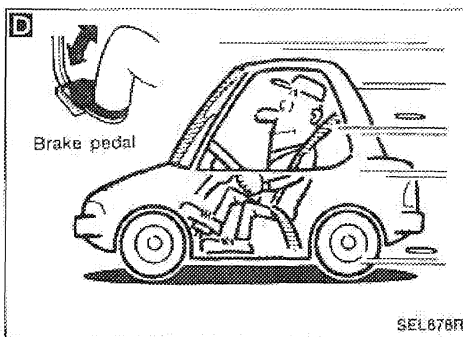
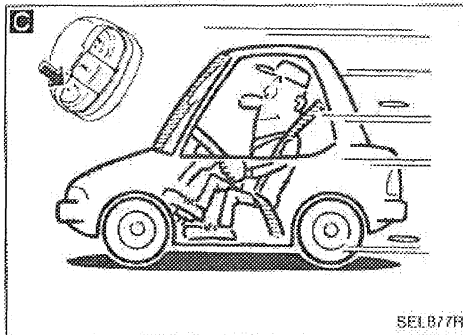
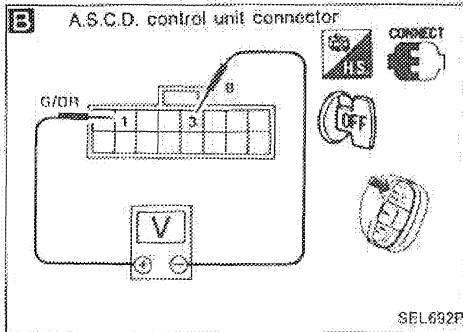
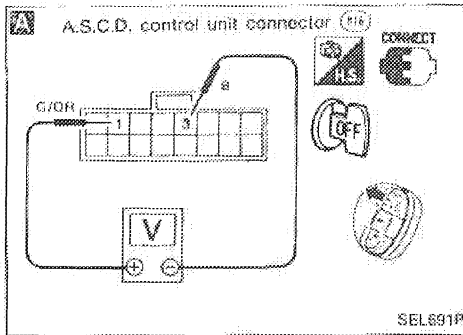
System is O.K.

AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

SYMPTOM: RESUME switch will not operate.

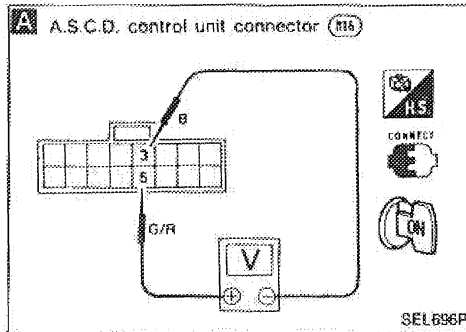


AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 7

SYMPTOM: Set speed cannot be cancelled.



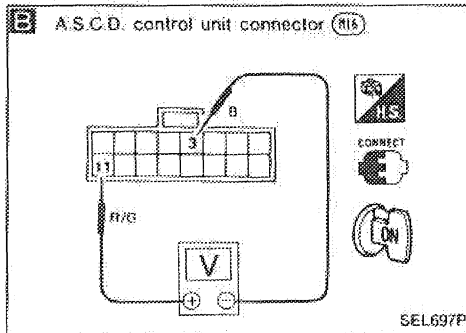
A

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
	A.S.C.D. cancel switch Released	Approx. 12
A/T	A.S.C.D. clutch switch Depressed	0
	A.S.C.D. clutch switch 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".



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. ↓

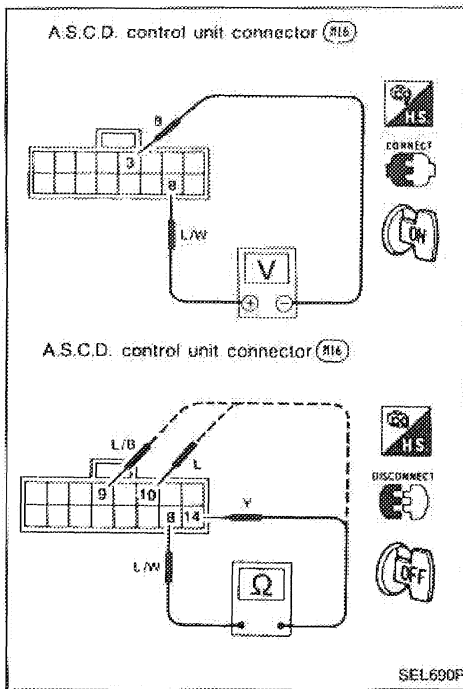
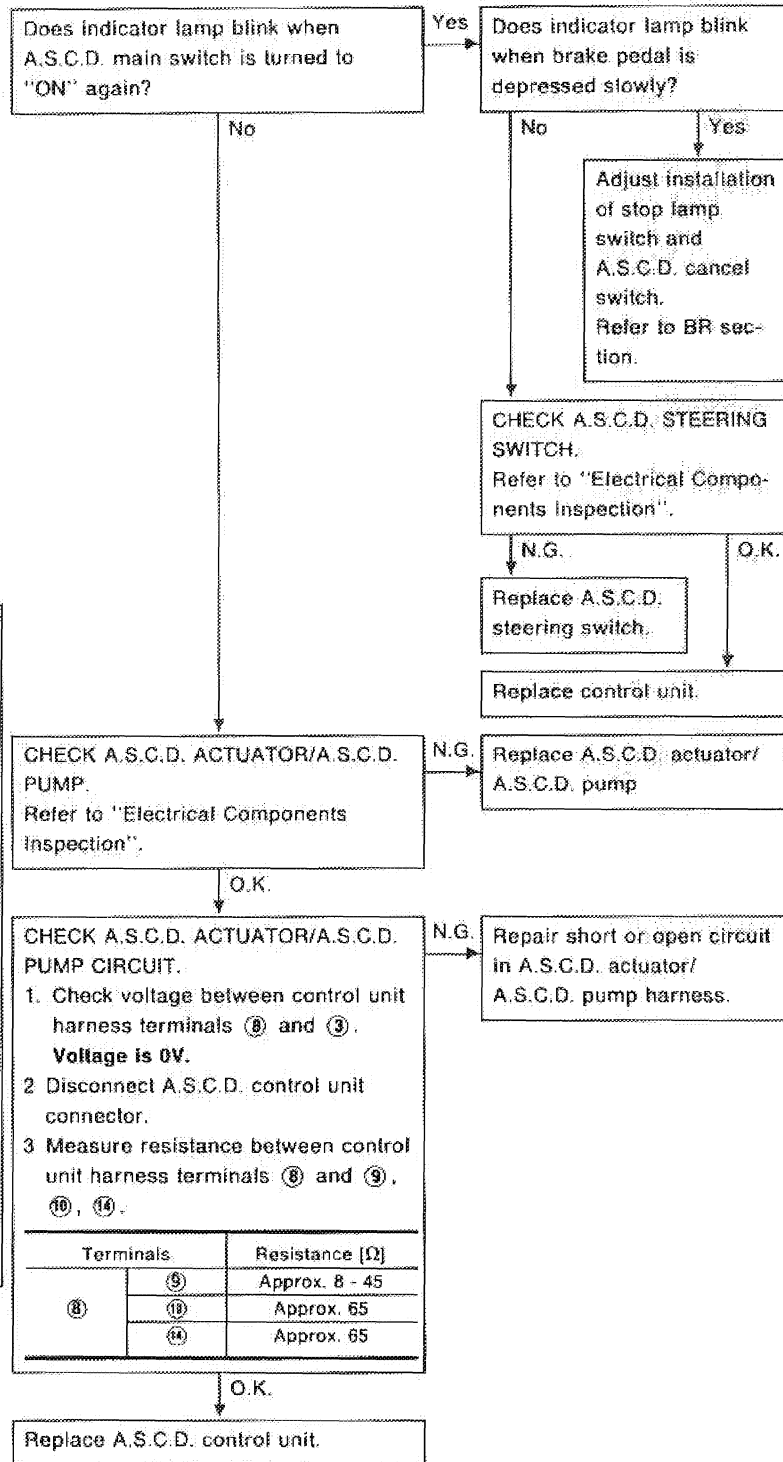
Replace A.S.C.D. control unit.

AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 8

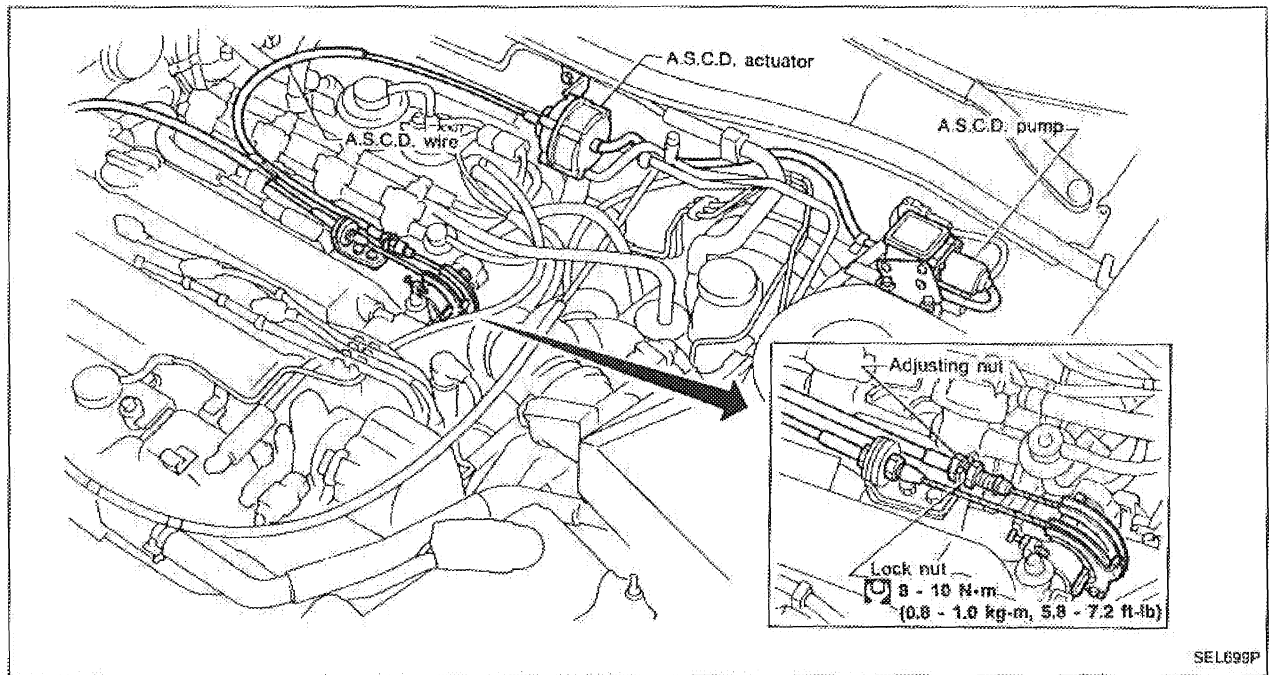
SYMPTOM: "CRUISE" indicator lamp blinks.



AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

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.

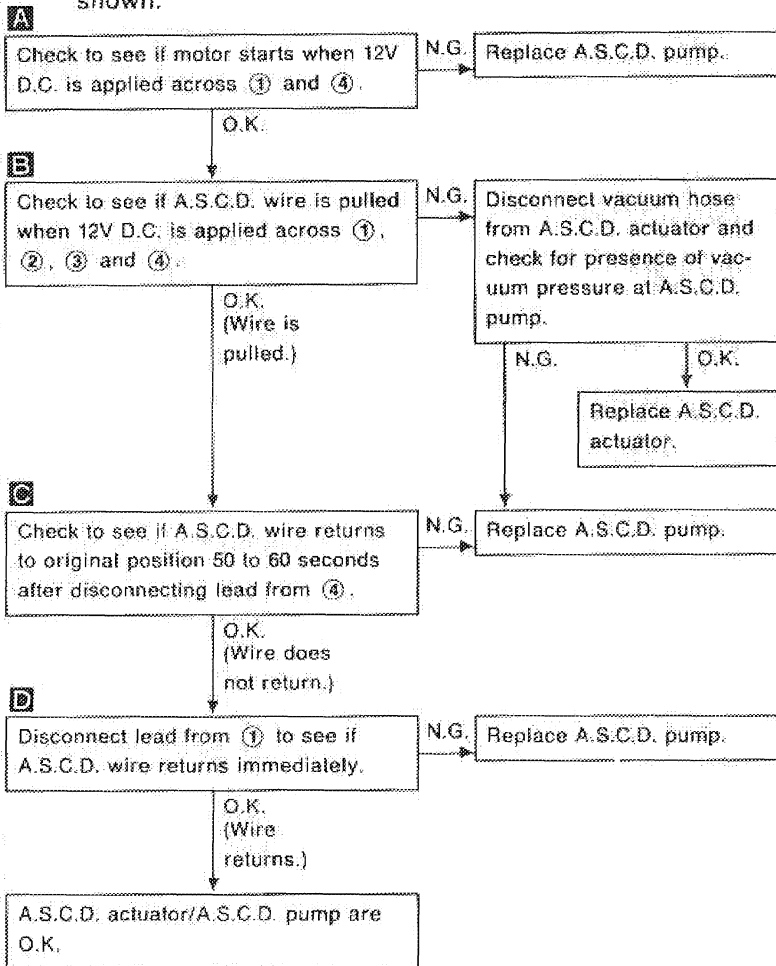
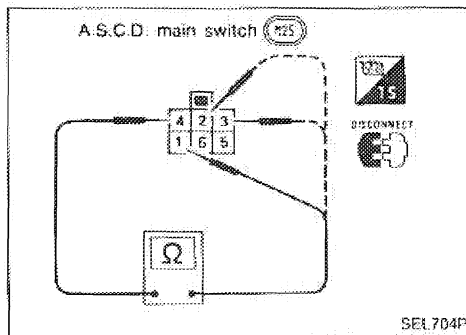
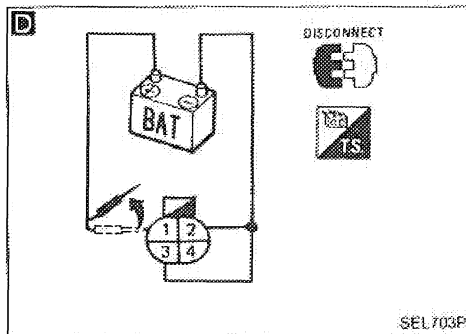
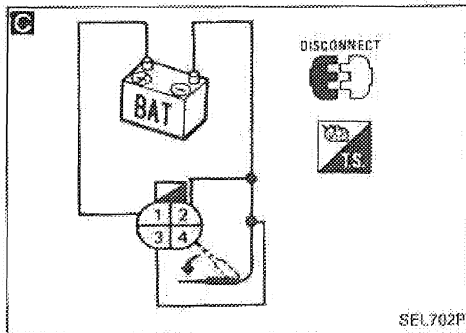
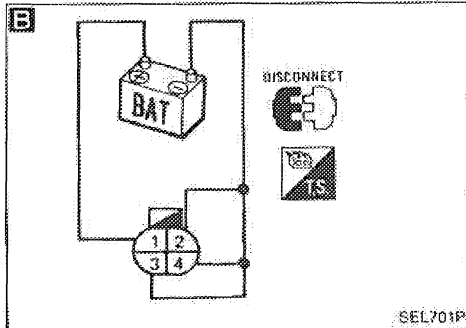
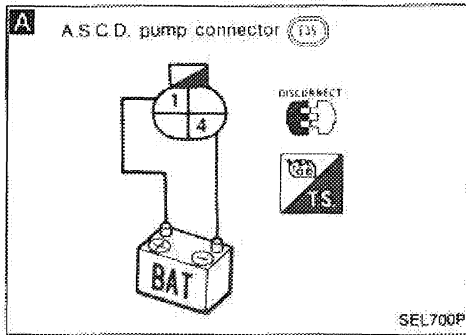
AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

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.S.C.D. main switch

Check continuity between terminals by pushing switch to each position.

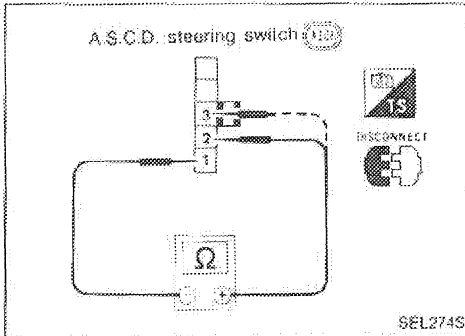
Switch position	Terminals					
	1	2	3	4	5	6
ON	○	○	○	○	○	○
N		○	○	○	○	ILL.
OFF						

AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

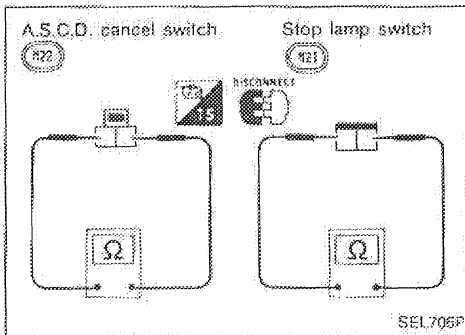
Trouble Diagnoses (Cont'd)

A.S.C.D. steering switch

Check continuity between terminals by pushing each button.



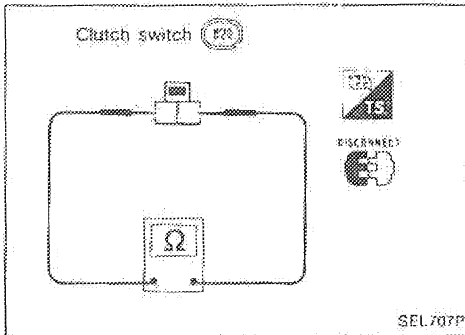
Button	Terminal		
	1	2	3
SET/COAST	○—○	○—○	
RESUME/ACCEL	○—○		○—○
CANCEL	○—○	○—○	
	○—○	○—○	○—○



A.S.C.D. cancel switch and stop lamp switch

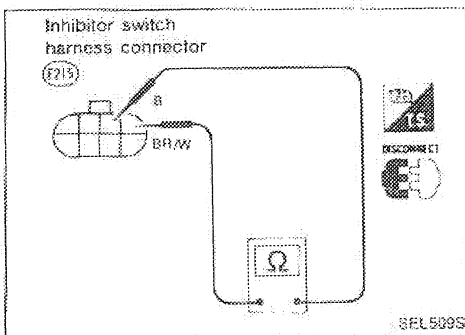
Condition	Continuity	
	A.S.C.D. cancel switch	Stop lamp switch
When brake pedal is depressed	No	Yes
When brake pedal is released	Yes	No

Check each switch after adjusting brake pedal — refer to BR section.



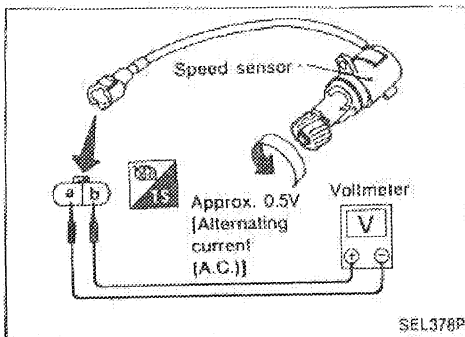
Clutch switch (For M/T models)

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

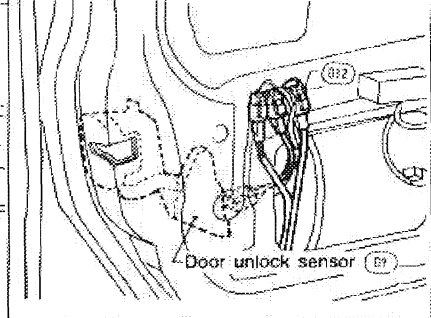
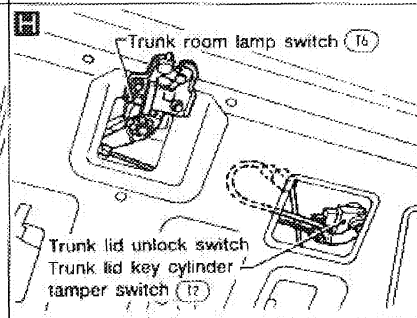
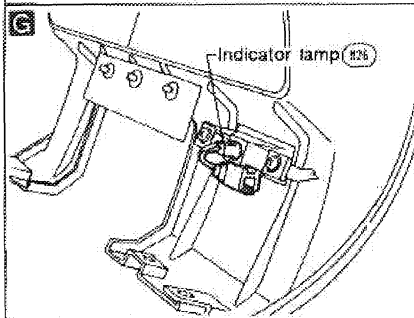
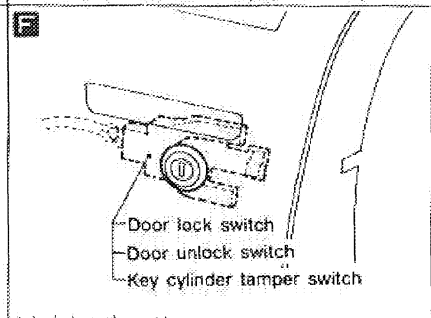
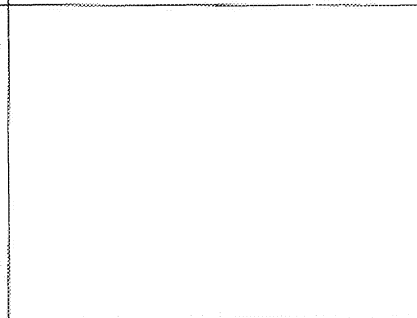
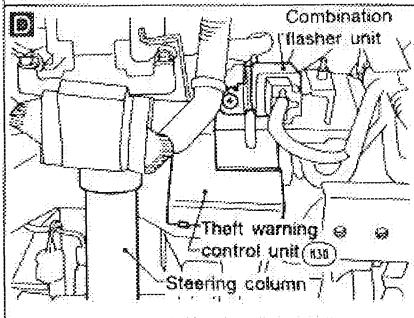
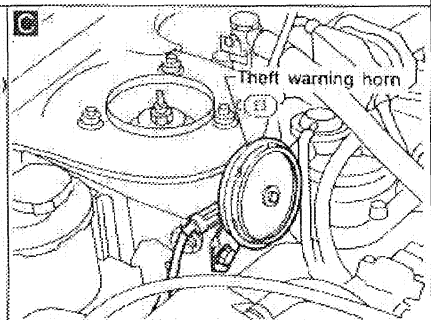
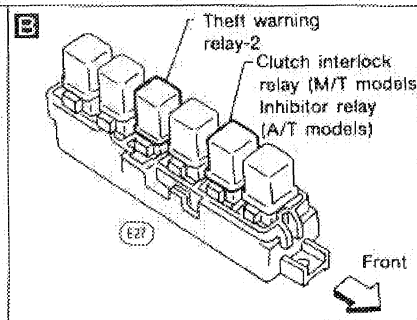
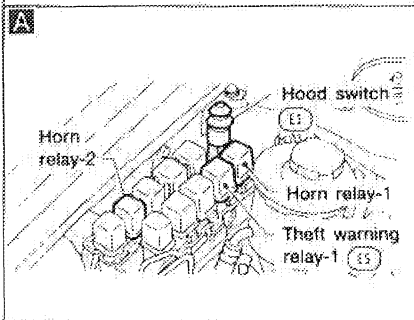
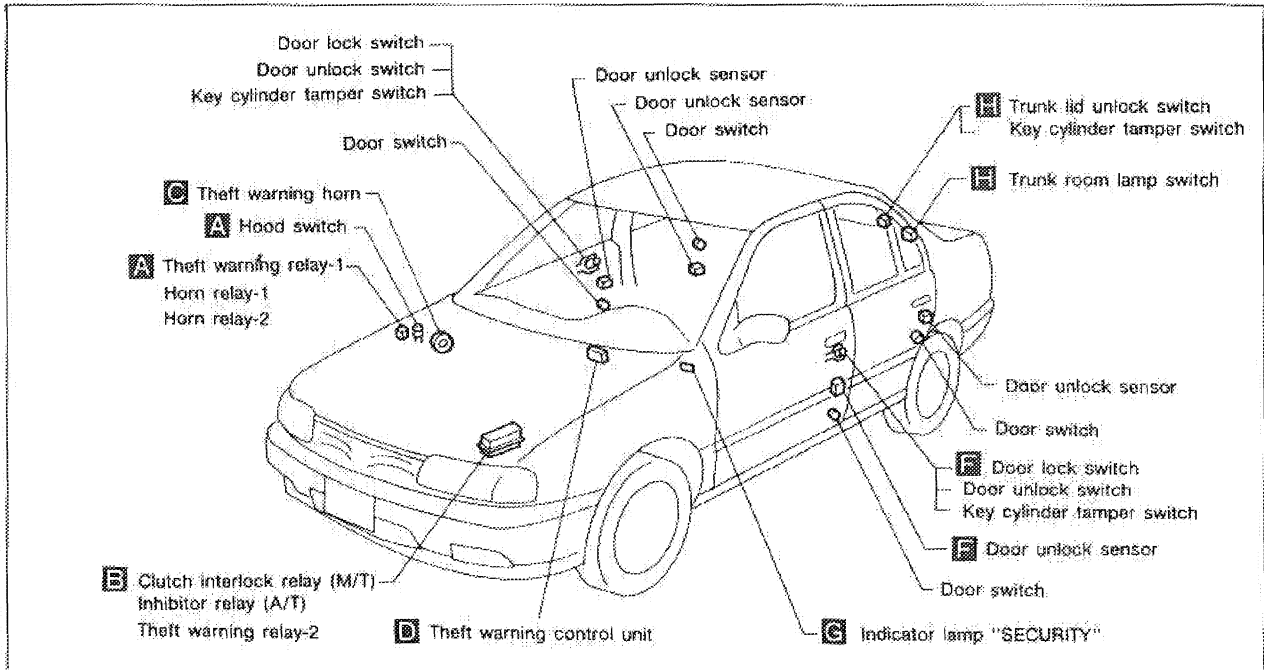
1. Remove speed sensor from transaxle.
2. Turn speed sensor pinion quickly and measure voltage across (a) and (b).

AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

NOTE

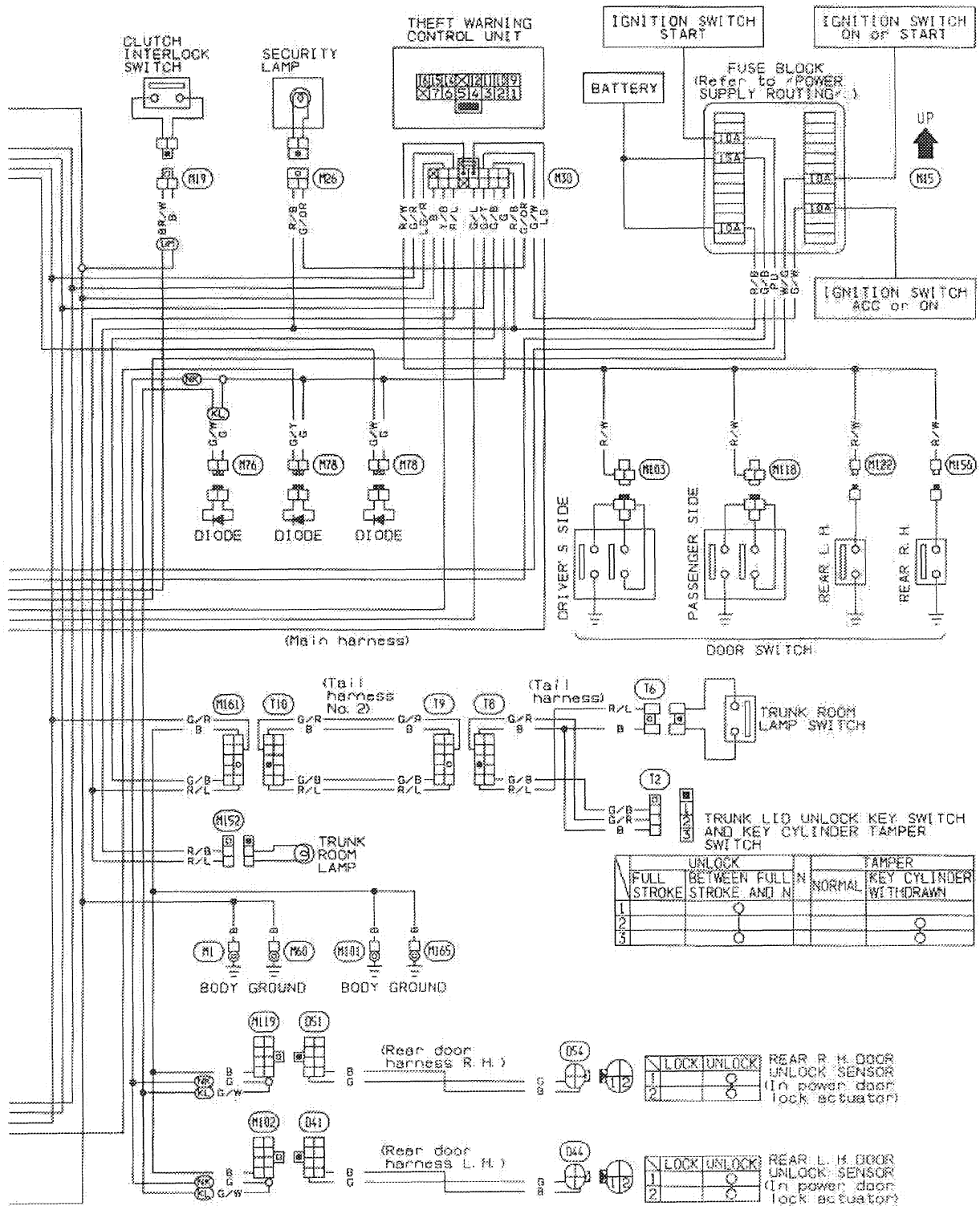
THEFT WARNING SYSTEM

Component Parts and Harness Connector Location



THEFT WARNING SYSTEM

Wiring Diagram (Cont'd)



	UNLOCK FULL STROKE	BETWEEN FULL STROKE AND N	UNLOCK FULL IN AND N	NORMAL	TAMPER KEY CYLINDER WITHDRAWN
1					
2					
5					

	LOCK	UNLOCK	REAR R. H. DOOR UNLOCK SENSOR (In power door lock actuator)
1			
2			

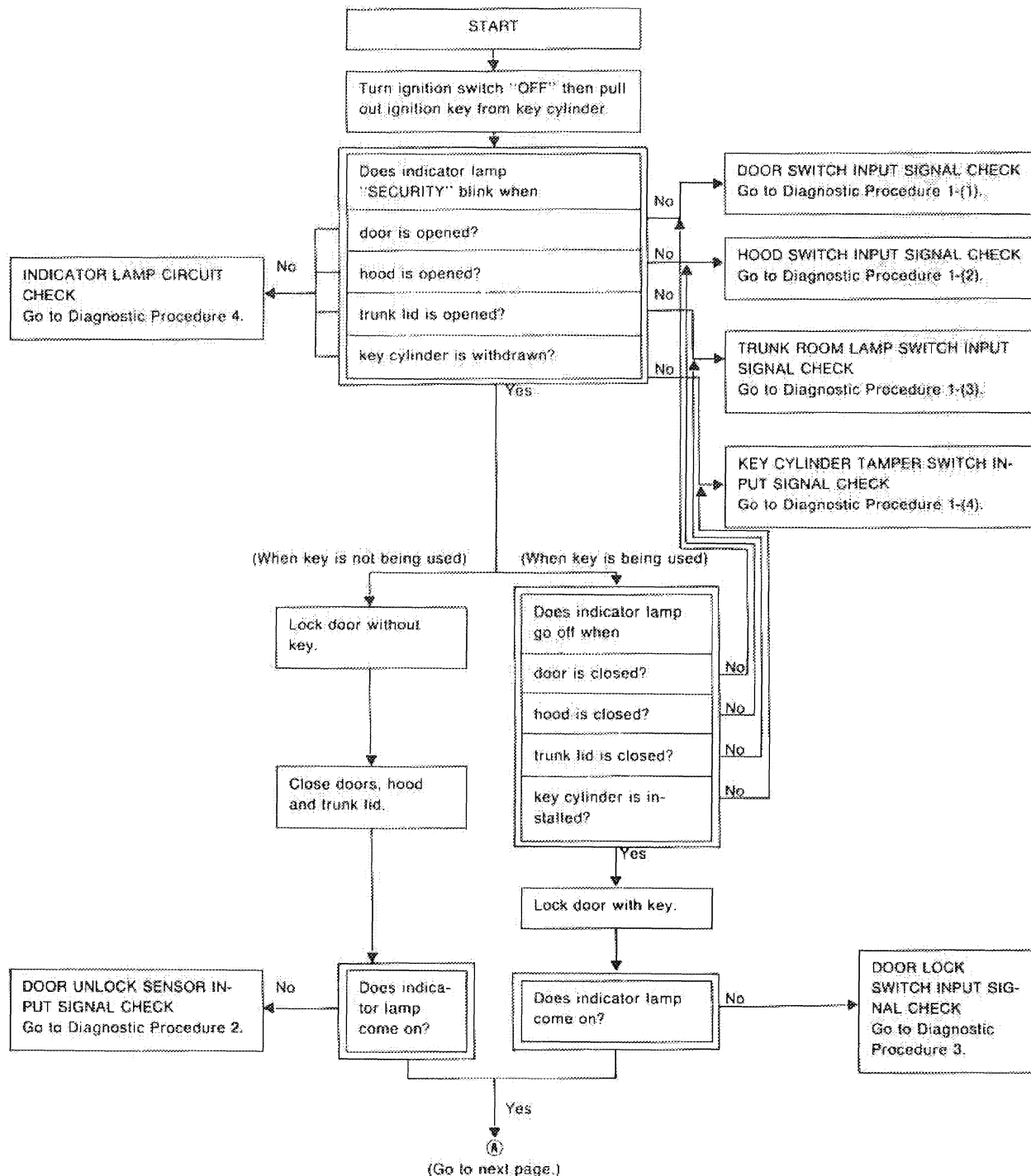
	LOCK	UNLOCK	REAR L. H. DOOR UNLOCK SENSOR (In power door lock actuator)
1			
2			

THEFT WARNING SYSTEM

Trouble Diagnoses

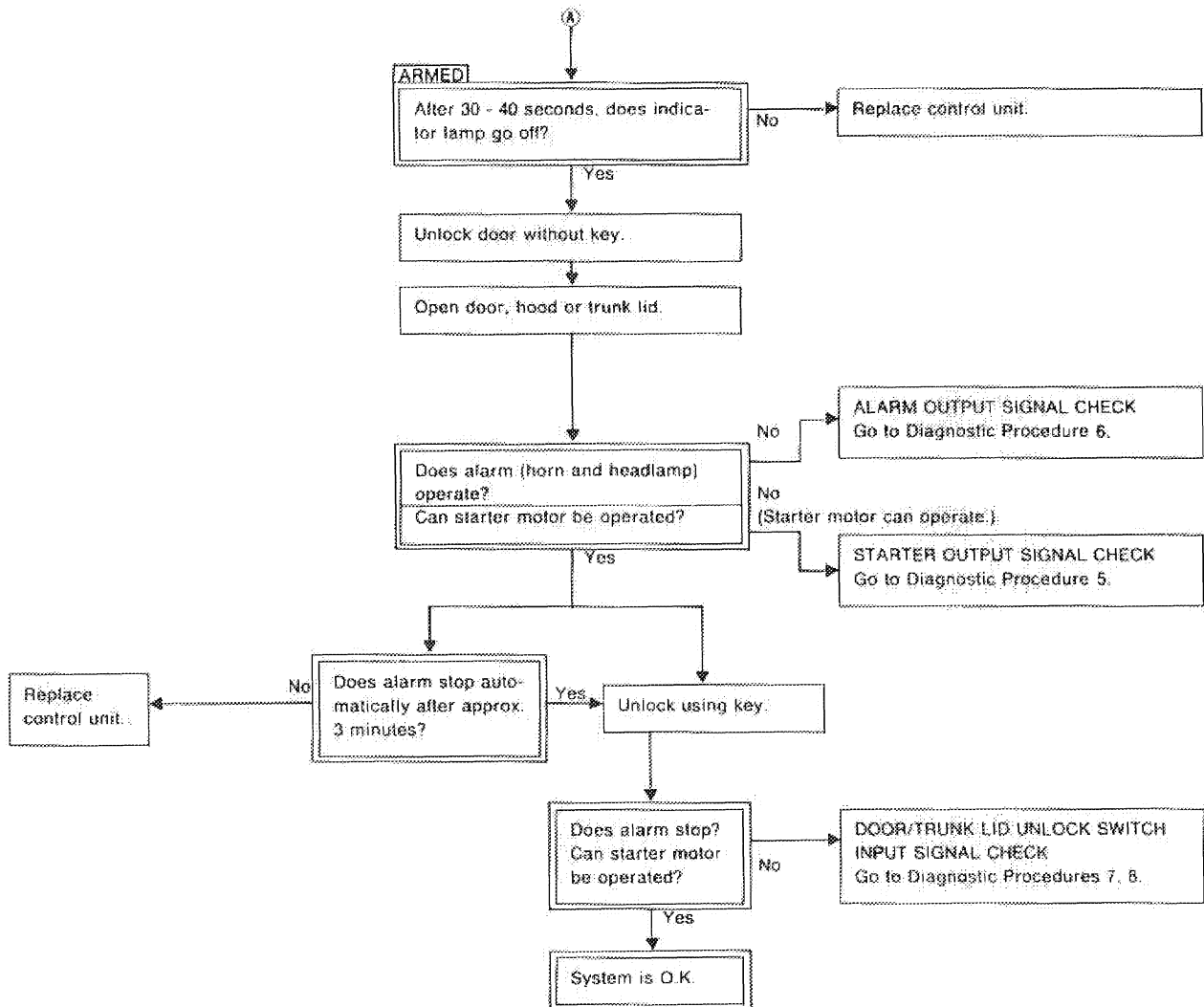
SYSTEM OPERATION CHECK

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.



THEFT WARNING SYSTEM

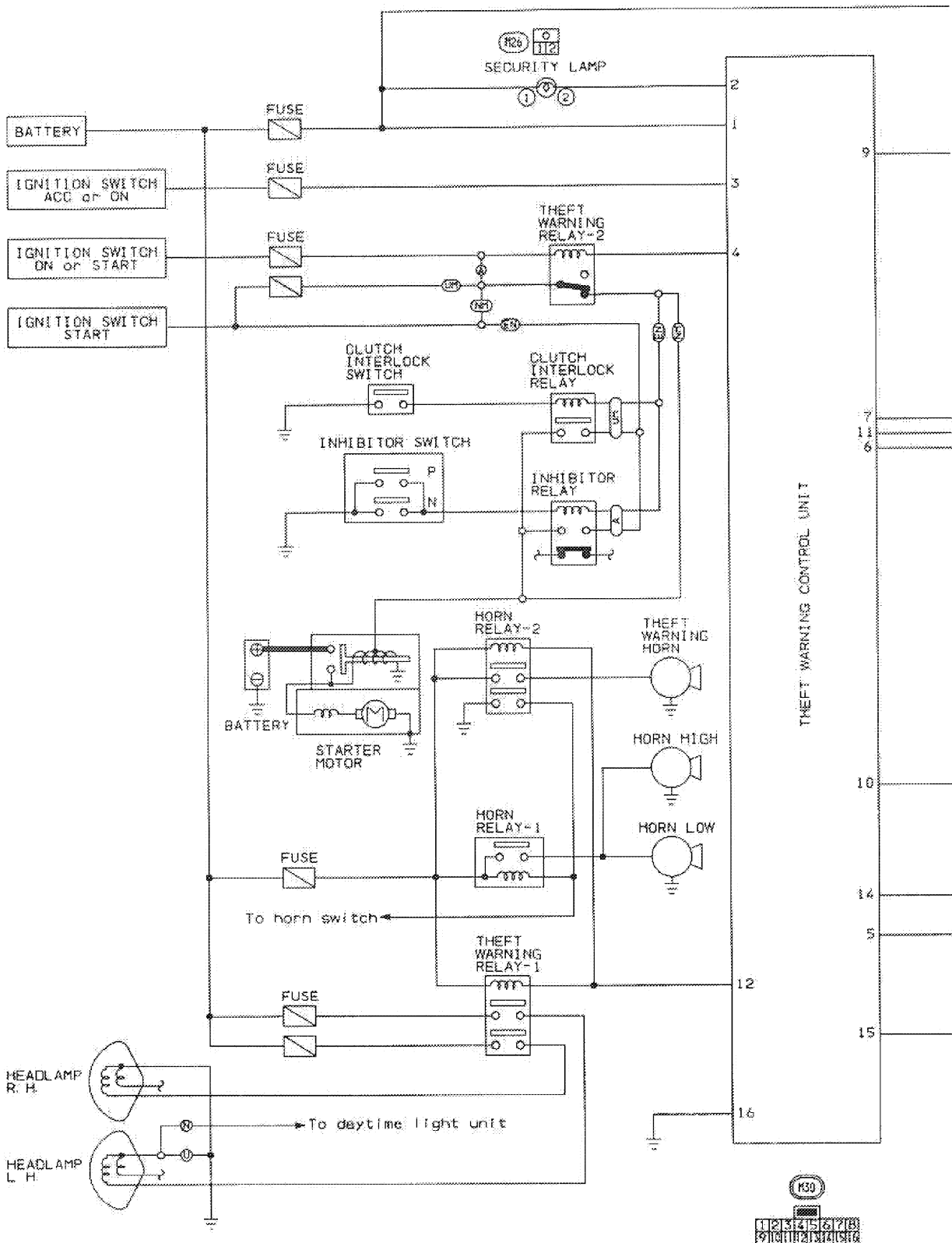
Trouble Diagnoses (Cont'd)



THEFT WARNING SYSTEM

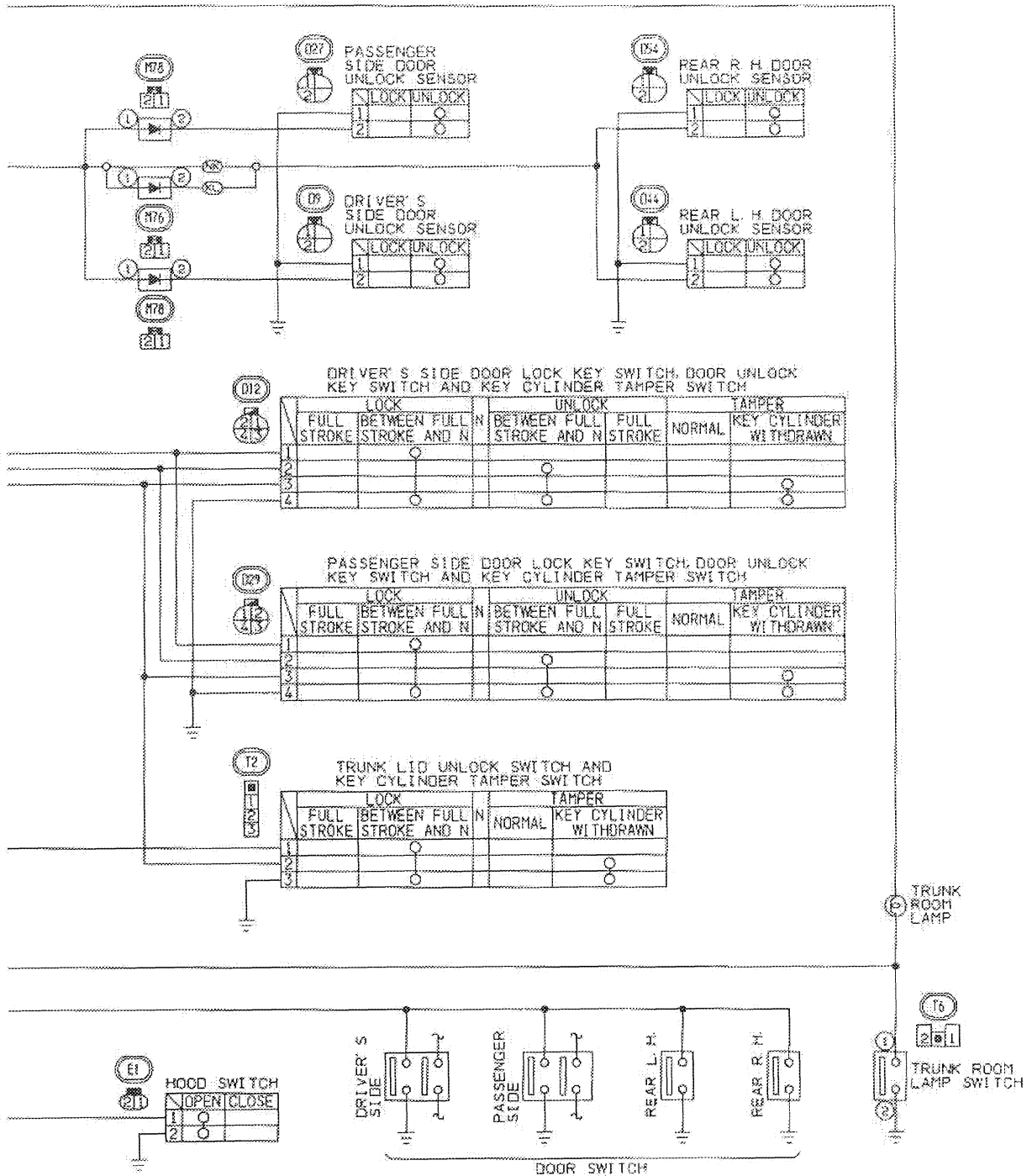
Trouble Diagnoses (Cont'd)

CIRCUIT DIAGRAM FOR QUICK PINPOINT CHECK



THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)



- (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

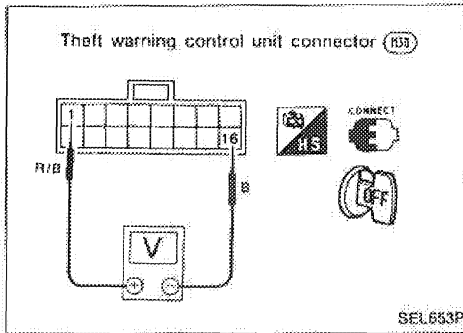
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

POWER SUPPLY AND GROUND CIRCUIT CHECK

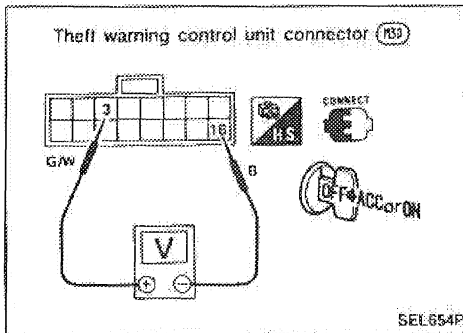
Main power supply circuit check

Terminals	Ignition switch position		
	OFF	ACC	ON
① - ⑯	Battery voltage	Battery voltage	Battery voltage



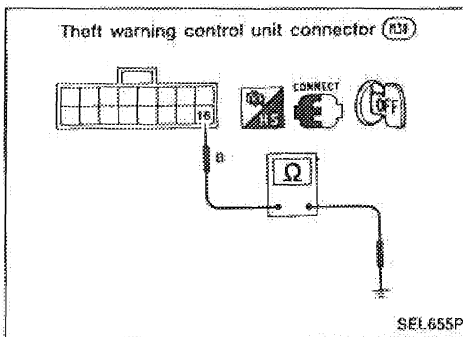
Power supply circuit check for system cancel

Terminals	Ignition switch position		
	OFF	ACC	ON
③ - ⑯	0V	Battery voltage	Battery voltage



Ground circuit check

Terminals	Continuity
⑯ - Ground	Yes



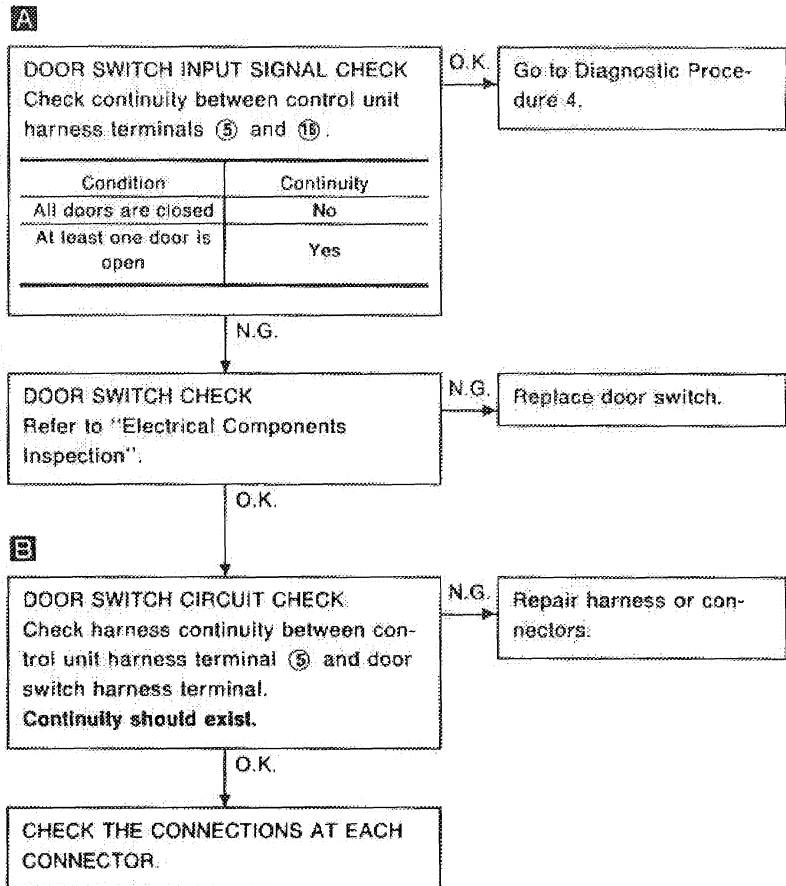
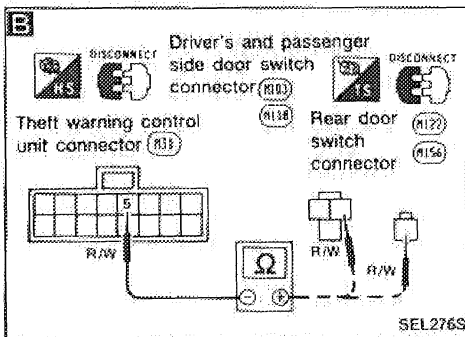
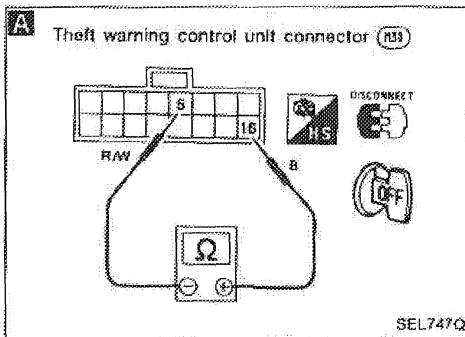
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 1

- SYMPTOM:**
- Indicator lamp does not blink.
 - Indicator lamp remains blinking.

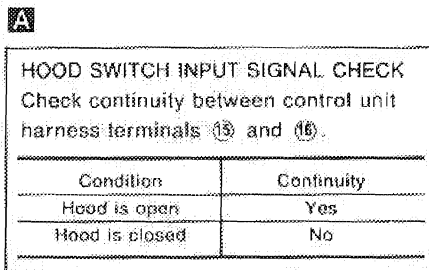
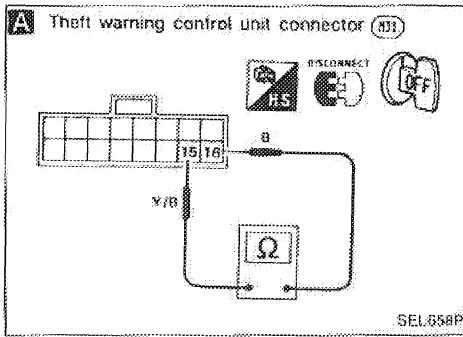
Diagnostic procedure 1-(1)



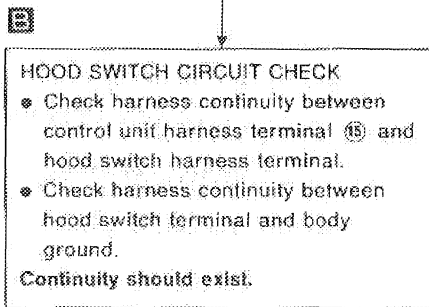
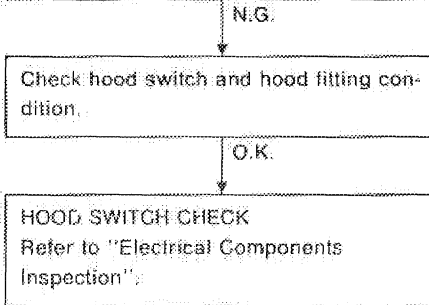
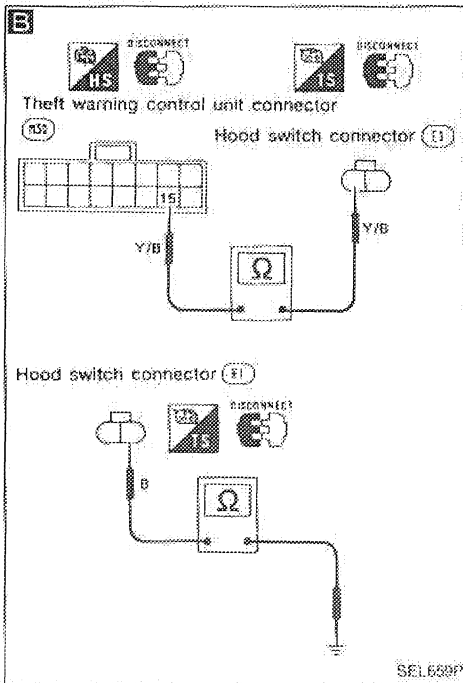
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

Diagnostic procedure 1-(2)



O.K. → Go to Diagnostic Procedure 4.

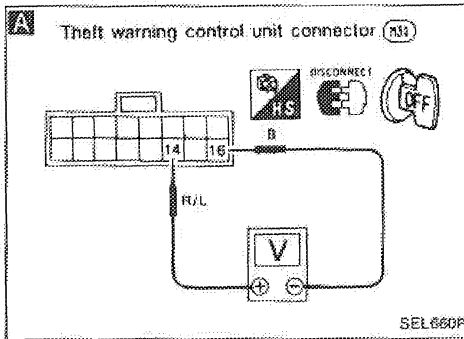


CHECK THE CONNECTIONS AT EACH CONNECTOR.

THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

Diagnostic procedure 1-(3)

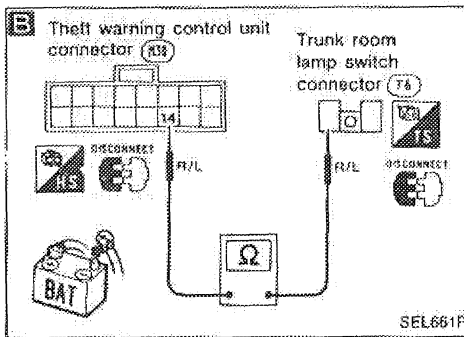


A

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** **TRUNK ROOM LAMP SWITCH CIRCUIT CHECK**
Check harness continuity between control unit harness terminal (14) and trunk room lamp harness terminal.

No ↓

TRUNK ROOM LAMP SWITCH CHECK
Refer to "Electrical Components Inspection".

O.K. → **B** **TRUNK ROOM LAMP SWITCH CIRCUIT CHECK**
Check harness continuity between control unit harness terminal (14) and trunk room lamp harness terminal.

N.G. ↓

Replace trunk room lamp switch.

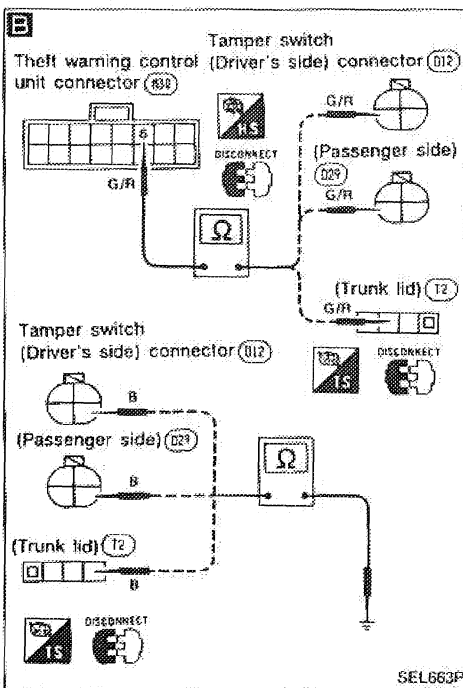
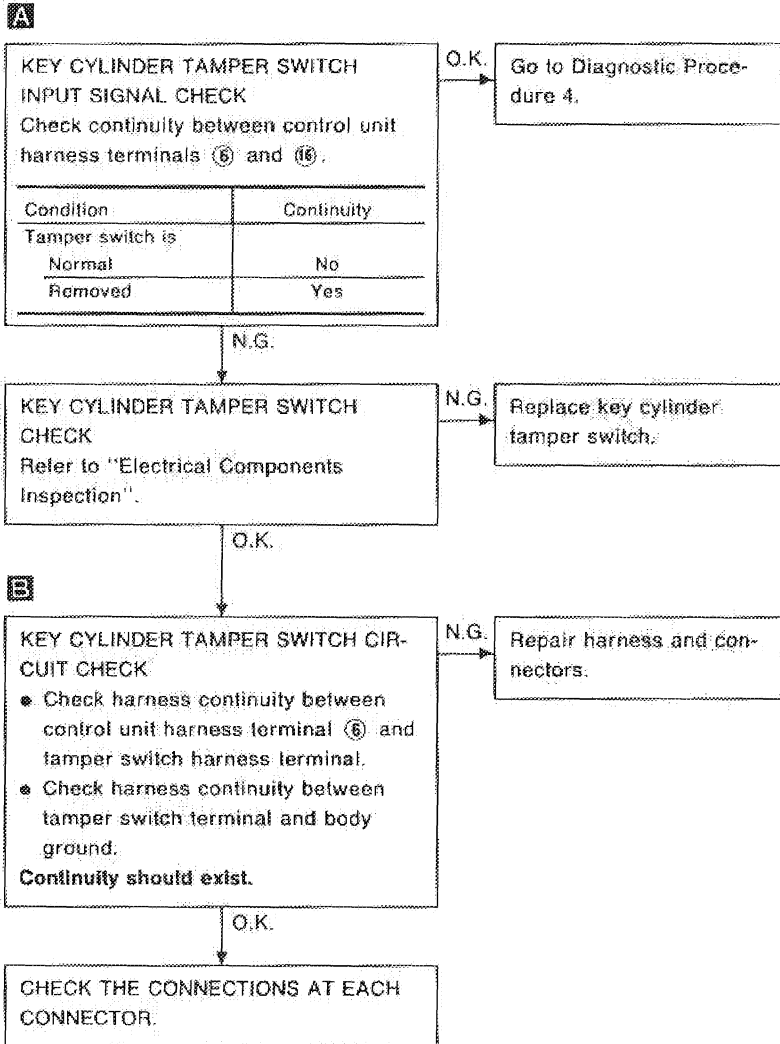
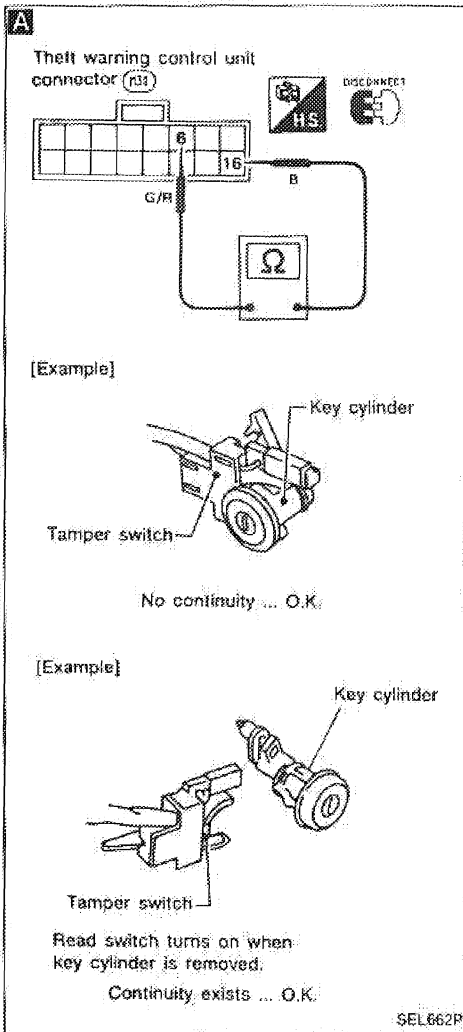
O.K. ↓

CHECK THE CONNECTIONS AT EACH CONNECTOR.

THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

Diagnostic procedure 1-(4)

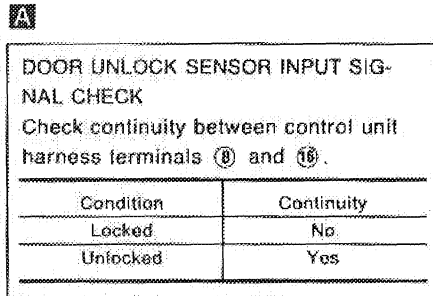
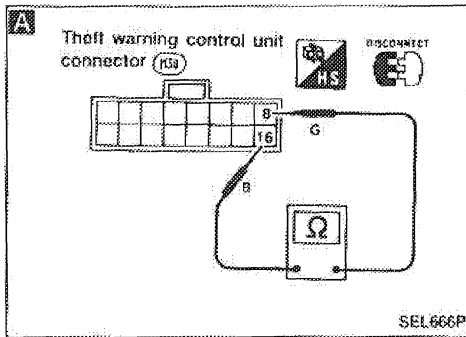


THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

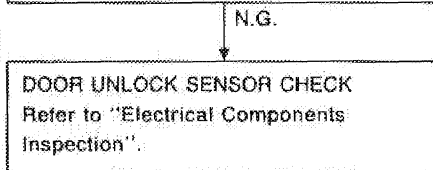
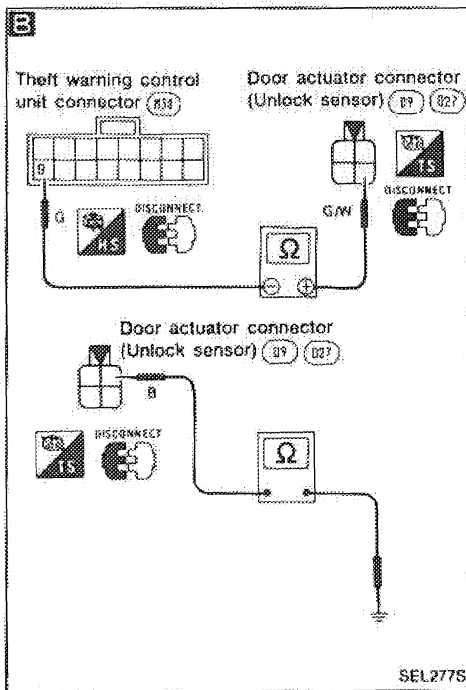
DIAGNOSTIC PROCEDURE 2

SYMPTOM: Indicator lamp does not come on.

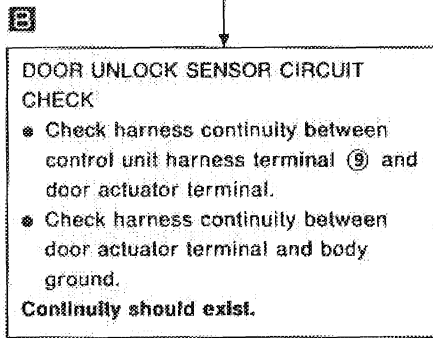


O.K. → Go to Diagnostic Procedure 3.

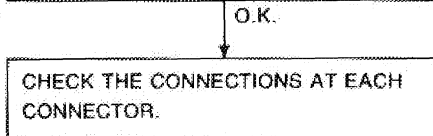
O.K. → Replace control unit.



N.G. → Replace door lock actuator.



N.G. → Repair harness or connectors.

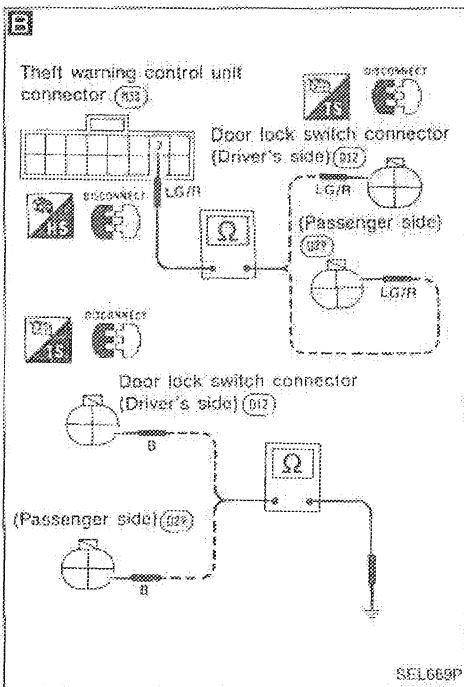
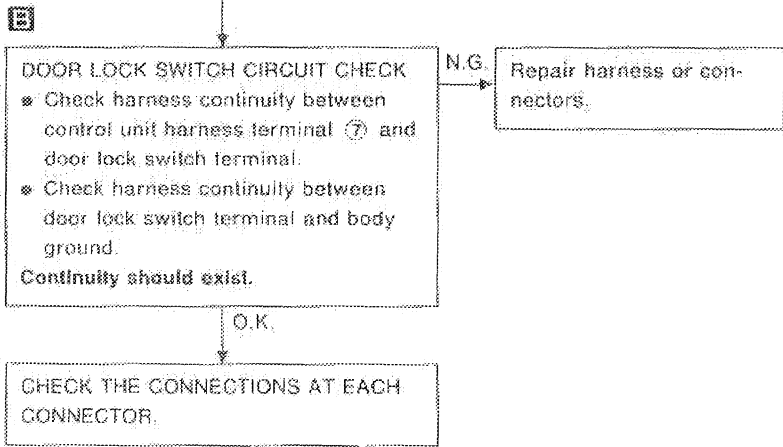
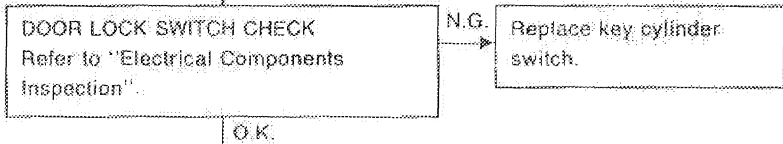
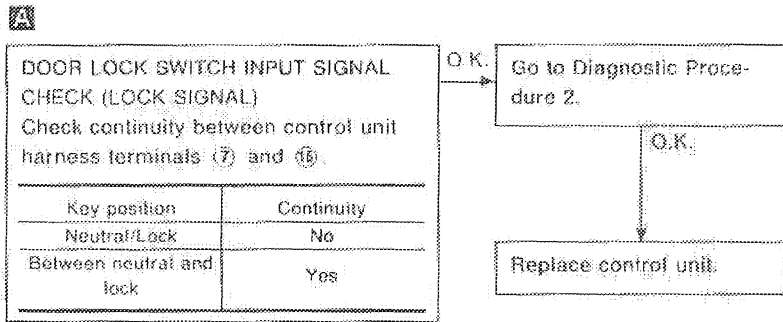
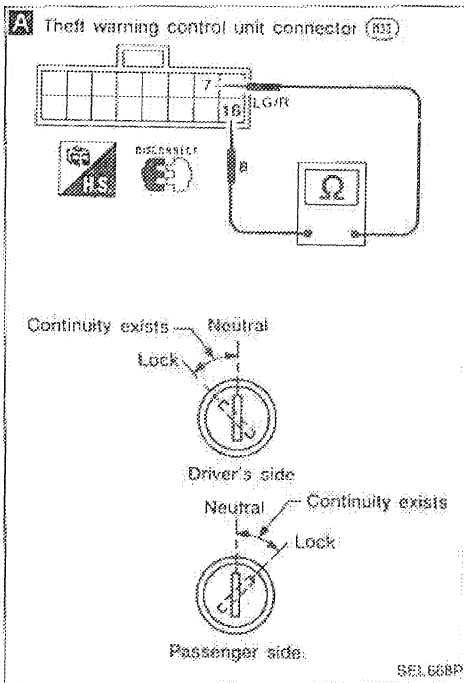


THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 3

SYMPTOM: Indicator lamp does not come on.

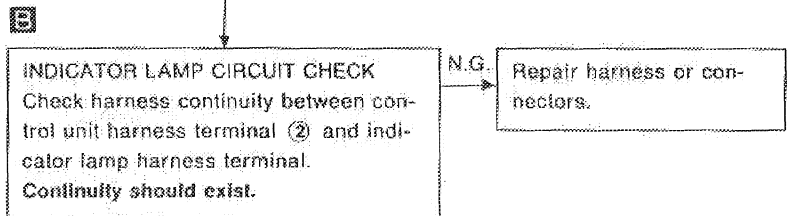
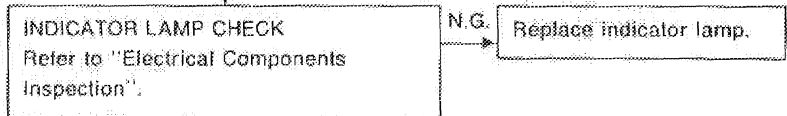
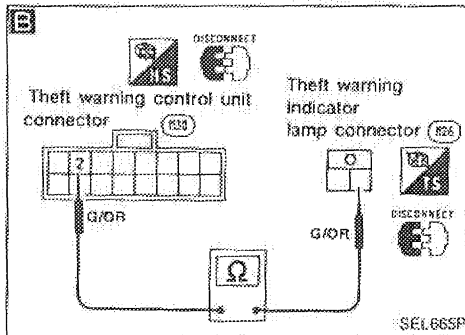
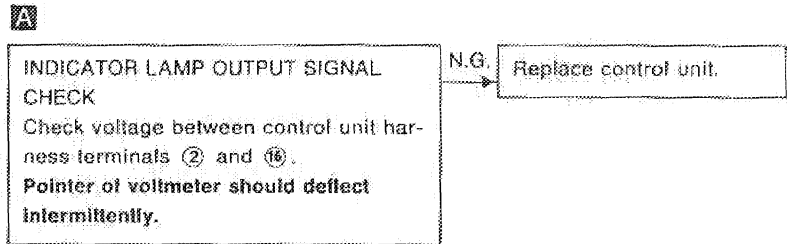
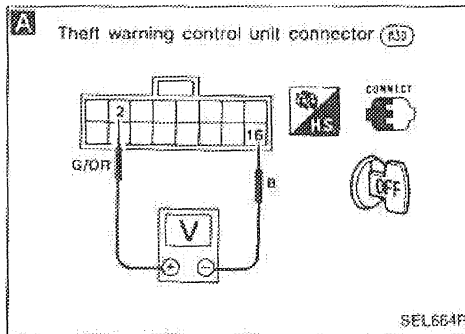


THEFT WARNING SYSTEM

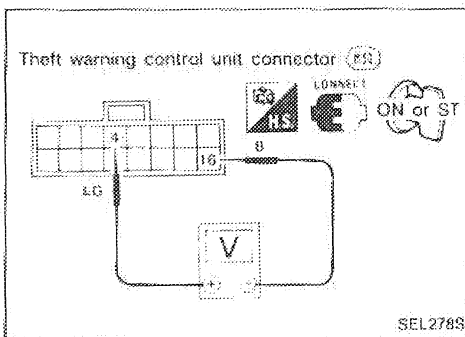
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 4

SYMPTOM: Indicator lamp does not blink.

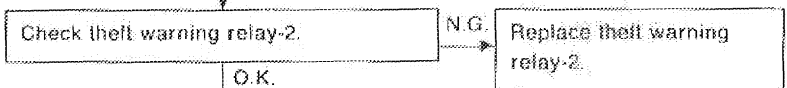
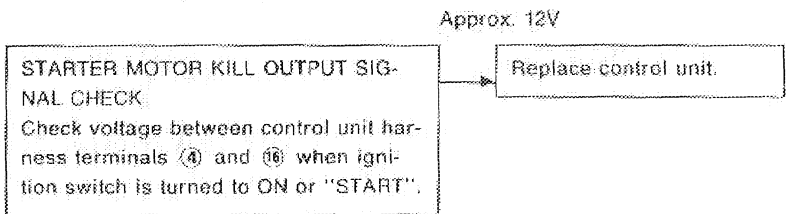


CHECK THE CONNECTIONS AT EACH CONNECTOR.



DIAGNOSTIC PROCEDURE 5

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



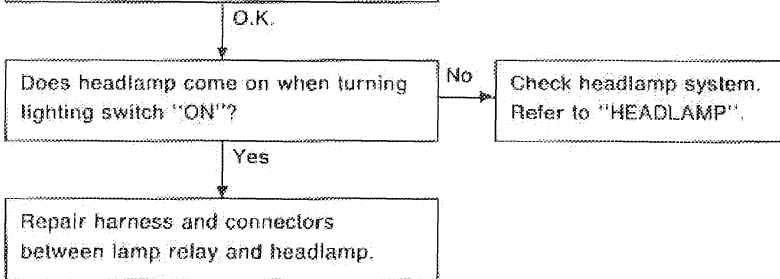
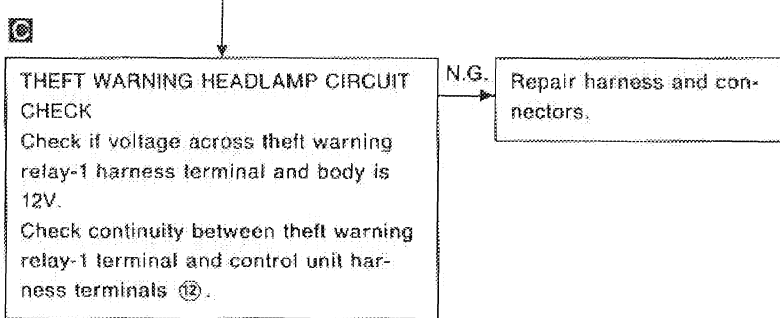
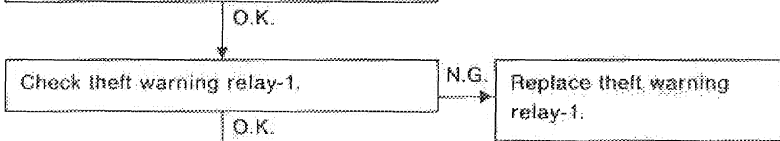
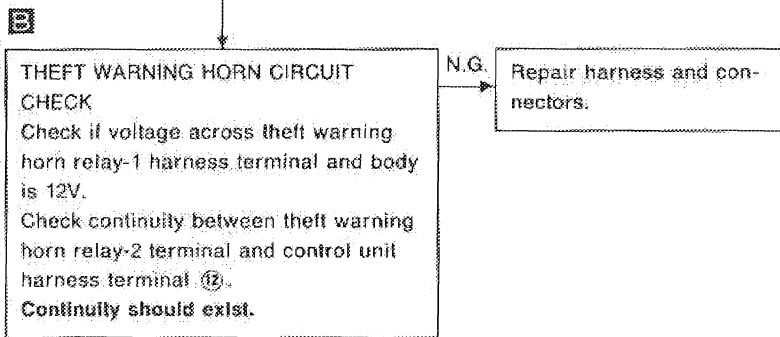
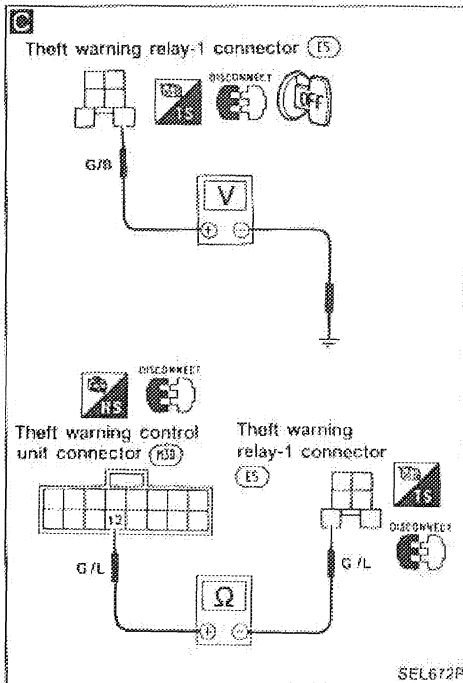
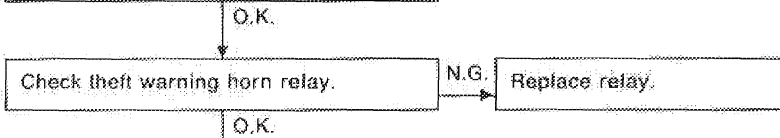
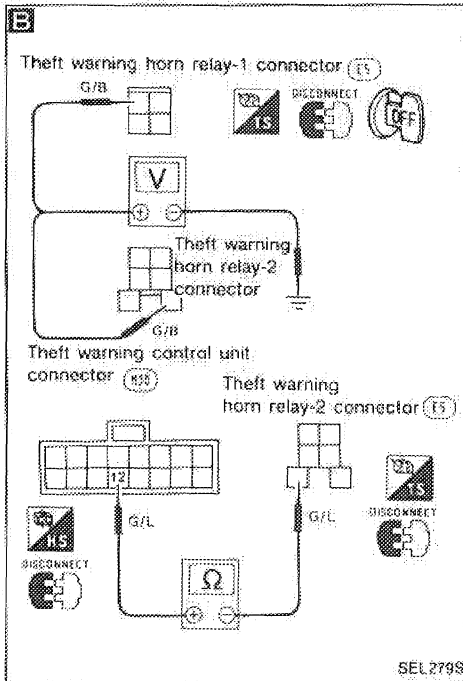
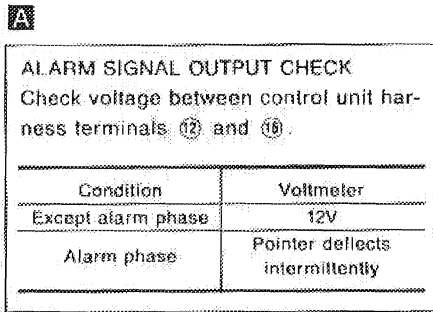
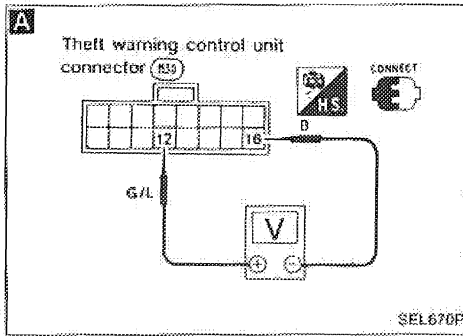
Repair harness between control unit and theft warning relay-2.

THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

SYMPTOM: Alarm does not operate.

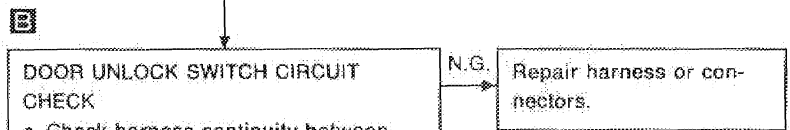
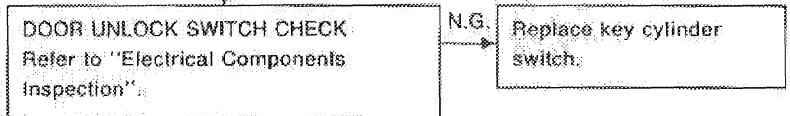
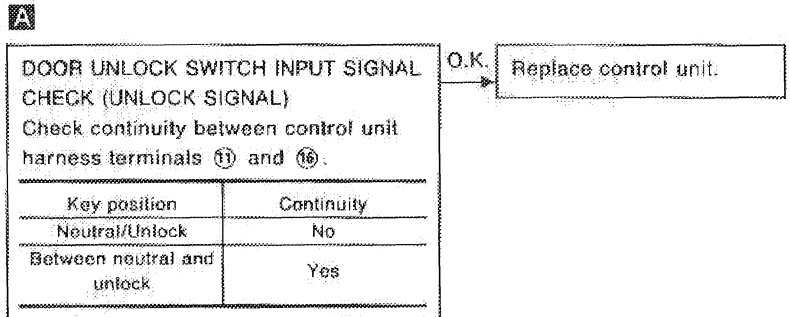
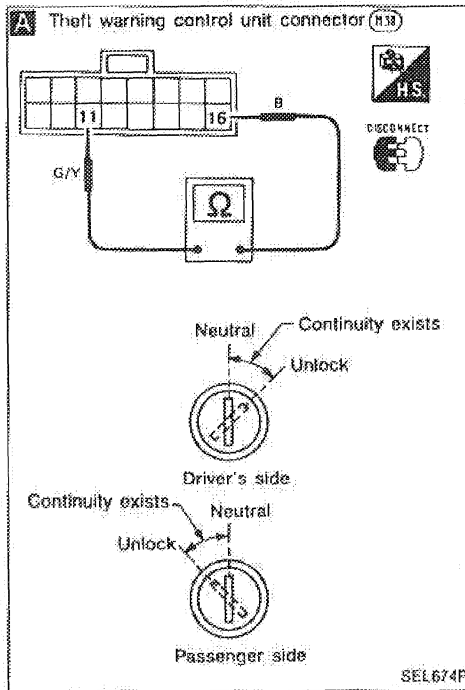


THEFT WARNING SYSTEM

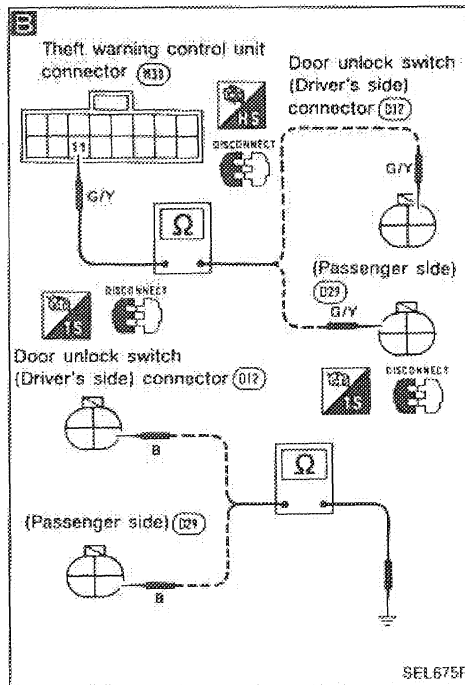
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 7

SYMPTOM: Alarm does not stop even if stop signal is given.



CHECK THE CONNECTIONS AT EACH CONNECTOR.

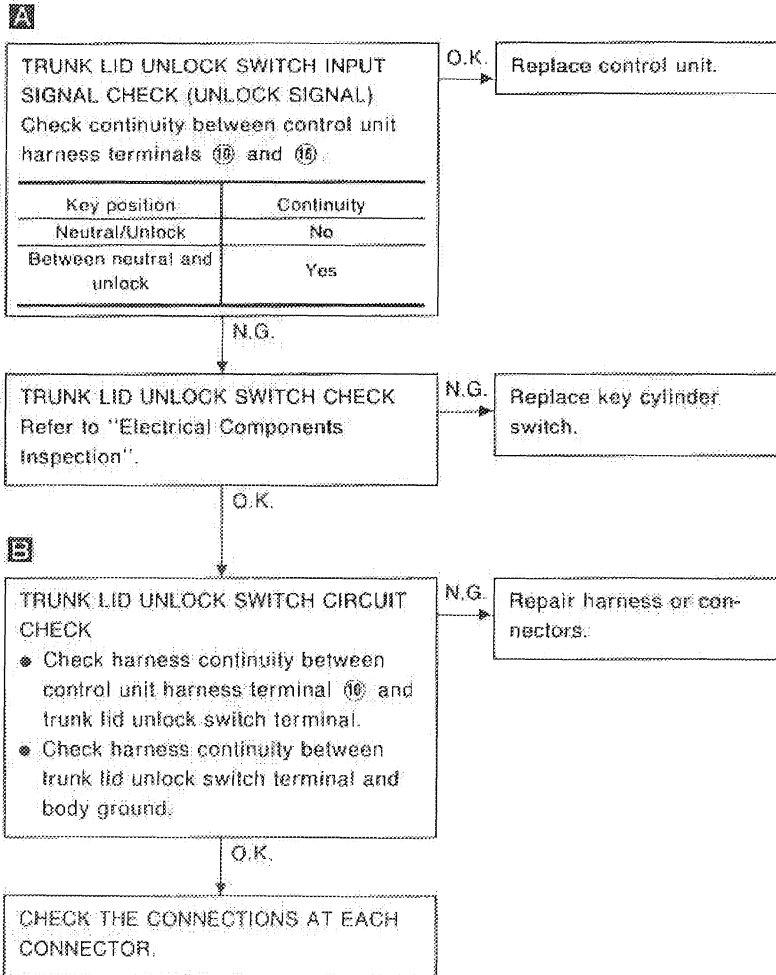
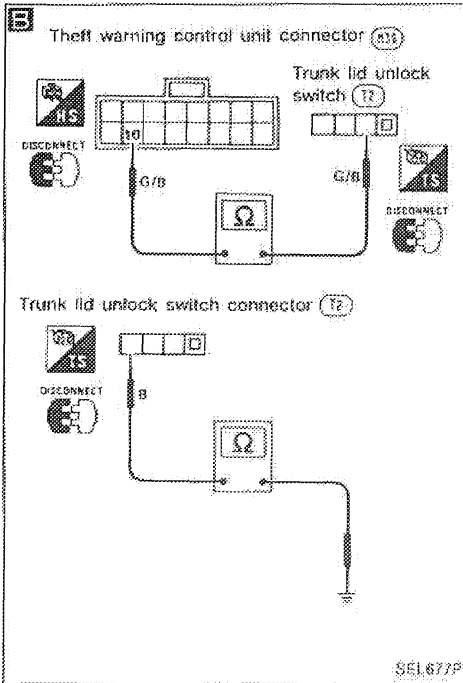
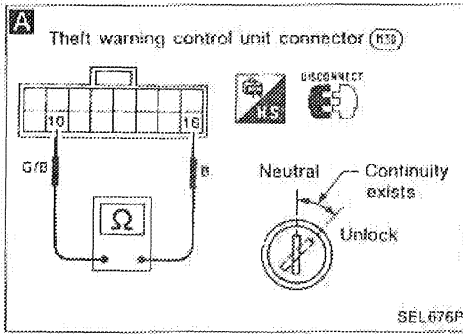


THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 8

SYMPTOM: Alarm does not stop even if stop signal is given.



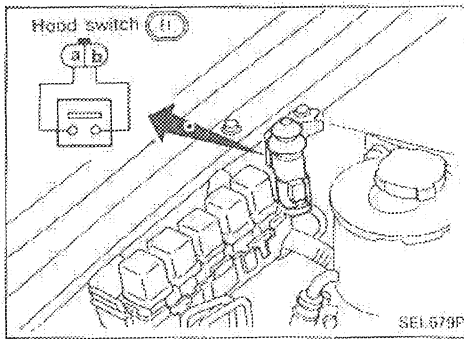
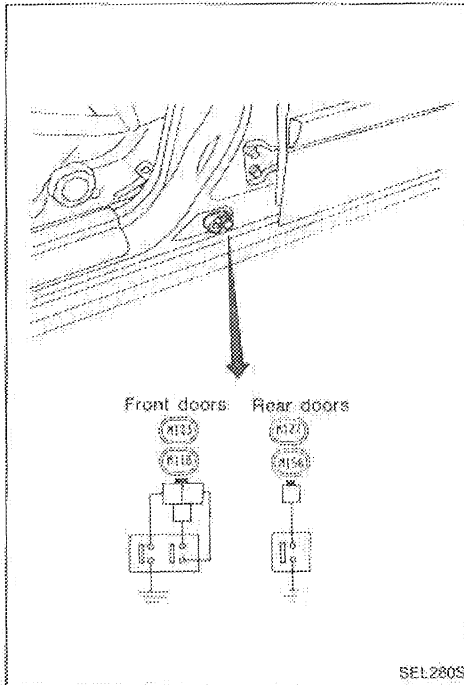
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont'd)

ELECTRICAL COMPONENTS INSPECTION

Door switches

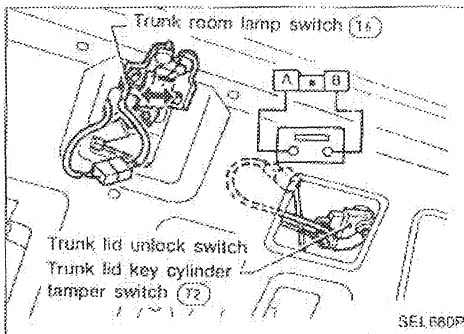
Check continuity between terminal and switch body.



Hood switch

Check continuity between terminals when hood switch is pushed and released.

Terminal	Pushed	Released
a		○
b		○



Trunk room lamp switch

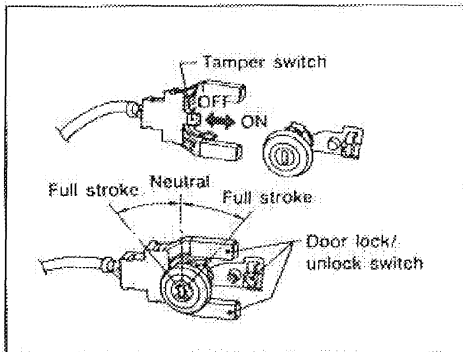
Terminal	Trunk lid	
	Closed	Open
a		○
b		○

THEFT WARNING SYSTEM

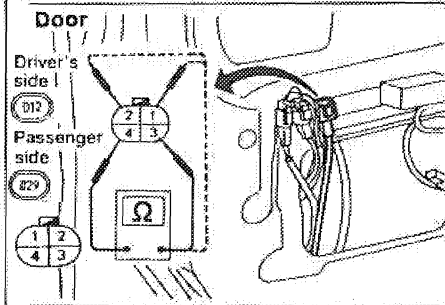
Trouble Diagnoses (Cont'd)

Key cylinder tamper switch, door lock switch and door unlock switch

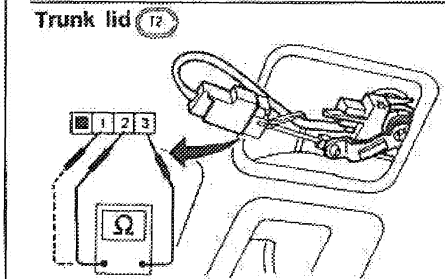
● Door



	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		○		○		○	

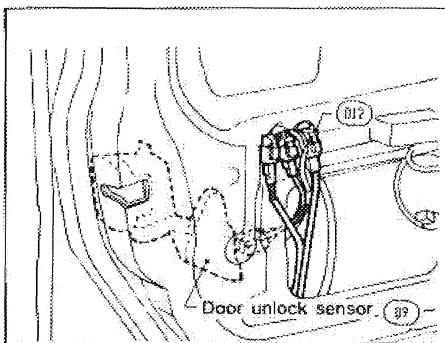


Trunk lid



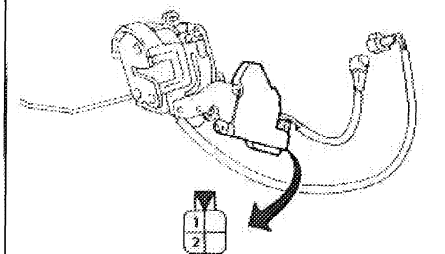
	TAMPER SWITCH		Trunk lid unlock switch		
	Key cylinder is installed	Key cylinder is removed	Full stroke	Between full stroke and neutral	Neutral
1				○	
2		○		○	
3		○		○	

SEL681P



Door unlock sensor

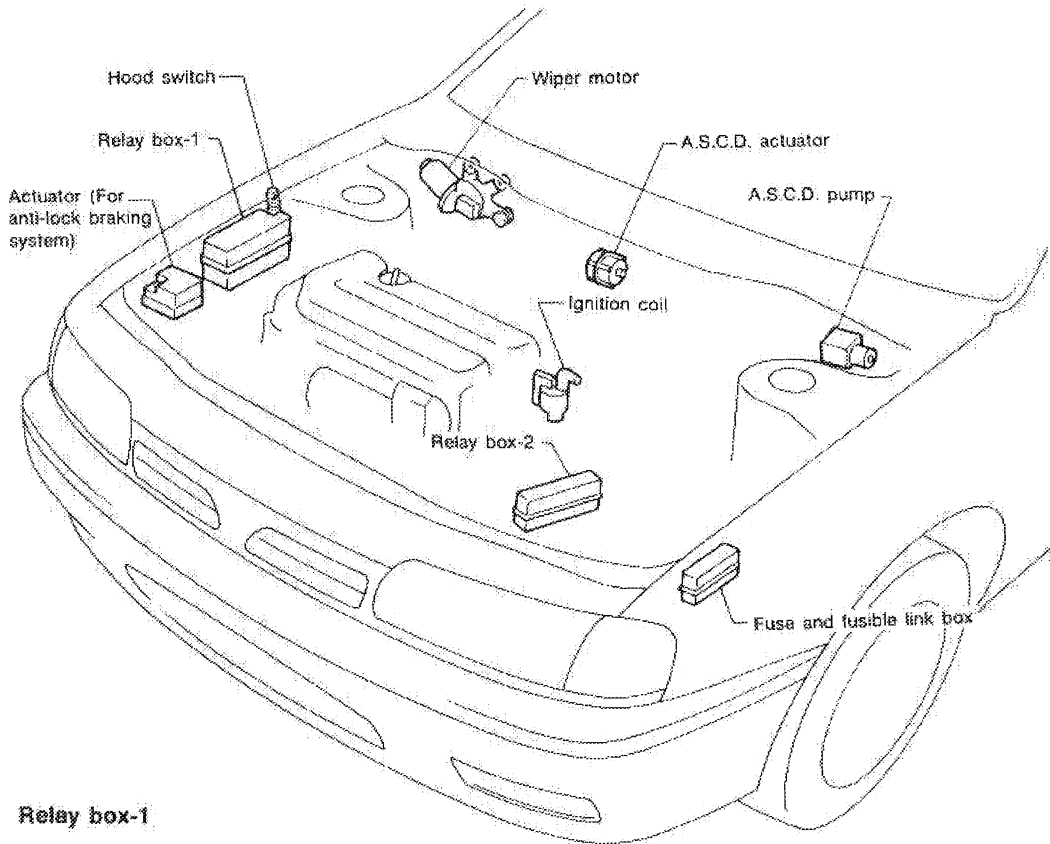
	LOCK	UNLOCK
1		○
2		○



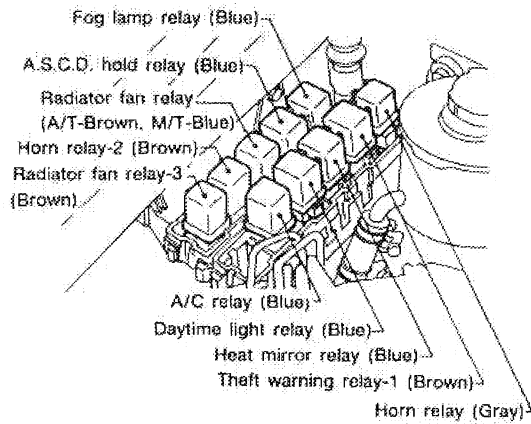
SEL281S

LOCATION OF ELECTRICAL UNITS

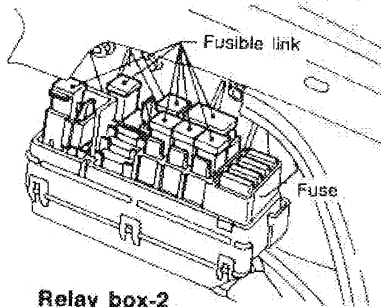
Engine Compartment



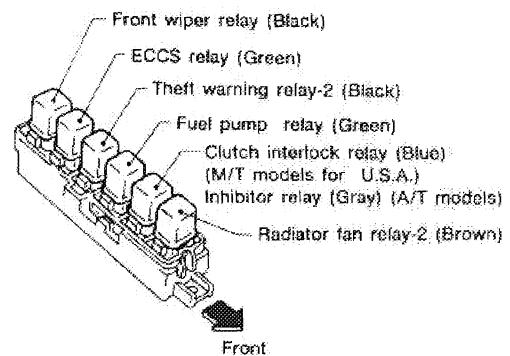
Relay box-1



Fuse and fusible link box

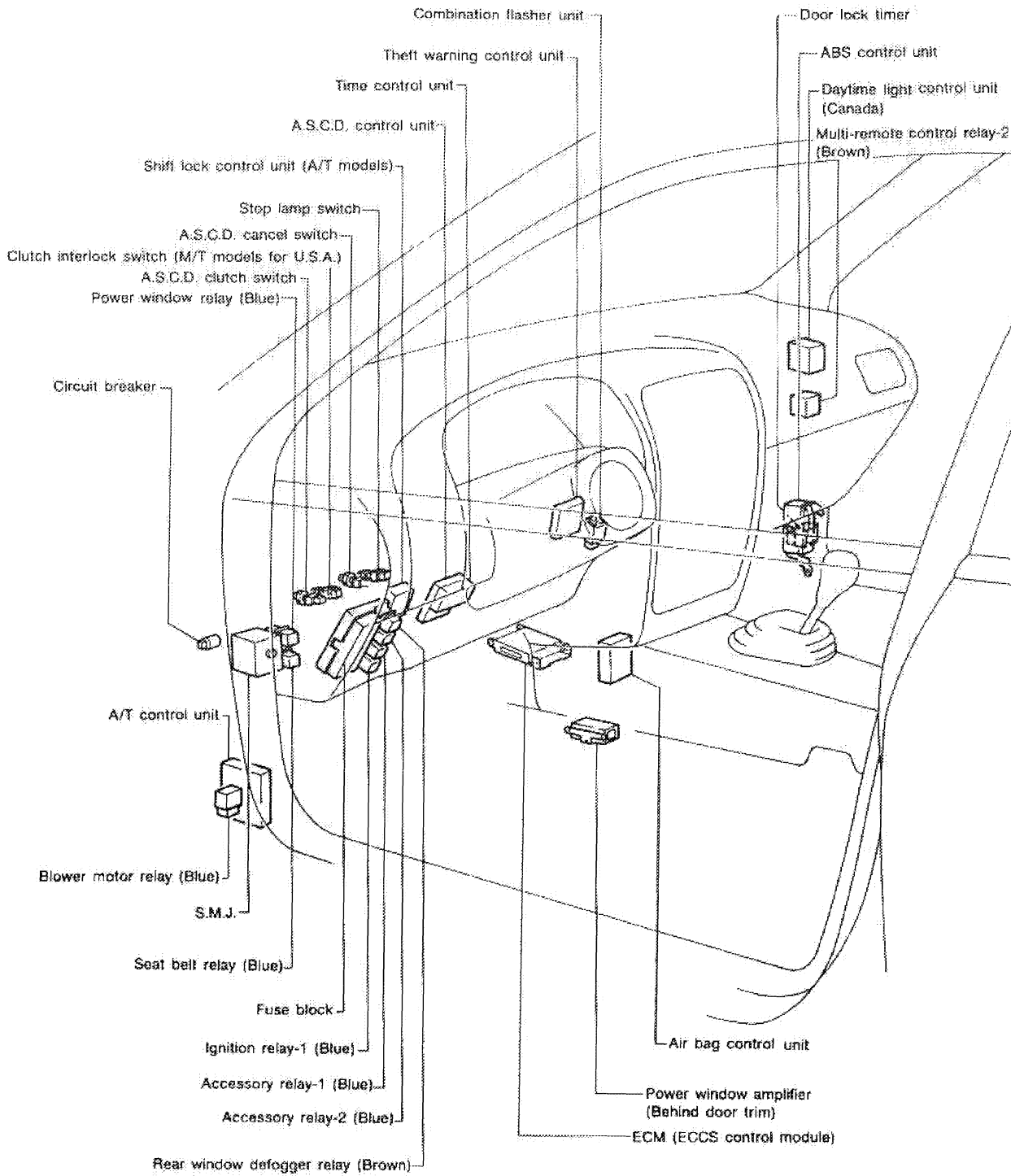


Relay box-2



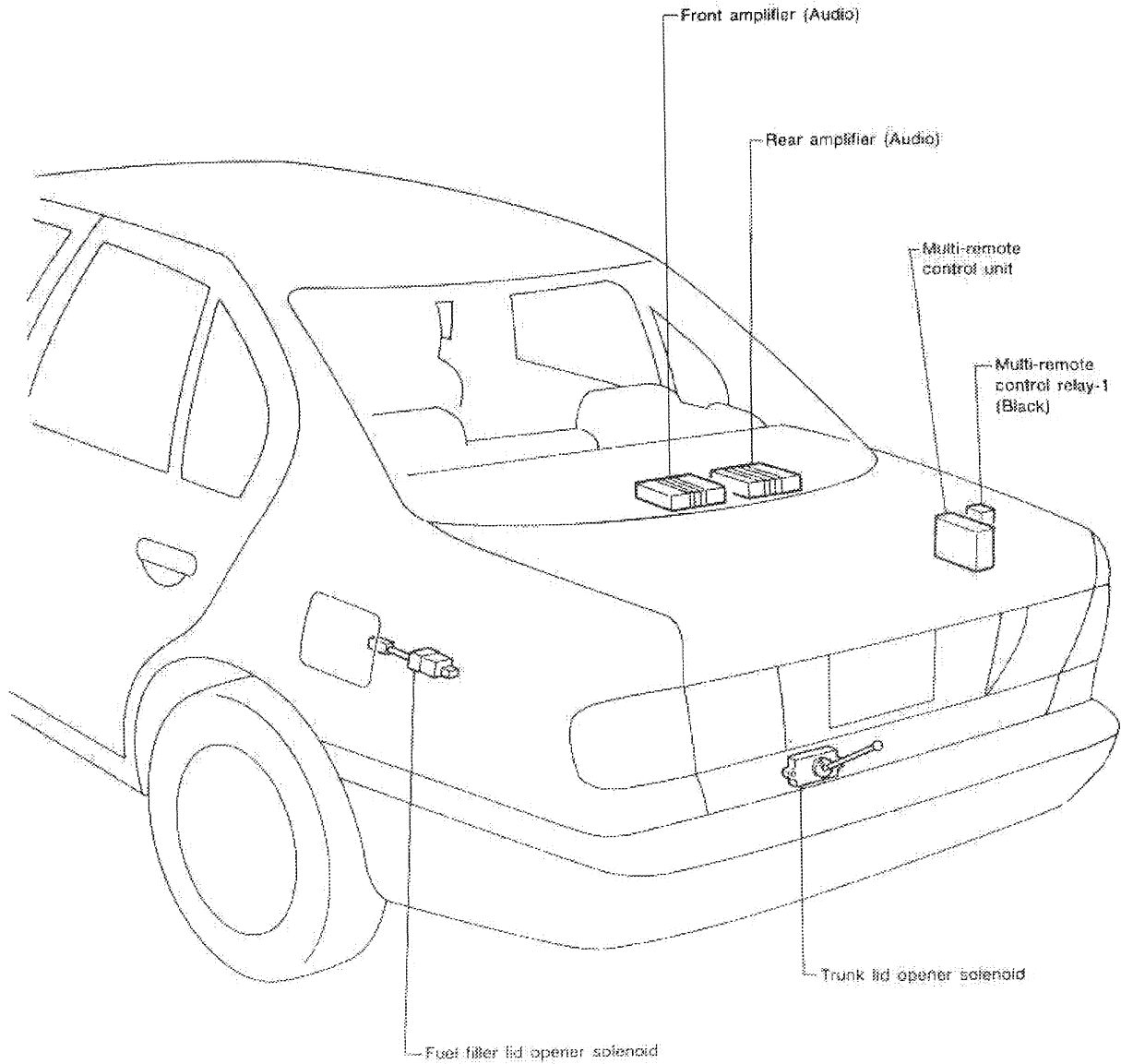
LOCATION OF ELECTRICAL UNITS

Passenger Compartment



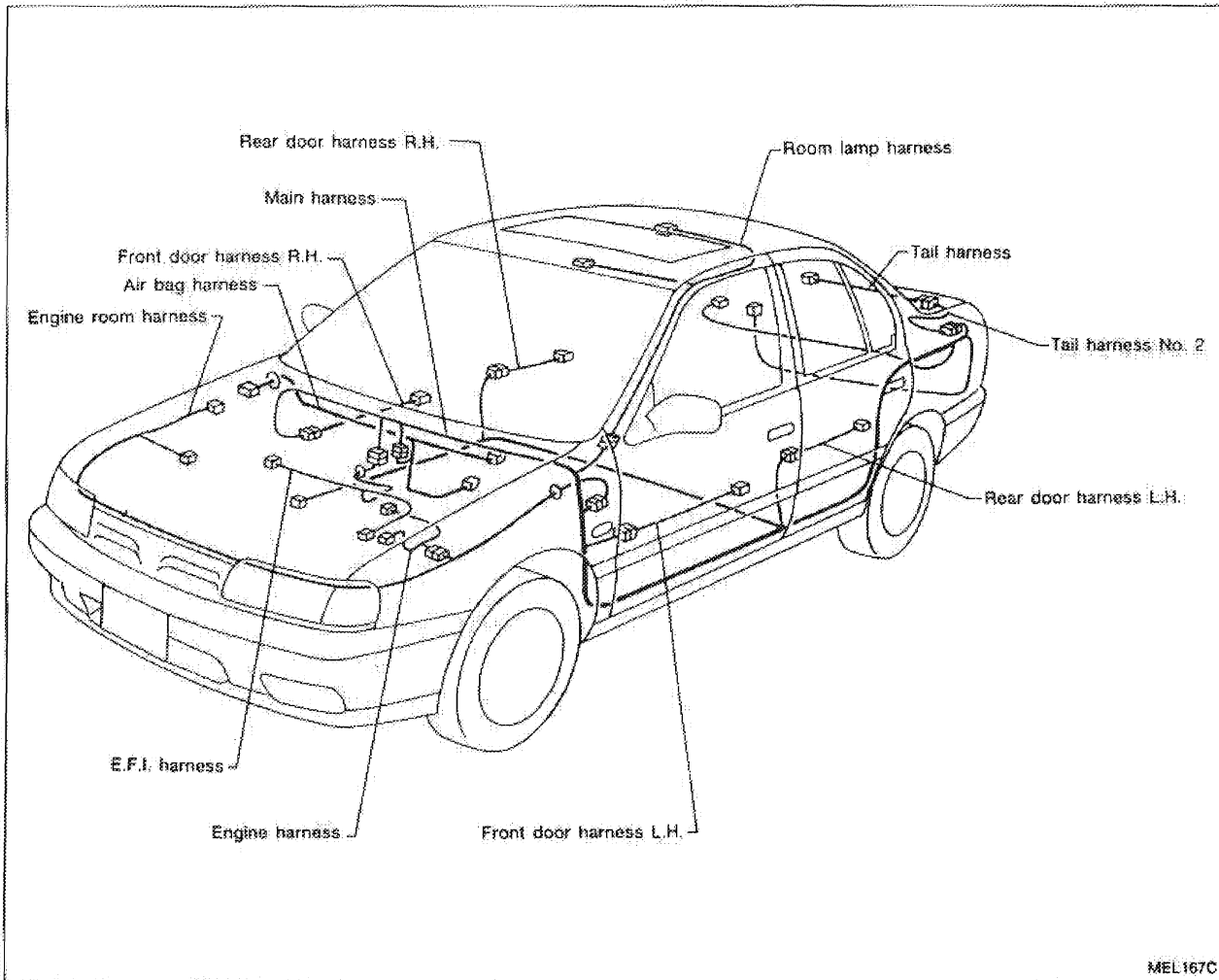
LOCATION OF ELECTRICAL UNITS

Luggage Compartment



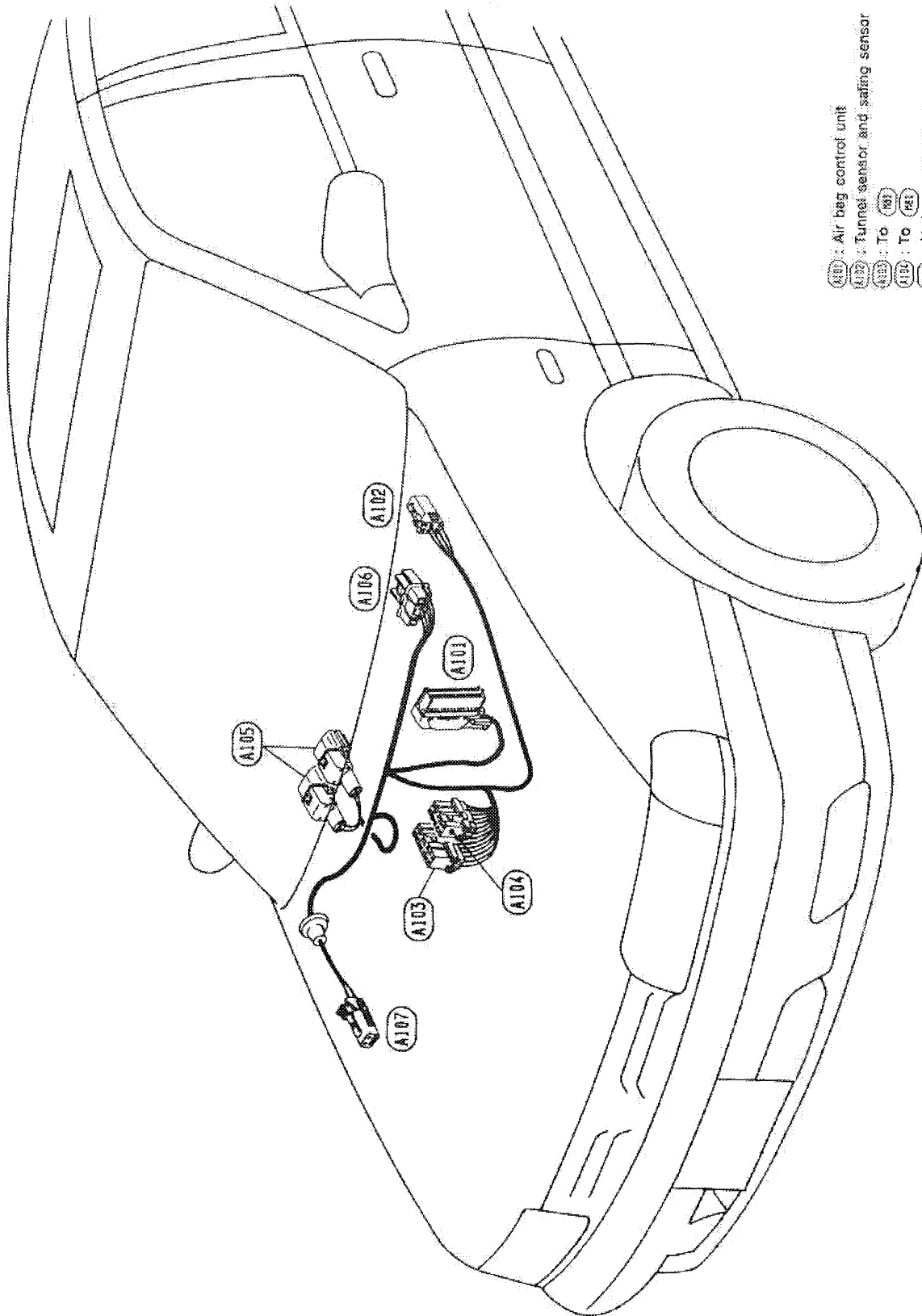
HARNESS LAYOUT

Outline



HARNES LAYOUT

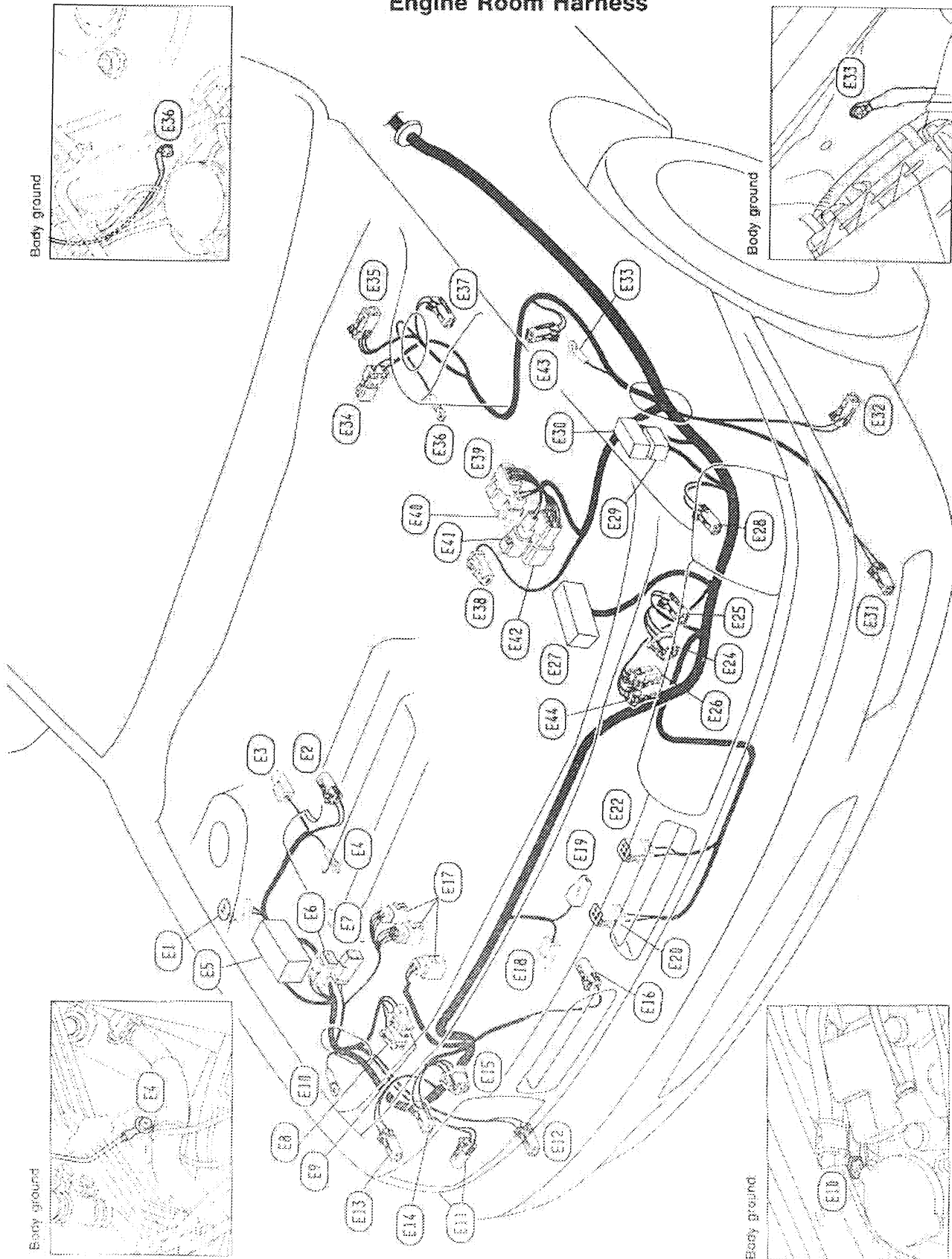
Air Bag Harness



- A102 : Air bag control unit
- A103 : Tunnel sensor and sitting sensor
- A104 : To (R)
- A105 : To (R)
- A106 : Air bag module R.H.
- A107 : Air bag module L.H.
- A108 : Front crash zone sensor

HARNESS LAYOUT

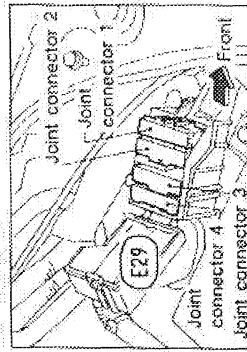
Engine Room Harness



HARNESS LAYOUT

Engine Room Harness (Cont'd)

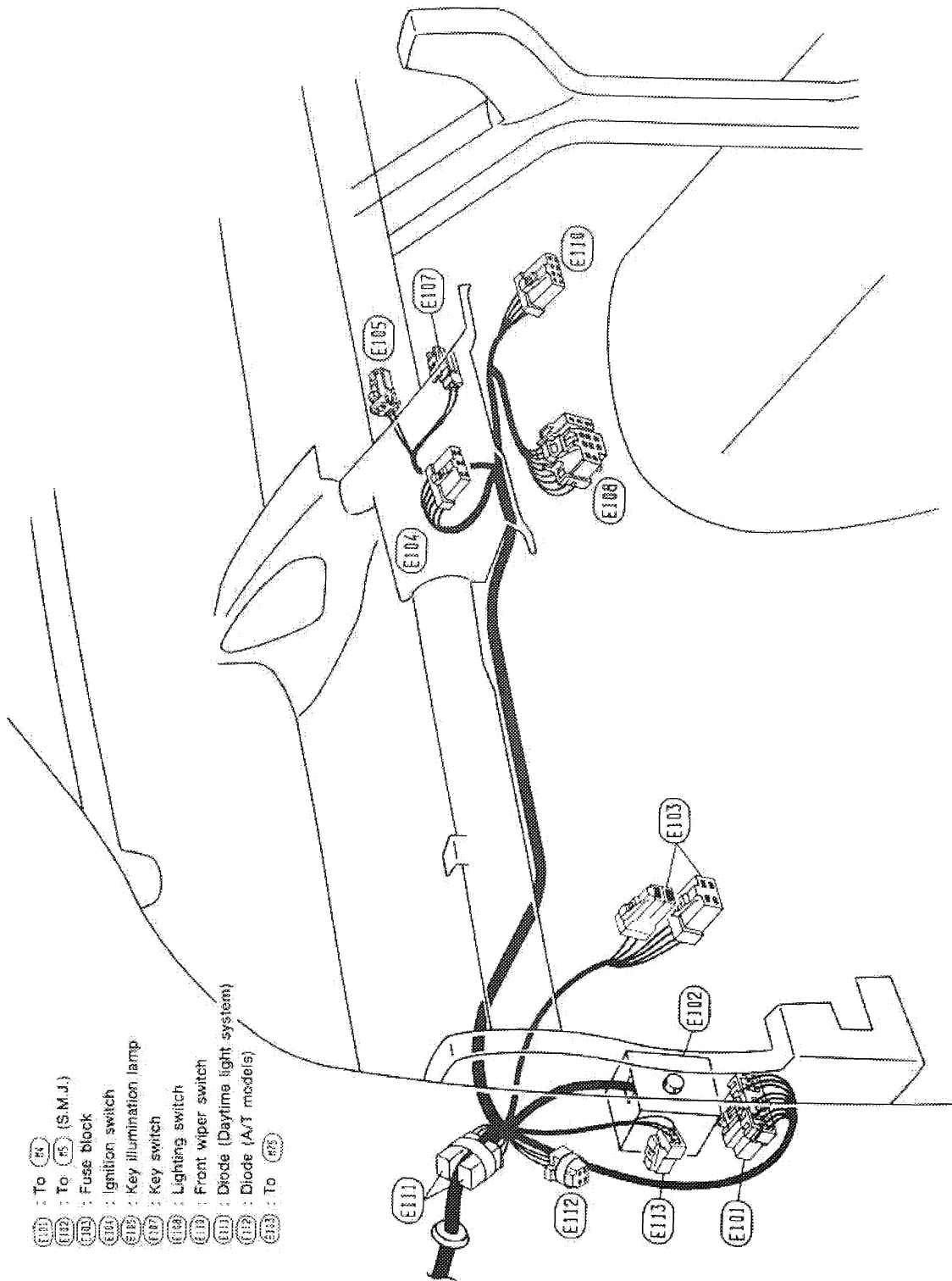
- (E24) : Headlamp L.H.
- (E25) : Clearance lamp L.H.
- (E26) : Triple-pressure switch (For U.S.A.)
- (E27) : Relay box-2 (Refer to "LOCATION OF ELECTRICAL UNITS".)
- (E28) : Front turn signal lamp L.H.
- (E29) : Joint connector box
- (E30) : Fuse and fusible link box
- (E31) : Front fog lamp L.H.
- (E32) : Front side marker lamp L.H.
- (E33) : Body ground
- (E34) : Brake fluid level switch
- (E35) : A.S.C.D. pump
- (E36) : Body ground (For anti-lock braking system)
- (E37) : Front wheel sensor L.H. (For anti-lock braking system)
- (E38) : Battery
- (E39) : To (E25)
- (E40) : To (E26)
- (E41) : To (E27)
- (E42) : To (E28)
- (E43) : Dropping resistor (A/T models)
- (E44) : Dual-pressure switch (For Canada)



- (E1) : Hood switch
- (E2) : Front wheel sensor R.H. (For anti-lock braking system)
- (E3) : Theft warning horn
- (E4) : Body ground (For anti-lock braking system)
- (E5) : Relay box-1 (Refer to "LOCATION OF ELECTRICAL UNITS".)
- (E6) : To (E1)
- (E7) : To (E2)
- (E8) : Front washer motor
- (E9) : Washer level switch
- (E10) : Body ground
- (E11) : Front side marker lamp R.H.
- (E12) : Front fog lamp R.H.
- (E13) : Front turn signal lamp R.H.
- (E14) : Clearance lamp R.H.
- (E15) : Headlamp R.H.
- (E16) : Compressor
- (E17) : Actuator (For anti-lock braking system)
- (E18) : Horn (Low)
- (E19) : Horn (High)
- (E20) : Radiator fan motor-1
- (E21) : Radiator fan motor-2

HARNES LAYOUT

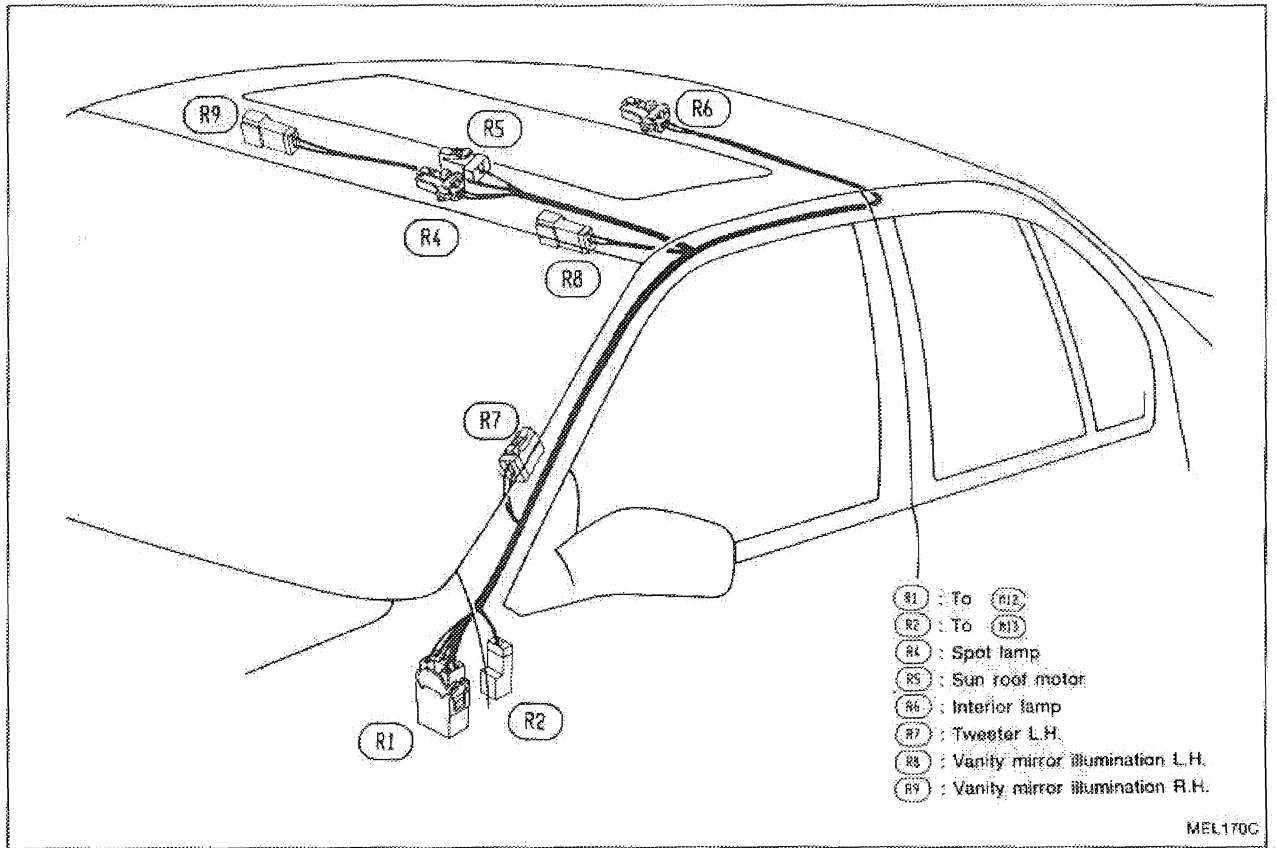
Engine Room Harness (Cont'd)



- E101 : To R
- E102 : To S (S.M.J.)
- E103 : Fuse block
- E104 : Ignition switch
- E105 : Key illumination lamp
- E106 : Key switch
- E107 : Lighting switch
- E108 : Front wiper switch
- E109 : Diode (Daytime light system)
- E110 : Diode (A/T models)
- E111 : To R2
- E112 : To R3
- E113 : To R4

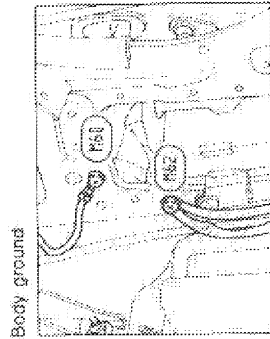
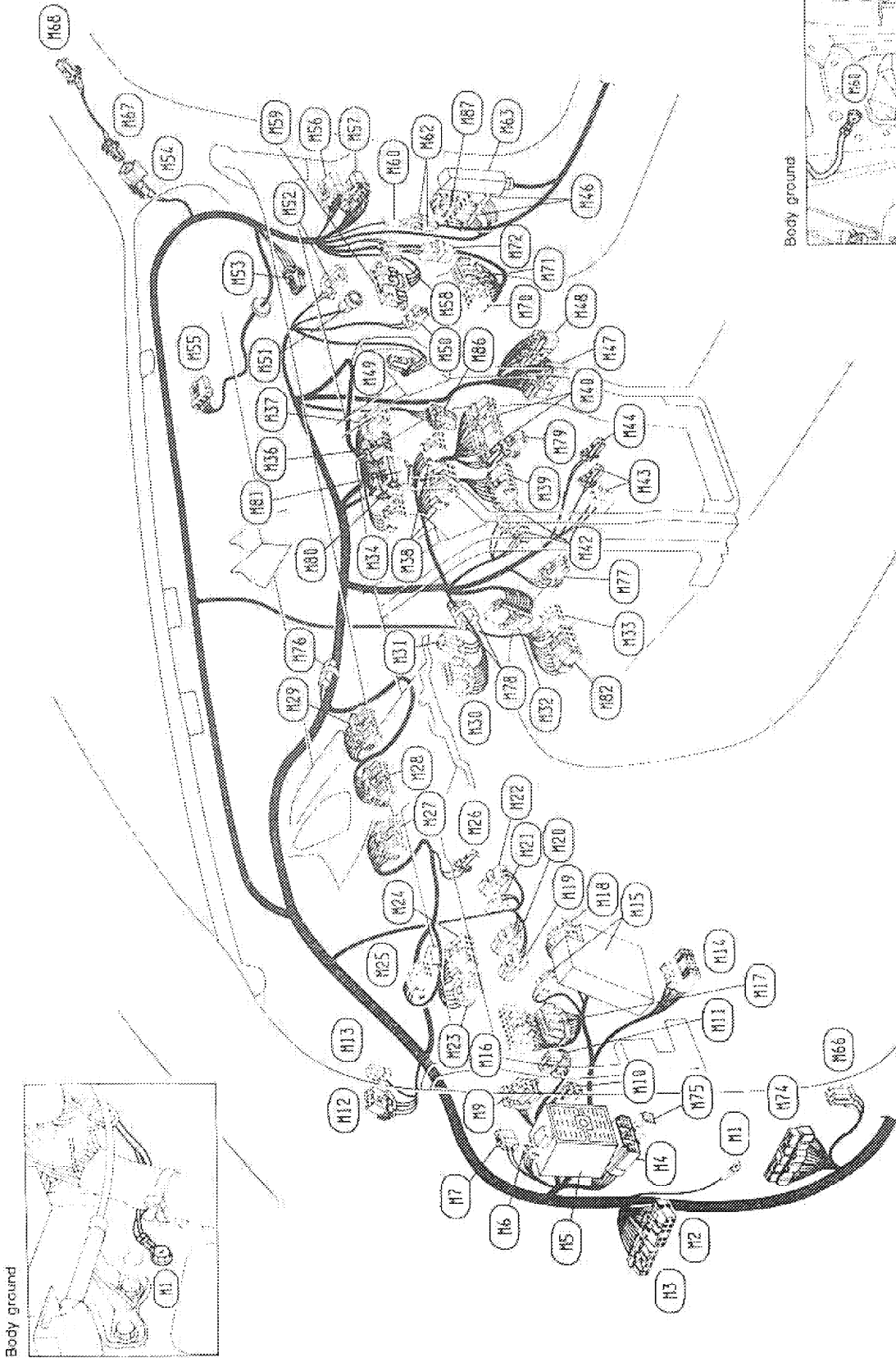
HARNES LAYOUT

Room Lamp Harness



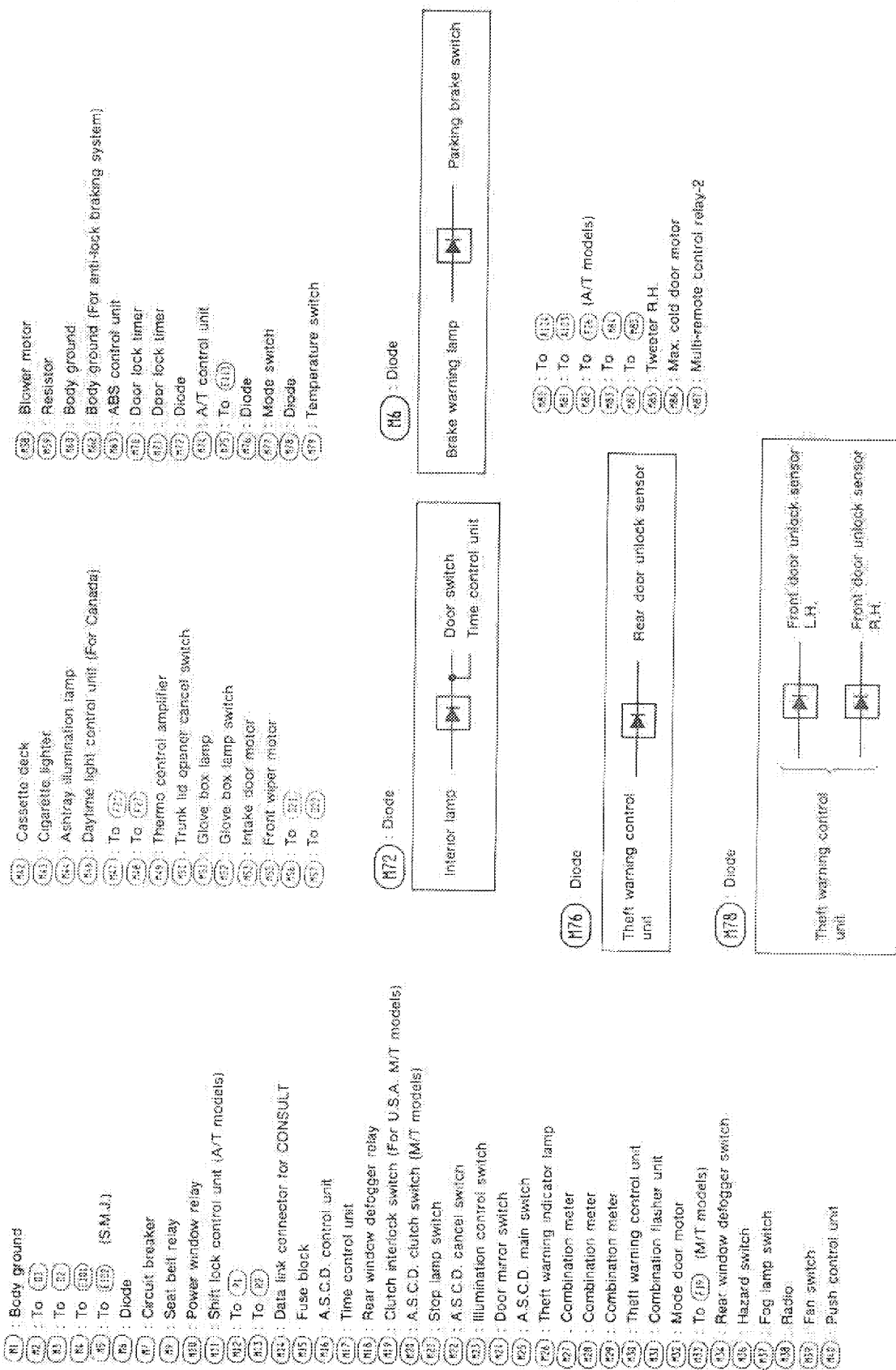
HARNESS LAYOUT

Main Harness



HARNESS LAYOUT

Main Harness (Cont'd)



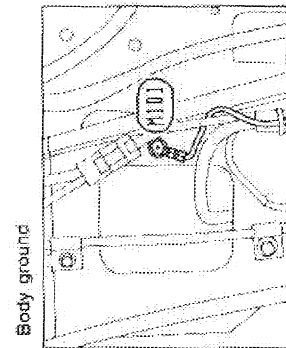
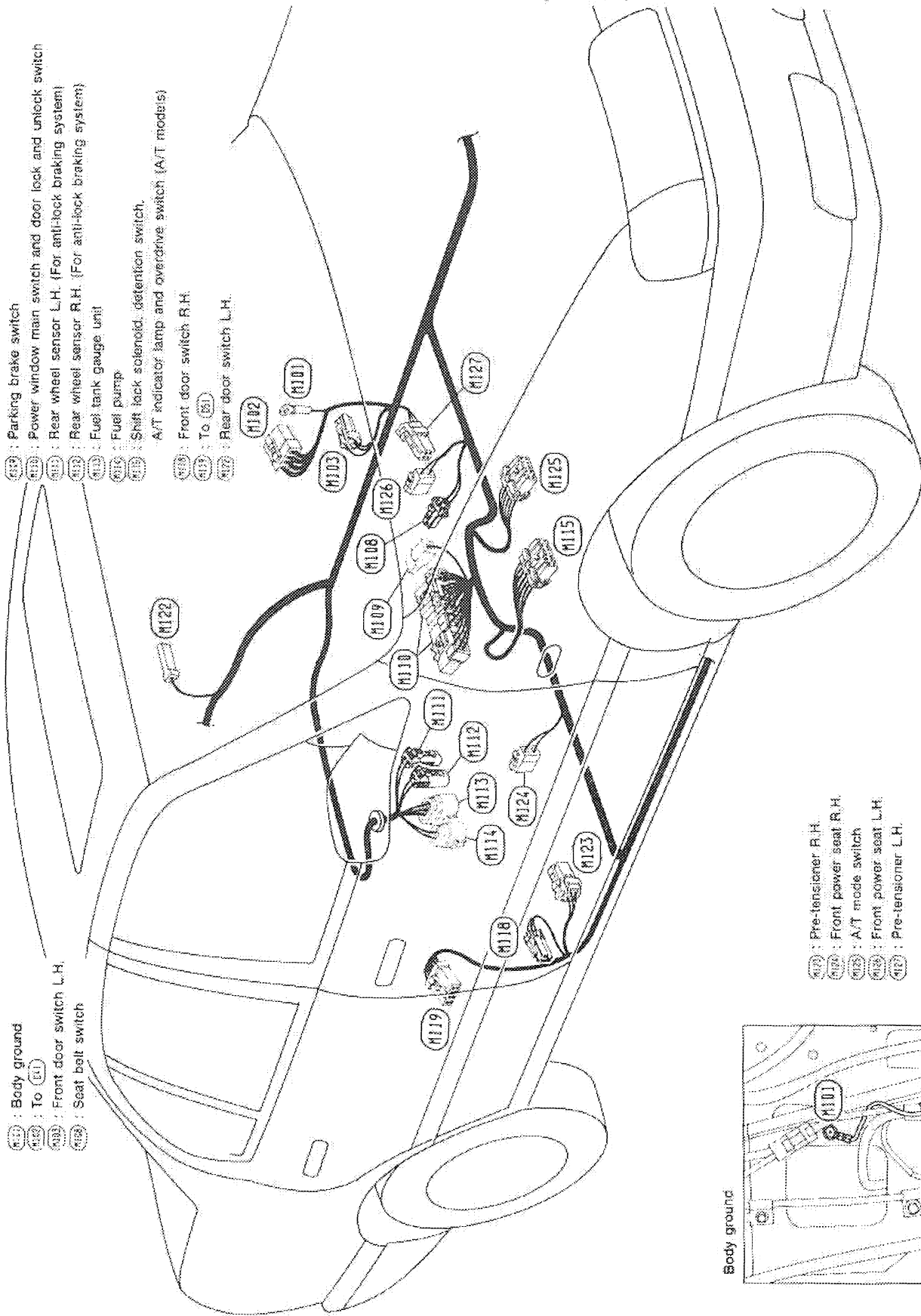
HARNESS LAYOUT

Main Harness (Cont'd)

- M117 : Parking brake switch
- M118 : Power window main switch and door lock and unlock switch
- M119 : Rear wheel sensor L.H. (For anti-lock braking system)
- M120 : Rear wheel sensor R.H. (For anti-lock braking system)
- M121 : Fuel tank gauge unit
- M122 : Fuel pump
- M123 : Shift lock solenoid, detention switch, A/T indicator lamp and overdrive switch (A/T models)
- M124 : Front door switch R.H.
- M125 : To (M1)
- M126 : Rear door switch L.H.

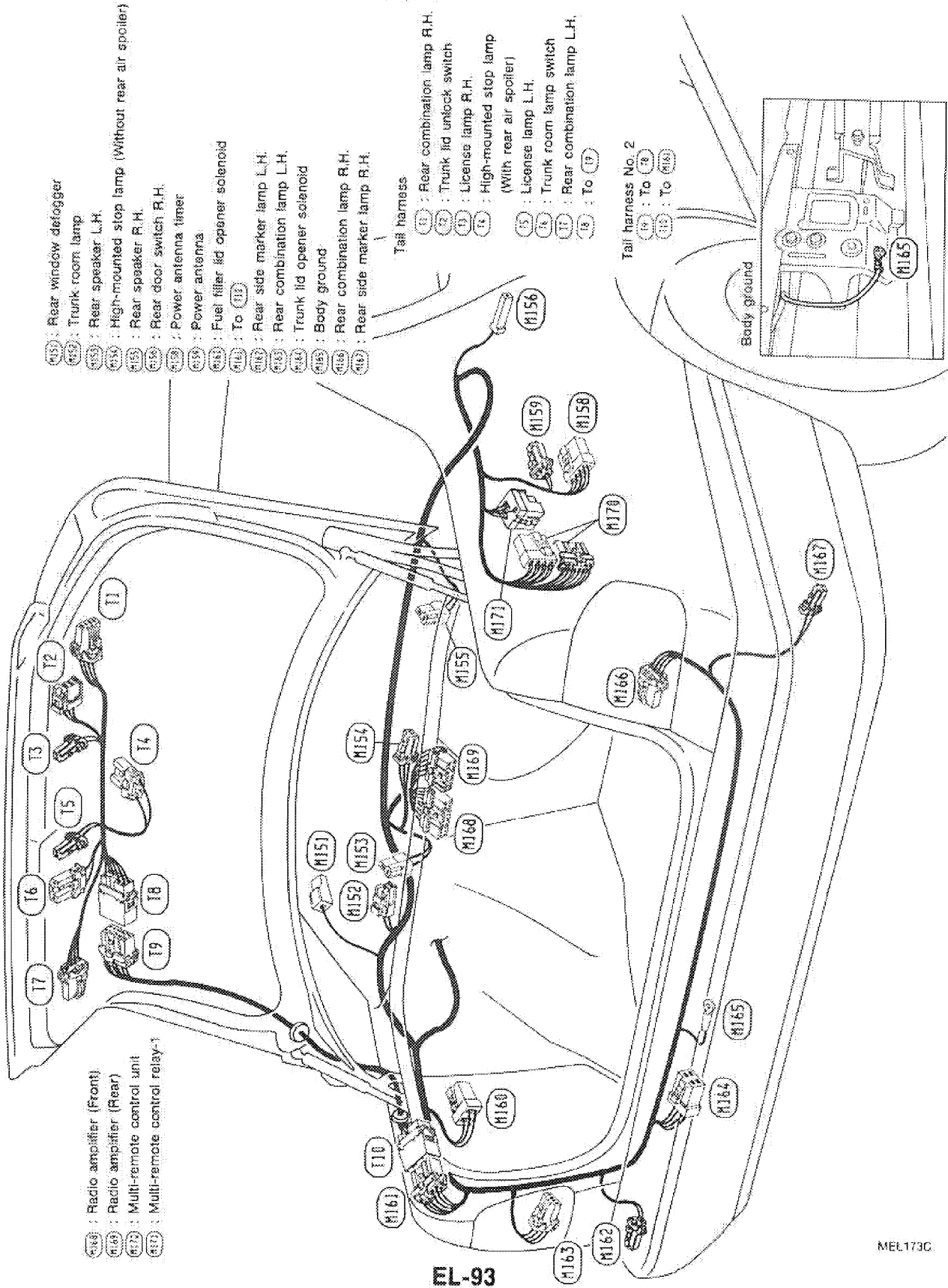
- M127 : Body ground
- M128 : To (U1)
- M129 : Front door switch L.H.
- M130 : Seat belt switch

- M131 : Pre-tensioner R.H.
- M132 : Front power seat R.H.
- M133 : A/T mode switch
- M134 : Front power seat L.H.
- M135 : Pre-tensioner L.H.



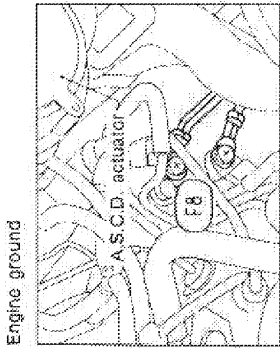
HARNESS LAYOUT

Main Harness, Tail Harness and Tail Harness No. 2

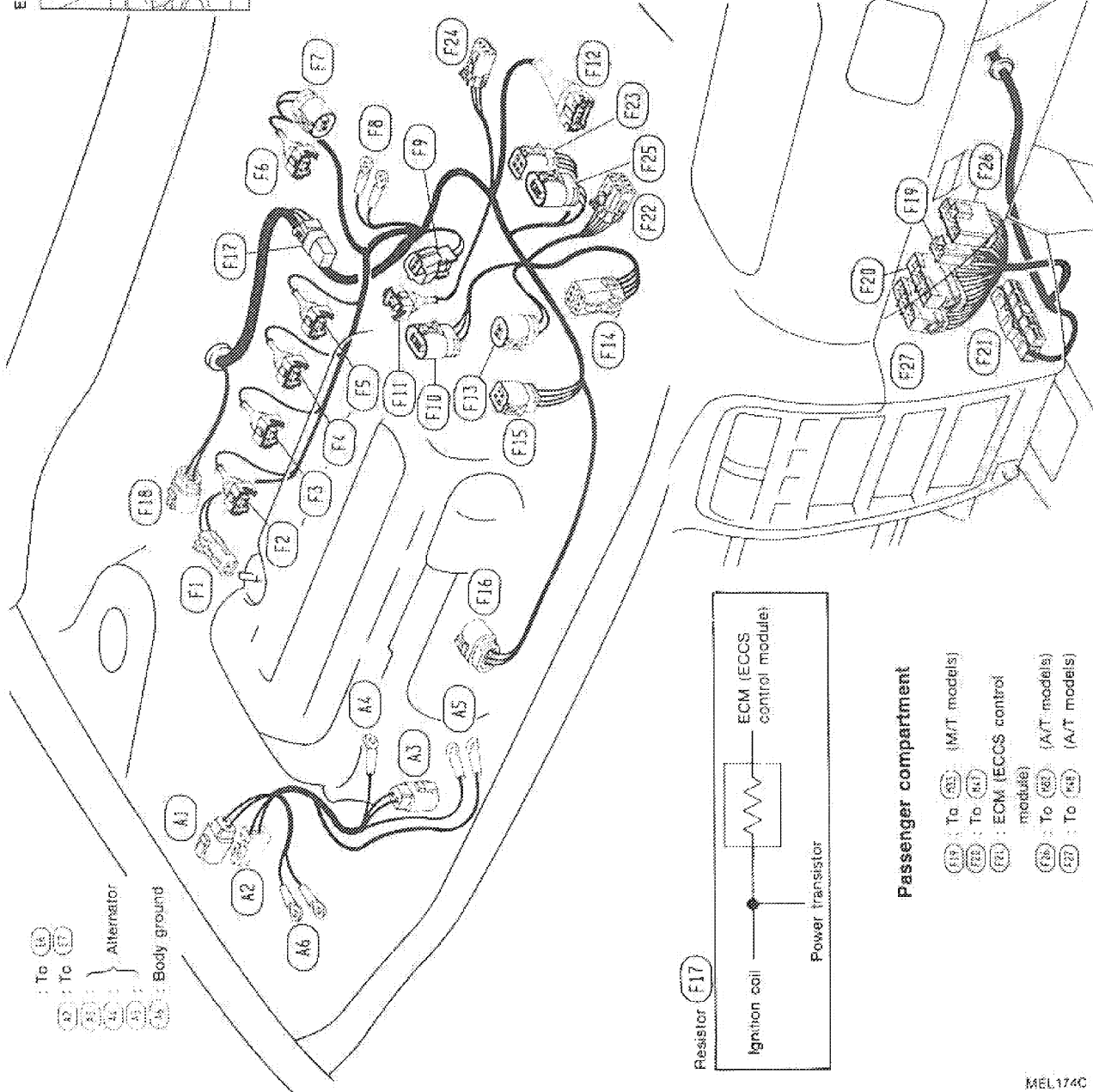
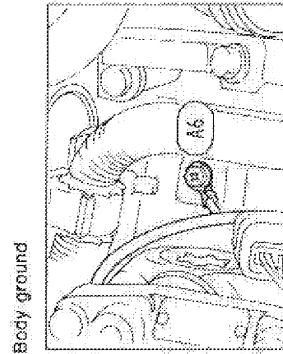


HARNESS LAYOUT

E.F.I. Harness and Alternator Harness



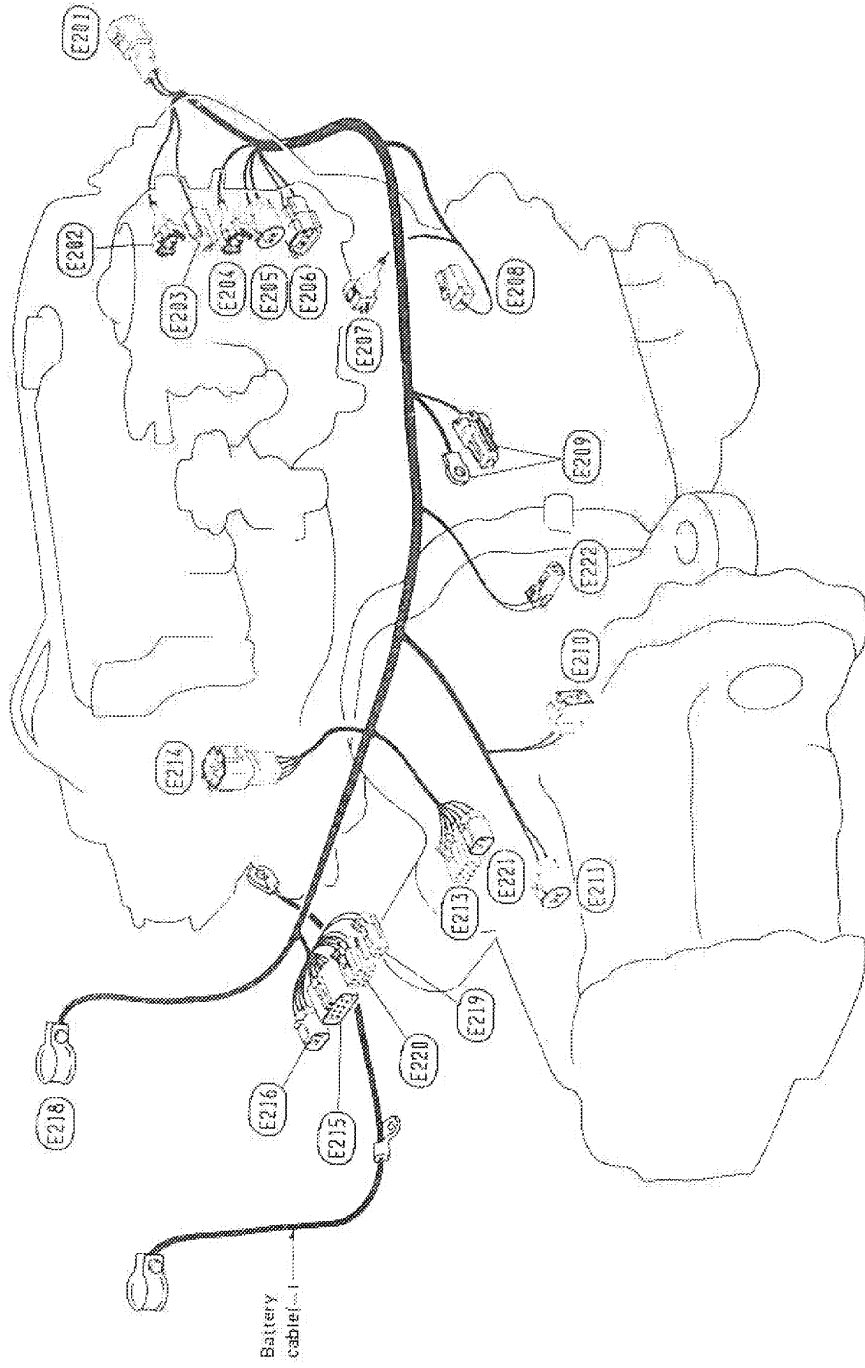
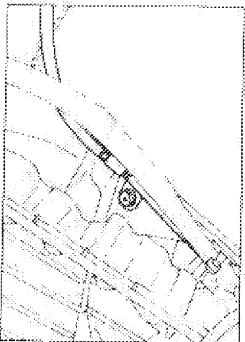
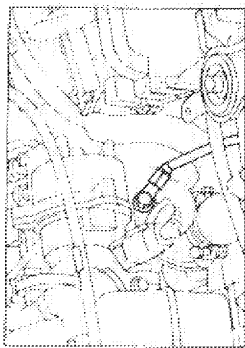
- (F1) : To (E3)
- (F2) : Injector No. 1
- (F3) : Injector No. 2
- (F4) : Injector No. 3
- (F5) : Injector No. 4
- (F6) : PAIRC-solenoid valve
- (F7) : EGR temperature sensor
- (F8) : Engine ground
- (F9) : Throttle position sensor (M/T models)
- (F10) : Power transistor
- (F11) : EGRC-solenoid valve
- (F12) : Mass air flow sensor
- (F13) : Ignition coil
- (F14) : To (E1)
- (F15) : Crankshaft position sensor
- (F16) : Heated oxygen sensor
- (F17) : Resistor and condenser
- (F18) : Power steering oil pressure switch
- (F19) : To sub-harness (A/T models)
- (F20) : Throttle position sensor (A/T models)
- (F21) : Engine revolution sensor (A/T models)
- (F22) : Throttle position sensor (A/T models)



HARNES LAYOUT

Engine Harness

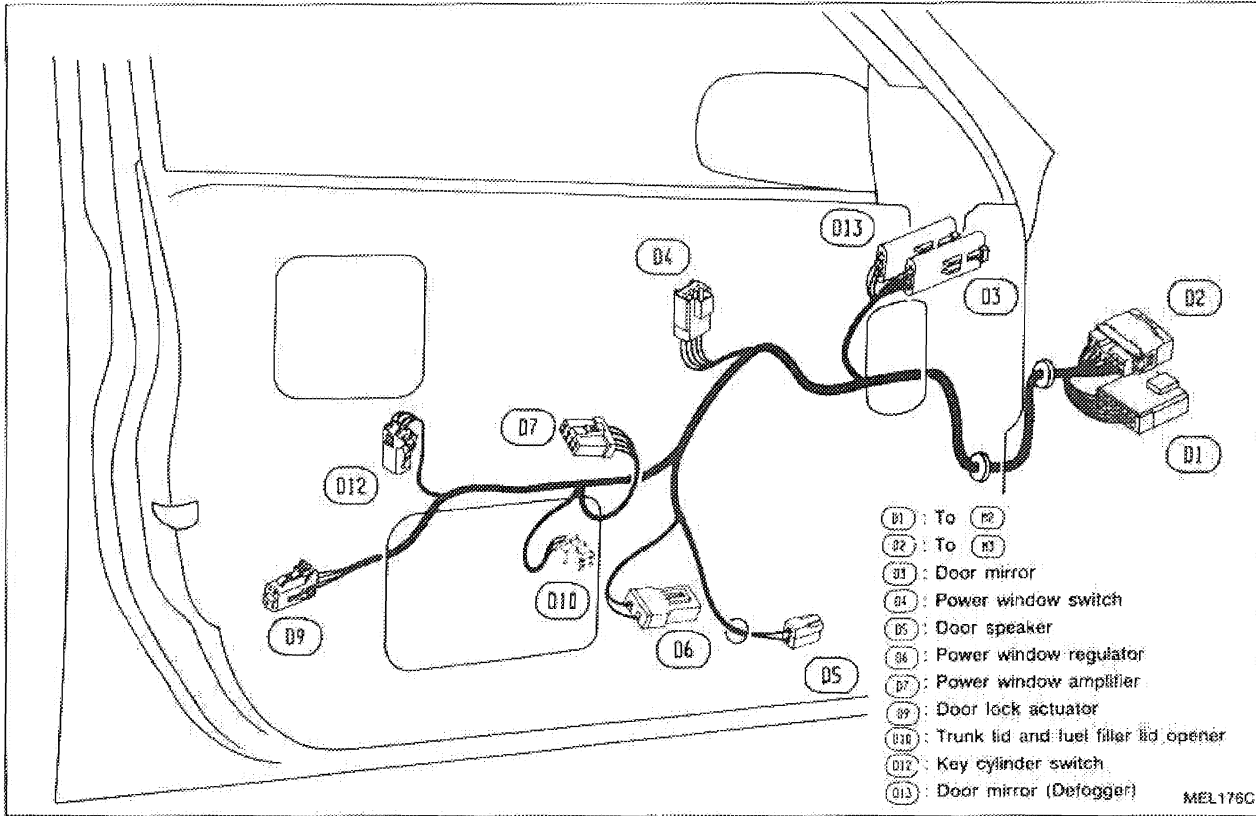
- (E218) : To (-)
- (E219) : Engine coolant temperature sensor
- (E220) : Thermal transmitter
- (E221) : IACV-air regulator
- (E222) : IACV-FICD solenoid valve
- (E223) : IACV-AAC valve
- (E224) : Knock sensor
- (E225) : Oil pressure switch
- (E226) : Starter motor
- (E227) : Neutral position switch (M/T models)
- (E228) : Back-up lamp switch (M/T models)
- (E229) : Inhibitor switch (A/T models)
- (E230) : To (+)
- (E231) : To (+)
- (E232) : To (+)
- (E233) : To (+)
- (E234) : To (+)
- (E235) : To (+)
- (E236) : To (+)
- (E237) : Inhibitor switch (M/T models)
- (E238) : Vehicle speed sensor



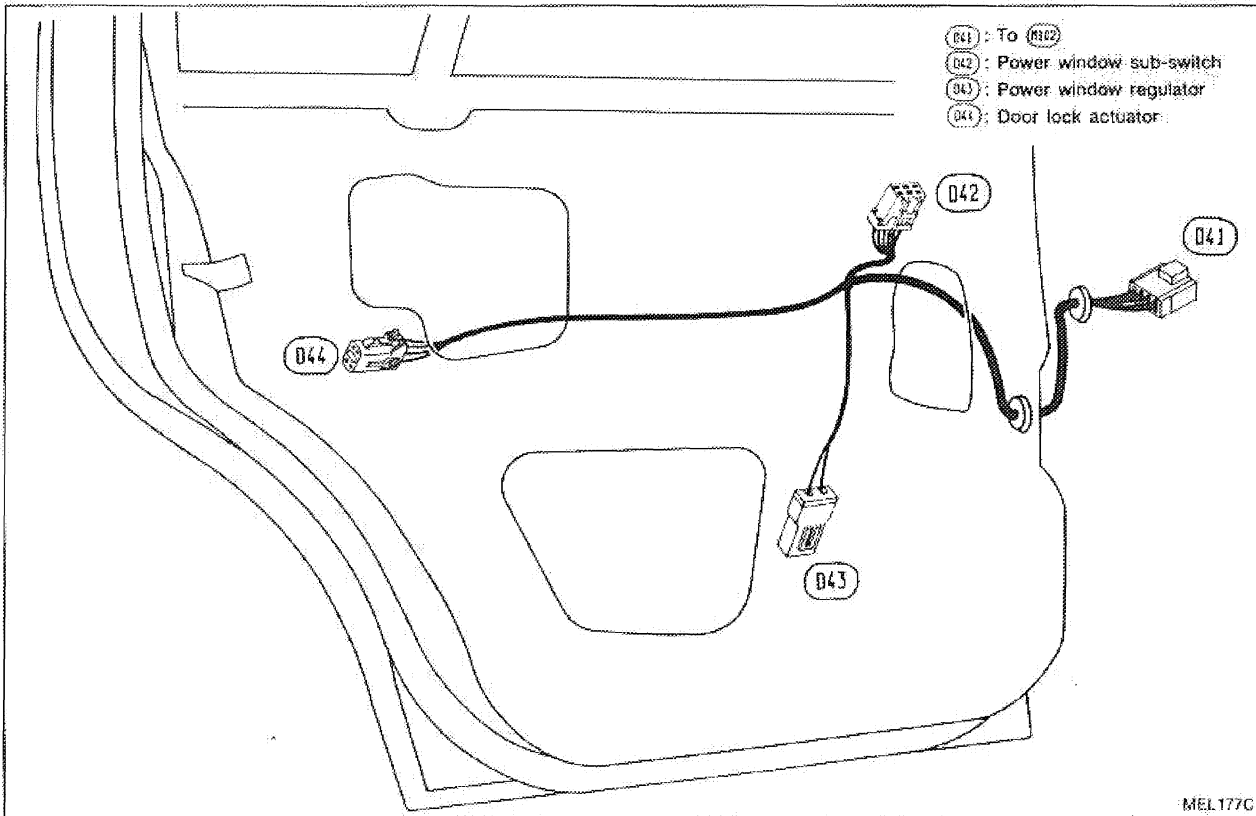
HARNES LAYOUT

FRONT

Door Harness (L.H. side)



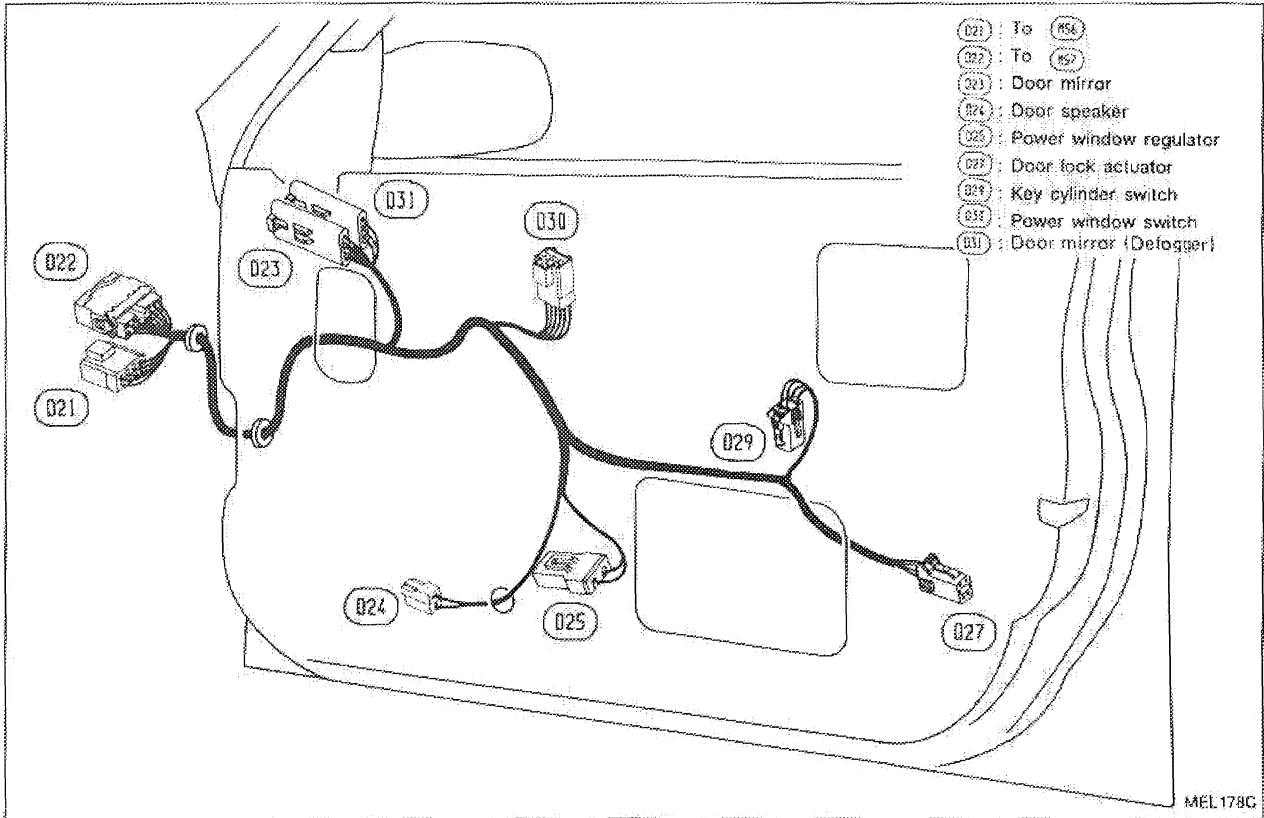
REAR



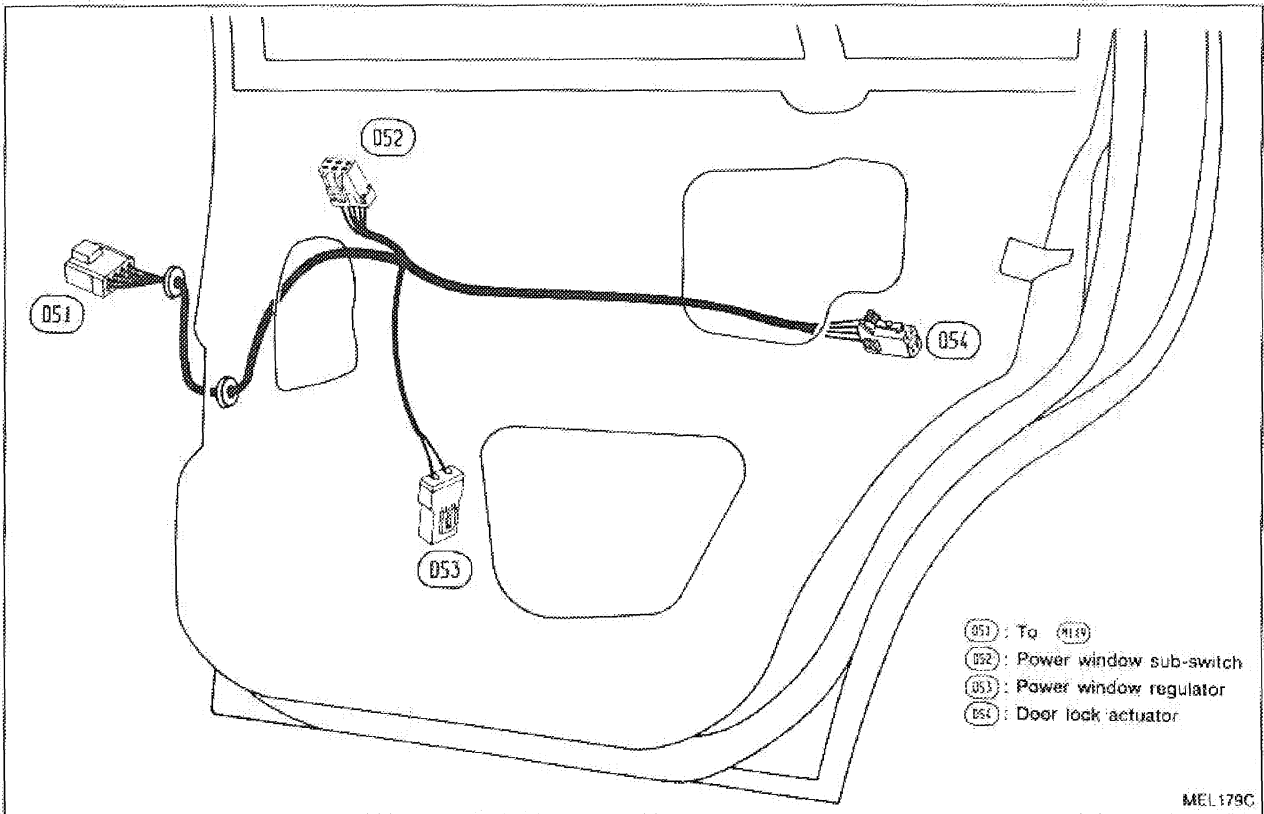
HARNESS LAYOUT

FRONT

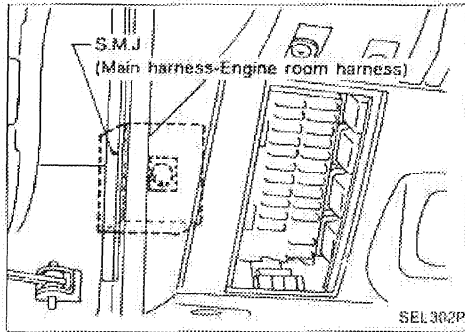
Door Harness (R.H. side)



REAR




SUPER MULTIPLE JUNCTION (S.M.J.)



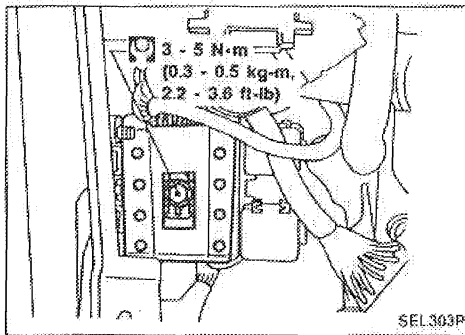
INSTALLATION

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.




SUPER MULTIPLE JUNCTION (S.M.J.)

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
H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12
I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12



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
B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12

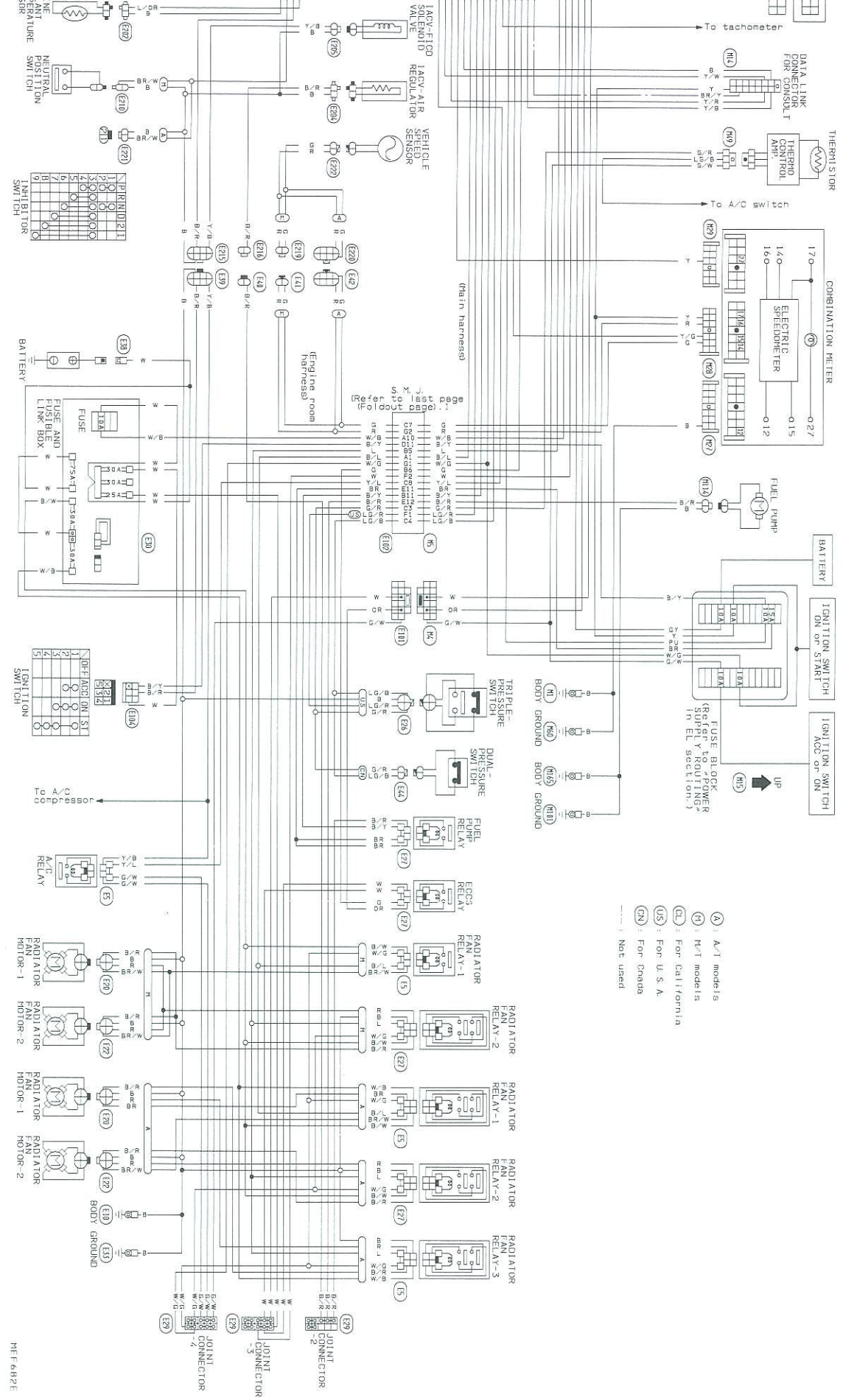
ENGINE ROOM HARNESS

ECM (ECCS CONTROL MODULE)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
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View from harness side





- (A) A/I models
- (N) N/I models
- (CL) For California
- (US) For U.S.A.
- (CN) For China
- Not used

1993 INFINITI G20 CIRCUIT DIAGRAM

