Mazda
626
626 Station Wagon

Workshop Manual Supplement

JMZ GF1*
JMZ GW1*
JMZ GW6*

9/1999 1671-1E-99I

mazda

European (L.H.D. U.K.) specs.

WARNING

Servicing a vehicle can be dangerous. If you have not received service-related training, the risks of injury, property damage, and failure of servicing increase. The recommended servicing procedures for the vehicle in this workshop manual were developed with Mazda-trained technicians in mind. This manual may be useful to non-Mazda trained technicians, but a technician with our service-related training and experience will be at less risk when performing service operations. However, all users of this manual are expected to at least know general safety procedures.

This manual contains "Warnings" and "Cautions" applicable to risks not normally encountered in a general technician's experience. They should be followed to reduce the risk of injury and the risk that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that the "Warnings" and "Cautions" are not exhaustive. It is impossible to warn of all the hazardous consequences that might result from failure to follow the procedures.

The procedures recommended and described in this manual are effective methods of performing service and repair. Some require tools specifically designed for a specific purpose. Persons using procedures and tools which are not recommended by Mazda Motor Corporation must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

The contents of this manual, including drawings and specifications, are the latest available at the time of printing, and Mazda Motor Corporation reserves the right to change the vehicle designs and alter the contents of this manual without notice and without incurring obligation.

Parts should be replaced with genuine Mazda replacement parts or with parts which match the quality of genuine Mazda replacement parts. Persons using replacement parts of lesser quality than that of genuine Mazda replacement parts must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

Mazda Motor Corporation is not responsible for any problems which may arise from the use of this manual. The cause of such problems includes but is not limited to insufficient service-related training, use of improper tools, use of replacement parts of lesser quality than that of genuine Mazda replacement parts, or not being aware of any revision of this manual.

Mazda 626 626 Station Wagon Workshop Manual Supplement

FOREWORD

This manual contains the changes and/or additions relating to on vehicle service and diagnosis procedures for the Mazda 626 and 626 Station Wagon.

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers. This manual should be kept up-to-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

Mazda Motor Corporation
HIROSHIMA, JAPAN

APPLICATION:
This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN), and related materials shown on the following page.

CONTENTS

There are explanations given only for the sections marked with shadow (■).

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1671-1E-99I

VEHICLE IDENTIFICATION NUMBERS (VIN)

U.K. specs.

JMZ	GF12P20#	400001 —	JMZ	GF14R20#	400001 —
JMZ	GF12F20#	400001 —	JMZ	GF12S*0#	400001 —
JMZ	GF12R20#	400001 —	JMZ	GW19F20#	200001 —
JMZ	GF14P20#	400001 —	JMZ	GW19S20#	200001 —
JMZ	GF14F*0#	400001 —	JMZ	GW19R20#	200001 —
JMZ	GF14S*0#	400001 —			

European (L.H.D.) specs.

JMZ	GF12P20#	400001 —	JMZ	GW19P20#	200001 —
JMZ	GF12P2Y#	400001 —	JMZ	GW19P2Y#	200001 —
JMZ	GF12F50#	400001 —	JMZ	GW69P2Y#	200001 —
JMZ	GF12F5Y#	400001 —	JMZ	GW69P20#	200001 —
JMZ	GF12F20#	400001 —	JMZ	GW19F50#	200001 —
JMZ	GF12F2Y#	400001 —	JMZ	GW19F5Y#	200001 —
JMZ	GF12S50#	400001 —	JMZ	GW69F5Y#	200001 —
JMZ	GF12S5Y#	400001 —	JMZ	GW69F50#	200001 —
JMZ	GF12S20#	400001 —	JMZ	GW19F20#	200001 —
JMZ	GF12S2Y#	400001 —	JMZ	GW19F2Y#	200001 —
JMZ	GF12T2Y#	400001 —	JMZ	GW69F2Y#	200001 —
JMZ	GF12R2Y#	400001 —	JMZ	GW69F20#	200001 —
JMZ	GF12T20#	400001 —	JMZ	GW19S50#	200001 —
JMZ	GF12R20#	400001 —	JMZ	GW19S5Y#	200001 —
JMZ	GF14P20#	400001 —	JMZ	GW69S5Y#	200001 —
JMZ	GF14P2Y#	400001 —	JMZ	GW69S50#	200001 —
JMZ	GF14F50#	400001 —	JMZ	GW19S20#	200001 —
JMZ	GF14F5Y#	400001 —	JMZ	GW19S2Y#	200001 —
JMZ	GF14F20#	400001 —	JMZ	GW69S2Y#	200001 —
JMZ	GF14F2Y#	400001 —	JMZ	GW69S20#	200001 —
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JMZ	GF14T2Y#	400001 —	JMZ	GW69T20#	200001 —
JMZ	GF14R2Y#	400001 —	JMZ	GW69R20#	200001 —
JMZ	GF14T20#	400001 —	JMZ	GW19T20#	200001 —
JMZ	GF14R20#	400001 —	JMZ	GW19R20#	200001 —

RELATED MATERIALS

626 Training Manual (Europe)	3303-10-97D
626 Workshop Manual (Europe)	1577-10-97D
626 Station Wagon Workshop Manual Supplement (Europe)	1603-10-97J
626 626 Station Wagon Workshop Manual Supplement RF Turbo	1614-10-98D
626 626 Station Wagon Wiring Diagram (Europe (L.H.D.))	5468-1*-99I
626 626 Station Wagon Wiring Diagram (UK)	5469-1*-99I
Engine Workshop Manual FP FS	1579-10-98D
Engine Workshop Manual RF Turbo	1615-10-98D
Manual Transaxle Workshop Manual G25M-R	1441-10-94F
ATX Workshop Manual GF4A-EL	1414-10-93I
ATX Workshop Manual GF4A-EL	1393-10-93H
ATX Workshop Manual FN4A-EL	1623-10-98E
626 Bodyshop Manual	3310-10-97D
626 Station Wagon Bodyshop Manual Supplement	3317-10-97J

*: Indicates the printing location
E—Europe
0—Japan

GENERAL INFORMATION

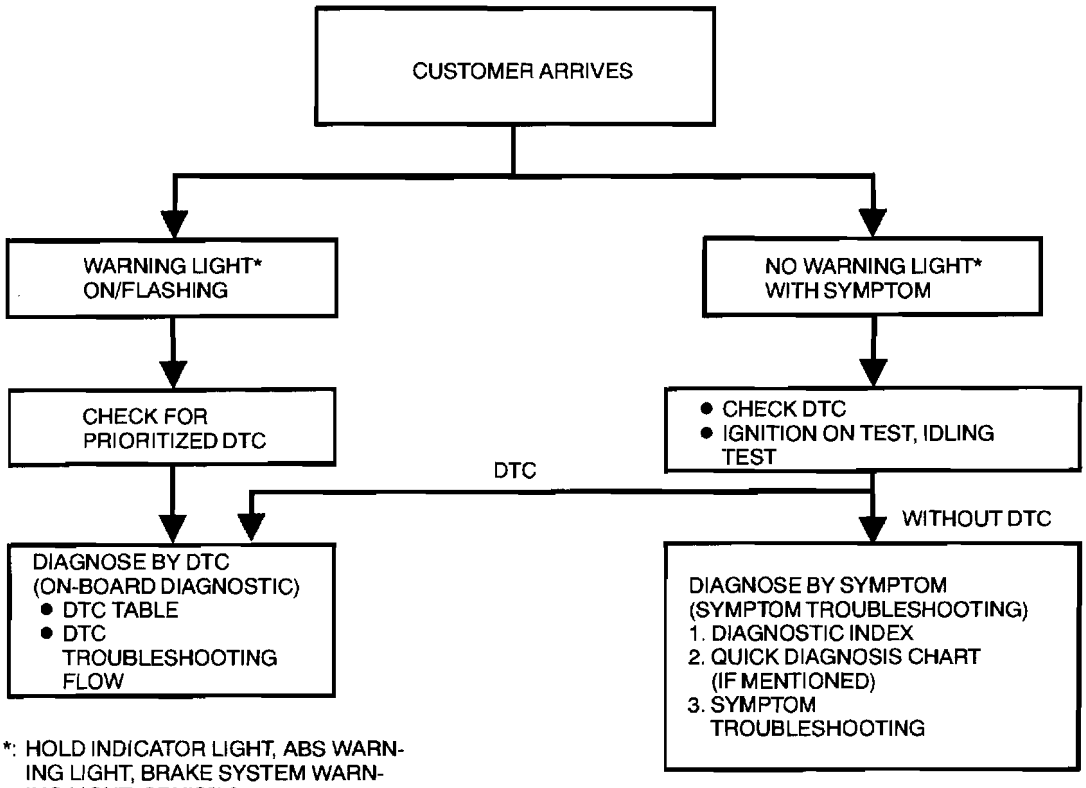
HOW TO USE THIS MANUAL

RANGE OF TOPICS

- This manual indicates only changes/additions, as it is the supplemental for the related materials. Therefore it may not contain the necessary referential service procedures to operate the services indicated in this manual. Only the referential section, e.g. (See Section B), is indicated, so refer to the appropriate section of the related materials for details.

TROUBLESHOOTING PROCEDURE

Basic flow of troubleshooting



*: HOLD INDICATOR LIGHT, ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, CRUISE SET INDICATOR LIGHT, AIR BAG SYSTEM WARNING LIGHT, SECURITY LIGHT, GENERATOR WARNING LIGHT

DTC troubleshooting flow (on-board diagnostic)

- Diagnostic trouble codes (DTCs) are important hints for repairing malfunctions that are difficult to simulate. Perform the specific DTC diagnostic inspection to quickly and accurately diagnose the malfunction.
- The on-board diagnostic function is used during inspection. When a DTC is shown specifying the cause of a malfunction, continue the diagnostic inspection according to the items indicated by the on-board diagnostic function.

Diagnostic index

- The diagnostic index lists the symptoms of specific malfunctions. Select the symptoms related or most closely relating to the malfunction.

Quick diagnosis chart (If mentioned)

- The quick diagnosis chart lists diagnosis and inspection procedures to be performed specifically relating to the cause of the malfunction.

Symptom troubleshooting

- Symptom troubleshooting quickly determines the location of the malfunction according to symptom type.

Procedures for Use

Using the basic inspection (section K)

- Perform the basic inspection procedure before symptom troubleshooting.
- Perform each step in the order shown.
- The reference column lists the location of the detailed procedure for each basic inspection.
- Although inspections and adjustments are performed according to the reference column procedures, if the cause of the malfunction is discovered during basic inspection, continue the procedures as indicated in the remarks column.

SHOWS INSPECTION ORDER

SHOWS ITEM NAMES FOR DETAILED PROCEDURES

SHOW POINTS REQUIRING ATTENTION BASED ON INSPECTION RESULTS

REFERENCE COLUMN

AUTOMATIC TRANSAXLE BASIC INSPECTION

STEP	INSPECTION		ACTION
1	• Turn ignition switch is on. • Does O/D OFF indicator light (illuminate/go out) correspond to O/D OFF switch position (on/off)?	Yes	Go to next step.
		No	Perform symptom troubleshooting No.26 "O/D OFF indicator light does not illuminate when O/D OFF switch is turned to on", or No.27 "O/D OFF indicator light illuminates when O/D OFF switch is not turned to on".
2	• Turn ignition switch is on. • When selector lever is moved, are selector lever position and indicator aligned? Also, when other ranges are selected from N or P during idling, does vehicle creep within 1 to 2 seconds?	Yes	Go to next step.
		No	Inspect selector lever. Repair or replace defective areas.
3	• Inspect the ATF color condition. • Are ATF color and odor normal?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	• Perform line pressure test. See K-2 Line Pressure Test • Is line pressure okay?	Yes	Go to next step.
		No	Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	• Perform stall test. See K-2 Stall Speed Test • Is stall speed okay?	Yes	Go to next step.
		No	Repair or replace defective parts according to inspection result.

Using the DTC troubleshooting flow

- DTC troubleshooting flow shows diagnostic procedures, inspection methods, and proper action to take for each DTC.

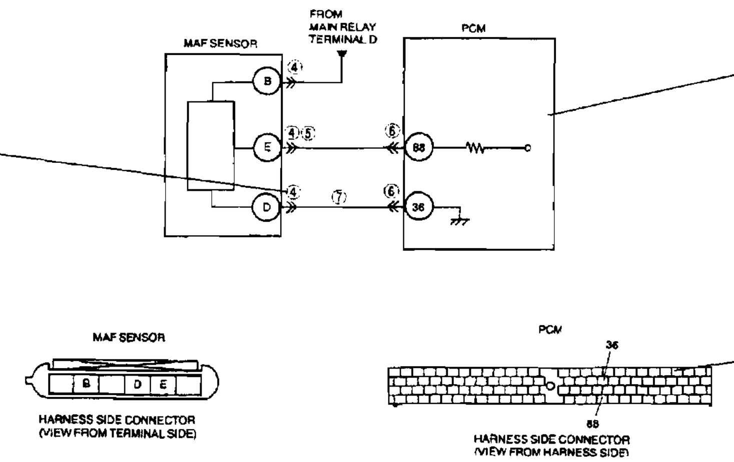
TROUBLE CONDITION

DETECTION CONDITION describes the condition under which the DTC is detected.

POSSIBLE CAUSE describes possible point(s) of malfunction

DTC P0103

DTC P0103	MAF circuit high input
DETECTION CONDITION	PCM monitors input voltage from TP sensor after ignition key is turned on. If input voltage at PCM terminal 68 is above 8.25 V, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Open circuit in wiring between MAF sensor terminal D and PCM terminal 36 • Open circuit in MAF sensor ground circuit



Indicates the inspection step No. to be performed (F1, F2 and K section)

Indicates the circuit to be inspected (F1, F2 and K section)

Indicates the connector related to the inspection

STEP shows the order of troubleshooting

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Are related Service Bulletins and/or on-line repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Connect NGS tester to DLC-2. • Start engine. • Access MAF V PID using NGS tester. • Is MAF V PID within 0.2 – 8.3 V?	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. See F1-33 INTERMITTENT CONCERN TROUBLESHOOTING
		No	Go to next step.
4	**INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect MAF sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.

INSPECTION describes the method to quickly determine the failed part(s).

ACTION describes the appropriate action to take as according to the result (Yes/No).

Reference item(s) to perform ACTION.

Using the diagnosis index

- The symptoms of the malfunctions are listed in the diagnostic index for symptom troubleshooting.
- The exact malfunction symptoms can be selected by following the index.

No.	TROUBLESHOOTING ITEM		DESCRIPTION	Page
1	Melting of main or other fuses		—	See F2-6 MELT NO.1 MAIN OR OTHER FUSE
2	Will not crank		Starter does not work	See F2-7 NO. 2 MIL COMES ON
3	Hard start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	See F2-8 NO. 3 WILL NOT CRANK
4	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle and/or after start.	See F2-9 NO.4 HARD START/ LONG CRANK/ERRATIC CRANK
5	Cranks normally but will not start		Starter cranks engine at normal speed but engine will not run.	See F2-11 NO. 5 ENGINE-STALLS AFTER START/AT IDLE
6	Slow return to idle		Engine takes more time than normal to return to idle speed.	See F2-15 NO.6 CRANKS NORMALLY BUT WILL NOT START
7	Engine runs rough/rolling idle		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	See F2-19 NO. 7 SLOW RERUN TO IDLE
8	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition key is turned to OFF.	See F2-20 NO. 8 ENGINE RUNS ROUGH/ROLLING IDLE
9	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	See F2-23 NO 9 FAST IDLE/RUNS ON

Using the quick diagnosis chart

- The chart lists the relation between the symptom and the cause of the malfunction.
- The chart is effective in quickly narrowing down the relation between symptom and cause of the malfunction. also specifies the area of the common cause when multiple malfunction symptoms occur.
- The appropriate diagnostic inspection relating to malfunction cause as specified by the symptoms can be selected by looking down the diagnostic inspection column of the chart.

(2) PARTS WHICH MAY BE THE CAUSE OF PROBLEMS

PART WHICH MAY BE THE SYMPTOM

(1) CHOOSE THE ACTUAL SYMPTOM

QUICK DIAGNOSIS CHART

Troubleshooting item		Possible factor →	Cooling fan seated improperly	Accelerator cable free play misadjustment	Fuel quality	Engine overheating	Air cleaner element clogged or restriction	Air leakage from intake-air system (Loose tubes, cracks, broken gaskets)	IAC valve improper operation	Throttle body malfunction	Vacuum leakage (Vacuum hose damage, misrouting)	Ignition coil malfunction (e.g. open, short or cracks)	Initial ignition timing misadjustment (CMP & crankshaft pulley misadjustment)	Spark plug malfunction	High-tension leads malfunction (Cracks, open, low resistance)	CMP sensor damaged (e.g. open or short circuits)
1	Melting of main or other fuses															
2	Will not crank															
3	Hard to start/long crank/erratic start/erratic crank				×		×	×			×			×	×	×
4	Engine stalls.	After start/at idle			×	×	×	×	×		×	×	×	×	×	×
5	Cranks normally but will not start				×	×		×	×		×	×	×	×	×	×
6	Slow return to idle									×						
7	Engine runs rough/rolling idle				×	×		×	×		×		×	×	×	×
8	Fast idle/runs on			×												
9	Low idle/stalls during deceleration							×	×							
10	Engine stalls/quits.	Acceleration/cruise			×	×	×	×		×	×			×		×
	Engine runs rough.	Acceleration/cruise			×	×	×	×		×	×			×		×
	Misses	Acceleration/cruise			×	×	×	×		×	×			×		×
	Buck/jerk	Acceleration/cruise/deceleration			×	×	×	×		×	×			×		×
	Hesitation/stumble	Acceleration			×	×	×	×		×	×			×		×
	Surges	Acceleration/cruise			×	×	×	×		×	×			×		×
11	Lack/loss of power	Acceleration/cruise			×	×	×	×		×				×		×
12	Knocking/pinging	Acceleration/cruise				×										
13	Poor fuel economy				×		×							×	×	
14	Emissions compliance						×	×		×				×	×	
15	High oil consumption/leakage															
16	Cooling system concerns	Overheating														
17	Cooling system concerns	Runs cold														
18	Exhaust smoke						×							×	×	
19	Fuel odor (in engine compartment)															
20	Engine noise							×			×					
21	Vibration concerns (engine)		×													
22	A/C does not work sufficiently.															
23	A/C is always on or A/C compressor runs continuously.															
24	A/C is not cut off under WOT conditions.															
25	Exhaust sulphur smell				×											
26	Intermittent concerns								×		×	×		×	×	×
27	Constant voltage															
28	Automatic transmission (AT) concerns	Upshift/downshift/engagement	See Section K TROUBLESHOOTING													

Using the symptom troubleshooting

- Symptom troubleshooting shows diagnostic procedures, inspection methods, and proper action to take for each trouble symptom.

DESCRIPTION describes what kind of TROUBLE SYMPTOM

TROUBLE SYMPTOM

POSSIBLE CAUSE describes possible point of malfunction

14	Engine flares up or slips when upshifting or down shifting
DESCRIPTION	• When accelerator pedal is depressed for driveway, engine speed increase but vehicle speed increase slowly. • When accelerator is depressed while driving, engine speed increases but vehicle not.
POSSIBLE CAUSE	• There is clutch slip because clutch is stuck or line pressure is low. — Clutch stuck, slippage (forward clutch, 3-4 clutch, 2-4 brake band, one-way clutch 1, one-way clutch 2) • Line pressure low • Malfunction or mis-adjustment of TP sensor • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of shift solenoid A, B or C • Malfunction of TCC solenoid valve • Malfunction of body ground • Malfunction of throttle cable • Malfunction of throttle valve body — Poor operating of mechanical pressure • Selector lever position disparity • TR switch position disparity **Note** • Before following troubleshooting steps, make sure that Automatic Transaxle On-board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

STEP shows the order of troubleshooting.

Reference item(s) for additional information to perform INSPECTION.

INSPECTION describes the method to quickly determine the failed part.

ACTION describes the appropriate action to take as a result (Yes/No) of INSPECTION.

How to perform ACTION is described in the relative material shown.

Reference item(s) to perform ACTION.

Diagnostic procedure

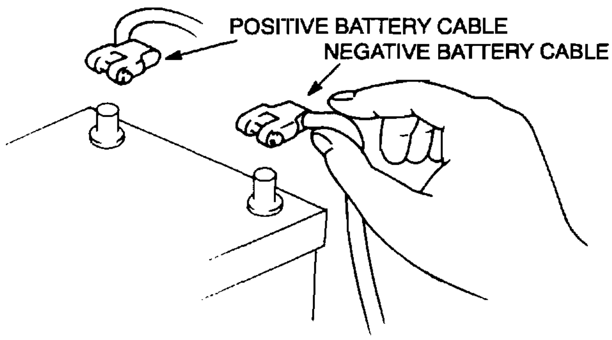
STEP	INSPECTION		ACTION
1	• Is line pressure okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection results.
2	• Is shift point okay? See K-5 Road Test Preparation	Yes	Go to next step.
		No	Go to symptom troubleshooting No.9 "Abnormal shift".
3	• Stop engine and turn ignition switch on. • Connect NGS tester to DLC-2. • Simulate SHIFT A, SHIFT B and SHIFT C PIDs for ON. • Is operating sound of shift solenoids heard?	Yes	• Overhaul control valve body and repair or replace any defective parts. See ATX Workshop Manual GF4A-EL (1666-1A-99F) • If problem remains, replace or overhaul transaxle and repair or replace defective parts.
		No	• Inspect for bend, damage, corrosion or loose connection if shift solenoid A, B, or C terminal on ATX. • Inspect for shift solenoid mechanical stuck. See K-14 Inspection of Operation • If shift solenoids are okay, inspect for open or short circuit between PCM connector terminal A, B or C.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. — If vehicle is repaired, troubleshooting completed. — If vehicle is not repaired or additional diagnostic information is not available, replace or reprogram PCM.		

ELECTRICAL SYSTEM

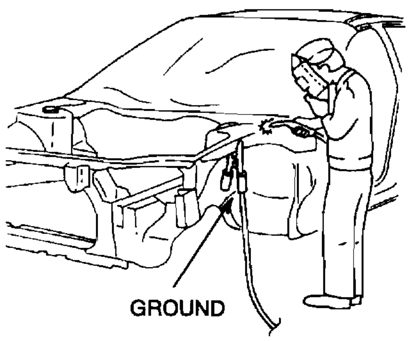
PRECAUTIONS BEFORE WELDING

Vehicles have various electrical parts. To protect the parts from excessive current generated when welding, be sure to perform the following procedure.

1. Turn the ignition switch to the LOCK position.
2. Disconnect the battery cables.



3. Securely connect the welding machine ground near the welding area.



4. Cover the peripheral parts of the welding area to protect them from weld spatter.

ABBREVIATIONS

ABDC	After bottom dead center
ABS	Anti-lock brake system
ACC	Accessories
ATDC	After top dead center
ATF	Automatic transaxle fluid
ATX	Automatic transaxle
BBDC	Before bottom dead center
BTDC	Before top dead center
CM	Control module
CPU	Central processing unit
DEF	Defroster
DOHC	Double over head camshaft
DI	Distributor ignition
DTC	Diagnostic trouble code
EBD	Electronic Brakeforce Distribution
EX	Exhaust
HI	High
HU	ABS hydraulic unit
IG	Ignition
IN	Intake
LED	Light emitting diode
L.H.D.	Left hand drive
MAX	Maximum
MTX	Manual transaxle
OFF	Switch off
ON	Switch on
PCM	Powertrain control module
P/W CM	Power window control module
REC	Recirculate
R.H.D.	Right hand drive
SAS	Sophisticated air bag sensor
SST	Special service tool
SW	Switch
TCS	Traction control system
TNS	Tail number side lights
1GR	First gear
2GR	Second gear
3GR	Third gear
4GR	Fourth gear
5HB	5 door hatchback

SCHEDULED MAINTENANCE

SCHEDULED MAINTENANCE TABLE

Chart symbols:

I : Inspect
Inspect and clean, repair, adjust, or replace if necessary. (Oil-permeated air cleaner elements cannot be cleaned using the air-blow method.)
R : Replace
T : Tighten
L : Lubricate

Remarks:

- To ensure efficient operation of the engine and all systems related to emission control, the ignition and fuel systems must be serviced regularly. It is strongly recommended that all servicing related to these systems be done by an authorized Mazda Dealer.
- After the described period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.

*1: Also inspect and adjust the power steering and air conditioner drive belts, if installed.

*2: Replacement of the timing belt is required at every 90,000 km (54,000 miles). Failure to replace the timing belt may result in damage to the engine.

*3: If the vehicle is operated under any of the following conditions, change the engine oil and oil filter every 10,000 km (6,000 miles) or shorter.
a. Driving in dusty conditions.
b. Extended periods of idling or low speed operation.
c. Driving for long period in cold temperatures or driving regularly at short distance only.

*4: If the vehicle is operated in very dusty or sandy areas, inspect and if necessary, clean or replace the air cleaner element more often than the recommended intervals.

*5: This is a full function check of electrical systems such as lights, wiper and washer systems (including wiper blades), and power windows.

*6: If the brakes are used extensively (for example, continuous hard driving or mountain driving) or if the vehicle is operated in extremely humid climates, change the brake fluid annually.

Maintenance Item		Maintenance Interval (Number of months or km (miles), whichever comes first)											
	Months	12	24	36	48	60	72	84	96	108	120	132	144
	×1000 Km	15	30	45	60	75	90	105	120	135	150	165	180
	(×1000 Miles)	(9)	(18)	(27)	(36)	(45)	(54)	(63)	(72)	(81)	(90)	(99)	(108)
GASOLINE ENGINE													
Engine valve clearance		Inspect every 90,000 km (54,000 miles).											
Idle speed		I		I		I		I		I		I	
Fuel filter							R						R
Spark plugs (Except for platinum-tipped type)	Except for Sweden			I			I			I			I
	For Sweden	Inspect every 50,000 km (30,000 miles).											
Spark plugs (Platinum-tipped type)		Replace every 90,000 km (54,000 miles).											
Evaporative system	Except for Sweden				I				I				I
	For Sweden	Inspect every 80,000 km (48,000 miles).											
E.G.R. system	Except for Sweden				I				I				I
	For Sweden	Inspect every 80,000 km (48,000 miles).											
DIESEL ENGINE (RF Turbo)													
Engine valve clearance			I		I		I		I		I		I
Fuel filter				R			R			R			R

SCHEDULED MAINTENANCE

Maintenance Item	Maintenance Interval (Number of months or km (miles), whichever comes first)												
	Months	12	24	36	48	60	72	84	96	108	120	132	144
	×1000 Km	15	30	45	60	75	90	105	120	135	150	165	180
	(×1000 Miles)	(9)	(18)	(27)	(36)	(45)	(54)	(63)	(72)	(81)	(90)	(99)	(108)

GASOLINE & DIESEL ENGINE

Maintenance Item	12	24	36	48	60	72	84	96	108	120	132	144
Drive belts *1	I	I	I	I	I	I	I	I	I	I	I	I
Engine timing belt *2	Replace every 90,000 km (54,000 miles).											
Engine oil *3	R	R	R	R	R	R	R	R	R	R	R	R
Oil filter *3	R	R	R	R	R	R	R	R	R	R	R	R
Cooling system (Including coolant level adjustment)		I		I		I		I		I		I
Engine coolant	Replace at first 4 years or 90,000 km (54,000 miles); after that, every 2 years.											
Air cleaner element *4	I	I	R	I	I	R	I	I	R	I	I	R
Fuel lines & hoses		I		I		I		I		I		I
Battery electrolyte level & specific gravity	I	I	I	I	I	I	I	I	I	I	I	I
All electrical system *5	I	I	I	I	I	I	I	I	I	I	I	I
Headlight alignment		I		I		I		I		I		I
Brake & clutch pedals	I	I	I	I	I	I	I	I	I	I	I	I
Clutch fluid	I	I	I	I	I	I	I	I	I	I	I	I
Brake lines, hoses & connections	I	I	I	I	I	I	I	I	I	I	I	I
Brake fluid *6	I	R	I	R	I	R	I	R	I	R	I	R
Parking brake	I	I	I	I	I	I	I	I	I	I	I	I
Power brake unit & hoses	I	I	I	I	I	I	I	I	I	I	I	I
Disc brakes	I	I	I	I	I	I	I	I	I	I	I	I
Drum brakes	I	I	I	I	I	I	I	I	I	I	I	I
Power steering fluid & lines	I	I	I	I	I	I	I	I	I	I	I	I
Steering operation & gear housing		I		I		I		I		I		I
Steering linkage, tie rod ends & arms		I		I		I		I		I		I
Manual transaxle oil						R						R
Automatic transaxle fluid level		I		I		I		I		I		I
Front & rear suspension & ball joints			I		I		I		I		I	
Driveshaft dust boots			I		I		I		I		I	
Exhaust system heat shields		I		I		I		I		I		I
Wheel nuts	T	T	T	T	T	T	T	T	T	T	T	T
Bolts & nuts on chassis & body	T	T	T	T	T	T	T	T	T	T	T	T
Body condition (for rust, corrosion & perforation)	Inspect annually.											
Tires (including spare tire) (with inflation pressure adjustment)	I	I	I	I	I	I	I	I	I	I	I	I
Hinges & catches	L	L	L	L	L	L	I	L	L	L	L	L
Underside of vehicle	I	I	I	I	I	I	I	I	I	I	I	I
Road test	I	I	I	I	I	I	I	I	I	I	I	I
Cabin air filter (if installed)	R	R	R	R	R	R	R	R	R	R	R	R

Scheduled Maintenance Service (Specific Work Required)

Maintenance Item	Specific Work Required
ENGINE	
Engine valve clearance	Measure clearance.
Drive belts	Inspect for wear, cracks and fraying, and check tension. Replace drive belt.
Engine timing belt	Replace engine timing belt.
Engine oil	Replace engine oil and inspect for leakage.
Oil filter	Replace oil filter and inspect for leakage.
Oil by-pass filter	Replace oil by-pass filter and inspect for leakage.
COOLING SYSTEM	
Cooling system (including coolant level adjustment)	Check coolant level and quality, and inspect for leakage.
Engine coolant	Replace coolant.
FUEL SYSTEM	
Idle speed	Check engine idle rpm.
Idle mixture (for CIS & carburetor leaded fuel)	Check the CO and HC concentrations (See W/M).
Choke system (for carburetor)	Check system operation.
Air cleaner element	Inspect for dirt, oil and damage. Clean air cleaner element (by blowing air). Replace air cleaner element.
Fuel filter	Replace fuel filter.
Fuel lines & hoses	Inspect for cracks, leakage and loose connection.
IGNITION SYSTEM (FOR GASOLINE)	
Initial ignition timing	Check initial ignition timing.
Spark plugs	Inspect for wear, damage, carbon, high-tension lead condition and measure plug gap. Replace spark plugs.
EMISSION CONTROL SYSTEM (FOR GASOLINE)	
Evaporative system	Check system operation (See W/M), vapor lines, vacuum fitting hoses and connection.
Throttle positioner system (if equipped)	Check the diaphragm and system operation, vacuum fitting hoses and connection.
Dash pot (for carburetor)	Check system operation.
E.G.R. system	Check system operation (See W/M), vacuum fitting hoses and connection.
ELECTRICAL SYSTEM	
Battery electrolyte level & specific gravity	Check level and specific gravity.
Battery condition	Check the battery for corroded or loose connections and cracks in the case (for maintenance free type).
All electrical system	Check function of lighting system, windshield wiper (including wiper blade condition) and washer and power windows.
Headlight alignment	Check headlight alignment
CHASSIS & BODY	
Brake & clutch pedals	Check pedal height and free play.
Brake fluid	Check fluid level and inspect for leakage. Replace brake fluid.
Clutch fluid	Check fluid level and inspect for leakage.
Brake lines, hoses & connections	Inspect for cracks, damage, chafing, corrosion, scars, swelling and fluid leakage.
Parking brake	Check lever stroke.
Power brake unit & hoses	Check vacuum lines, connections and check valve for improper attachment, air tightness, cracks chafing and deterioration.

Maintenance Item	Specific Work Required
Disc brakes	Test for judder and noise. Inspect caliper for correct operation and fluid leakage, brake pads for wear. Check disc plate condition and thickness.
Drum brakes	Test for judder and noise. Inspect brake drum for wear and scratches; brake lining for wear, peeling and cracks; and wheel cylinder for fluid leakage.
Manual steering gear oil	Check gear oil level.
Power steering fluid & lines	Check fluid level and lines for improper attachment, leakage, cracks, damage, loose connections, chafing and deterioration.
Power steering fluid	Check fluid level.
Power steering system & hoses	Check lines for improper attachment, leakage, cracks, damage, loose connections, chafing and deterioration.
Steering & front suspension	Check free play of steering system, inspect shock absorbers for correct damping force, oil leakage, damage and looseness, and inspect coil springs, arms, links and stabilizer for damage and looseness.
Steering operation & gear housing	Check that the steering wheel has the specified play. Be sure to check for changes, such as excessive play, hard steering or strange noises. Check gear housing and boots for looseness, damage and grease/gear oil leakage.
Steering linkages tie rod ends & arms	Check ball joint, dust cover and other components for looseness, wear, damage and grease leakage.
Front & rear suspension ball joints	Inspect for grease leakage, cracks, damage and looseness.
Manual transmission/transaxle oil	Check oil level and inspect for leakage. Replace manual transmission/transaxle oil.
Automatic transaxle oil level	Check oil level.
Automatic transmission/transaxle fluid level	Check fluid level.
Automatic transmission/transaxle fluid	Replace automatic transmission/transaxle fluid.
Front & rear differential oil	Check oil level and inspect for leakage. Replace front & rear differential oil.
Rear differential oil	Check oil level and inspect for leakage. Replace rear differential oil.
Transfer oil (for 4 × 4)	Check oil level and inspect for leakage. Replace transfer oil.
Upper arm shafts (for B-Series)	Lubricate the upper arm shafts for looseness or damage.
Front & rear wheel bearing grease	Remove wheel bearing and replace the grease.
Propeller shaft joints (with grease nipple)	Lubricate propeller shaft joints.
Driveshaft dust boots	Inspect for grease leakage, cracks, damage and looseness.
Wheel nuts	Tighten wheel nuts.
Bolts & nuts on chassis & body	Tighten bolts and nuts fastening suspension components, members and seat frames.
Body condition (for rust, corrosion & perforation)	Inspect body surface for paint damage, rust, corrosion and perforation.
Exhaust system heat shields	Inspect for damage, corrosion, looseness of connections and gas leakage.
Tires (including spare tire) (with inflation pressure adjustment)	Check air pressure and inspect tires for tread wear, damage and cracks; and wheels for damage and corrosion.
Hinges & catches	Lubricate hinges and catches of doors, trunk lid and hood.
Seat belts	Inspect seat belt webbing for scratches, tears and wear, and check anchor bolt tightness.
Rear suspension uni-ball & sliding rubber bushing (for RX-7)	Inspect for cracks, damage and looseness.
Underside of vehicle	Inspect underside of vehicle (floor pans, frames, fuel lines, around exhaust system, etc.) for damage and corrosion.

Maintenance Item	Specific Work Required
Road test	Check brake operation/clutch operation/steering control/operation of meters and gauges/squeaks, rattles or unusual noises/engine general performance/emergency locking retractors.
AIR CONDITIONER SYSTEM (IF EQUIPPED)	
Refrigerant amount	Check refrigerant amount.
Compressor operation	Check compressor operation, and inspect for noise, oil leakage, cracks and refrigerant leakage.
Cabin air filter	Replace cabin air filter.
4WS SYSTEM	
Front & rear power steering system & hoses	Check lines for improper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.
4WS operation & linkages	Inspect for leakage, cracks, damage and looseness.
Rear wheel steering angle	Inspect for rear wheel steering angle.
Rear suspension outer ball joints	Inspect for grease leakage, cracks, damage and looseness.

ENGINE
(FP, FS, FS (Hi-power))

FEATURES

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the face-lifted FP, FS, FS (Hi-power) engine models are essentially carried over from those of the current 626 (GF), 626 Station Wagon (GW) (FP, FS, FS (Hi-power)) engine models, except for the following features. (See 626 Training Manual 3303-10-97D.)

FEATURES

Improved Engine Performance

- The shape of the intake port has been modified. (FP)
- The valve timing of exhaust valve has been changed from BBDC 48° to BBDC 44°, and ATDC 2° to ATDC 6°. (FP)
- The compression ratio has been increased from 9.6:1 to 9.7:1. (FP)

SPECIFICATIONS

Item			Specification		
			FP	FS	FS (Hi-power)
Type			Gasoline, 4-cycle		
Cylinder arrangement and number			In-line, 4-cylinder		
Combustion chamber			Pentroof		
Valve system			DOHC, timing belt driven, 16 valves		
Displacement (ml {cc, cu in})			1,840 {1,840, 112.2}	1,991 {1,991, 121.5}	
Bore × stroke (mm {in})			83.0 × 85.0 {3.27 × 3.35}	83.0 × 92.0 {3.27 × 3.62}	
Compression ratio			9.7:1	9.7:1	
Compression pressure (kPa {kgf/cm^2, psi} [rpm])			1,471 {15.0, 213} [300]		
Valve timing	IN	Open BTDC (°)	0	2	5
		Close ABDC (°)	35	48	56
	EX	Open BBDC (°)	44	48	
		Close ATDC (°)	6	2	
Valve clearance [Engine cold]		IN (mm {in})	0.26 {0.010}		
		EX (mm {in})	0.26 {0.010}		

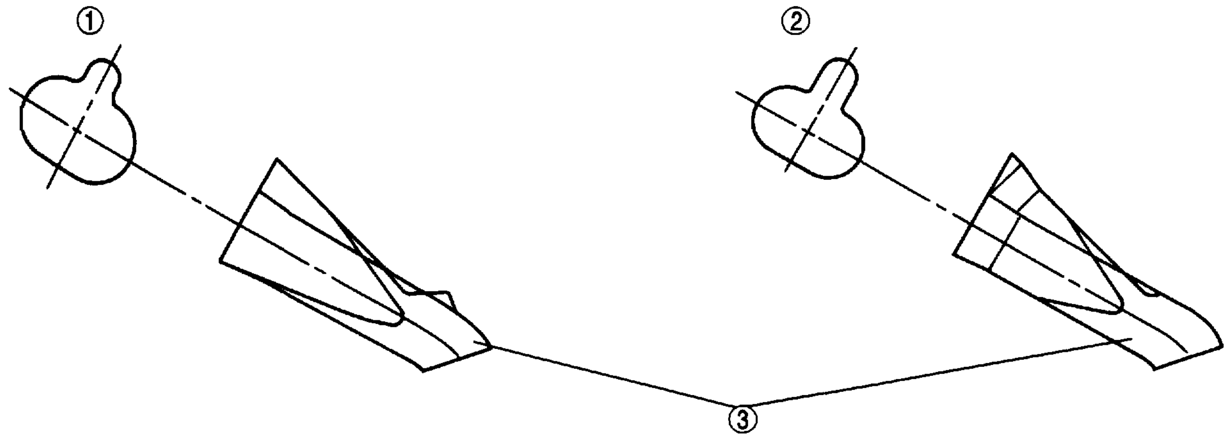
▭ Indicates new specification

ENGINE MECHANISM

CYLINDER HEAD

FP

- The intake port has been enlarged to improve charging efficiency. This improves combustion efficiency at all speeds.



1	Face-lifted model
2	Current model

3	Intake port

FUEL AND EMISSION CONTROL SYSTEMS (FP, FS, FS (Hi-power))

OUTLINE

OUTLINE OF CONSTRUCTION

- The fuel and emission control systems of the face-lifted FP, FS, FS (Hi-power) engine models is essentially carried over from that of the current 626 (GF), 626 station wagon (GW) FP, FS, FS (Hi-power) engine models except for the following features. (See 626 Training Manual 3303-10-97D.)

FEATURES

System simplification

- The check valve (two-way) has been integrated with the rollover valve to match vehicle characteristics.

Improved serviceability

- The locations of the fuel pump relay and the main relay have been changed to in the relay box.

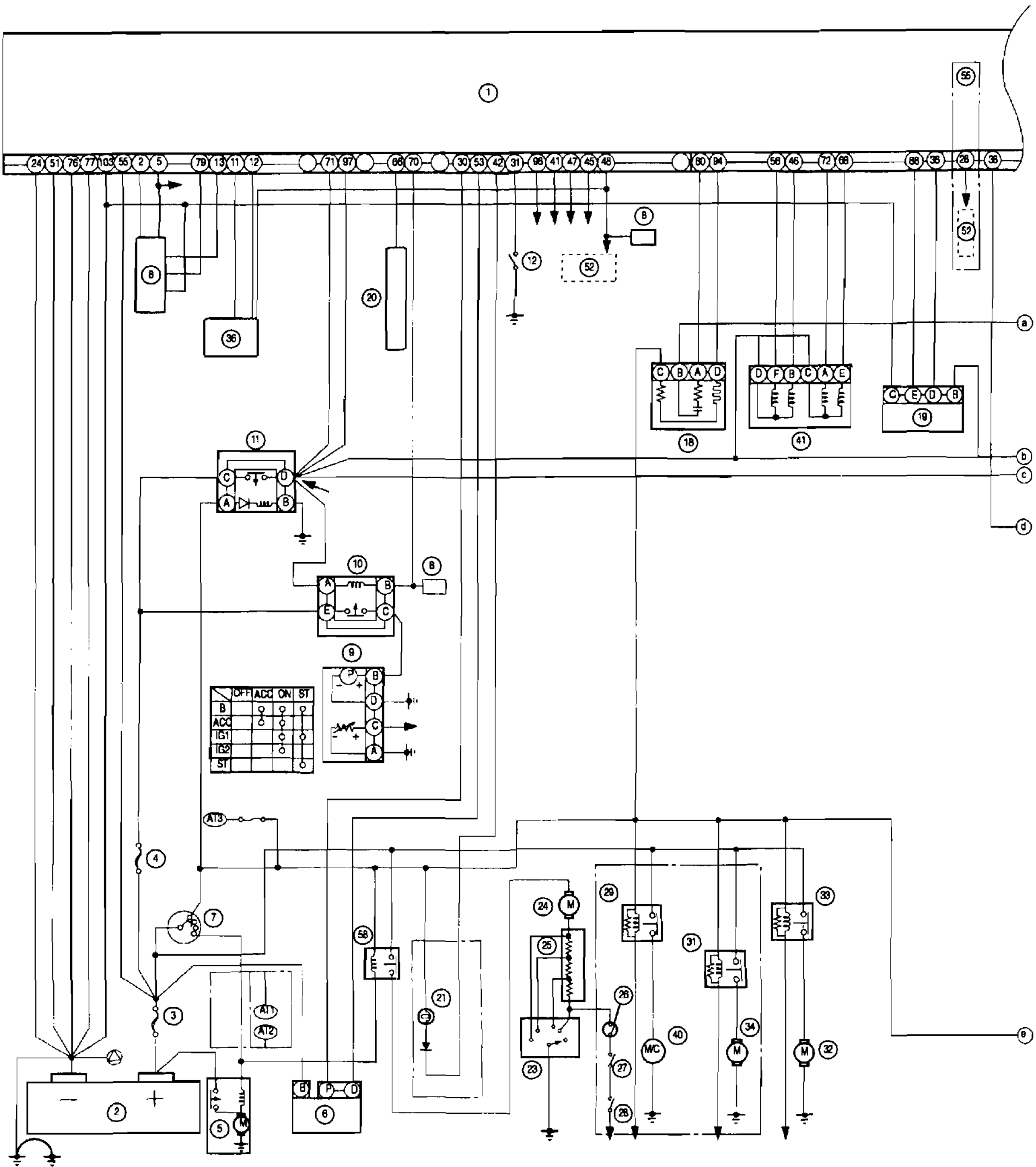
Improved reliability

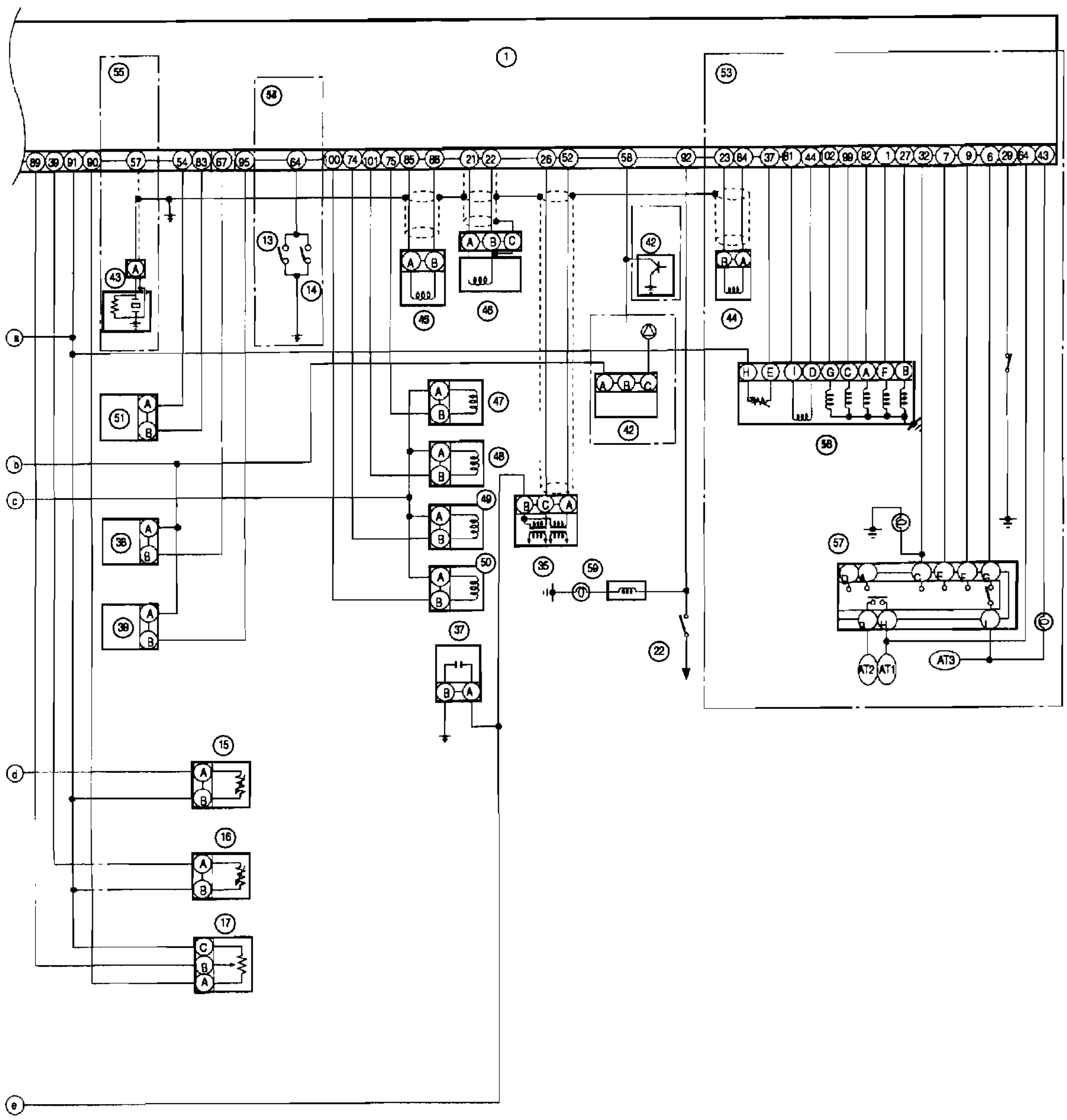
- The engine control (PCM program) has been changed. (Except for GF4A-EL models)

SPECIFICATIONS

Item		Engine
		FP, FS, FS (Hi-power)
Air cleaner element	Type	Paper element (oil permeated)
IAC valve	Type	Duty control
Fuel injector	Type	Hi-ohmic
	Type of fuel delivery	Top-feed
	Type of drive	Voltage
Pressure regulator	Regulating pressure (kPa {kgf/cm^2, psi})	210-260 {2.1-2.6, 30-36}
Fuel pump	Type	Impeller
Fuel tank	Capacity (L {US qt, Imp qt})	64 {68, 56}
Fuel	Specification	Unleaded (RON 95 or higher)
Catalyst	Type	TWC (monolythic)
EGR control	Type	Stepping motor type
Evaporative emission control system	Type	Canister type
PCV system	Type	Closed type

CONTROL SYSTEM WIRING DIAGRAM
With Immobilizer System

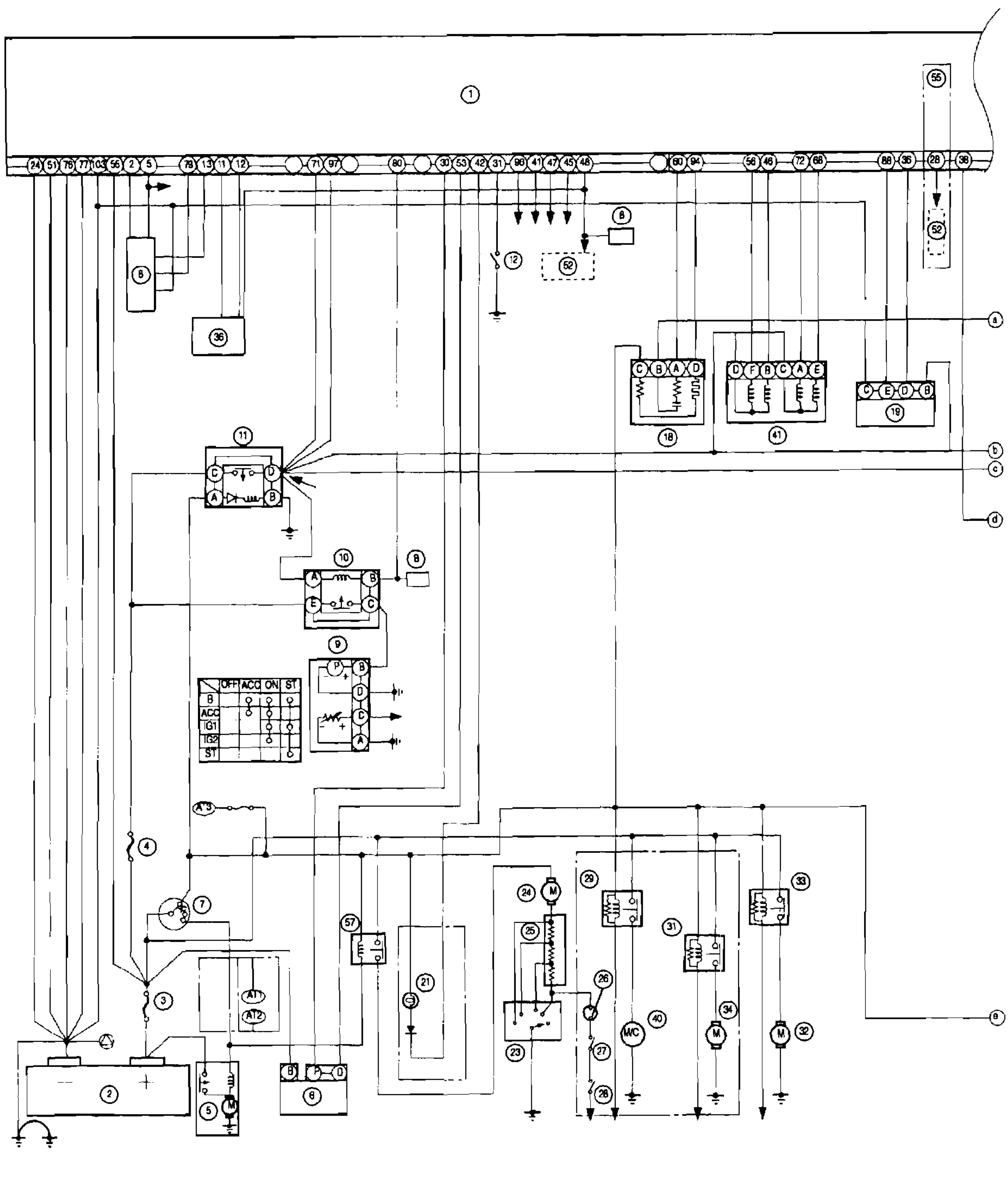


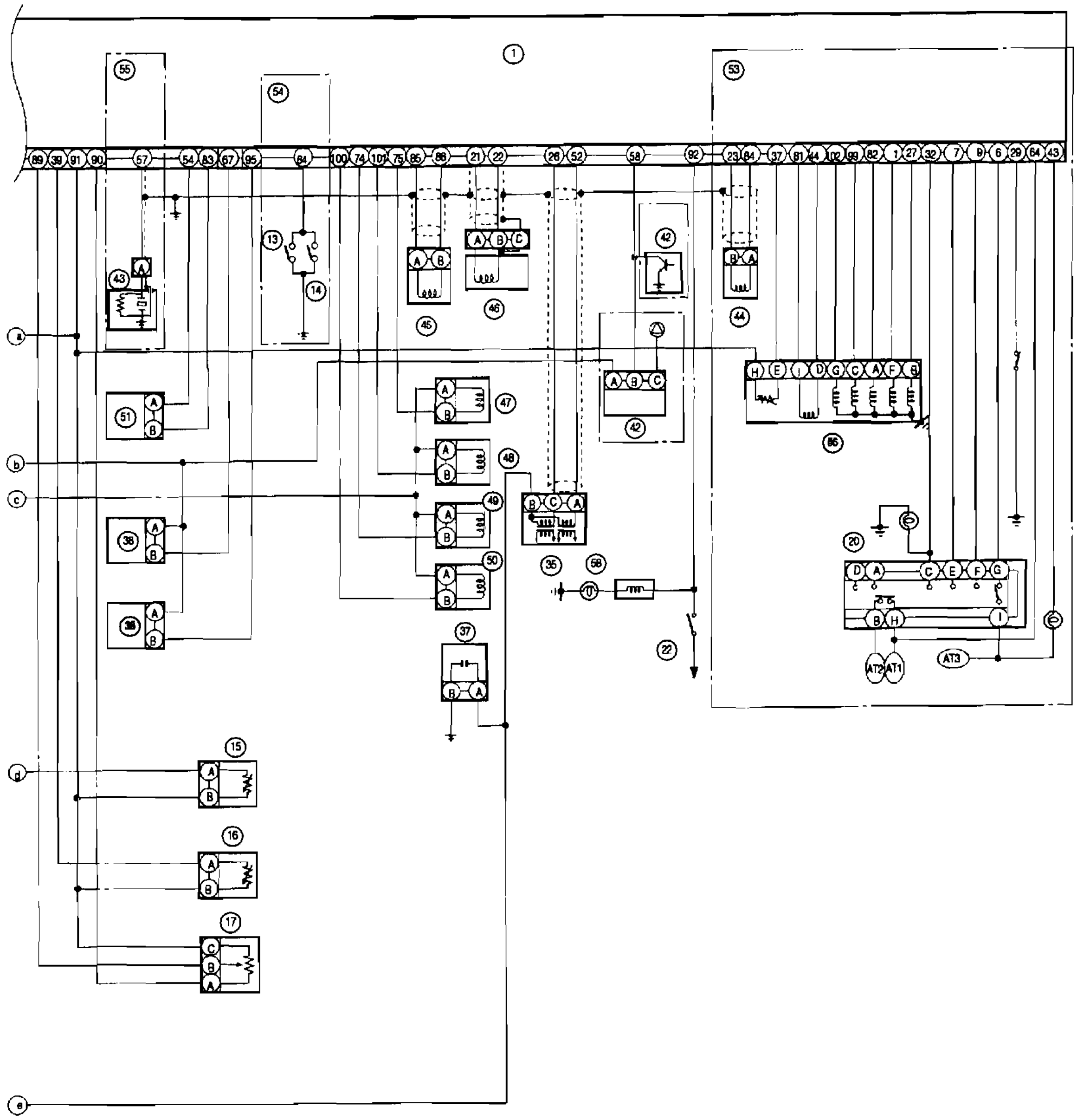


1	PCM
2	Battery
3	MAIN fuse
4	EGI fuse
5	Starter
6	Generator
7	Ignition switch
8	DLC
9	Fuel pump
10	Fuel pump relay
11	Main relay
12	PSP switch
13	Neutral switch
14	Clutch switch
15	ECT sensor
16	IAT sensor
17	TP sensor
18	HO2S
19	MAF sensor
20	Immobilizer unit
21	Generator warning light
22	Brake switch
23	Fan switch
24	Blower motor
25	A/C amplifier
26	A/C switch
27	Refrigerant pressure switch (low pressure)
28	Refrigerant pressure switch (high pressure)
29	A/C relay
30	A/C compressor

31	Fan relay No.2
32	Cooling fan motor
33	Fan relay No.1
34	Condenser fan motor
35	Ignition coil
36	ABS/TCS HU/CU
37	Condenser
38	Purge solenoid valve
39	PRC solenoid valve
40	Magnetic clutch
41	EGR valve
42	VSS
43	Knock sensor
44	Input/turbine speed sensor
45	CMP sensor
46	CKP sensor
47	Fuel injector No.1
48	Fuel injector No.2
49	Fuel injector No.3
50	Fuel injector No.4
51	IAC valve
52	To instrument cluster
53	FN4A-EL models only
54	MTX models only
55	FS engine models only
56	Control valve body
57	TR switch
58	Blower relay
59	Brake light

Without Immobilizer System





1	PCM
2	Battery
3	MAIN fuse
4	EGI fuse
5	Starter
6	Generator
7	Ignition switch
8	DLC
9	Fuel pump
10	Fuel pump relay
11	Main relay
12	PSP switch
13	Neutral switch
14	Clutch switch
15	ECT sensor
16	IAT sensor
17	TP sensor
18	HO2S
19	MAF sensor
20	TR switch
21	Generator warning light
22	Brake switch
23	Fan switch
24	Blower motor
25	A/C amplifier
26	A/C switch
27	Refrigerant pressure switch (low pressure)
28	Refrigerant pressure switch (high pressure)
29	A/C relay

30	A/C compressor
31	Fan relay No.2
32	Cooling fan motor
33	Fan relay No.1
34	Condenser fan motor
35	Ignition coil
36	ABS/TCS HU/CU
37	Condenser
38	Purge solenoid valve
39	PRC solenoid valve
40	Magnetic clutch
41	EGR valve
42	VSS
43	Knock sensor
44	Input/turbine speed sensor
45	CMP sensor
46	CKP sensor
47	Fuel injector No.1
48	Fuel injector No.2
49	Fuel injector No.3
50	Fuel injector No.4
51	IAC valve
52	To instrument cluster
53	FN4A-EL models only
54	MTX models only
55	FS engine models only
56	Control valve body
57	Blower relay
58	Brake light

CONTROL SYSTEM

OUTLINE

- Construction and operation of adopted components of the control system is the same as that of the current 626 (GF), 626 station wagon (GW) FP, FS, FS (Hi–power) engine models.
- The engine control (PCM program) of the face–lifted FP, FS, FS (Hi–power) engine models (except for GF4A-EL models) is essentially carried over from the current MPV (LW) FS engine models except for the following:
  — Idle speed has been changed to match vehicle characteristics.
  — High vehicle speed fuel reduce corrections of fuel injection control and electronic spark advance (ESA) control have been eliminated.
  — Operation conditions of pressure regulator control (PRC), O2S heater control, EGR control and A/C cut-off control have been modified to match vehicle characteristics.
  — Shapes and terminal numbers of PCM have been changed.
- The engine control (PCM program) of the face–lifted 626 FP, FS, FS (Hi–power) engine models (for GF4A-EL models) is the same as the current 626 station wagon (GW) FP, FS, FS (Hi–power) engine ATX models.

CONTROL DEVICES AND CONTROL RELATIONSHIP CHART

×: Applied

		Control item												
		IAC	FUEL INJECTION CONTROL	FUEL PUMP CONTROL	PRC	ESA CONTROL	O2S HEATER CONTROL	PURGE CONTROL	EGR CONTROL	A/C CUT-OFF CONTROL	ELECTRIC FAN CONTROL	GENERATOR CONTROL	IMMOBILIZER SYSTEM*3	FUEL CONSUMPTION CALCULATION FUNCTION
Input device	IAT sensor	×	×		×	×			×			×		×
	MAF sensor	×	×			×	×	×	×					×
	TP sensor	×	×		×	×			×	×	×			×
	CMP sensor		×			×								×
	CKP sensor	×	×	×	×	×	×	×	×	×		×		×
	ECT sensor	×	×		×	×		×	×	×	×			×
	Knock sensor					×								
	HO2S		×					×						×
	VSS		×			×		×	×			×		×
	Neutral/clutch switch*1	×	×		×	×		×		×				×
	TR switch*2	×	×		×	×		×		×				×
	PSP switch	×	×			×								×
	Brake switch		×											×
	A/C switch, refrigerant pressure switch (high, low pressure)	×	×			×				×	×			×
	Generator (terminal P: output voltage)	×				×						×		
	DLC (terminal TEN)	×				×		×			×			
	Battery		×			×		×				×		×
	Immobilizer unit*3												×	
Output device	IAC valve	×												
	Fuel injector		×										×	
	Fuel pump relay			×										
	PRC solenoid valve				×									
	Ignition coil					×							×	
	O2S heater						×							
	Purge solenoid valve							×						
	EGR valve								×					
	A/C relay									×				
	Fan relay No.1, No.2, No.3										×			
	Generator (terminal D: field coil)											×		
	Generator warning light											×		
	Drive information system display													×

*1: For MTX
*2: For ATX
*3: If equipped

IDLE AIR CONTROL (IAC) DESCRIPTION

- A comparison of the idle speed for the face-lifted 626 (GF), 626 station wagon (GW) FP, FS, FS (Hi-power) engine models and the current MPV (LW) FS engine models is as shown in the following table.

Condition	Idle speed (rpm)	
	Face-lifted 626, 626 station wagon FP, FS, FS (Hi-power)	MPV (LW) FS
No load	650	650
A/C is operating.*1	650	700
Electrical load is on.*2	650	650
P/S is operating.*3	650	650

*1: A/C switch and fan switch are on.
*2: Headlight is on, fan switch is on, cooling fan is operating, or window defroster is on.
*3: Steering wheel is fully turned.

PRESSURE REGULATOR CONTROL (PRC) DESCRIPTION

Except for GF4A-EL Models

- Specification of operation conditions has been changed from the MPV (LW) FS engine models.

Operation condition

- The PCM carries out the PRC when all of the following conditions are satisfied.
  - — At start and 104 seconds after start.
  - — Intake air temperature is above 35°C {95°F}.
  - — Engine coolant temperature is above 90°C {194°F}.
  - — Throttle valve is fully closed and engine speed is below 1500 rpm.
  - — No load (ATX: in P or N position, MTX: in neutral position or clutch pedal is depressed)

Operation condition

- The PCM cuts off the power supply to the O2S heater when the engine speed is above 3750 rpm and charging efficiency is low.

EGR CONTROL DESCRIPTION

Except for GF4A-EL Models

- Specification of engine speed in operation conditions has been changed from the MPV (LW) FS engine models.

Operation condition

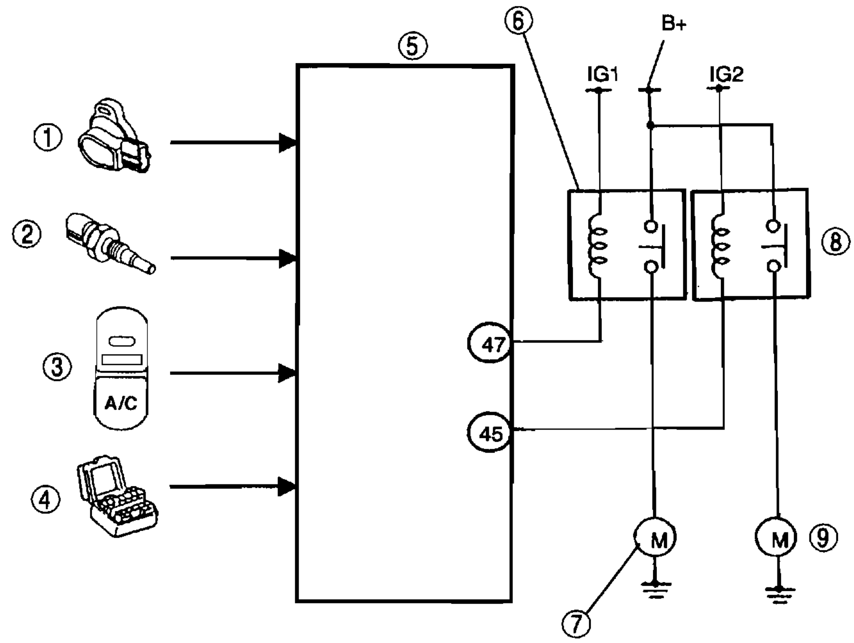
- The PCM carries out the EGR control when all of the following conditions are satisfied.
  - — Except cranking
  - — Except idling
  - — Engine speed is within 1200—4000 rpm.
  - — Except heavy load volume increase zone (fuel injection control)
  - — Vehicle speed is above 3.8 km/h {2.4 mph}.

A/C CUT-OFF CONTROL DESCRIPTION

Except for GF4A-EL Models

- The A/C cut-off control is essentially carried over from the MPV (LW) FS engine models except for the operation condition and the PCM terminals connected to the fan relay.

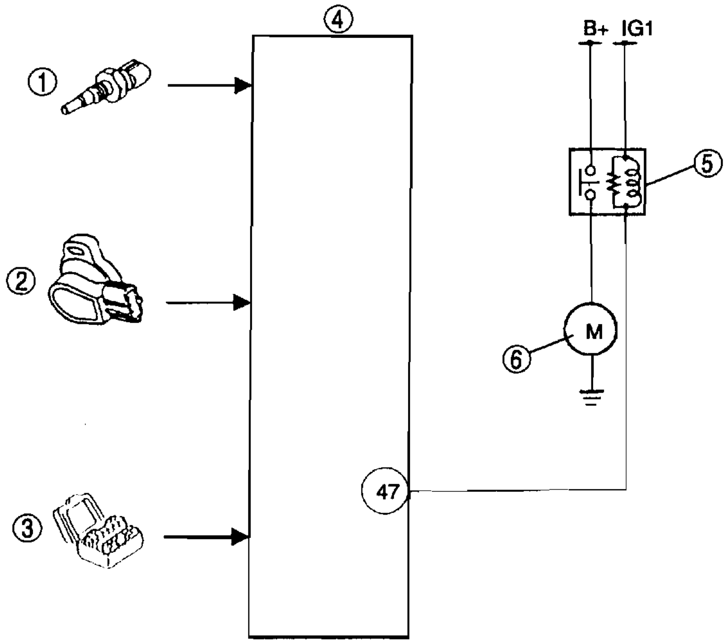
System diagram
With A/C



1	TP sensor
2	ECT sensor
3	A/C switch
4	DLC (TEN terminal)
5	PCM

6	Fan relay No.2
7	Cooling fan motor
8	Fan relay No.1
9	Condenser fan motor

Without A/C



1	ECT sensor		4	PCM	
2	TP sensor		5	Fan relay No.2	
3	DLC (TEN terminal)		6	Cooling fan motor	

Operation condition

- While A/C is operating, the PCM cuts the power supply off the A/C relay as shown below.

A/C cut-off condition	A/C cut-off time	Purpose
During cranking	For approx. 4.0 seconds	Startability improvement
Vehicle start-off (for ATX)	For approx. 2.0 seconds	Acceleration perfomance improvement
Throttle valve is opened above 87.5 %	For approx. 5.0 seconds	Engine reliability improvement
Engine coolant temperature is above 113°C {235°F}	Alternates between 10 seconds on and off untill engine coolant temperature falls to 107°C {225°F}	
Engine coolant temperature is above 117°C {243°F}	Until engine coolant temperature falls below 110°C {230°F}	

ON-BOARD DIAGNOSTIC

OUTLINE

Except for GF4A-EL Models

- The DTCs and PIDs (monitoring items and simulation items) are essentially carried over from the MPV (LW) FS engine models.

DTC

Except for GF4A-EL Models

- The DTCs for the fuel and emission control systems are as shown in the following table.

DTC table

×: Applied
–: Not Applied

DTC	Diagnosed circuit	Detection condition	Fail-safe	Memory function
P0102	MAF sensor	PCM monitors input voltage from MAF sensor when engine is running. If input voltage at PCM terminal 88 is below 0.3 V, PCM determines that MAF circuit has malfunction.	• Adjusts charging efficiency to set value • Adjusts ignition timing to fixed value (6°CA) • Stops fuel cut-off at shifting (ATX)	×
P0103		PCM monitors input voltage from MAF sensor when engine is running. If input voltage at PCM terminal 88 is above 4.3 V, PCM determines that MAF circuit has malfunction.		×
P0112	IAT sensor	PCM monitors input voltage from IAT sensor when engine is running. If input voltage at PCM terminal 39 is below 0.2 V, PCM determines that IAT circuit has malfunction.	• Sets intake air temperature for engine control 20°C {68°F} • Illuminates generator warning light • Stops fuel cut-off at shifting (ATX)	×
P0113		PCM monitors input voltage from IAT sensor when engine is running. If input voltage at PCM terminal 39 is above 4.6 V, PCM determines that IAT circuit has malfunction.		×
P0117	ECT sensor	PCM monitors input voltage from ECT sensor when engine is running. If input voltage at PCM terminal 38 is below 0.2 V, PCM determines that ECT circuit has malfunction.	• Sets engine coolant temperature for engine control 40°C {104°F} • Sets engine coolant temperature for IAC control 80°C {176°F}	×
P0118		PCM monitors input voltage from ECT sensor when engine is running. If input voltage at PCM terminal 38 is above 4.6 V, PCM determines that ECT circuit has malfunction.		×
P0122	TP sensor	PCM monitors input voltage from TP sensor when engine is running. If input voltage at PCM terminal 89 is below 0.1 V, PCM determines that TP circuit has malfunction.	Sets throttle opening angle for engine control open	×
P0123		PCM monitors input voltage from TP sensor when engine is running. If input voltage at PCM terminal 89 is above 4.8 V, PCM determines that TP circuit has malfunction.		×

DTC	Diagnosed circuit	Detection condition	Fail-safe	Memory function
P0134	HO2S	PCM monitors input voltage from HO2S when the following monitoring conditions are met. If input voltage at PCM terminal 60 never exceed 0.55 V for 73.6 seconds, PCM determines that HO2S sensor circuit is not activated. **Monitoring conditions** • Engine speed is above 1500 rpm • Engine coolant temperature is above 80°C {176°F}	Stops feedback control of fuel injection control	×
P0135	HO2S heater	PCM monitors input voltage from HO2S heater just after turning ignition key to ON. If voltage at PCM terminal 93 is low, PCM determines that purge solenoid valve circuit has malfunction.	—	—
P0328	Knock sensor	PCM monitors input voltage from knock sensor when engine is running. If input voltage at PCM terminal 57 is above 4.0 V, PCM determines that knock sensor circuit has malfunction.	• Stops fuel cut-off at shifting (ATX) • Ignition retard of knocking is canceled.	×
P0335	CKP sensor	If PCM does not receive input voltage from CKP sensor for 4.2 seconds while MAF is 1.99 g/sec. {0.257 lb/min.} or above, PCM determines that CKP sensor has malfunction.	Stops fuel injection control	×
P0443	Purge solenoid valve	PCM monitors input voltage from purge solenoid valve just after turning ignition key to ON. If voltage at PCM terminal 67 is low, PCM determines that purge solenoid valve circuit has malfunction.	—	—
P1170	HO2S	PCM monitors input voltage from HO2S when the following monitoring conditions are met. If input voltage at PCM terminal 60 is below or above 0.55 V for 30.4 seconds, PCM determines that there is no HO2S inversion. **Monitoring conditions** • Engine speed is above 1500 rpm • Engine coolant temperature is above 80°C {176°F}	Stops feedback control of fuel injection control	×
P1250	PRC solenoid valve	PCM monitors input voltage from PRC solenoid valve just after turning ignition key to ON. If voltage at PCM terminal 95 is low, PCM determines that PRC solenoid valve circuit has malfunction.	—	—
P1345	CMP sensor	If PCM does not receive input voltage from CMP sensor within 12 engine cycles, PCM determines that CMP circuit has malfunction.	Stops fuel injection control	×

DTC	Diagnosed circuit	Detection condition	Fail-safe	Memory function
P1496	EGR valve	PCM monitors input voltage from EGR valve coil just after turning ignition key to ON. If voltage at PCM terminal 68 is low, PCM determines that EGR valve circuit has malfunction.	—	—
P1497	EGR valve	PCM monitors input voltage from EGR valve coil just after turning ignition key to ON. If voltage at PCM terminal 72 is low, PCM determines that EGR valve circuit has malfunction.	—	—
P1498	EGR valve	PCM monitors input voltage from EGR valve coil just after turning ignition key to ON. If voltage at PCM terminal 46 is low, PCM determines that EGR valve circuit has malfunction.	—	—
P1499	EGR valve	PCM monitors input voltage from EGR valve coil just after turning ignition key to ON. If voltage at PCM terminal 56 is low, PCM determines that EGR valve circuit has malfunction.	—	—
P1504	IAC valve	If PCM detects that PCM terminal 83 voltage is above threshold or below threshold when IAC duty target is within 18—70 %, PCM determines that IAC valve circuit has malfunction	Stops IAC	×
P1562	Battery	PCM monitors voltage of back-up battery positive terminal at PCM terminal 55. If PCM detects battery positive terminal voltage below 2.5 for 2 seconds, PCM determines that back-up voltage circuit has malfunction.	—	×
P1602	Immobilizer system	Commanded transmission from PCM to immobilizer unit exceeds limit. No response from immobilizer unit.	—	×
P1603	Immobilizer system	Code word is not registered in PCM.	—	×
P1604	Immobilizer system	Key ID numbers are not registered in PCM.	—	×
P1621	Immobilizer system	Code words stored in PCM and immobilizer unit do not match.	—	×
P1622	Immobilizer system	ID numbers stored in immobilizer unit and PCM do not match. This DTC is installed only after immobilizer unit is replaced and reprogramming system.	—	×
P1623	Immobilizer system	PCM internal EEPROM is damaged.	—	×
P1624	Immobilizer system	PCM detects immobilizer system communication malfunction more than three times.	—	×
P1627	TCS	PCM detects TCS communication malfunction.	—	×
P1631	Generator	PCM monitors input voltage from generator. If PCM detects generator output voltage below 8.5 V for 5 seconds while engine is running, PCM determines that charging system has malfunction.	—	×
P1633	Battery	PCM monitors input voltage from generator and battery positive terminal. If PCM detects generator output voltage above 18.5 V or battery voltage above 16.5 V for 5 seconds while engine is running, PCM determines that charging system has malfunction.	—	×

DTC	Diagnosed circuit	Detection condition	Fail-safe	Memory function
P1634	Generator	PCM monitors input voltage from generator and battery positive terminal. If PCM detects generator output voltage above 18.5 V and battery voltage below 16.5 V for 5 seconds while engine is running, PCM determines that charging system has malfunction.	—	×

PID/DATA MONITOR AND RECORD
Except for GF4A-EL Models

- The PID monitoring items for the fuel and emission control systems are as shown in the following table.

PID/DATA monitor table

Monitor item (Display on NGS tester)	Monitoring item	Condition/ unit	PCM terminal
A/C RLY	A/C relay	ON/OFF	96
A/C SW	Refrigerant pressure switch (high, low pressure), A/C switch	ON/OFF	41
ALTF	Generator field coil duty value	%	53
ALTT V	Generator output voltage	V	30
B+	B+	V	55
BRK SW	Brake switch	ON/OFF	92
CHRGLMP	Generator warning light	ON/OFF	42
ECT	Engine coolant temperature	°C/°F	38
ECT V	Engine coolant temperature signal voltage	V	38
FAN2	Condenser fan control	ON/OFF	45
FAN3	Cooling fan control	ON/OFF	47
FHO2S	HO2S	V	60
FHO2SH	HO2S heater control	ON/OFF	94
FP RLY	Fuel pump relay control	ON/OFF	70*1/80*2
IACV	IAC valve control	ms	54, 83
IAT	Intake air temperature	°C/°F	39
IAT V	Intake air temperature signal voltage	V	39
IGT	Ignition timing	BTD	26, 52
INJ	Fuel injection duration	ms	74,75, 100,101
KR	Knocking retard	DEG	57
MAF V	MAF signal voltage	V	88
NL SW	Neutral switch	ON/OFF	64
PRCV	Pressure regulator control	ON/OFF	95
PRGV	Purge solenoid valve duty value	%	67
PSP SW	PSP switch	ON/OFF	31
RPM	Engine speed	RPM	21, 22
RPM DES	Target idle speed	RPM	—
SEGRP	EGR valve stepping motor position	Step	46, 56, 68,72
TEN	TEN terminal condition (in DLC)	ON/OFF	5
TP V	TP sensor signal voltage	V	89
VS	Vehicle speed	KPH/MPH	58

*1: With immobilizer system
*2: Without immobilizer system

SIMULATION TEST

Except for GF4A-EL Models

- The simulation test items are as shown in the following table.

Simulation item table

Simulation item	Definition	Operation	Test condition		PCM terminal
			IG ON	IDLE	
A/C RLY	A/C relay	ON or OFF	×	×	96
ALTF	Generator field coil	OFF	—	×	53
CHRGLMP	Generator warning light	ON or OFF	×	×	42
FAN2	Fan relay No.1	ON or OFF	×	×	45
FAN3	Fan relay No.2	ON or OFF	×	×	47
FP RLY	Fuel pump relay	ON or OFF	×	×	70*1/ 80*2
IACV	IAC valve	Actuated at any duty value (0—100 %)	×	×	54, 83
INJ	Fuel injection duration	Actuated at any injection value (-50 %—50 %)	—	×	74, 75, 100, 101
INJ#1	Fuel injector No.1	OFF	—	×	75
INJ#2	Fuel injector No.2	OFF	—	×	101
INJ#3	Fuel injector No.3	OFF	—	×	74
INJ#4	Fuel injector No.4	OFF	—	×	100
PRCV	PRC solenoid valve	ON or OFF	×	×	95
PRGV	Purge solenoid valve	Actuated at any duty value (0—100 %)	×	×	67
SEGRP	EGR valve	Actuated at any stepping value (0—60 steps)	×	×	46,56, 68,72

*1: With immobilizer system
*2: Without immobilizer system

SUPPLEMENTAL SERVICE INFORMATION

The following changes and/or additions have been made since publication of the Mazda 626 Workshop Manual (1577-10-97D).

Engine tune-up (except for GF4A-EL models)
- Inspection procedure has been modified.
- Adjustment procedure has been modified.

Fuel tank
- Inspection procedure has been has been modified.

Fuel pump relay
- Inspection procedure has been modeified.

PCM (except GF4A-EL models)
- Inspection procedure has been modified.

Main relay
- Inspection procedure has been modified.

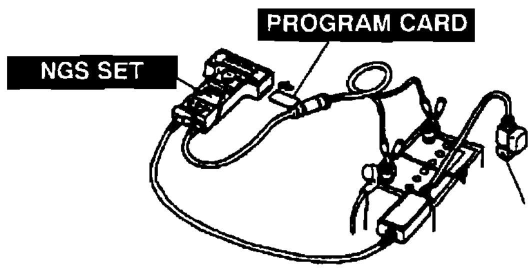
On-board diagnostic (except for GF4A-EL models)
- Inspection procedure has been modified.

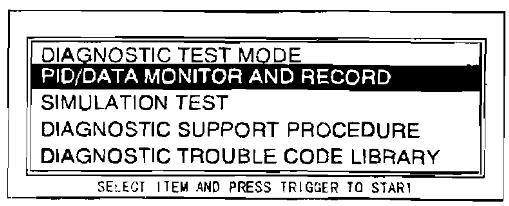
Troubleshooting
- Inspection procedure has been modified.

ENGINE TUNE-UP

Note
- This engine tune-up is only for engines other than GF4A-EL models. If tuning up the engine for GF4A-EL models, see Mazda 626 Workshop Manual (1577-10-97D).

ENGINE TUNE-UP PREPARATION
Except for GF4A-EL Models
Using the SSTs (NGS tester)
1. Warm up the engine to normal operating temperature.
2. Shift the transaxle into neutral (MTX) or **P**, N position (ATX).
3. Turn off all electrical loads.
   - Headlight switch
   - Blower control switch
   - Rear window defroster switch
   - A/C switch
4. Verify that the steering wheel is at the straight ahead position.
5. Connect the **SSTs** (NGS tester) to the DLC and select "PID/DATA MONITOR AND RECORD". (See F1-30 NGS tester hook-up procedure.)





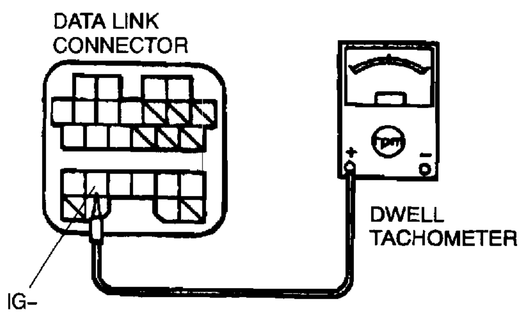
6. Access **RPM** PID. Press the trigger key to enter this selection. (See F1-33 PID/DATA monitor and record procedure.)
7. Wait until the electrical fan stops.

Not using the SSTs (NGS tester)
1. Warm up the engine to normal operating temperature.
2. Shift the transaxle into neutral (MTX) or N range (ATX).

3. Turn off all electrial loads.
   - Headlight switch
   - Blower control switch
   - Rear defroster switch
   - A/C switch
4. Verify that the steering wheel is at straight ahead position.

Caution
- **Connecting the wrong DLC terminal may possibly cause a malfunction. Carefully connect the specified terminal only.**

5. Connect a dwell tachometer to the DLC terminal IG-.

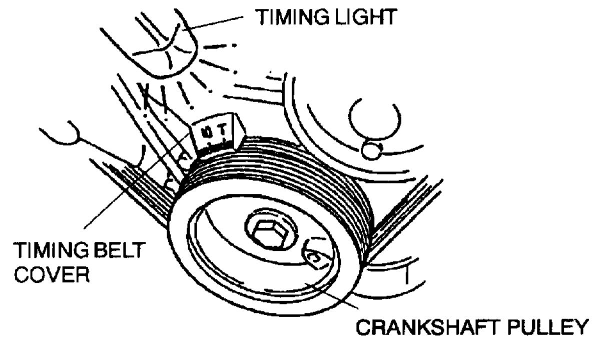


6. Wait until the electrical fan stops.

IGNITION TIMING INSPECTION
Except for GF4A-EL Models
Using the SSTs (NGS tester)
1. Perform "ENGINE TUNE-UP PREPARATION".
2. Verify that the RPM PID is within the specification.
   - If not as specified, adjust the idle speed by turning the AAS. (See F1-22 IDLE SPEED ADJUSTMENT.)

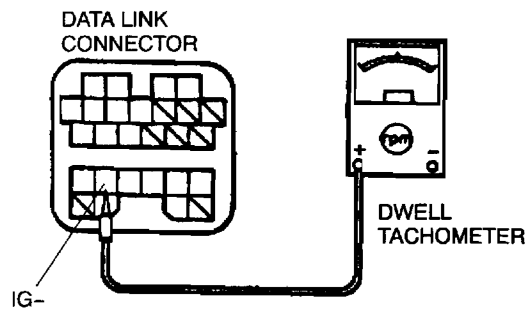
Specification
600—700 (650 ± 50)rpm

3. Connect the timing light to the high-tension lead of No.1 cylinder.
4. Verify that the timing mark (yellow) on the crankshaft pulley is within the specification.
   - If not as specified, inspect the following:
     — CMP sensor (See Section F.)
     — CKP sensor (See Section F.)
     — TP sensor (See Section F.)
     — ECT sensor (See Section F.)
     — Neutral switch (MTX) (See Section F.)
     — Clutch switch (MTX) (See Section F.)
     — TR switch (ATX) (See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)
   - If the devices are normal, replace the PCM. (See Section F.)

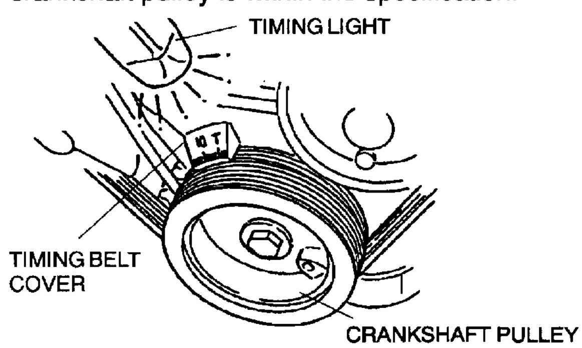


Specification
BTDC 6°—18° (12° ± 6°)

Not using the SSTs (NGS tester)
1. Perform "ENGINE-TUNE UP PREPARATION".
2. Connect a dwell tachometer to DLC terminal IG-



3. Verify that the idle speed is normal.(See F1-22 IDLE SPEED ADJUSTMENT.)
4. Connect the timing light to the high-tension lead of the No.1 cylinder.
5. Verify that the timing mark (yellow) on the crankshaft pulley is within the specification.



Specification
BTDC 6°—18° (12° ± 6°)

6. Verify that the timing mark (yellow) on the crankshaft pulley is within the specification.
   - If the devices are normal, replace the PCM.(See Section F).

- If not as specified, inspect the following:
  - — CMP sensor (See Section F.)
  - — CKP sensor (See Section F.)
  - — TP sensor (See Section F.)
  - — ECT sensor (See Section F.)
  - — Neutral switch (MTX) (See Section F.)
  - — Clutch switch (MTX) (See Section F.)
  - — TR switch (ATX) (See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)

IDLE SPEED ADJUSTMENT
Except for GF4A-EL Models
Using the SSTs (NGS tester)

1. Perform "ENGINE TUNE-UP PREPARATION".
2. Verify that the RPM PID is within the specification.

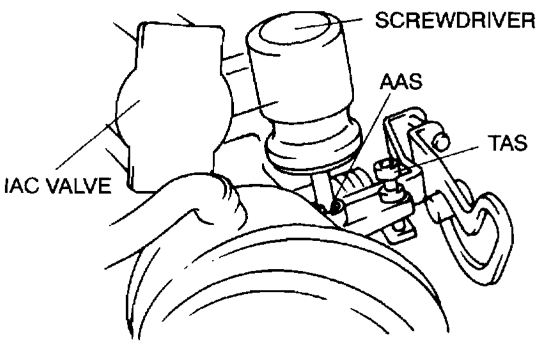
Specification
600—700 (650 ± 50)rpm

3. Press **SETUP** (key 8) and turn the test mode on.
4. Press **CANCEL**.
5. Press **START**.

Caution
- **The TAS is set at the factory and must not be adjusted. Any adjustment will negatively affect the engine performance.**

6. Verify that the RPM PID is within the specification.
   - If not as specified, adjust the idle speed by turning the AAS.

Specification
500—750 rpm



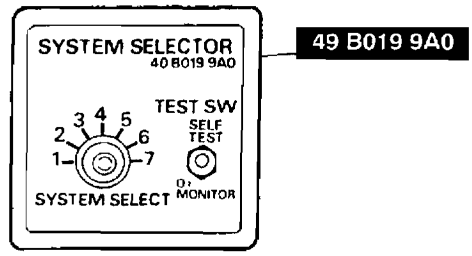
7. Press **SETUP** (Key 8) and turn the test mode off.
8. Press **CLEAR** to clear previously selected items.
9. Disconnect the **SSTs (NGS Tester)**.

Not using the SSTs (NGS tester)

1. Perform "ENGINE TUNE-UP PREPARATION".
2. Verify that the RPM PID is within the specification.

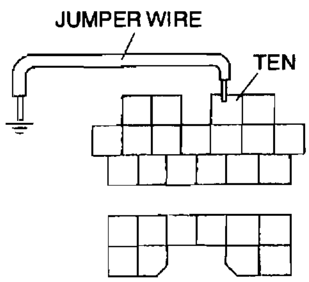
Specification
600—700 (650 ± 50)rpm

3. If using the **SST** (System selector) to turn on the test mode, perform as follows:
   (1) Connect the **SST** to the DLC.
   (2) Set the system select switch to position 1.
   (3) Set the test switch to SELF TEST.



Caution
- **Connecting the wrong DLC terminal may possibly cause a malfunction. Carefully connect the specified terminal only.**

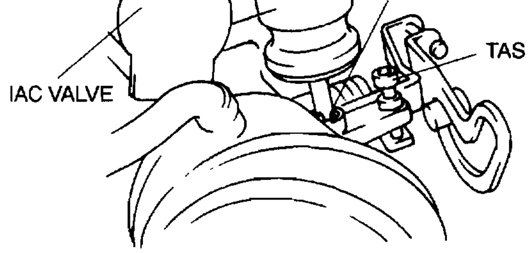
4. If using a jumper wire to turn on the test mode, perform the following:
   (1) Short the DLC terminal TEN to body GND using a jumper wire.



Caution
- **The TAS is set at the factory and must not be adjusted. Any adjustment will negatively affect the engine performance.**

5. Verify that the idle speed is within the specification.
   - If not as specified, adjust the idle speed by turning the AAS.

Specification
500—750 rpm



6. Disconnect the **SST** or a jumper wire.
7. Disconnect the dwell tachometer.

IDLE SPEED INSPECTION
Except for GF4A-EL Models
Using the SSTs (NGS tester)
1. Perform "ENGINE TUNE-UP PREPARATION".
2. Verify that the idle speed is normal. (See F1-22 IDLE SPEED ADJUSTMENT.)
3. Verify that the RPM PID is within the specification using the **SSTs** (NGS tester).
   - If not as specified with all load conditions, inspect the IAC valve.
   - If not as specified with some load condition, inspect the related input switches, harnesses, and connectors.

Specification

Load condition	Idle-up speed (rpm) *1	
	P, N position	D range
No load	600—700 (650 ± 50)	
E/L ON *2		
P/S operating *3		
A/C ON *4		

*1 : Excludes temporary idle speed drop just after the electrical loads (E/L) are turned on.

*2 : Headlight is on, blower control switch is above 1st, cooling fan is operating, rear window defroster is on.

*3 : Steering wheel is fully turned.

*4 : A/C switch and blower control switch are on.

Not using the SSTs (NGS tester)
1. Perform "ENGINE TUNE-UP PREPARATION".
2. Verify that the idle speed is normal. (See F1-22 IDLE SPEED ADJUSTMENT.)
3. Verify that idle speed is within the specification using the dwell tachometer.
   - If not as specified with all load conditions, inspect the IAC valve.
   - If not as specified with some load condition, inspect the related input switches, harnesses, and connectors.

Specification

Load condition	Idle-up speed (rpm) *1	
	P, N position	Range D
No load	600—700 (650 ± 50)	
E/L ON *2		
P/S operating *3		
A/C ON *4		

*1 : Excludes temporary idle speed drop just after the electrical loads (E/L) are turned on.

*2 : Headlight is on, fan switch is above 1st, cooling fan is operating, rear window defroster is on.

*3 : Steering wheel is fully turned.

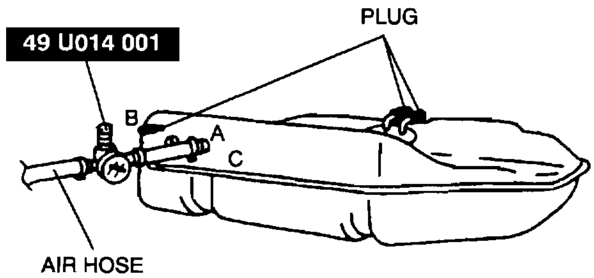
*4 : A/C switch and fan switch are on.

IDLE MIXTURE INSPECTION
Except for GF4A-EL Models
1. Perform "ENGINE TUNE-UP PREPARATION".
2. Verify that the idle speed and ignition timing are within the specification. (See F1-21 IGNITION TIMING INSPECTION.)
3. Warm up the engine by holding the engine speed at **2500—3000 rpm** for **approx. 3 minutes**.
4. Insert an exhaust gas analyzer to the tailpipe.
5. Verify that the CO and HC concentrations are within the regulation.
   - If not within the regulation, inspect the following:
     - — On-board diagnostic (See F1-30 ON-BOARD DIAGNOSTIC TEST.)
     - — HO2S (See Section F.)
     - — Intake manifold vacuum (See Section F.)
     - — Fuel line pressure (See Section F.)
     - — Ignition timing control (See F1-21 IGNITION TIMING INSPECTION.)
       - If the systems and devices are normal, replace the TWC.

FUEL SYSTEM

FUEL TANK INSPECTION

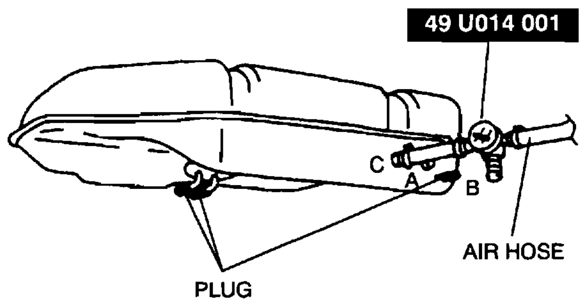
1. Remove the fuel tank.
2. Attach an air hose to the **SST**.
3. Plug the main and return fuel pipes a on the fuel pump.
4. Connect the **SST** to Port A and plug **Port** B as shown in the figure.



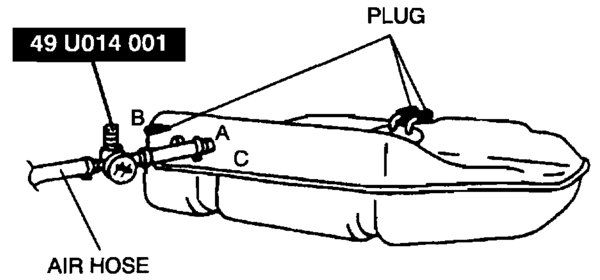
5. Level the fuel tank.
6. Apply pressure to Port A and inspect operation of the check valve.
   - If not as specified, replace the fuel tank.

Condition	Airflow
Apply below **+2.9 kPa {+22 mmHg, +0.87 inHg}** pressure to Port A	No
Apply over **+5.9 kPa {+44 mmHg, +1.7 inHg}** pressure to Port A	Yes

7. Turn the fuel tank upside-down with Port B plugged as shown in the figure.



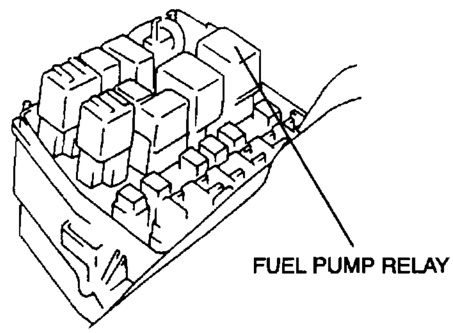
8. Apply pressure of **+0.98 kPa {+7.4 mmHg, +0.29 inHg}** to Port A and verify that there is no airflow from Port C.
   - If there is airflow, replace the fuel tank.
9. Turn over the fuel tank, and level it.
10. Connect the **SST** to Port C as shown in the figure.



11. Apply pressure of **+0.98 kPa {+7.4 mmHg, +0.29 inHg}** to Port C and inspect if there is airflow from Port A.
    - If there is no airflow, replace the fuel tank.

FUEL PUMP RELAY REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the fuel pump relay.
3. Install in the reverse order of removal.



CONTROL SYSTEM

PCM INSPECTION
Except for GF4A-EL models
Using SSTs (NGS tester)

Note
- PIDs for the following parts are not available on this model. Go to the appropriate part inspection page.
  — Water temperature sender unit (integrated with ECT sensor) (See Section F.)
  — CMP sensor (See Section F.)
  — Main relay (See Section F.)

1. Connect the **SSTs** (NGS tester) to the DLC. (See F1-30 NGS tester hook-up procedure.)
2. Turn the ignition key to ON (Engine OFF).
3. Select the "PID/DATA MONITOR AND RECORD" function on the NGS tester display and press TRIGGER. (See F1-33 PID/DATA monitor and record procedure.)
4. Select the appropriate PID on the NGS tester display and press START.
5. Measure the PID value.
   - If PID value is not within the specification, follow the instruction in Action column.

Note
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.
- For input/output signals except those of the monitoring items, use a voltmeter to measure the PCM terminal voltage.
- When measuring the following PID value, perform the following:
  — TP V PID at Constant Voltage Terminal Inspection.
- Perform the SIMULATION TEST for the output device (A/C RLY, FP RLY, FAN2, FAN3, IACV, INJ, PRCV, PRGV, VICSV) after PID/DATA measurement is completed.

PID/DATA Monitor Table

Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
1GR*1 (First gear)	ON/OFF	First gear:ON Others:OFF	Inspect following PIDs: SHIFT A, SHIFT B, SHIFT C.	—
2GR*1 (Second gear)	ON/OFF	Second gear: ON Others:OFF	Inspect following PIDs: SHIFT A, SHIFT B, SHIFT C.	—
3GR*1 (Third gear)	ON/OFF	Third gear: ON Others:OFF	Inspect following PIDs: SHIFT A, SHIFT B, SHIFT C.	—
4GR*1 (Fourth gear)	ON/OFF	Fourth gear: ON Others:OFF	Inspect following PIDs: SHIFT A, SHIFT B, SHIFT C.	—
A/C RLY (A/C relay)	ON/OFF	Ignition switch ON: OFF A/C switch ON and fan switch ON at idle: ON	Inspect following PIDs: RPM, TP V, ECT V, A/C SW. Inspect A/C relay. See Section U	96
A/C SW (A/C switch)	ON/OFF	A/C switch and fan switch ON at ignition switch ON: ON A/C switch OFF at ignition switch ON: OFF	Inspect A/C switch. See Section U	41
ALTF (Generator field coil control duty value)	%	Ignition switch ON: 0% Idle: 0—100% Just after A/C switch ON and fan switch ON at idle: Duty value rises	Inspect following PIDs: IAT, IAT V, RPM, B+, ALTT V. Inspect generator. See Section G-3 GENERATOR INSPECTION	53
ALTT V (Generator output voltage)	V	Ignition switch ON: 0 V Idle: 14—16 V	Inspect following PIDs: IAT, IAT V, RPM, B+, ALTF. Inspect generator. See Section G-3 GENERATOR INSPECTION	30

*1: For ATX

Monitor item (Definition)	Unit/ Condition		Condition/Specification	Action	PCM terminal
ATFT*1 (Transaxle fluid temperature)	°C	°F	Transaxle fluid temperature 20 °C {68 °F}: 20 °C {68 °F} Transaxle fluid temperature 130 °C {266 °F}: 130 °C {266 °F}	Inspect transaxle fluid temperature sensor. See Section K2-34 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION	37
ATFT V*1 (Transaxle fluid temperature sensor signal voltage)	V		Transaxle fluid temperature 20 °C {68 °F}: 3.3—3.4 V Transaxle fluid temperature 130 °C {266 °F}: 1.7—1.8 V	Inspect transaxle fluid temperature sensor. See Section K2-34 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION	37
B+ (B+)	V		Ignition switch ON: B+	Inspect main relay. See Section F Inspect battery. See Section G	55
BRK SW (Brake switch)	ON/OFF		Brake pedal depressed: ON Brake pedal released: OFF	Inspect brake switch. See Section P	92
CHRGLMP (Generator warning light)	ON/OFF		Ignition switch ON: ON Idle: OFF	Inspect generator warning light.	42
D SW*1 (TR switch [D range])	ON/OFF		D range: ON Others: OFF	Inspect TR switch. See Section K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	6
ECT (ECT)	°C	°F	Engine coolant temperature 20 °C {68 °F}: 20 °C {68 °F} Engine coolant temperature 60 °C {140 °F}: 60 °C {140 °F}	Inspect ECT sensor. See Section F	38
ECT V (ECT signal voltage)	V		Engine coolant temperature 20 °C {68 °F}: 2.9—3.3 V After warm up: Below 1.0 V	Inspect ECT sensor. See Section F	38
FAN2 (Condenser fan control)	ON/OFF		Engine coolant temperature above 112 °C {234 °F}: ON Terminal TEN (DLC) shorted to GND and throttle valve open: ON A/C operating: ON Others: OFF	Inspect following PIDs: RPM, TP V, ECT V, A/C SW, TEN. Inspect condenser fan relay. See Section U	45
FAN3 (Cooling fan control)	ON/OFF		Engine coolant temperature above 97 °C {207 °F}: ON Terminal TEN (DLC) shorted to GND and throttle valve open: ON A/C operating: ON Others: OFF	Inspect following PIDs: RPM, TP V, ECT V, A/C SW, TEN. Inspect condenser fan relay. See Section U	47
FHO2S (HO2S)	V		Ignition switch ON: 0—1.0 V After warm up: 0—1.0 V Acceleration (after warm up): 0.5—1.0 V Deceleration (after warm up): 0—0.5 V	Inspect HO2S. See Section F	60
FHO2SH (HO2S heater)	ON/OFF		Ignition switch ON: ON (HO2S heater operated) Idle: ON (HO2S heater operated) Engine speed above approx. 3750 rpm: OFF	Inspect following PIDs: ECT V, MAF V. Inspect HO2S heater. See Section F	94
FP RLY (Fuel pump relay)	ON/OFF		Ignition switch ON: OFF Idle: ON Cranking: ON	Inspect following PID: RPM. Inspect fuel pump relay. See Section F	70*2 80*3

*1: For ATX
*2: With Immobilizer system
*3: Without Immobilizer system

Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
HOLD LP[*1] (HOLD indicator light)	ON/OFF	HOLD mode: ON Others: OFF	Inspect HOLD indicator light.	43
HOLD SW[*1] (HOLD switch)	ON/OFF	HOLD switch pressed: ON Others:OFF	Inspect HOLD switch. See Section K2-29 HOLD SWITCH INSPECTION	29
IACV (IAC valve)	%	Ignition switch ON: 19.9 % Idle: 40—50 %	Inspect following PIDs: IAT V, RPM, ECT V, MAF V, TP V, NL SW, PSP SW, A/C SW, TEN. Inspect IAC valve. See Section F	54,83
IAT (IAT)	°C / °F	Intake air temperature 20°C {68°F}: 20°C {68°F}:	Inspect IAT sensor. See Section F	39
IAT V (IAT sensor signal voltage)	V	Intake air temperature 20°C {68°F}: 2.9—3.3 V Intake air temperature 30°C {86°F}: 2.4—2.8 V	Inspect IAT sensor. See Section F	39
IGT (Ignition timing)	BTC	Ignition switch ON: 0.0 Idle: BTDC6°—18°	Inspect following PIDs: MAF V, IAT V, RPM, TP V, ECT V, PSP SW, NL SW, A/C SW, TEN. Inspect CMP sensor. See Section F Inspect idle speed and ignition timing. See F1-20 ENGINE TUNE-UP	26, 52
INJ (Fuel injection duration)	MS	Ignition switch ON: 0.0 ms Idle: 2.0—2.5 ms	Inspect following PIDs: MAF, V, IAT V, RPM, TP V, ECT V, NL SW, FHO2S, PSP SW, BRK SW, A/C SW, B+. Inspect CMP sensor. See Section F	74,75, 100,101
KR (Knocking retard)	DEG	Ignition switch ON: 0 DEG Idle: 0 DEG	Inspect knock sensor See Section F	57
L SW[*1] (TR switch [L range])	ON/OFF	L range: ON Others: OFF	Inspect TR switch. See Section K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	7
LINE[*1] (Pressure control solenoid)	A	ATF temperature at 60—70°C {140—158°F} • Idle: 0.94—0.96 A • Stall (D range): 0.25—0.35 A • Stall (R range): 0—0.05 A	Inspect pressure control solenoid. See Section K2-38 SOLENOID VALVES INSPECTION	44, 81
MAF V (MAF signal voltage)	V	Ignition switch ON: 1.2—1.6 V Idle: 1.5—2.5 V	Inspect MAF sensor. See Section F	88
NL SW (Load/no load condition signal)	ON/OFF	MTX: Neutral position: ON Clutch pedal depressed: ON Others: OFF	Inspect neutral switch. See Section F Inspect clutch switch. See Section F	64
		ATX: Selector lever at P or N: ON Others: OFF	Inspect TR switch. See Section K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	64
PRCV (Pressure regulator control)	ON/OFF	Ignition switch ON: OFF Idle: OFF Engine start at hot condition: ON	Inspect following PIDs: ECT V, IAT V, RPM, TP V, B+. Inspect PRC solenoid valve. See Section F	95

*1: For ATX

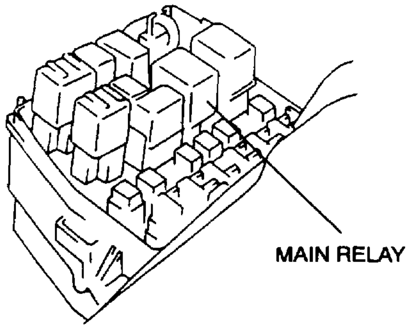
Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
PRGV (Purge solenoid valve duty value)	%	Ignition switch ON: 0% Idle: 0%	Inspect following PIDs: IAT V, RPM, ECT V, MAF V, TP V, FHO2S, B+. Inspect purge solenoid valve. See Section F	67
PSP SW (PSP switch)	ON/OFF	Steering wheel fully turned: ON Steering wheel in straight ahead position: OFF	Inspect PSP switch. See Section F	31
R SW[*1] (TR switch [R range])	ON/OFF	R range: ON Others: OFF	Inspect TR switch. See Section K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	32
RPM (Engine speed)	RPM	Idle: 600—700 rpm.	Inspect CKP sensor. See Section F	21, 22
RPM DES (Target engine speed)	RPM	No load: 650 rpm A/C ON: 650 rpm E/L operating (30—40A): 650rpm E/L operating (above 40A): 650rpm P/S operating: 650rpm	Inspect following PIDs: IAT V, RPM,ECT V, MAF V, TP V, NL SW, PSP SW, A/C SW, TEN. Inspect IAC valve. See Section F Inspect CKP sensor. See Section F	—
S SW[*1] (Transaxle range switch [S range])	ON/OFF	S range: ON Others: OFF	Inspect TR switch. See Section K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	9
SEGRP (EGR valve stepping motor) position)	STP	Ignition switch ON: 0 step Idle: 0 step Cranking: 40—60 steps	Inspect following PIDs: ECT V, TP V. Inspect EGR valve. See Section F	46,56, 68,72
SHIFT A[*1] (Shift solenoid A)	%	Fourth gear: 99% Others: 0%	Inspect shift solenoid A. See Section K2-38 SOLENOID VALVES INSPECTION	82
SHIFT B[*1] (Shift solenoid B)	%	First gear: 99% Others: 0%	Inspect shift solenoid B. See Section K2-38 SOLENOID VALVES INSPECTION	99
SHIFT C[*1] (Shift solenoid C)	%	First gear: 99% Second gear: 99% Others: 0%	Inspect shift solenoid C. See Section K2-38 SOLENOID VALVES INSPECTION	102
SHIFT D[*1] (Shift solenoid D)	ON/OFF	N or P position: ON Others: OFF	Inspect shift solenoid D. See Section K2-38 SOLENOID VALVES INSPECTION	27
SHIFT E[*1] (Shift solenoid E)	ON/OFF	Fourth gear at D range: ON Others: OFF	Inspect shift solenoid E. See Section K2-38 SOLENOID VALVES INSPECTION	1
TEN (TEN terminal (in DLC))	ON/OFF	Terminal TEN (DLC) shorted to GND: ON Terminal TEN (DLC) open: OFF	Inspect wiring from DLC terminal TEN to PCM terminal 1L	5
THOP[*1] (TP)	%	CTP: 0% WOT: 99%	Inspect TP sensor. See Section F	89
TP V (TP signal voltage)	V	CTP: 0.1—0.6 V WOT: 3.6—4.8 V	Inspect TP sensor. See Section F	89
TURBINE[*1] (Input/turbine speed signal)	RPM	Ignition switch ON: 0 rpm Idle: 675—825 rpm	Inspect input/turbine speed sensor. See Section K2-35 INPUT/TURBINE SPEED SENSOR INSPECTION	23, 84

*1: For ATX

Monitor Item (Definition)	Unit/ Condition		Condition/Specification	Action	PCM terminal
VS (Vehicle speed)	KPH	MPH	Vehicle speed 20 km/h {12 mph}: 20 km/h {12 mph} Vehicle speed 40 km/h {25 mph}: 40 km/h {25 mph}	ATX: Inspect VSS. See Section K2-36 VEHICLE SPEED SENSOR (VSS) INSPECTION MTX: Inspect instrument cluster. See Section T-26 INSTRUMENT CLUSTER INSPECTION	58

MAIN RELAY REMOVAL/INSTALLATION

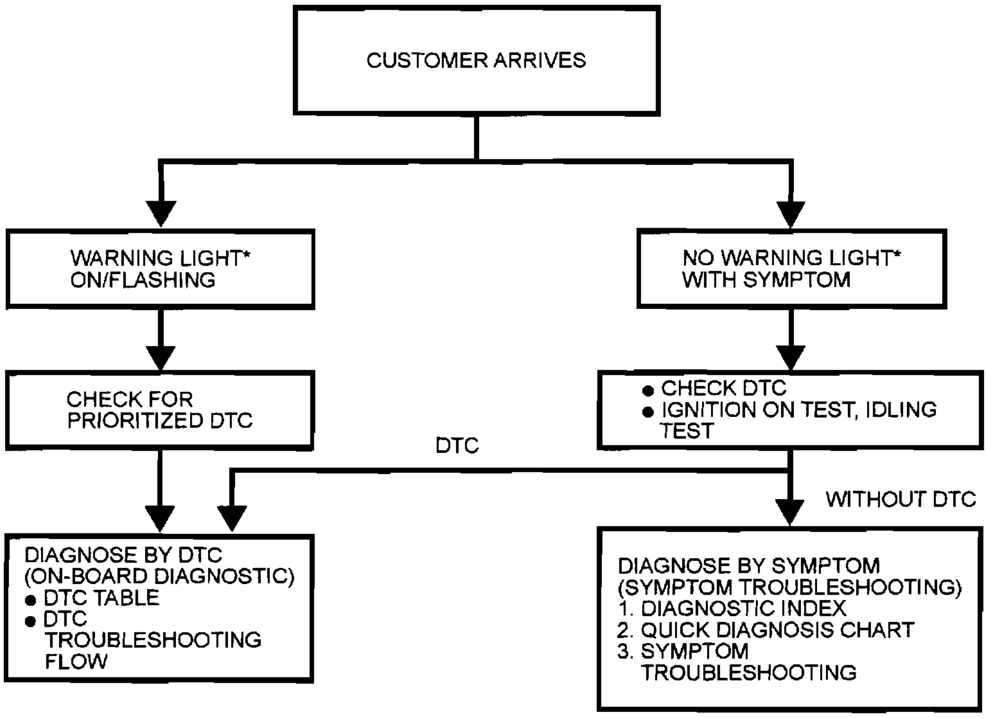
1. Disconnect the negative battery cable.
2. Remove the main relay.
3. Install in the reverse order of removal.



ON-BOARD DIAGNOSTIC

FOREWORD

- When the customer reports a vehicle malfunction, check the diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart.
  - —If the DTC exists, diagnose the applicable DTC inspection. (See F1-37 DTC TABLE.)
  - —If the DTC does not exist and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See F1-99 TROUBLESHOOTING ITEM TABLE)



*: Generator Warning Light, Security Light

OUTLINE

Except for GF4A-EL Models

Read/clear diagnostic test results

- This retrieves all stored DTCs in the PCM and clears the DTC.

Parameter identification (PID) access

- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since PID values for output devices are PCM internal data values, perform the Simulation Test to identify which output devices are malfunctioning.

Simulation test

- Output devices can be turned on and off by sending simulation command signals from the NGS tester to the PCM. The "Idling Test" and "Ignition ON Test" are available in this test. These tests will verify the PCM status, output devices, and related circuit wiring harnesses.

Diagnostic support procedure

- This tests the ability of the powertrain control system to detect a change in certain input devices by following the instructions on the NGS tester. There are two options: **ALL TEST** and **SINGLE TEST**. **ALL TEST** takes you through all the diagnostic support tests. **SINGLE TEST** enables you to perform specific tests that relate to the particular diagnosis that you are conducting. This test MUST follow the instructions on the NGS tester. If not, a "**TEST CONDITIONS NOT CORRECT**" message will appear, or else the test result will be **FAULTY**.

ON-BOARD DIAGNOSTIC TEST

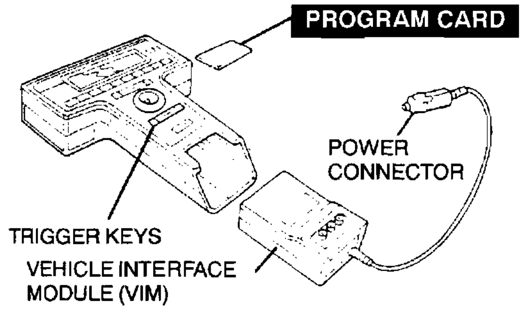
Except for GF4A-EL Models

NGS tester hook-up procedure

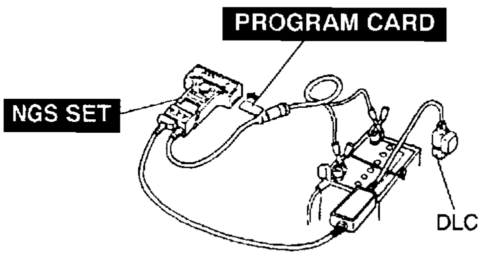
Note

- Make sure the ignition key is OFF.

1. Insert the vehicle interface module and latest program card into the hand-held NGS control unit.



2. Plug the adapter harness connector into the cigarette lighter.
3. Plug the NGS tester power connector into the NGS OBD-II adapter power cable connector or cigarette lighter. Alternatively, enable to use a battery hook-up adapter.
4. Alternatively, use a battery hook-up adapter.

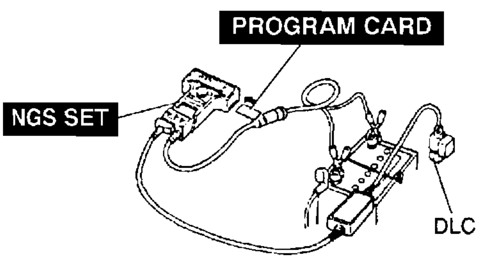


5. Listen to the double beep.
6. The NGS tester is now initialized.

DTCs reading procedure
Using the NGS tester

Note
- Start the engine and keep it running. If the engine will not start, turn the ignition key to ON during the procedure.

1. Perform the necessary vehicle preparation and visual inspection.
2. Hook the NGS tester up to the vehicle.



3. Move the cursor to **VEHICLE & ENGINE SELECTION.**
4. Press the **TRIGGER** key to enter this selection.

```
VEHICLE & ENGINE SELECTION
DIAGNOSTIC DATA LINK
VIEW RECORDER AREAS
DIGITAL MEASUREMENT SYSTEM
NEW GENERATION STAR SETUP
SELECT ITEM AND PRESS TRIGGER TO START
```

5. Move the cursor to **SELECT NEW VEHICLE YEAR & MODEL.**
6. Press the **TRIGGER** key to enter this selection.

```
NO VEHICLE SELECTED
SELECT NEW VEHICLE YEAR & MODEL
DESELECT CURRENT MODEL
SELECT ITEM AND PRESS TRIGGER TO START
```

```
1999-
1998
1997
1996
1995                                  ↓
SELECT ITEM AND PRESS TRIGGER TO START
```

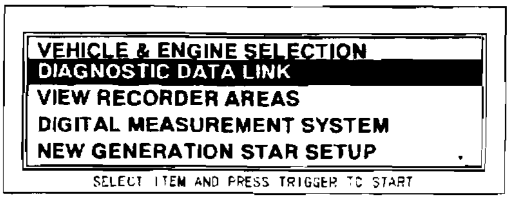
7. Move the cursor to **626 (GF)** or **626 WAGON (GW)**.
8. Press the **TRIGGER** key to enter this selection.

```
323 (BJ)
626/MX-6 (GF)
626 (GF)
626 WAGON (GW)
MX-3 (EC)                             ↓
SELECT VEHICLE AND PRESS TRIGGER TO START
```

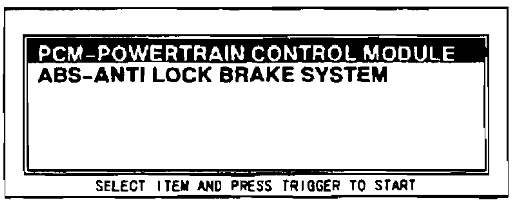
Note
- Make sure the selected vehicle is correct.

9. A vehicle selection screen showing the selected vehicle will be displayed.
10. Move the cursor to the vehicle selected.

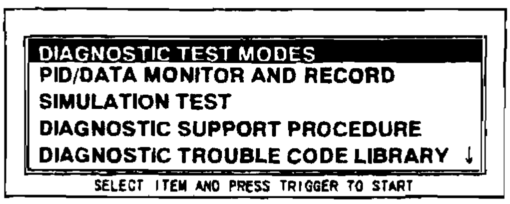
11. Press the **TRIGGER** key.
12. Move the cursor to **DIAGNOSTIC DATA LINK** on the main menu screen.
13. Press the **TRIGGER** key to enter into menu system diagnostics.



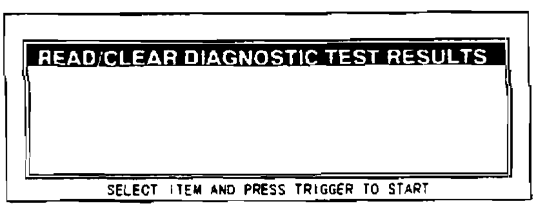
14. Move the cursor to **PCM - POWERTRAIN CONTROL MODULE.**
15. Press the **TRIGGER** key to enter this selection.



16. Move the cursor to **DIAGNOSTIC TEST MODES.**
17. Press the **TRIGGER** key to enter this selection.



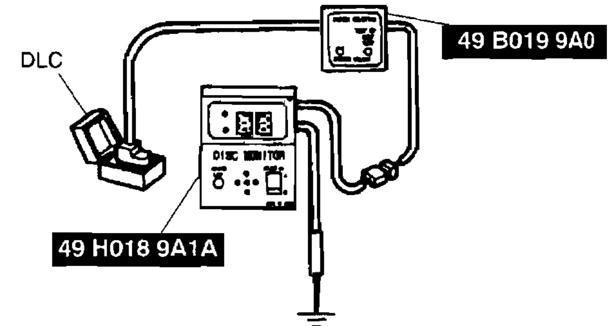
18. Move the cursor to **READ/CLEAR DIAGNOSTIC TEST RESULTS.**
19. Press the **TRIGGER** key to enter this selection.



20. Press **START.**
21. Retrieve DTCs.

Using the self-diagnosis checker

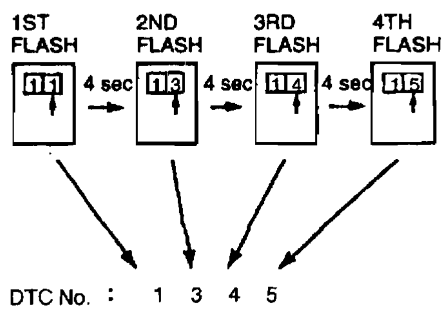
1. Connect the **SSTs** to the DLC located in the engine compartment and ground the black (negative) lead to the body.



2. Set the select switch on the **SST** (self-diagnosis checker) to A.
3. Turn the dial switch on the **SST** (system selector) to 1, and the test switch to SELF TEST.
4. Turn the ignition key to ON (engine off).
5. Verify that the buzzer sounds for **approximately 3 seconds** and code "88" flashes for **5 seconds.**
   - If DTC is not detected, "00" will then be indicated.
   - If any DTCs are indicated, inspect the appropriate area and repair as necessary.

Note
- If the "88" does not flash, inspect + B terminal of the DLC, and the related harnesses and connectors. If the "88" flashes and the buzzer sound **more than 20 seconds**, inspect the harness between the PCM terminal and the DLC. If the harness is normal, replace the PCM and inspect.
- A DTC consists of four numbers. They are flashed one by one in the right window on the display. ("1" is always shown on the left window.)

6. After completion of repairs, erase all DTCs from the memory. (See F1-36 Not using the NGS tester.)
7. Remove the **SSTs.**



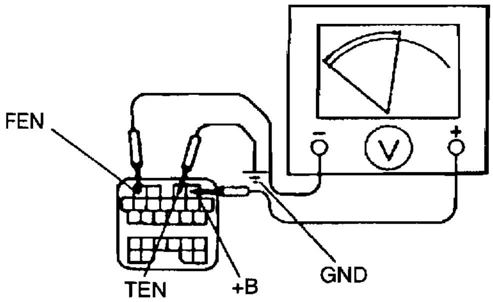
Using the voltmeter

1. Turn the ignition key to OFF.

2. Short terminal TEN of the DLC located in the engine compartment to body GND using a jumper wire.

Caution
- **Connecting the wrong DLC terminals may possibly cause a malfunction. Carefully connect the specified terminals only.**

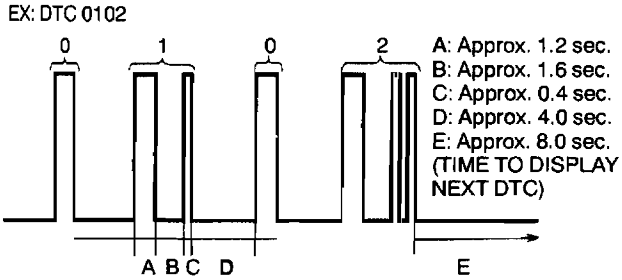
3. Connect the negative battery lead of voltmeter (20 V range) to the DLC terminal FEN, and the positive lead to the DLC terminal +B.



4. Turn the ignition key to ON (engine off).
5. The voltmeter indicates the **B+** for **approximately 3 seconds**, then indicates **0 V**.
6. Read the DTCs indicated by the movement of the voltmeter's needle.
   - If no DTC is detected, the needle does not move.
   - If any DTCs are indicated, inspect the appropriate area and repair as necessary.

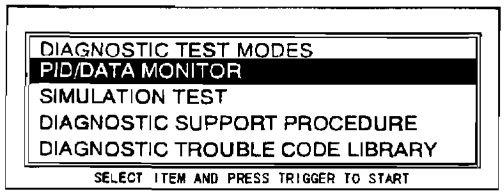
Note
- The DTC will be output as shown.

EX: DTC 0102



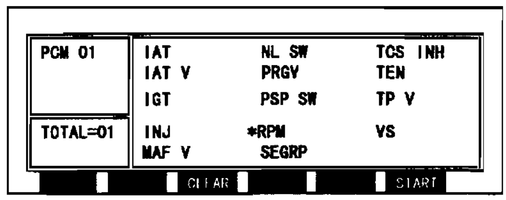
7. After completion of repairs, erase all DTCs from the memory. (See F1-36 Not using the NGS tester.)
8. Remove the voltmeter and jumper wire.

PID/DATA monitor and record procedure
1. Perform the NGS tester Hook-up Procedure.
2. Perform Steps 1 through 15 from the DTCs Reading Procedure.
3. Turn the ignition key to ON (Engine OFF) or engine start.
4. Move the cursor to **PID/DATA MONITOR AND RECORD.**
5. Press the **TRIGGER** key to enter this selection.

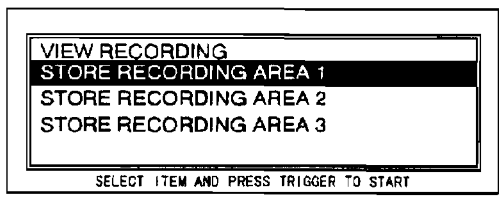


6. Move the cursor to PID values to view.
7. Press the **TRIGGER** key. A star symbol will appear next to the item when it is selected.

Note
- Press the **TRIGGER** key once again to deselect a PID.
- Press **CLEAR** to deselect all PIDs.



8. Press **START** to begin.
9. When ready to capture and store the selected PIDs, press the **TRIGGER** key.
10. Press the **TRIGGER** key again when ready to save information.
11. Move the cursor to **STORE RECORDING AREA 1.**
12. Press the **TRIGGER** key.



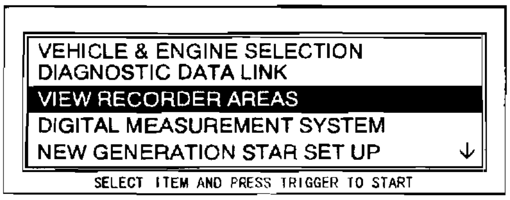
13. Follow the instructions displayed on the NGS tester to save the recording data.

Playback of stored PIDs procedure

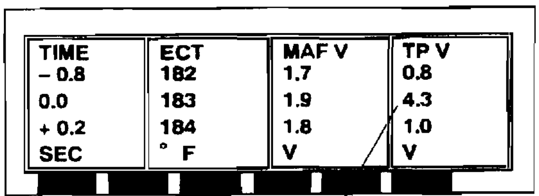
Note
- Look for abnormal behavior or values that are clearly incorrect. Inspect the signals for abrupt or unexpected changes.
- Look for agreement in related signals.

- Make sure signals act in proper sequence.

1. Select **VIEW RECORDER AREAS.**

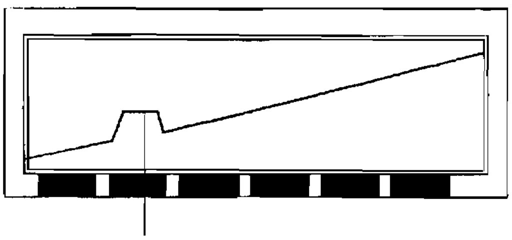


2. Select up to the four PIDs to review in the table format or two PIDs to review in the graph mode.
   (1) Table format: Scroll through the PID data while analyzing the information. Look for sudden drops or peaks in the values.



SUDDEN PEAK—POSSIBLE FAULT

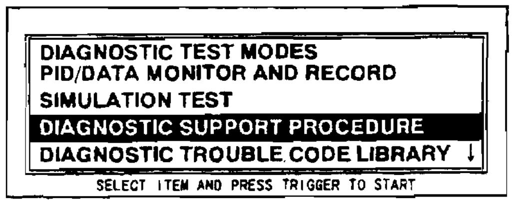
   (2) Graph format: Scroll through the PID data while analyzing the information. Look for sudden drops or spikes in the linear lines showing the transformation of values to the line graph.



NON LINEAR—POSSIBLE FAULT IN SENSOR/CIRCUIT

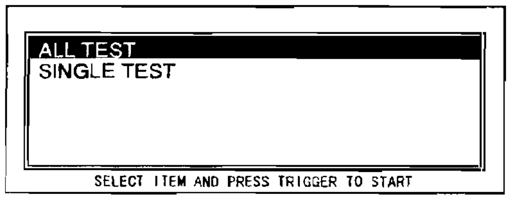
Diagnostic support procedure

1. Perform the NGS Tester Hook-up Procedure.
2. Perform Steps 1 through 15 from the DTC Reading Procedure. (See F1-31 Using the NGS tester.)
3. Move the cursor to **DIAGNOSTIC SUPPORT PROCEDURE.**
4. Press the **TRIGGER** key to enter this selection.



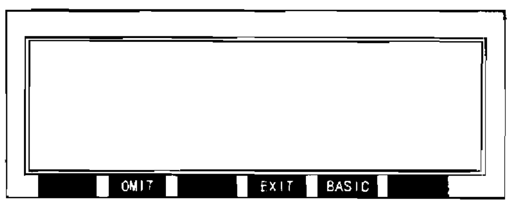
5. Move the cursor to **ALL TEST** or **SINGLE TEST.**
6. Press the **TRIGGER** key.

Note
- **ALL TEST** inspects each item according to an established programmed order. With **SINGLE TEST**, enable to select and inspect any test item in any order, one at a time.



7. Follow the instructions displayed on the NGS tester.
8. Press the **TRIGGER** key.

Note
- To skip a test item, press **OMIT.**
- Before performing the test, the basic condition on the test vehicle must be set-up in order to get exact data. Press **BASIC** to view the basic condition instruction screen.
- If the screen shows **PASSED**, the system operates correctly.
- If the screen shows **FAULTY**, the system operates incorrectly.



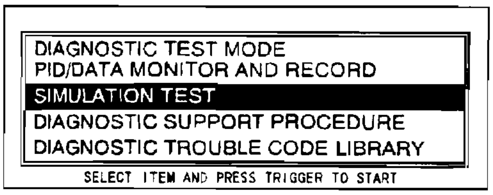
Diagnostic support procedure table

Diagnostic table
READ/CLEAR DIAGNOSTIC TEST RESULT
TPS. CTP SW TEST
TR, SHIFT SW TEST
MAF/VAF TEST
BASIC SW TEST

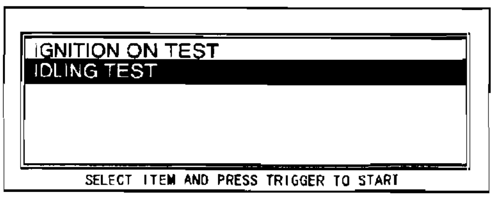
Simulation Test Procedure

Idling test

1. Perform the **NGS tester hook-up procedure**.
2. Perform Steps 1 through 15 from the DTCs Reading Procedure.
3. Start the engine and run it at idle.
4. Move the cursor to **SIMULATION TEST**.
5. Press the **TRIGGER** key to enter this selection.



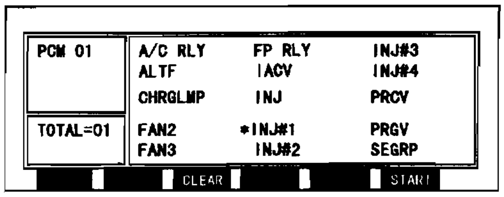
6. Move the cursor to **IDLING TEST**.
7. Press the **TRIGGER** key to enter this selection.



8. The screen will display PIDs. Select the appropriate PID for testing, then press the **TRIGGER** key.

Note

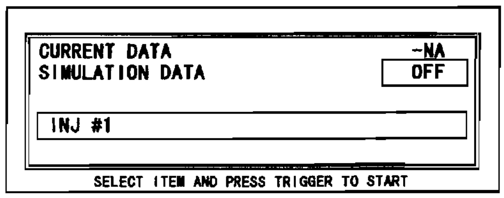
- Only one PID can be selected at a time.



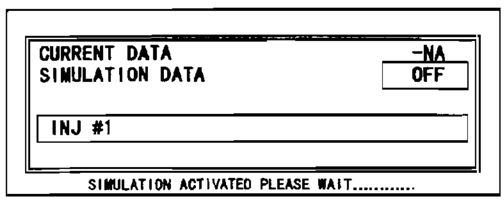
9. Press **START**.

Note

- If the screen displays "**TEST CONDITION NOT CORRECT**", inspect the following three signal conditions and determine whether or not they are normal:
  — Idle SW: ON (Equipped vehicles)
  — TR SW: P or N
  — RPM: above 550



10. Press the **TRIGGER** key.
11. The simulation is performed **for 3 seconds**, and a **"SIMULATION ACTIVATED PLEASE WAIT"** message is displayed during those **3 seconds**.

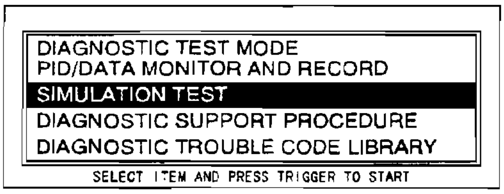


12. To perform the simulation again, press the **TRIGGER** key. To exit the idling test, press the cancel key.

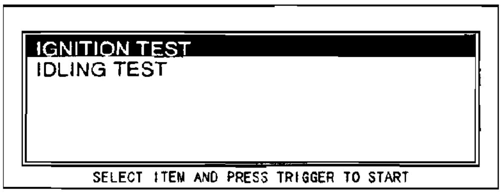
Ignition on test

1. Perform Steps 1 through 15 from the **DTCs Reading Procedure**.
2. Turn the ignition key to ON (Engine OFF).
3. Move the cursor to **SIMULATION TEST**.

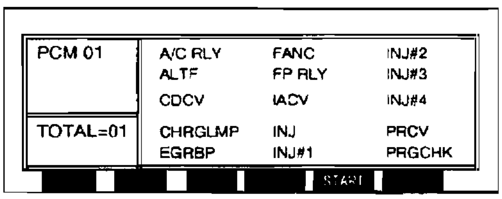
4. Press the **TRIGGER** key to enter this selection.

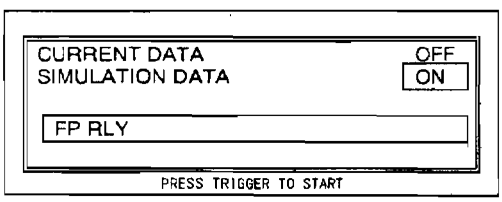


5. Move the cursor to **IGNITION TEST**.
6. Press the **TRIGGER** key to enter this selection.



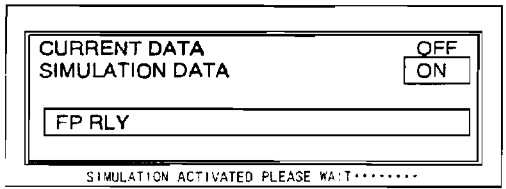
7. The screen will display a list of PIDs. Select the appropriate PID for testing, then press the **TRIGGER** key.
8. Press **START**.



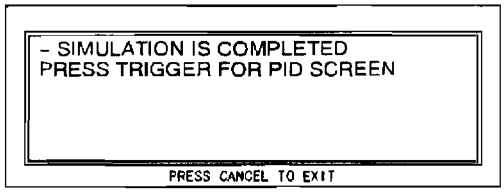


9. Press the **TRIGGER** key.

10. The simulation is performed **for 3 seconds**, and a **"SIMULATION ACTIVATED PLEASE WAIT"** message is displayed during those **3 seconds**.



11. To perform the simulation again, press the **TRIGGER** key. To exit the **IGNITION TEST**, press the **CANCEL** key.



AFTER REPAIR PROCEDURE
Except for GF4A-EL Models
Using the NGS tester

1. After repairs have been made, perform the DTC Reading Procedure. (See F1-31 Using the NGS tester.)
2. Press **CLEAR**.
3. Press the **TRIGGER** key.
4. Press the **CANCEL** key.
5. Ensure that the customer's concern has been resolved.

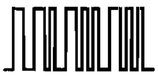
Not using the NGS tester

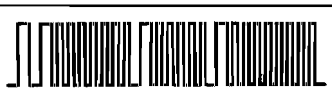
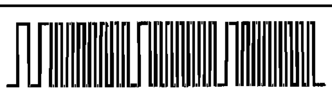
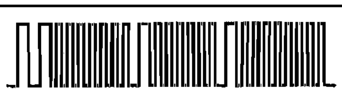
1. After repairs, disconnect the negative battery cable for at least **20 seconds**, and depress the brake pedal.
2. Reconnect the negative battery cable.
3. Warm up the engine to normal operating temperature.

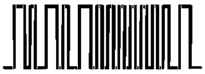
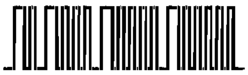
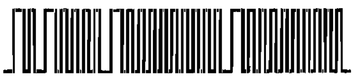
Note
- If the engine will not start, keep the starter operated for **5—6 seconds.**

4. Perform the "DTC READING PROCEDURE" again.
5. Verify that the DTC is not detected.

DTC TABLE

DTC	Output pattern	Display on NGS tester	Possible cause	Page
P0102		MAF/VAF -CIRCIUT LOW INPUT	MAF circuit low input	(See F1-41 DTC P0102)
P0103		MAF/VAF -CIRCIUT HIGH INPUT	MAF circuit high input	(See F1-43 DTC P0103)
P0112		IAT -CIRICUIT LOW INPUT	IAT circuit low input	(See F1-45 DTC P0112)
P0113		IAT -CIRCIUT HIGH INPUT	IAT circuit high Input	(See F1-47 DTC P0113)
P0117		ECT -CIRCIUT LOW INPUT	ECT circuit low input	(See F1-49 DTC P0117)
P0118		ECT -CIRCUIT HIGH INPUT	ECT circuit high input	(See F1-51 DTC P0118)
P0122		TP -CIRCUIT LOW INPUT	TP circuit low input	(See F1-53 DTC P0122)
P0123		TP -CIRCUIT HIGH INPUT	TP circuit high input	(See F1-55 DTC P0123)
P0134		O2S 11 -CIRCUIT NO ACTIVITY DETECTED	HO2S circuit no activity detected	(See F1-57 DTC P0134)
P0135		O2S 11 -HEATER CIRCUIT MALFUNCTION	HO2S heater circuit malfunction	(See F1-59 DTC P0135)
P0328		KNOCK SENSOR 1 -CIRCUIT HIGH INPUT	Knock sensor circuit high input	(See F1-61 DTC P0328)
P0335		CRANKSHAFT POS SENSOR -CKT MALFUNCTION	CKP sensor circuit malfunction	(See F1-62 DTC P0335)
P0443		EVAP SYSTEM -PURGE CTRL VALVE CKT MALF	Purge control solenoid valve circuit malfunction	(See F1-64 DTC P0443)
P0500		VEHICLE SPEED SENSOR -MALFUNCTION	(See K2-66 DTC P0500)	
P0705		TRANS RANGE SENSOR -CKT MALFUNCTION	(See K2-69 DTC P0705)	
P0706		TRANS RANGE SENSOR -CKT RANGE/PERF	(See K2-72 DTC P0706)	
P0710		TRANS FLUID TEMP SENS -CKT MALFUNCTION	(See K2-75 DTC P0710)	
P0711		TRANS FLUID TEMP SENS -CKT RANGE/PREF	(See K2-78 DTC P0711)	
P0715		INPUT/TSS -CIRCUIT MALFUNCTION	(See K2-79 DTC P0715)	

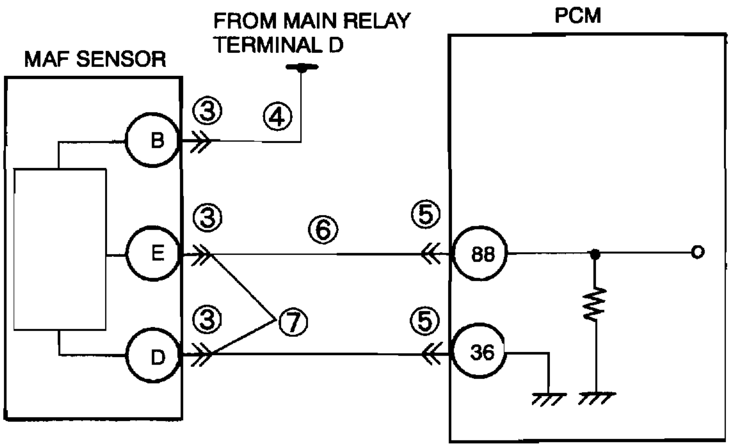
DTC	Output pattern	Display on NGS tester	Possible cause	Page
P0731		GEAR 1 -INCORRECT RATIO	(See K2-82 DTC P0731)	
P0732		GEAR 2 -INCORRECT RATIO	(See K2-84 DTC P0732)	
P0733		GEAR 3 -INCORRECT RATIO	(See K2-87 DTC P0733)	
P0734		GEAR 4 -INCORRECT RATIO	(See K2-90 DTC P0734)	
P0741		TORQUE CONV CLUTCH SYS -PERF/STUCK	(See K2-93 DTC P0741)	
P0742		TORQUE CONV CLUTCH SYS -STUCK ON	(See K2-95 DTC P0742)	
P0745		PRESSURE CTRL SOLENOID -MALFUNCTION	(See K2-97 DTC P0745)	
P0751		SHIFT SOLENOID A -PERF/STUCK	(See K2-100 DTC P0751)	
P0752		SHIFT SOLENOID A -STUCK ON	(See K2-102 DTC P0752)	
P0753		SHIFT SOLENOID A -ELECTRICAL	(See K2-104 DTC P0753)	
P0756		SHIFT SOLENOID B -PERF/STUCK	(See K2-107 DTC P0756)	
P0757		SHIFT SOLENOID B -STUCK ON	(See K2-109 DTC P0757)	
P0758		SHIFT SOLENOID B -ELECTRICAL	(See K2-111 DTC P0758)	
P0761		SHIFT SOLENOID C -PERF/STUCK	(See K2-114 DTC P0761)	
P0762		SHIFT SOLENOID C -STUCK ON	(See K2-116 DTC P0762)	
P0763		SHIFT SOLENOID C -ELECTRICAL	(See K2-118 DTC P0763)	
P0766		SHIFT SOLENOID D -PERF/STUCK	(See K2-121 DTC P0766)	
P0767		SHIFT SOLENOID D -STUCK ON	(See K2-123 DTC P0767)	
P0768		SHIFT SOLENOID D -ELECTRICAL	(See K2-125 DTC P0768)	
P0771		SHIFT SOLENOID E -PERF/STUCK	(See K2-128 DTC P0771)	

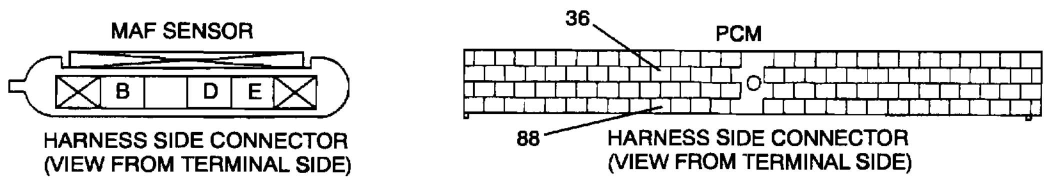
DTC	Output pattern	Display on NGS tester	Possible cause	Page
P0772		SHIFT SOLENOID E -STUCK ON	(See K2-130 DTC P0772)	
P0773		SHIFT SOLENOID E -ELECTRICAL	(See K2-132 DTC P0773)	
P1170		HO2S 11-INVERSION	HO2S no inversion	(See F1-66 DTC P1170)
P1250		PRC-OPEN OR SHORT	Pressure regulator control (PRC) valve circuit malfunction	(See F1-68 DTC P1250)
P1345		SGC SIGNAL-NO SGC SIGNAL	CMP sensor circuit malfunction	(See F1-70 DTC P1345)
P1496		EGR STEPPING MOTOR 1 -OPEN OR SHORT	EGR valve motor coil 1 open or short	(See F1-72 DTC P1496)
P1497		EGR STEPPING MOTOR 2 -OPEN OR SHORT	EGR valve motor coil 2 open or short	(See F1-74 DTC P1497)
P1498		EGR STEPPING MOTOR 3 -OPEN OR SHORT	EGR valve motor coil 3 open or short	(See F1-76 DTC P14978)
P1499		EGR STEPPING MOTOR 4 -OPEN OR SHORT	EGR valve motor coil 4 open or short	(See F1-78 DTC P1499)
P1504		IAC – CKT MALFUNCTION	IAC valve circuit malfunction	(See F1-80 DTC P1504)
P1562		PCM +BB VOLTAGE LOW	Battery voltage circuit malfunction	(See F1-82 DTC P1562)
P1602		IMMOBILIZER UNIT-PCM COMM ERROR	Immobilizer unit-PCM communication error	(See F1-84 DTC P1602)
P1603		ID NUMBER-UNREGISTERED	Key ID numbers are not registered in PCM	(See F1-87 DTC P1603)
P1604		CODE WORD-UNREGISTERED	Code word is not registered in PCM	(See F1-87 DTC P1604)
P1608		PCM (CPU)-MALFUNCTION	Malfunction in PCM circuit	(See F1-88 DTC P1608)
P1621		CODE WORDS-DO NOT MATCH	Code word mismatch after engine cranking	(See F1-89 DTC P1621)
P1622		ID NUMBER-DO NOT MATCH	Key ID number mismatch	(See F1-89 DTC P1622)
P1623		CODE WORD ID NUMBER WRITE/READ ERROR	Code word or key ID number read/write error in PCM	(See F1-90 DTC P1623)
P1624		IMMOBILIZER COMMUNICATION COUNTER=0	Immobilizer system communication counter = 0	(See F1-90 DTC P1624)

DTC	Output pattern	Display on NGS tester	Possible cause	Page
P1627		PCM/TCS LINE-COMMUNICATION ERROR	PCM/TCM line -communication error	(See F1-91 DTC P1627)
P1631		GENERATOR -NO GENERATE ELECTRICITY	Generator output voltage signal no electricity	(See F1-93 DTC P1631)
P1633		BATTERY VOLTAGE CIRCUIT-MALFUNCTION	Battery overcharge	(See F1-95 DTC P1633)
P1634		GENERATOR BATTERY TERMINAL-OPEN	Generator terminal B circuit open	(See F1-97 DTC P1634)

DTC P0102
Except for GF4A-EL Models

DTC P0102	MAF circuit low input
DETECTION CONDITION	• PCM monitors input voltage from MAF sensor when engine speed is **above 500 rpm**. If input voltage at PCM terminal 88 is **below 0.3 V**, PCM determines that MAF circuit has a malfunction.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to ground in wiring between MAF sensor terminal E and PCM terminal 88 • Open circuit in wiring between MAF sensor terminal E and PCM terminal 88 • Open circuit in wiring between main relay and MAF sensor terminal B





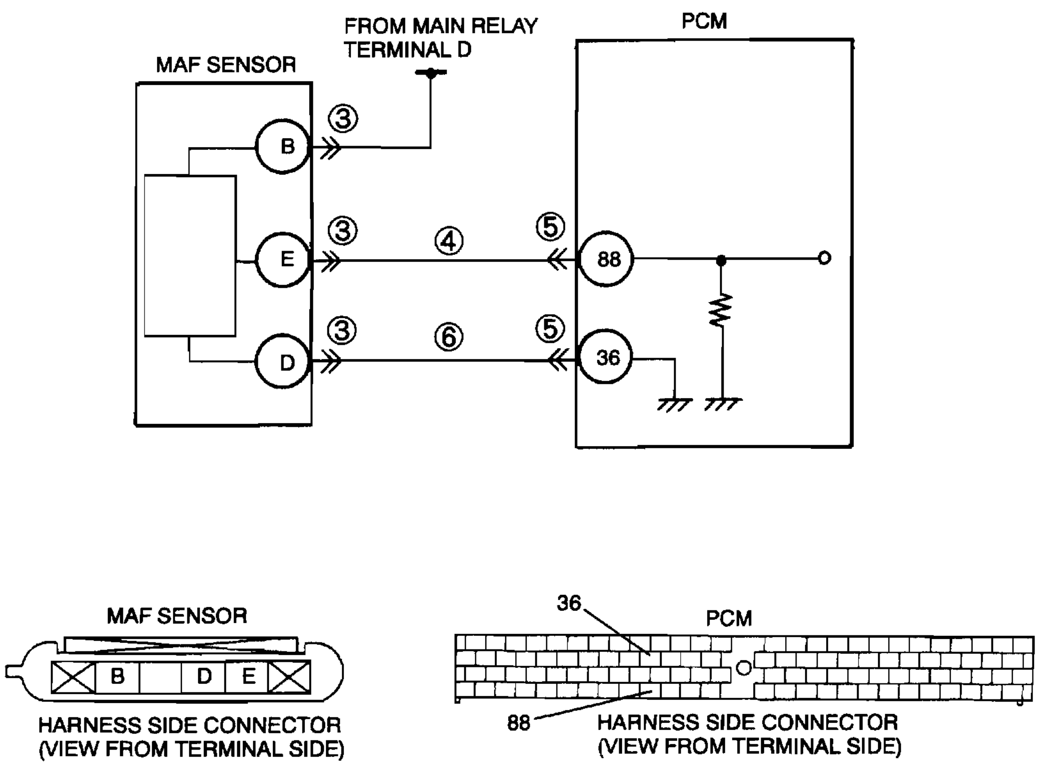
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS – IS CONCERN INTERMITTENT OR CONSTANT** • Connect NGS tester to DLC. • Start engine. • Access MAF V PID using NGS tester. • Is MAF V PID **above 0.3 V**?	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1–142 No.26 INTERMITTENT CONCERNS)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect the MAF sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**CHECK POWER SUPPLY CIRCUIT FOR OPEN** • Turn ignition key to ON (Engine OFF). • Check voltage at MAF sensor terminal B (harness-side). • Is there voltage **B+**?	Yes	Go to next step.
		No	Inspect for open circuit in wiring harness between MAF sensor terminal B (harness-side) and main relay. Repair or replace harness, then go to Step 8.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
6	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN** • Check for continuity between MAF sensor terminal E (harness-side) and PCM terminal 88 (harness-side). • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 8.
7	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT** • Check continuity between following circuits: — MAF sensor terminal E (harness-side) and body ground — MAF sensor connector terminals D (harness-side) and E (harness-side) • Are there any continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Replace MAF sensor, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from memory using NGS tester. • Access MAF V **PID** using NGS tester. **Note** • MAF V PID should indicate **within 0.3— 4.3 V.** • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-**37** DTC TABLE)
		No	Troubleshooting completed.

DTC P0103
Except for GF4A-EL Models

DTC P0103	MAF circuit high input
DETECTION CONDITION	• PCM monitors input voltage from MAF sensor when engine speed is **below 4100 rpm.** If input voltage at PCM terminal 88 is **above 4.3 V**, PCM determines that MAF circuit has a malfunction.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Open circuit in wiring between MAF sensor terminal D and PCM terminal 36



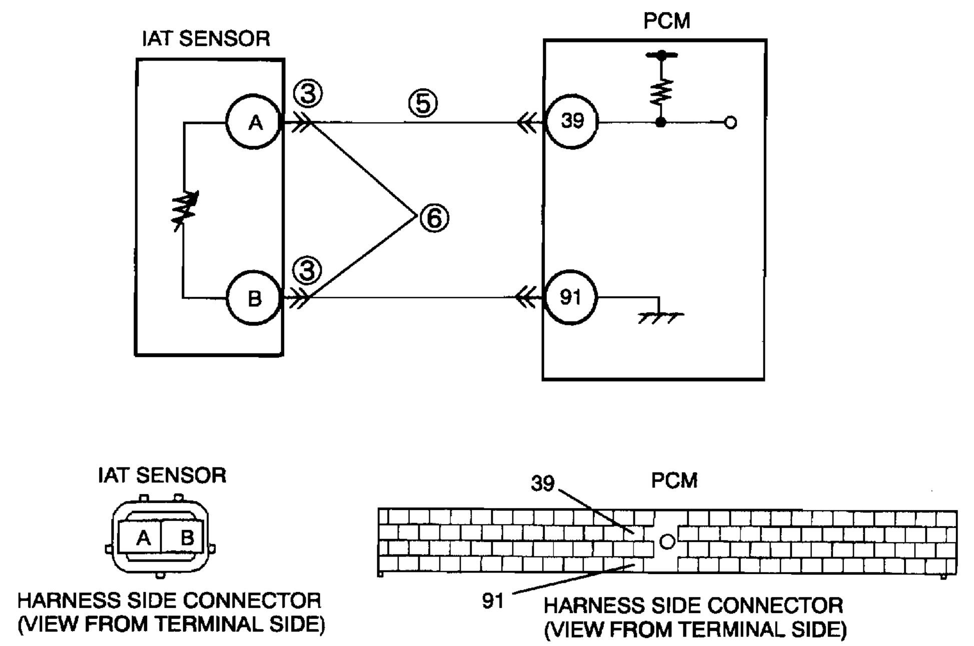
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT** • Connect NGS tester to DLC • Start engine. • Access MAF V PID using NGS tester. • Is MAF V PID **below 4.3 V**?	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect the MAF sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace terminals, then go to Step 7.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT MAF SIGNAL CIRCUIT FOR SHORT TO POWER CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between MAF sensor terminal E (harness-side) and body ground. • Is there voltage **0 V**?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 7.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT MAF SENSOR GROUND CIRCUIT FOR OPEN** • Check for continuity between MAF sensor terminal D (harness-side) and PCM terminal 36 (harness-side). • Is there any continuity?	Yes	Replace MAF sensor, then go to next step.
		No	Repair or replace suspected harness, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from memory using NGS tester. • Access MAF V PID using NGS tester. **Note** • MAF V PID should indicate **within 0.3— 4.3 V.** • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0112
Except for GF4A-EL Models

DTC P0112	IAT circuit low input
DETECTION CONDITION	• PCM monitors IAT sensor signal at PCM terminal 39. If PCM detects IAT sensor voltage **below 0.2 V**, PCM determines that IAT sensor circuit has malfunction.
POSSIBLE CAUSE	• IAT sensor malfunction • Short to ground circuit between IAT sensor terminal A and PCM terminal 39 • Short each harness IAT signal circuit and IAT ground circuit. • PCM malfunction



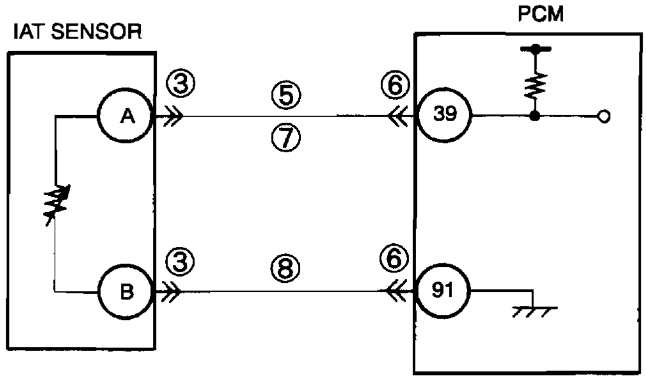
Diagnostic procedure

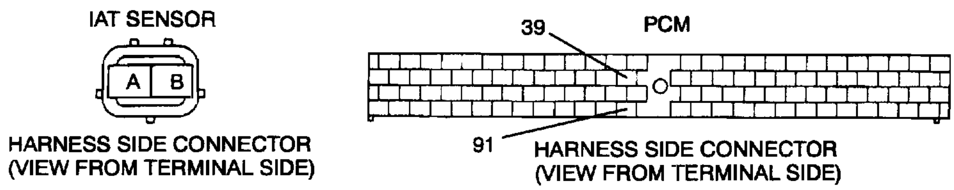
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS– IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to ON (Engine OFF). • Access IAT V PID using NGS tester. • Is IAT V PID **below 0.2 V**?	Yes	Go to next step.
		No	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1–142 No.26 INTERMITTENT CONCERNS)
3	**INSPECT MAF SENSOR TERMINAL** • Turn ignition key to OFF. • Disconnect IAT sensor connector. • Check IAT sensor terminals A and B (part-side) for bent. • Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**CLASSIFY IAT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Disconnect IAT sensor connector. • Turn ignition key to ON (Engine OFF). • Access IAT V PID using NGS tester. • Is IAT V PID **below 0.2 V**?	Yes	Go to next step.
		No	Replace IAT sensor, then go to Step 7.

STEP	INSPECTION		ACTION
5	**INSPECT IAT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Check continuity between MAF sensor terminal A (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to Step 7.
		No	Go to next step.
6	**INSPECT IAT CIRCUITS FOR SHORT** • Check continuity between MAF sensor terminals A and B (harness-side). • Is there any continuity?	Yes	Repair or replace harness, then go to Step 7.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0113
Except for GF4A-EL Models

DTC P0113	IAT circuit high input
DETECTION CONDITION	• PCM monitors IAT sensor signal at PCM terminal 39. If PCM detects IAT sensor voltage **above 4.6 V**, PCM determines that IAT sensor circuit has malfunction.
POSSIBLE CAUSE	• IAT sensor malfunction • Open circuit between IAT sensor terminal A and PCM terminal 39. • Short to power circuit between IAT sensor terminal A and PCM terminal 39. • Open circuit between IAT sensor terminal B and PCM terminal 91. • Poor connection of IAT sensor or PCM connectors. • PCM malfunction





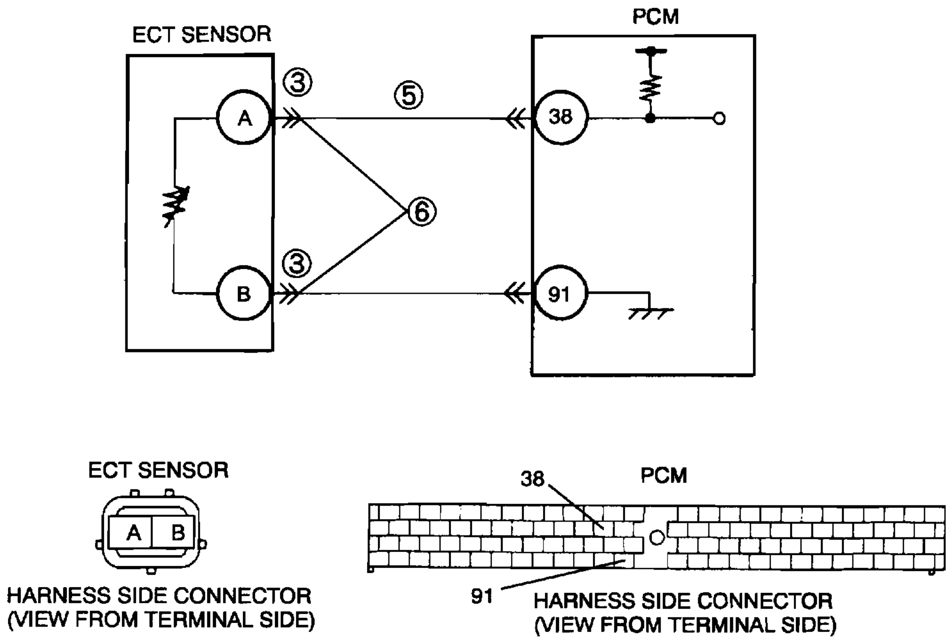
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS– IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to ON (Engine OFF). • Access ECT V PID using NGS tester. • Is ECT V PID **above 4.6V**?	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF IAT SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect IAT sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**CLASSIFY IAT SENSOR OR HARNESS MALFUNCTION** • Connect jumper wire between A and B (harness-side) • Access IAT V PID using **NGS** tester. • Is IAT V PID **approx. 0 V**?	Yes	Replace IAT sensor, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between IAT sensor terminal A (harness-side) and body ground. • Is voltage B+?	Yes	Repair or replace harness, then go to Step 9.
		No	Go to next step.
6	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR OPEN** • Check continuity between IAT sensor terminal A (harness-side) and PCM terminal 39. • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 9.
8	**INSPECT ECT SENSOR GROUND CIRCUIT FOR OPEN** • Check continuity between IAT sensor terminal B (harness-side) and PCM terminal 91. • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0117
Except for GF4A-EL Models

DTC P0117	ECT circuit low input
DETECTION CONDITION	• PCM monitors ECT sensor signal at PCM terminal 38. If PCM detects ECT sensor voltage is **below 0.2 V**, PCM determines that ECT sensor circuit has malfunction.
POSSIBLE CAUSE	• ECT sensor malfunction • Short to ground circuit between ECT sensor terminal A and PCM connector terminal 38. • Short each harness ECT signal circuit and ECT ground circuit. • PCM malfunction



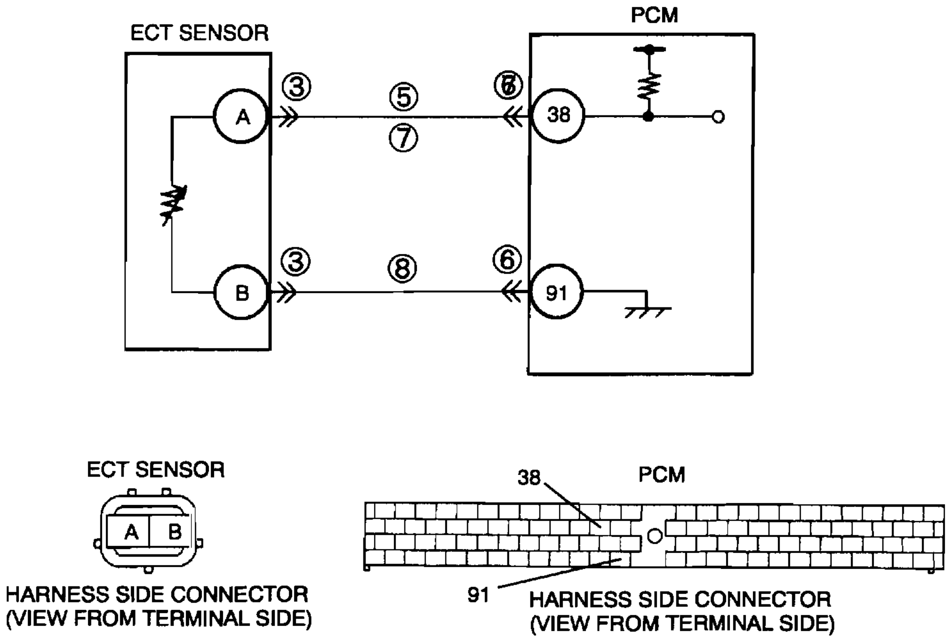
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS– IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to ON (Engine OFF). • Access ECT V PID using NGS tester. • Is ECT V PID **below 0.2 V**?	Yes	Go to next step.
		No	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**INSPECT TERMINAL BENT** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Check ECT sensor terminals A and B (harness-side) for bent. • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**CLASSIFY ECT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Disconnect ECT sensor connector. • Turn ignition key to ON (Engine OFF). • Access ECT V PID using NGS tester. • Is ECT V PID **below 0.2 V**?	Yes	Go to next step.
		No	Replace ECT sensor, then go to Step 7.

STEP	INSPECTION		ACTION
5	**INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Check continuity between ECT sensor terminal A (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to Step 7.
		No	Go to next step.
6	**INSPECT IAT CIRCUIT FOR SHORT** • Check continuity between ECT sensor terminals A and B (harness-side). • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0118
Except for GF4A-EL Models

DTC P0118	ECT circuit high input
DETECTION CONDITION	• PCM monitors ECT sensor signal at PCM terminal 38. If PCM detects ECT sensor voltage **above 4.6 V**, PCM determines that ECT sensor circuit has malfunction.
POSSIBLE CAUSE	• ECT sensor malfunction • Open circuit between ECT sensor terminal A and PCM terminal 38. • Short to power circuit between ECT sensor terminal A and PCM terminal 38. • Open circuit between ECT sensor terminal B and PCM terminal 91. • Poor connection of ECT sensor or PCM connectors. • PCM malfunction



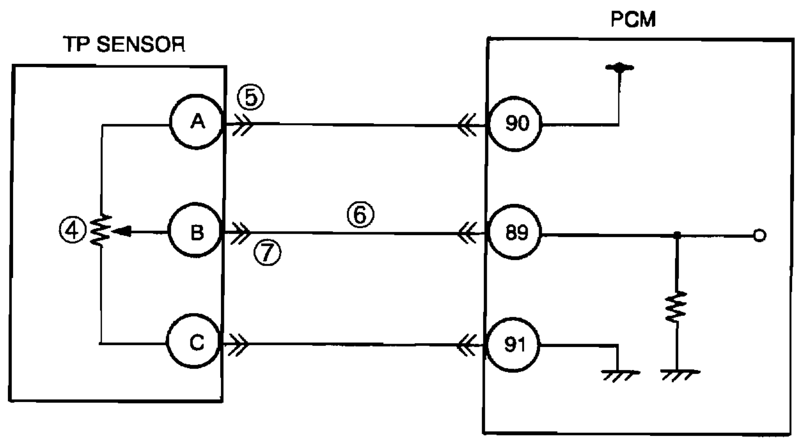
Diagnostic procedure

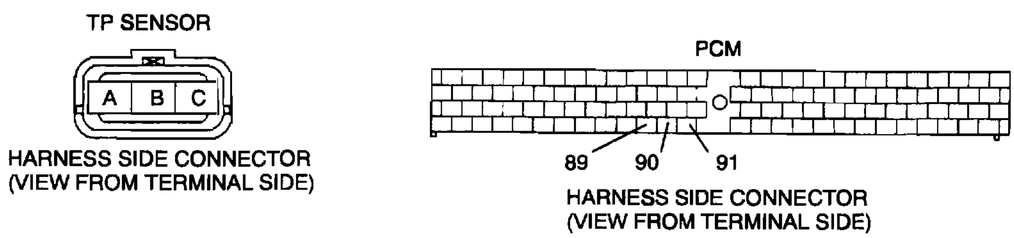
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS– IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to ON (Engine OFF). • Access ECT V PID using NGS tester. • Is ECT V PID **above 4.6 V**?	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF ECT SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**CLASSIFY ECT SENSOR OR HARNESS MALFUNCTION** • Connect jumper wire between A and B (harness-side) • Access ECT V PID using NGS tester. • Is ECT V PID **approx. 0 V**?	Yes	Replace ECT sensor, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between ECT sensor terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness, then go to Step 9.
		No	Go to next step.
6	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out pins, corrosion, etc.). • Are there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR OPEN** • Check continuity between ECT sensor terminal A (harness-side) and PCM terminal 3E. • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 9.
8	**INSPECT ECT SENSOR GROUND CIRCUIT FOR OPEN** • Check continuity between ECT sensor terminal B (harness-side) and PCM terminal 4F. • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Turn ignition key to ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0122
Except for GF4A-EL Models

DTC P0122	TP circuit low input
DETECTION CONDITION	• If PCM detects TP sensor voltage at PCM terminal 89 is **below 0.1 V** after engine start, PCM determines that TP circuit has a malfunction.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between TP sensor terminal B and PCM terminal 89 • Short to ground circuit between TP sensor terminal B and PCM terminal 89 • Open circuit between TP sensor terminal A and PCM terminal 90 • Short to ground circuit between TP sensor terminal A and PCM terminal 90 • PCM malfunction





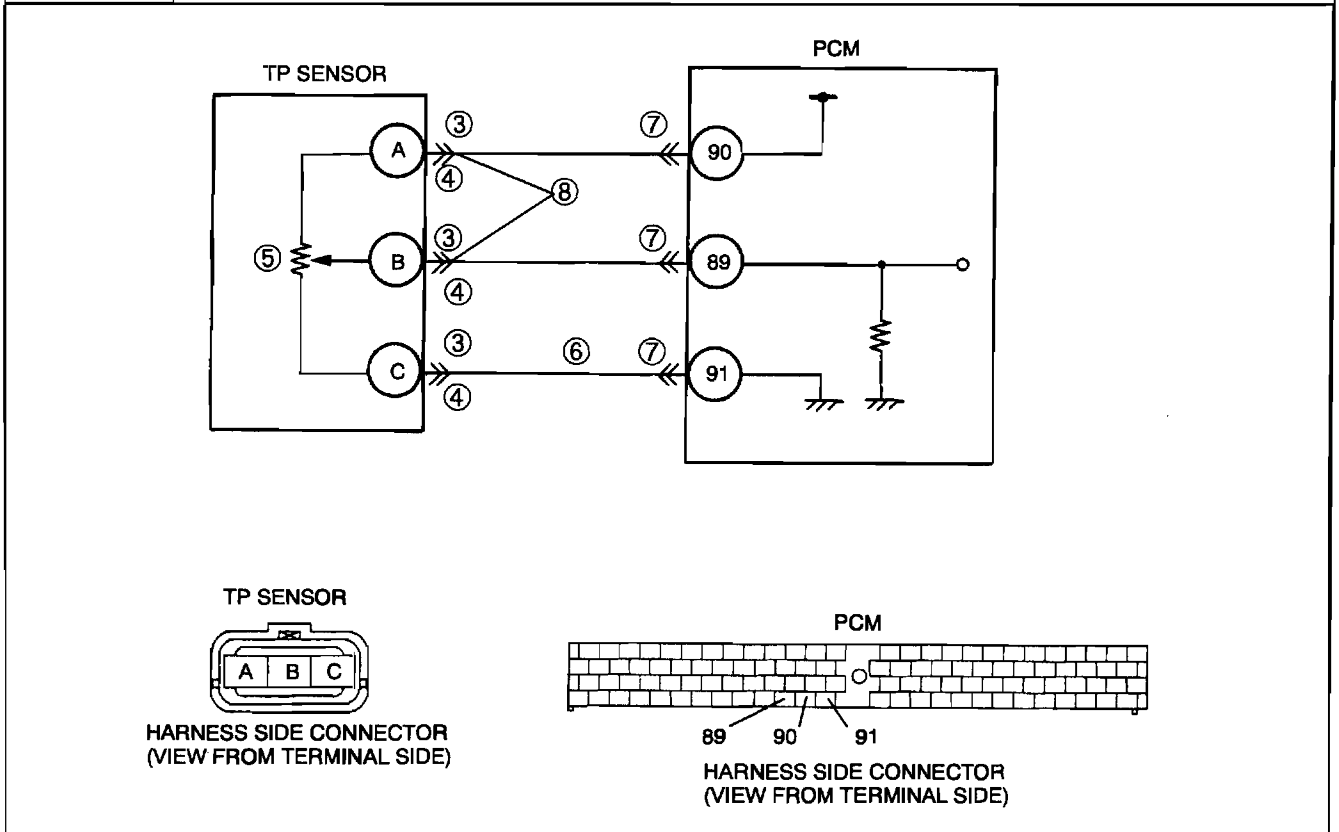
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS – IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to ON (Engine OFF). • Access TP V PID using NGS tester. • Check TP V PID while gradually depressing accelerator pedal. • Is TP V PID **below 0.1 V**?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)

<table>
<tr><th>STEP</th><th>INSPECTION</th><th colspan="2">ACTION</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">CLASSIFY TP SENSOR OR HARNESS MALFUNCTION
• Disconnect TP sensor connector.
• Connect jumper wire between TP sensor terminals A and B (harness-side).
• Check TP V PID.
— TP V PID reading: 4.8 V or above
• Is PID reading okay?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Go to Step 5.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">CHECK TP SENSOR CIRCUIT FOR OPEN
• Turn ignition key to OFF.
• Check for continuity between TP sensor terminals A and B (part-side).
• Is there continuity?</td><td>Yes</td><td>Check TP sensor connector terminal A for poor connection. Repair or replace as necessary, then go to Step 11.</td></tr>
<tr><td>No</td><td>Replace TP sensor, then go to Step 8.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">CHECK POWER SUPPLY CIRCUIT VOLTAGE AT TP SENSOR CONNECTOR
• Turn ignition key to ON (Engine OFF).
• Check voltage at TP sensor terminal A (harness-side).
• Is voltage within 4.5—5.5 V?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Repair or replace open circuit in wiring harness between TP sensor terminal A (harness-side) and PCM terminal 90 (harness-side), then go to Step 8.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">VERIFY TP SIGNAL CIRCUIT FOR OPEN
• Turn ignition key to OFF.
• Disconnect PCM connector.
• Connect breakout box with PCM disconnected.
• Disconnect TP sensor connector.
• Check for continuity between TP sensor terminal C (harness-side) and breakout box terminal 89.
• Is there continuity?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Repair or replace suspected harness, then go to Step 8.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">VERIFY TP SIGNAL CIRCUIT FOR SHORT TO GROUND
• Check for continuity between TP sensor connector terminal C and body ground.
• Is there continuity?</td><td>Yes</td><td>Repair or replace suspected harness, then go to Step 8.</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED
• Make sure to reconnect all disconnected connectors.
• Start engine.
• Clear DTC from PCM memory using NGS tester generic OBD-II function.
• Access TP V PID using NGS tester.
• Verify TP V PID is within 0.1—4.8 V.
• Is same DTC present?</td><td>Yes</td><td>Replace PCM, then go to next step.</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">9</td><td rowspan="2">VERIFY AFTER REPAIR PROCEDURE
• Perform “After Repair Procedure.”
(See F1-36 AFTER REPAIR PROCEDURE)
• Are there any DTCs present?</td><td>Yes</td><td>Go to applicable DTC inspection.
(See F1-37 DTC TABLE)</td></tr>
<tr><td>No</td><td>Troubleshooting completed.</td></tr>
</table>

DTC P0123
Except for GF4A-EL Models

DTC P0123	TP circuit high input
DETECTION CONDITION	• If PCM detects TP sensor voltage at PCM terminal 89 is **above 4.8 V** after engine start, PCM determines that TP circuit has a malfunction.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between TP sensor terminal C and PCM terminal 91 • Short to reference voltage (Vref) supply circuit between TP sensor terminal B and PCM terminal 89 • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS – IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to ON (Engine OFF). • Access TP V PID using NGS tester. • Check TP V PID while gradually depressing accelerator pedal. • Is TP V PID **above 4.8 V**?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1–142 No.26 INTERMITTENT CONCERNS)
3	**CHECK TP SENSOR CONNECTOR** • Turn ignition key to OFF. • Verify that the TP sensor connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Connect the connector securely, then go to Step 9.

STEP	INSPECTION		ACTION
4	**INSPECT POOR CONNECTION OF TP SENSOR CONNECTOR** • Disconnect TP sensor connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace suspected terminal, then go to Step 9.
		No	Go to next step.
5	**CHECK TP SENSOR RESISTANCE** • Check resistance between following TP sensor terminals (part-side): Terminals A and B: **Within 3.2—4.8 kΩ** Terminals B and C: **Within 0.2—1.2 kΩ** • Are both resistances within specifications?	Yes	Go to next step.
		No	Replace TP sensor, then go to Step 9.
6	**VERIFY TP SENSOR GROUND CIRCUIT FOR OPEN AT TP SENSOR CONNECTOR** • Check for continuity between TP sensor terminal B (harness-side) and body ground. • Is there continuity?	Yes	Go to Step 8.
		No	Go to next step.
7	**CHECK PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection at terminals 89, 90 and 91 (damaged/pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminal, then go to Step 9.
		No	Repair or replace open circuit in wiring harness between TP sensor terminal B and PCM connector terminal 91 (harness-side). Then, go to Step 9.
8	**VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Check for continuity between TP sensor terminals A and C. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using NGS tester generic OBD-II function. • Access TP V PID using NGS tester. • Verify TP V PID is **within 0.1—4.8 V.** • Does the same DTC appear?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0134
Except for GF4A-EL Models

DTC P0134	HO2S circuit no activity detected
DETECTION CONDITION	• PCM monitors input voltage from HO2S when the following monitoring conditions are met. If input voltage at PCM terminal 60 never **exceed 0.55 V** for **73.5 seconds**, PCM determines that sensor circuit is not activated. **MONITORING CONDITIONS** • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 80 °C {158 °F}**.
POSSIBLE CAUSE	• HO2S deterioration • HO2S heater malfunction • Leakage in exhaust system • Open or short to ground circuit between HO2S terminal A (harness-side) and PCM terminal 60 • Insufficient compression • Engine malfunction

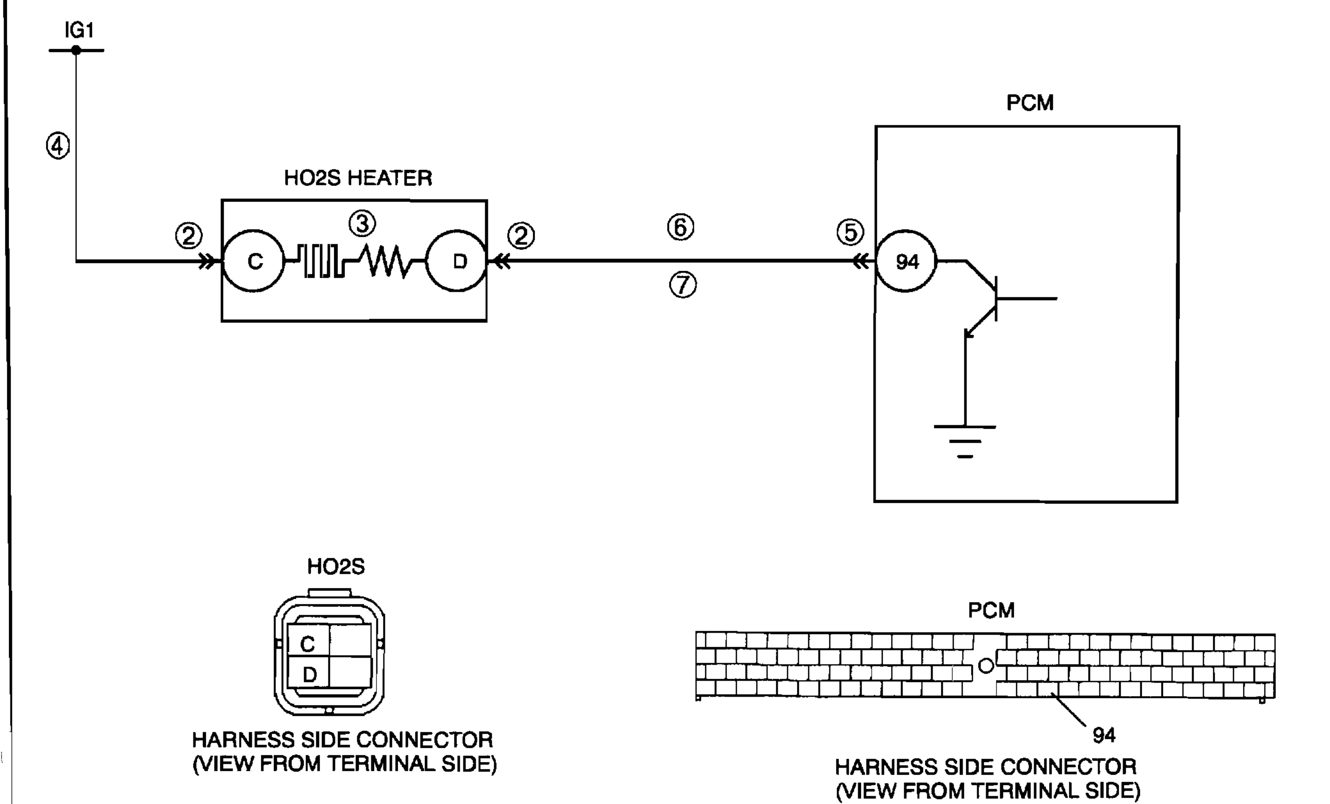
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access FHO2S PID using NGS tester. • Verify PID while racing engine (in PARK or NEUTRAL). • Is PID reading okay? — **More than 0.55 V** when suddenly depressing accelerator pedal (rich condition). — **Less than 0.55 V** just after release of accelerator pedal (lean condition)	Yes	Go to Step 5.
		No	Go to next step.
3	**INSPECT INSTALLATION OF HO2S** • Check if HO2S is loosely installed. • Is sensor installed securely?	Yes	Go to next step.
		No	Install sensor securely, then go to Step 7.
4	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust manifold and HO2S. • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 7.
		No	• Inspect the following harnesses for open or short to ground circuit — HO2S terminal A (harness-side) to PCM terminal 60 (harness-side) • Repair or replace harness if necessary. • If all items above are okay, replace faulty sensor. Then go to Step 7.

STEP	INSPECTION		ACTION
5	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. • When removing radiator cap, wrap a thick cloth around and turn it slowly. • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Are there any small bubbles, which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 7.
		No	Go to next step.
6	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See Section B) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0134 or P0154 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using NGS tester. • Perform following procedures twice. — Start engine. — Access RPM and ECT PIDs using NGS. — Verify that ECT PID is reading **above 80 °C {158 °F}**. — Increase engine speed **above 1,500 rpm** (RPM PID reading) **more than 73.5 seconds.** • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0135
Except for GF4A-EL Models

DTC P0135	HO2S heater circuit malfunction
DETECTION CONDITION	• PCM monitors HO2S heater control signal at PCM terminal 94. If PCM turns HO2S heater on and off but voltage at PCM terminal 94 does not change, PCM determines that HO2S heater circuit has malfunction.
POSSIBLE CAUSE	• HO2S malfunction • Open circuit between the main relay terminal D and HO2S terminal C • Open circuit between the HO2S terminal D and PCM terminal 94 • Short to ground circuit between HO2S terminal D and PCM terminal 94 • Poor connection at HO2S or PCM connector • PCM malfunction



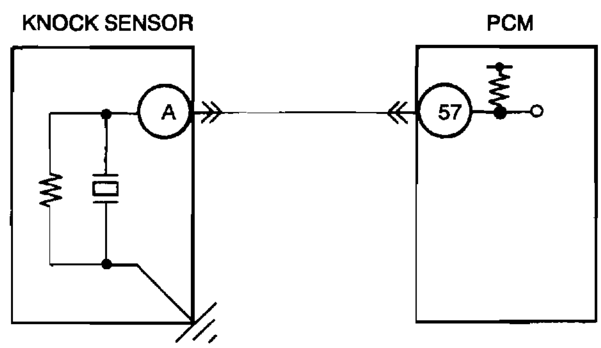
Diagnostic procedure

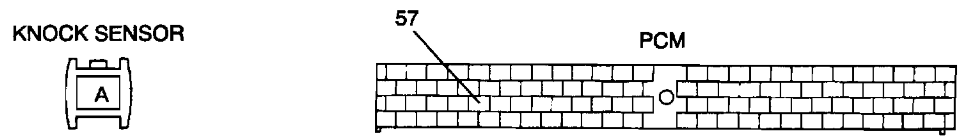
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**INSPECT POOR CONNECTION OF HO2S CONNECTOR** • Turn ignition key to OFF. • Disconnect HO2S connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
3	**INSPECT HO2S HEATER** • Measure resistance between HO2S terminals C and D (part-side). • Is there resistance **within 5.0—6.8 Ω**?	Yes	Go to next step.
		No	Replace the HO2S, then go to Step 9.

STEP	INSPECTION		ACTION
4	**INSPECT POWER CIRCUIT OF HO2S HEATER (RH) FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S terminal C (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
6	**INSPECT CONTROL CIRCUIT OF HO2S HEATER FOR SHORT TO GROUND** • Check continuity between HO2S terminal D (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
7	**INSPECT CONTROL CIRCUIT OF HO2S HEATER FOR OPEN CIRCUIT** • Check continuity between HO2S terminal D (harness-side) and PCM terminal 94. • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
8	**VERIFY TROUBLESHOOTING OF DTC P0135 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are there any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0328
Except for GF4A-EL Models

DTC P0328	Knock sensor circuit high input
DETECTION CONDITION	• If PCM detects knock sensor voltage at PCM terminal 57 is **above 4.0 V** after ignition key turned to ON, PCM determines that knock sensor circuit has malfunction.
POSSIBLE CAUSE	• Knock sensor malfunction • Connector or terminal malfunction • Open circuit in wiring between knock sensor terminal and PCM terminal 57





HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

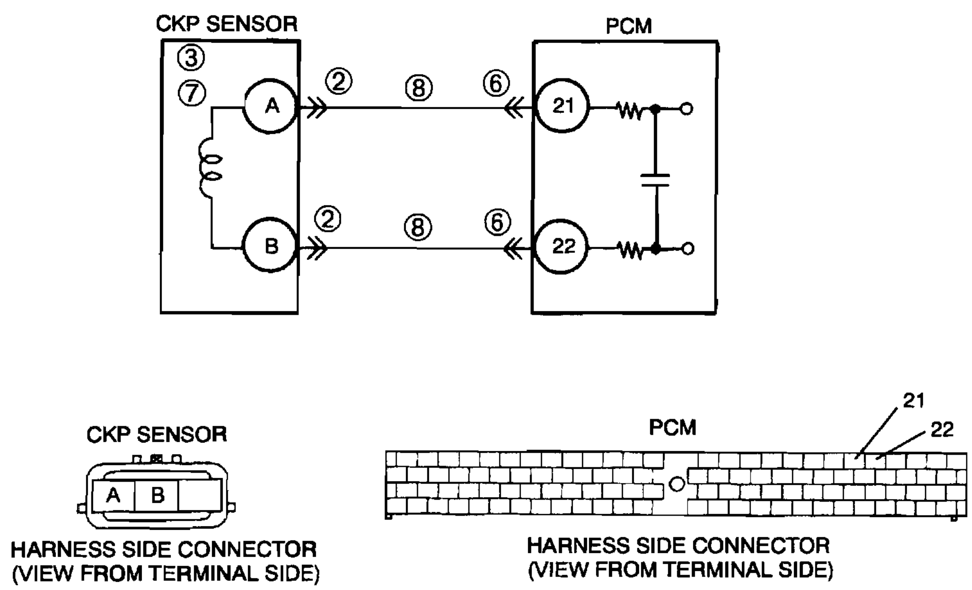
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CHECK KNOCK SIGNAL CIRCUIT FOR OPEN** • Turn ignition key to OFF. • Disconnect knock sensor connector. • Measure voltage between knock sensor terminal and body ground. • Is voltage **approx. 5 V**?	Yes	Then go to Step 4.
		No	Go to next step.
3	**CHECK PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal then go to Step 5.
		No	Repair or replace harness for open, then go to Step 5.
4	**CHECK KNOCK SENSOR** • Measure resistance between knock sensor terminal A and sensor body • Is resistance **within 550—570 Ω**?	Yes	Go to next step.
		No	Replace knock sensor, then go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0328 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0335
Except for GF4A-EL Models

DTC P0335	CKP sensor circuit malfunction
DETECTION CONDITION	• If PCM does not receive input voltage from CKP sensor for **4.2 seconds** while MAF is **1.99 g/sec. {0.257 lb./min.} or above**, PCM determines that CKP circuit has a malfunction.
POSSIBLE CAUSE	• CKP sensor malfunction • Connector or terminal malfunction • CKP sensor is dirty. • Short to ground between CKP sensor terminal A to PCM terminal 21 • Short to ground between CKP sensor terminal B to PCM terminal 22 • Open circuit between CKP sensor terminal A to PCM terminal **3D** • Open circuit between CKP sensor terminal B to PCM terminal 3F • CKP sensor pulse wheel malfunction



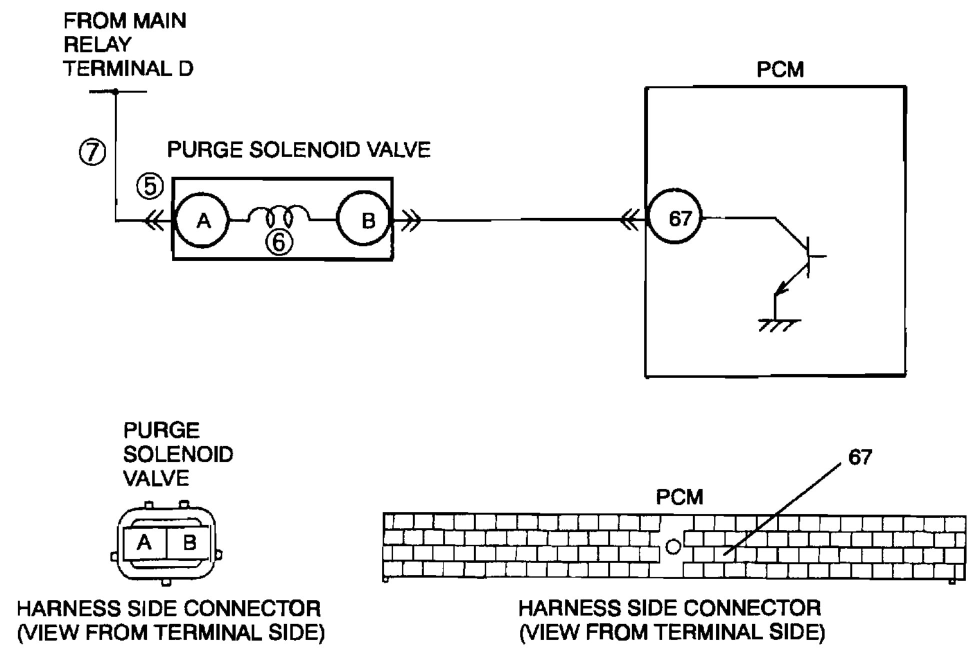
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**INSPECT POOR CONNECTION OF CKP SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect CKP sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal then go to Step 10.
		No	Go to next step.
3	**CHECK CKP CIRCUIT RESISTANCE** • Check resistance between CKP sensor terminals A and B (part-side). • Is resistance **within 540—560 Ω?**	Yes	Connect CKP sensor connector, then go to next step.
		No	Replace CKP sensor, then go to Step 10.

STEP	INSPECTION		ACTION
4	**CHECK CKP SENSOR DIRT** • Disconnect CKP sensor connector. • Is CKP sensor dirty?	Yes	Clean CKP sensor up, then go to Step 10.
		No	Go to next step.
5	**CHECK CKP SENSOR PULSE WHEEL MALFUNCTION** • Is CKP sensor pulse wheel damaged?	Yes	Replace CKP sensor pulse wheel, then go to step 10.
		No	Go to next step.
6	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal then go to Step 10.
		No	Go to next step.
7	**INSPECT CKP SENSOR CIRCUIT FOR OPEN** • Measure resistance between PCM terminal 21 and 22 (harness-side). • Is resistance **within 540—560** Ω?	Yes	Go to next step.
		No	Repair or replace following harness. • CKP sensor terminal A and PCM terminal 21 • CKP sensor terminal B and PCM terminal 22 Then go to Step 10.
8	**INSPECT CKP SENSOR CIRCUIT FOR SHORT TO GROUND** • Disconnect CKP sensor connector. • Check for continuity between PCM terminal 21 (harness-side) and body ground. • Is there any continuity ?	Yes	Repair or replace harness, then go to Step 10.
		No	Go to next step.
9	**INSPECT CKP SENSOR CIRCUIT FOR SHORT TO GROUND** • Disconnect CKP sensor connector. • Check for continuity between PCM terminal 22 (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P0443
Except for GF4A-EL Models

DTC P0443	Purge control solenoid valve circuit malfunction
DETECTION CONDITION	• PCM monitors purge solenoid control signal at PCM terminal 67. If PCM turns purge solenoid valve on and off but voltage at PCM terminal 67 does not change, PCM determines that purge solenoid valve circuit has malfunction.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Connector or terminal malfunction • Short to ground in wiring between purge solenoid valve terminal B and PCM terminal 67 • Open circuit in wiring between main relay terminal D and purge solenoid valve terminal A • Open circuit in wiring between purge solenoid valve terminal B and PCM terminal 67 • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect purge solenoid valve tube that is connected to intake manifold. • Connect vacuum pump to purge solenoid valve. • Pump vacuum pump several times and stop. • Wait a **few seconds**. • Is vacuum maintained?	Yes	Go to Step 5.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect purge solenoid valve connector. • Pump vacuum pump several times. Stop pumping and wait a **few seconds**. • Is vacuum maintained?	Yes	Repair or replace harness, then go to Step 10.
		No	Replace purge solenoid valve, then go to Step 10.
5	**INSPECT POOR CONNECTION OF PURGE SOLENOID VALVE CONNECTOR** • Turn ignition key to OFF. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
6	**INSPECT PURGE SOLENOID VALVE** • Measure resistance between purge solenoid valve terminals (part-side). • Is resistance **within 30 —34** Ω ?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
7	**INSPECT PURGE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN** • Turn ignition key to ON (Engine OFF). • Measure voltage between purge solenoid valve connector terminal A and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 10.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
9	**INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT FOR OPEN** • Connect purge solenoid valve connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between PCM terminal 67 and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1170
Except for GF4A-EL Models

DTC P1170	HO2S no inversion
DETECTION CONDITION	• PCM monitors input voltage from HO2S when following monitoring conditions are met. If input voltage from sensor is **below or above 0.55 V** for **30.4 seconds**, PCM determines that there is no HO2S inversion. **MONITORING CONDITIONS** • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 80 °C {176 °F}**.
POSSIBLE CAUSE	• HO2S malfunction • Fuel injector malfunction • Pressure regulator malfunction • Fuel pump malfunction • Clog or leakage from following fuel line — Between fuel tank and fuel distributor. — Between pressure regulator and fuel tank • Air suction or leakage from intake air system • Purge solenoid valve malfunction • Insufficient compression

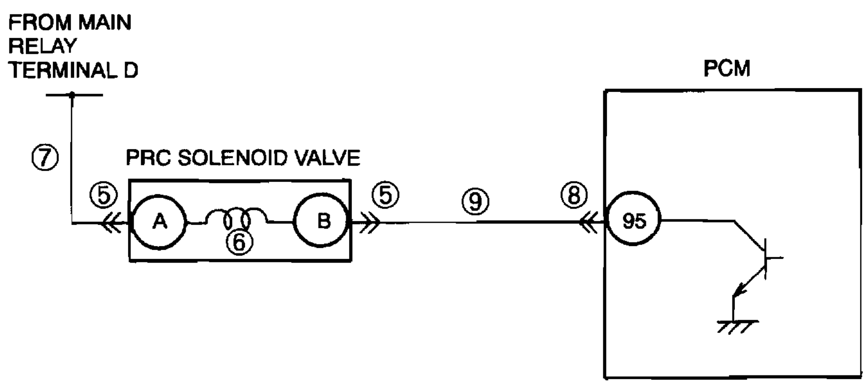
Diagnostic procedure

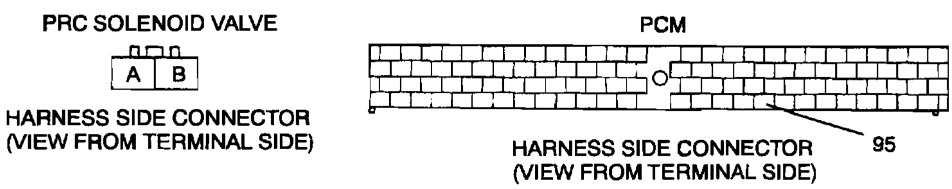
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using NGS tester. • Perform following procedure twice. — Start engine — Access ECT and RPM PIDs using NGS tester. — Make sure that ECT PID is **above 80 °C {176 °F}** — Increase and keep engine speed **above 1,500 rpm** for **at least 20.4 seconds**. • Is another DTC present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
3	**IDENTIFY TRIGGER DTC** • Is DTC P1170 present?	Yes	Go to next step.
		No	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 NO.26 INTERMITTENT CONCERNS TROUBLESHOOTING)
4	**INSPECT HO2S OUTPUT VOLTAGE** • Start engine • Access FHO2S PID using **NGS** tester. • Is FHO2S PID value goes up and down at **over 0.55 V**?	Yes	Malfunction not by HO2S circuit. Go to Step 6.
		No	Malfunction by HO2S circuit. Go to next step.
5	**INSPECT HO2S CIRCUIT** • Inspect following circuit for open or short. — Between HO2S terminal A (harness-side) and PCM terminal 60 (harness-side) — Between HO2S terminal B (harness-side) and PCM terminal 91 (harness-side) — Between HO2S terminal C (harness-side) and battery positive voltage. — Between HO2S terminal D (harness-side) and PCM terminal 94 (harness-side) • Are there any malfunctions?	Yes	Repair or replace appropriate wiring harness, then go to Step 13.
		No	Replace appropriate HO2S, then go to Step 13.

STEP	INSPECTION		ACTION
6	**INSPECT INTAKE AIR SYSTEM** • Inspect air cleaner element clogs. • Is air cleaner element clogs?	Yes	Replace air cleaner element, then go to Step 13.
		No	Go to next step.
7	**INSPECT PURGE CONTROL SYSTEM** • Inspect purge control system. (See F-153 Purge Control Inspection) • Is purge control system okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part as Purge Control Inspection, then go to Step 13.
8	**INSPECT EGR CONTROL SYSTEM** • Inspect EGR control system. (See F1-152 EGR Control Inspection) • Is EGR control system okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part as EGR Control Inspection, then go to Step 13.
9	**INSPECT FUEL LINE PRESSURE** • Inspect fuel line pressure. (See Section F) • Is fuel line pressure okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part as FUEL LINE PRESSURE INSPECTION, then go to Step 13.
10	**INSPECT FUEL INJECTOR OPERATION** • Inspect fuel injector inspection. (See Section F) • Is fuel injector operation okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part as Fuel Injector Operation Inspection, then go to Step 13.
11	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble, which makes engine coolant white at filling opening. **Note** • Large bubble are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing to head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 13.
		No	Go to next step.
12	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See Section B) • Is engine compression okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part as COMPRESSION INSPECTION, then go to next step.
13	**VERIFY TROUBLESHOOTING OF DTC P1170 COMPLETED** • Turn ignition key to ON. (Engine OFF). • Clear DTC from memory using NGS tester. • Preform following procedure twice. — Start engine. — Access ECT and RPM PIDs using NGS tester. — Make sure that ECT PID is **above 80 °C {176 °F}** — Increase and keep speed **above 1,500 rpm** for **at least 20.4 seconds**. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTC present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1250
Except for GF4A-EL Models

DTC P1250	Pressure regulator control (PRC) valve circuit malfunction
DETECTION CONDITION	• PCM monitors PRC solenoid control signal at PCM terminal 95. If PCM turns PRC sorenoid valve on and off but voltage at PCM terminal 95 does not change, PCM determines that PRC solenoid valve circuit has malfunction.
POSSIBLE CAUSE	• PRC solenoid valve malfunction • Connector or terminal malfunction • Short to ground in wiring between PRC solenoid valve terminal B and PCM terminal 95 • Open circuit in wiring between main relay terminal D and PRC solenoid valve terminal A • Open circuit in wiring between PRC solenoid valve terminal B and PCM terminal 95 • PCM malfunction





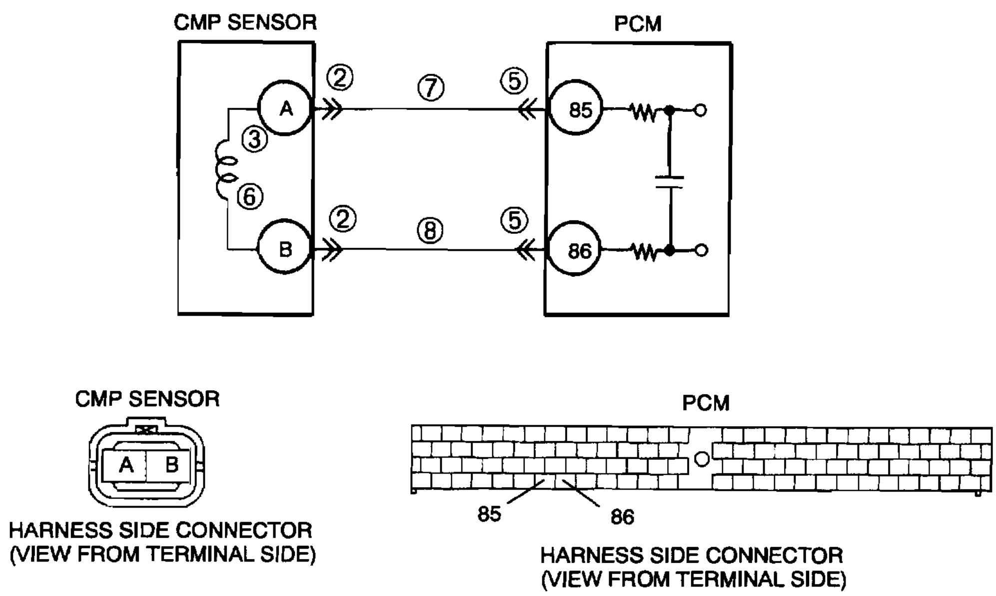
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See F1-142 NO.26 INTERMITTENT CONCERNS)
3	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect PRC solenoid valve tube that connects to intake manifold. • Connect vacuum pump to PRC solenoid valve. • Pump vacuum pump several times and stop to pumps then wait **a few seconds**. • Is vacuum maintained?	Yes	Go to next step.
		No	Go to Step **5**.

STEP	INSPECTION		ACTION
4	**INSPECT PASSAGE CONTROL OF PRC SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect PRC solenoid valve connector. • Pump vacuum pump several times. Stop pumping and wait **a few seconds**. • Is vacuum maintained?	Yes	Replace PRC solenoid valve, then go to Step 10.
		No	Repair or replace harness for short to ground, then go to Step 10.
5	**INSPECT POOR CONNECTION OF PRC SOLENOID VALVE CONNECTOR** • Turn ignition key to OFF. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
6	**INSPECT PRC SOLENOID VALVE** • Measure resistance between PRC solenoid valve terminals (part-side). • Is resistance **within 37 —43** Ω ?	Yes	Go to next step.
		No	Replace PRC solenoid valve, then go to Step 10.
7	**INSPECT PRC SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN** • Turn ignition key to ON (Engine OFF). • Measure voltage between PRC solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 10.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
9	**INSPECT PRC SOLENOID VALVE CONTROL CIRCUIT FOR OPEN** • Connect PRC solenoid valve connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between PCM terminal 95 and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P1250 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1345
Except for GF4A-EL Models

DTC P1345	CMP sensor circuit malfunction
DETECTION CONDITION	• If PCM does no receive input voltage from CMP sensor within 12 engine cycles, PCM determines that CMP circuit has malfunction.
POSSIBLE CAUSE	• CMP sensor malfunction • Connector or terminal malfunction • CMP sensor is dirty • Open or short circuit between CMP sensor terminal A and PCM terminal 85 • Open or short circuit between CMP sensor terminal B and PCM terminal 86



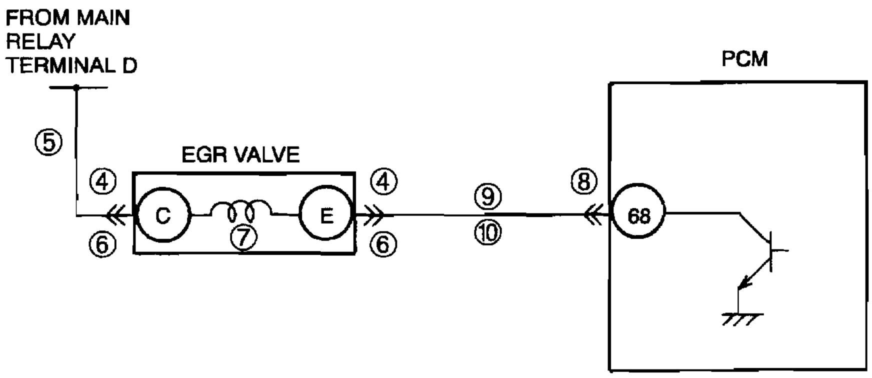
Diagnostic procedure

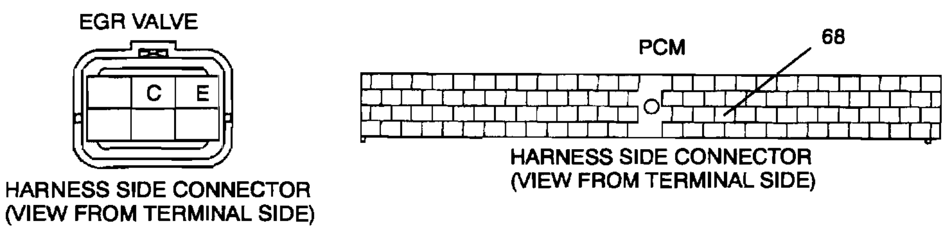
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**INSPECT POOR CONNECTION OF CMP SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect CMP sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal then go to Step 9.
		No	Go to next step.
3	**CHECK CMP CIRCUIT RESISTANCE** • Check resistance between CMP sensor terminals A and B (part-side). • Is resistance **within 540—560** Ω?	Yes	Connect CMP sensor connector, then go to next step.
		No	Replace CMP sensor, then go to Step 9.
4	**CHECK CMP SENSOR DIRT** • Is CMP sensor dirty?	Yes	Clean CMP sensor, then go to Step 9.
		No	Go to next step.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any continuity?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT CKP SENSOR CIRCUIT FOR OPEN** • Measure resistance between PCM terminal 85 and 86 (harness-side). • Is resistance **within 540—560** Ω?	Yes	Go to next step.
		No	Repair or replace following harness. • CKP sensor terminal A and PCM terminal 85 • CKP sensor terminal B and PCM terminal 86 Then go to Step 9.
7	**INSPECT CKP SENSOR CIRCUIT FOR SHORT TO GROUND** • Disconnect CMP sensor connector. • Check for continuity between PCM terminal 85 (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to Step 9.
		No	Go to next step.
8	**INSPECT CKP SENSOR CIRCUIT FOR SHORT TO GROUND** • Disconnect CKP sensor connector. • Check for continuity between PCM terminal 86 (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P1345 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1496
Except for GF4A-EL Models

DTC P1496	EGR valve motor coil 1 open or short
DETECTION CONDITION	• PCM monitors EGR valve coil control signal at PCM terminal 68. If PCM turns EGR valve coil on and off but voltage at PCM terminal 68 does not change, PCM determines that EGR valve circuit has malfunction.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to ground circuit in wiring between EGR valve terminal E and PCM terminal 68 • Open circuit in wiring between EGR valve terminal E and PCM terminal 68 • Open circuit in wiring between main relay terminal D and EGR valve terminal C • PCM malfunction





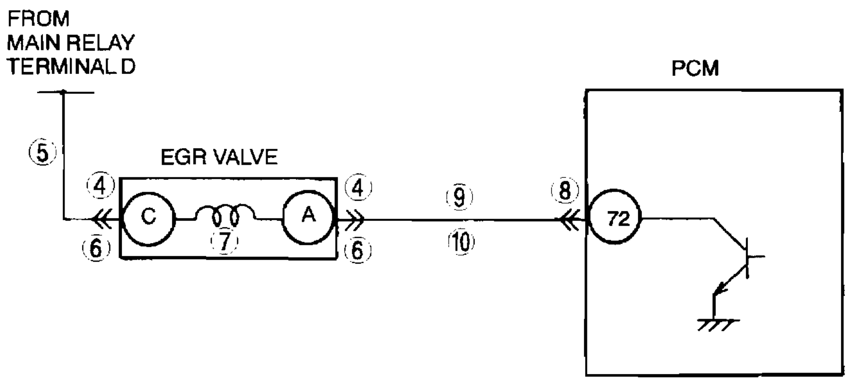
Diagnostic procedure

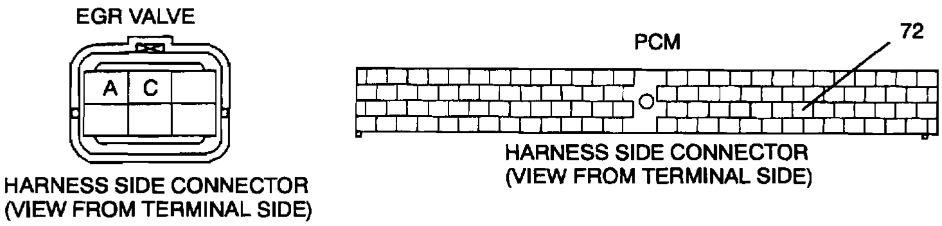
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Are same DTC and P1497 present?	Yes	Malfunction at EGR valve or power circuit. Go to next step.
		No	Malfunction at EGR valve or control circuit. Go to Step 6.
4	**INSPECT POOR CONNECTION OF EGR VALVE** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT POWER CIRCUIT FOR OPEN** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR valve terminal C (harness-side) and body ground. • Is voltage **B+**?	Yes	Inspect EGR valve coils 1 and 2. (See Section F) • If there is a malfunction, replace EGR valve, and then go to Step 11. • If there is no malfunction, go to Step 11.
		No	Repair or replace harness, then go to Step 11.
6	**INSPECT POOR CONNECTION OF EGR VALVE** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
7	**INSPECT EGR VALVE** • Measure resistance between EGR valve terminals C and E (part-side). • Is resistance **approx. 22 Ω** ?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	**INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND** • Check continuity between EGR valve terminal E (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness, then go to Step 11.
		No	Go to next step.
10	**INSPECT CONTROL CIRCUIT FOR OPEN** • Check continuity between EGR valve terminal E (harness-side) and PCM terminal 68. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1496 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1497
Except for GF4A-EL Models

DTC P1497	EGR valve motor coil 2 open or short
DETECTION CONDITION	• PCM monitors EGR valve coil control signal at PCM terminal 72. If PCM turns EGR valve coil on and off but voltage at PCM terminal 72 does not change, PCM determines that EGR valve circuit has malfunction.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to ground circuit in wiring between EGR valve terminal A and PCM terminal 72 • Open circuit in wiring between EGR valve terminal A and PCM terminal 72 • Open circuit in wiring between main relay terminal D and EGR valve terminal C • PCM malfunction





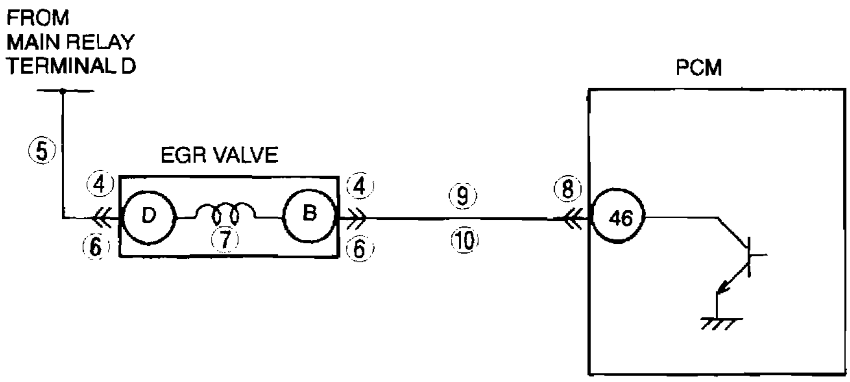
Diagnostic procedure

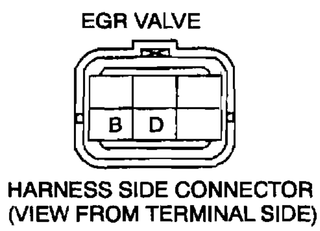
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Is same DTC and P1496 present?	Yes	Malfunction at EGR value or power circuit. Go to next step.
		No	Malfunction at EGR valve or control circuit. Go to Step 6.
4	**INSPECT POOR CONNECTION OF EGR VALVE** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.

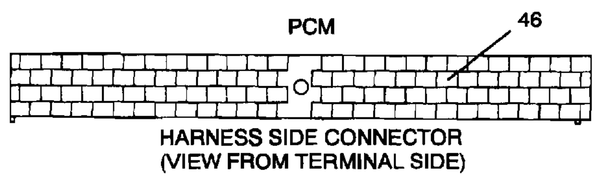
STEP	INSPECTION		ACTION
5	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** ● Turn ignition key to ON (Engine OFF). ● Measure voltage between EGR valve terminal C (harness-side) and body ground. ● Is voltage **B+**?	Yes	Inspect EGR valve coils 1 and 2. (See Section F) ● If there is a malfunction, replace EGR valve, and then go to Step 11. ● If there is no malfunction, then go to Step 11.
		No	Repair or replace harness, then go to Step 11.
6	**INSPECT POOR CONNECTION OF EGR VALVE** ● Turn ignition key to OFF. ● Disconnect EGR valve connector. ● Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). ● Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
7	**INSPECT EGR VALVE** ● Measure resistance between EGR valve terminals C and A (part-side). ● Is resistance **approx. 22 Ω** ?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** ● Disconnect PCM connector. ● Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). ● Are there any malfunctions?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	**INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND** ● Check continuity between EGR valve terminal A (harness-side) and body ground. ● Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 11.
		No	Go to next step.
10	**INSPECT CONTROL CIRCUIT FOR OPEN** ● Check continuity between EGR valve terminal A (harness-side) and PCM terminal 72. ● Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1497 COMPLETED** ● Make sure to reconnect all disconnected connectors. ● Turn ignition key to OFF, then ON (Engine OFF). ● Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** ● Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) ● Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1498
Except for GF4A-EL Models

DTC P1498	EGR valve motor coil 3 open or short
DETECTION CONDITION	• PCM monitors EGR valve coil control signal at PCM terminal 46. If PCM turns EGR valve coil on and off but voltage at PCM terminal 46 does not change, PCM determines that EGR valve circuit has malfunction.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to ground circuit in wiring between EGR valve terminal B and PCM terminal 46 • Open circuit in wiring between EGR valve terminal B and PCM terminal 46 • Open circuit in wiring between main relay terminal D and EGR valve terminal D • PCM malfunction







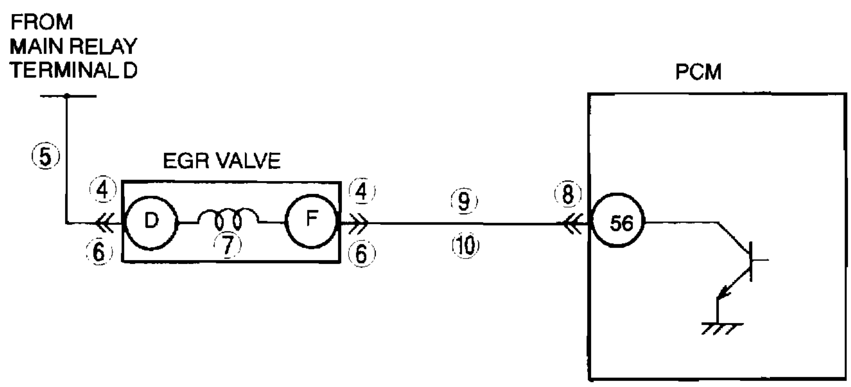
Diagnostic procedure

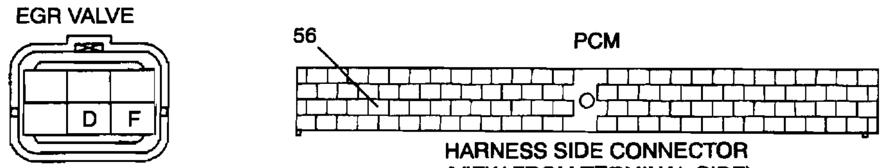
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Are same DTC and P1499 present?	Yes	Malfunction at EGR value or power circuit. Go to next step.
		No	Malfunction at EGR valve or control circuit. Go to Step 6.
4	**INSPECT POOR CONNECTION OF EGR VALVE** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT POWER CIRCUIT FOR OPEN** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR valve terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Inspect EGR valve coils 3 and 4. (See Section F) • If there is a malfunction, replace EGR valve, and then go to Step 11. • If there is no malfunction, go to Step 11.
		No	Repair or replace harness, then go to Step 11.
6	**INSPECT POOR CONNECTION OF EGR VALVE** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
7	**INSPECT EGR VALVE** • Measure resistance between EGR valve terminals D and B (part-side). • Is resistance **approx. 22 Ω** ?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminals, then go to Step 11.
		No	Go to next step.
9	**INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND** • Check continuity between EGR valve terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness, then go to Step 11.
		No	Go to next step.
10	**INSPECT CONTROL CIRCUIT FOR OPEN** • Check continuity between EGR valve terminal B (harness-side) and PCM terminal 46. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1498 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF, then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1499
Except for GF4A-EL Models

DTC P1499	EGR valve motor coil 4 open or short
DETECTION CONDITION	• PCM monitors input voltages from EGR valve coil control signal at PCM terminal 56. If PCM turns EGR valve coil on and off but voltage at PCM terminal 56 does not change, PCM determines that EGR valve circuit has malfunction.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to ground circuit in wiring between EGR valve terminal F and PCM terminal 56 • Open circuit in wiring between EGR valve terminal F and PCM terminal 56 • Open circuit in wiring between main relay terminal D and EGR valve terminal D • PCM malfunction





HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

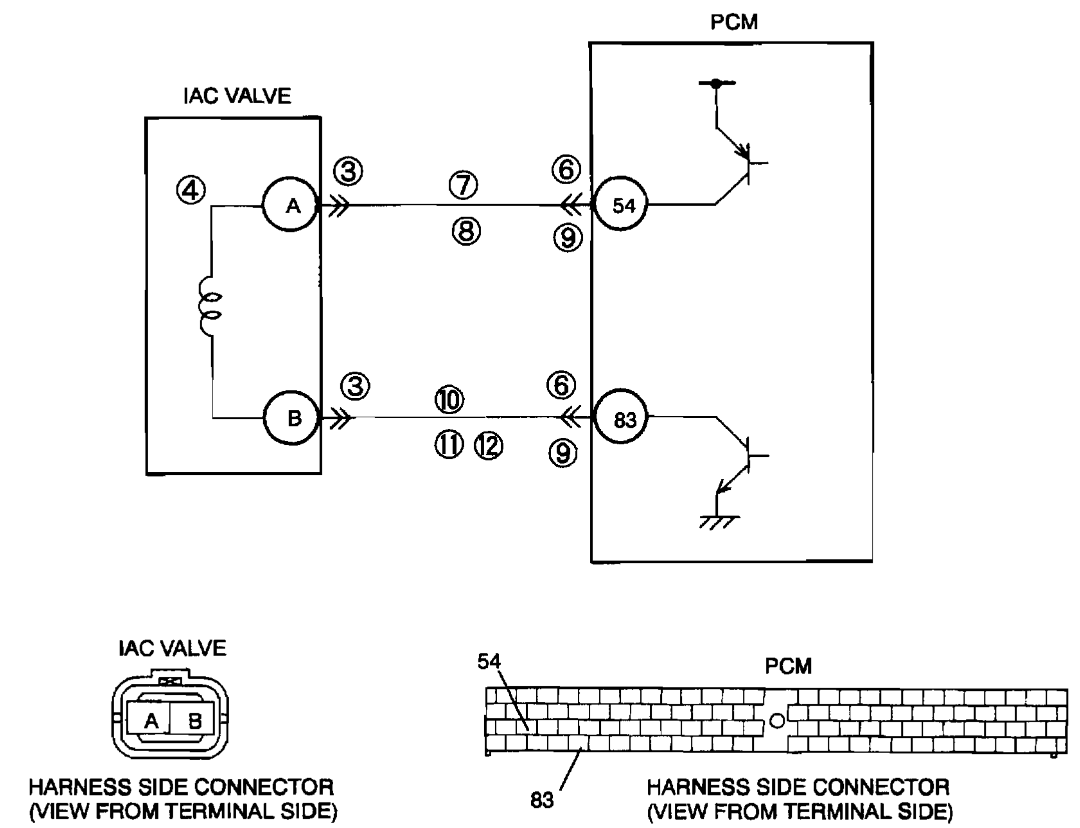
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Are same DTC and P1498 present?	Yes	Malfunction at EGR valve power circuit. Go to next step.
		No	Malfunction at EGR valve or control circuit. Go to Step 6.
4	**INSPECT POOR CONNECTION OF EGR VALVE** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT POWER CIRCUIT FOR OPEN** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR valve terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Inspect EGR valve coils 3 and 4. (See Section F) • If there is a malfunction, replace EGR valve, and then go to Step 11. • If there is no malfunction, go to Step 11.
		No	Repair or replace harness, then go to Step 11.
6	**INSPECT POOR CONNECTION OF EGR VALVE** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
7	**INSPECT EGR VALVE** • Measure resistance between EGR valve terminals D and F (part-side). • Is resistance **approx. 22 Ω**?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there malfunctions?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	**INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND** • Check continuity between EGR valve terminal F (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness , then go to Step 11.
		No	Go to next step.
10	**INSPECT CONTROL CIRCUIT FOR OPEN** • Check continuity between EGR valve terminal **F** (harness-side) and PCM terminal 56. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1499 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF, then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1504
Except for GF4A-EL Models

DTC P1504	IAC valve circuit malfunction
DETECTION CONDITION	• If PCM detects that PCM terminal 4M voltage is above threshold* or below threshold* when IAC control duty target is **within 18—70 %**, PCM determines that IAC valve circuit has malfunction. *:When detected the threshold value depends on battery voltage and IAC control signal duty value.
POSSIBLE CAUSE	• IAC valve circuit malfunction • Short to ground between IAC valve terminal A and PCM terminal 4M • Open circuit between IAC valve terminal A and PCM terminal 4M • Short to ground between IAC valve terminal B and PCM terminal 4O • Short to power between IAC valve terminal B and PCM terminal 4O • Open circuit between IAC valve terminal B and PCM terminal 4O • Poor connection of IAC valve connector or PCM connector • PCM malfunction



Diagnostic procedure

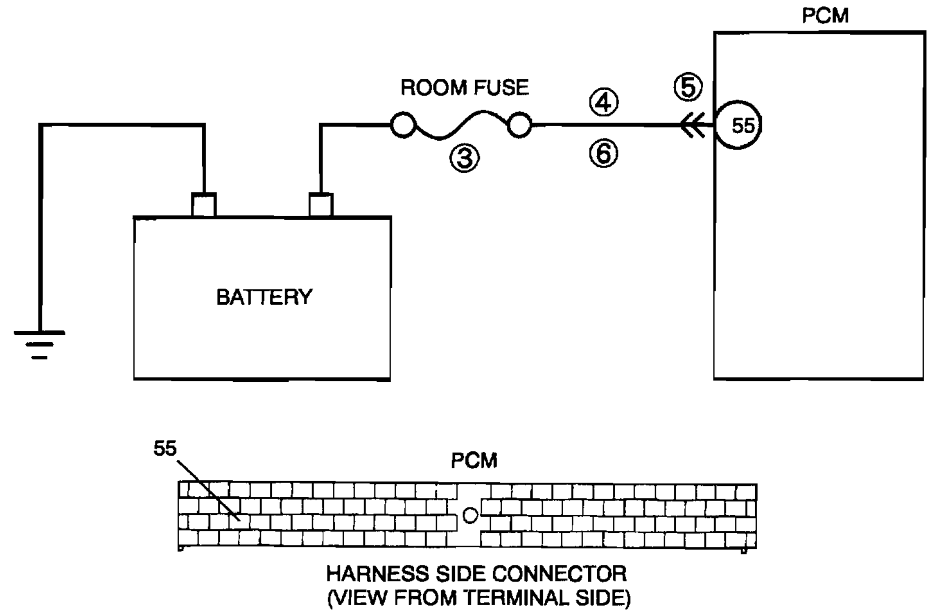
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC from memory using NGS tester. • Start engine and warm it up completely. • Is same DTC detected?	Yes	Go to next step.
		No	Go to intermittent concern. (See F1-142 No.26 INTERMITTENT CONCERNS)

STEP	INSPECTION		ACTION
3	**INSPECT POOR CONNECTION OF IAC VALVE CONNECTOR** • Turn ignition key to OFF. • Disconnect IAC valve connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
4	**INSPECT IAC VALVE ELECTRICAL MALFUNCTION** • Measure resistance between IAC valve terminals A and B (part-side). • Is resistance **within 4— 5k Ω** ?	Yes	Go to next step.
		No	Replace IAC valve, then go to Step 14.
5	**CLASSIFY MALFUNCTION AT POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between IAC valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Malfunction at control circuit. Go to Step 9.
		No	Malfunction at power supply circuit. Go to next step.
6	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
7	**INSPECT POWER CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check continuity between IAC valve terminal A (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to Step 14.
		No	Go to next step.
8	**INSPECT POWER CIRCUIT FOR OPEN** • Turn ignition key to OFF • Check continuity between IAC valve terminal A (harness-side) and PCM terminal 54. • Is there any continuity?	Yes	Repair or replace harness, then go to Step 14.
		No	Go to Step 14.
9	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
10	**INSPECT CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to **ON** (Engine OFF). • Measure voltage between IAC valve terminal B (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness, then go to Step 14.
		No	Go to next step.
11	**INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check continuity between IAC valve terminal B (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to Step 14.
		No	Go to next step.
12	**INSPECT CONTROL CIRCUIT MALFUNCTION FOR OPEN** • Check continuity between IAC valve terminal B (harness-side) and PCM terminal 83. • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
13	**VERIFY TROUBLESHOOTING OF DTC P1504 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC using NGS tester. • Start engine and warm it up completely. • Is same DTC No. present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1562
Except for GF4A-EL Models

DTC P1562	Battery voltage circuit malfunction
DETECTION CONDITION	• PCM monitors voltage of back-up battery positive terminal at PCM terminal 1A. If PCM detects battery positive terminal voltage is **below 2.5 V** for **2 seconds**, PCM determines that backup voltage circuit has malfunction.
POSSIBLE CAUSE	• Meltdown ROOM fuse. • Open circuit in wiring between battery positive terminal (harness-side) and PCM terminal 1A (harness-side) • Poor connection of PCM connector. • PCM malfunction



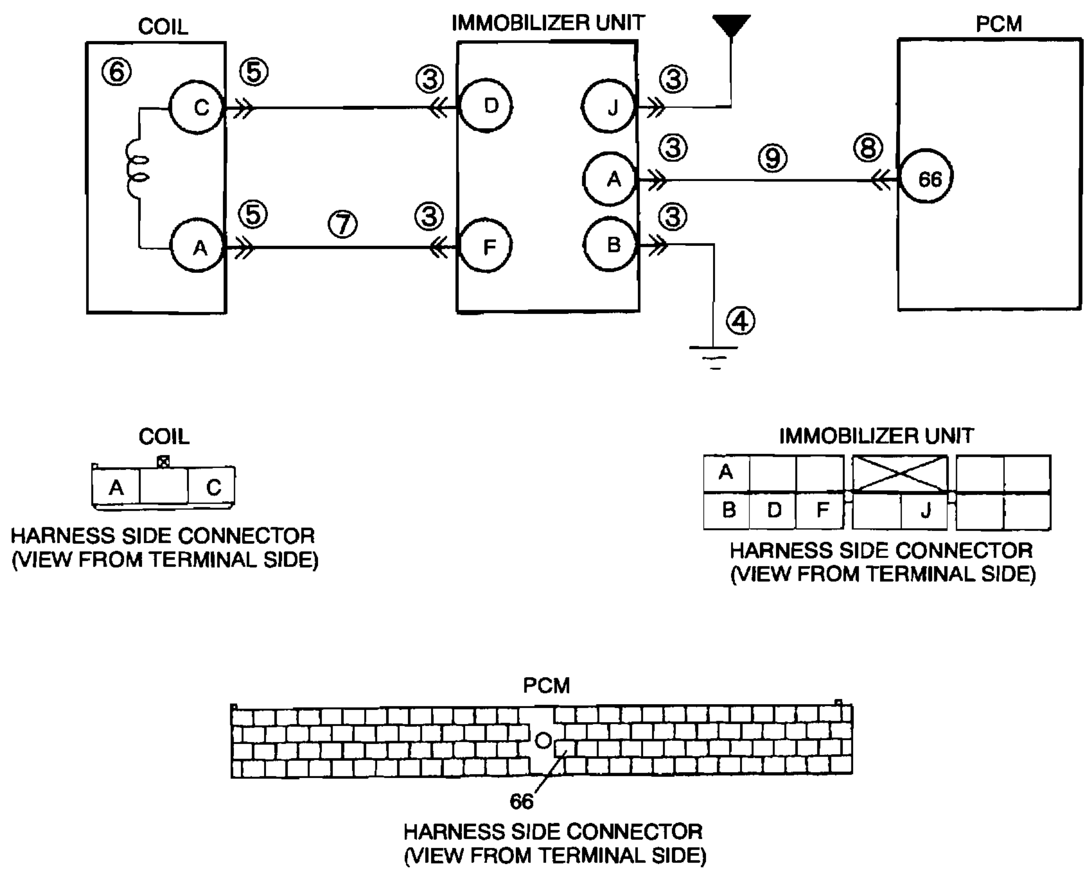
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**INSPECT ROOM FUSE** • Turn ignition key to OFF. • Inspect ROOM fuse for failure and proper. • Is it okay?	Yes	Go to Step 5.
		No	• If ROOM fuse has been melt down, then go to next step. • If ROOM fuse is not installed correctly, install it correctly then go to Step 6.

STEP	INSPECTION		ACTION
3	**INSPECT MONITOR CIRCUIT FOR SHORT TO GROUND** • Disconnect battery cables. • Check continuity between ROOM fuse terminal and body ground. • Is there continuity?	Yes	Repair or replace harness and install new fuse, then go to Step 6.
		No	Go to Step 6.
4	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminals, then go to Step 6.
		No	Go to next step.
5	**INSPECT MONITOR CIRCUIT FOR OPEN** • Disconnect battery cables. • Check continuity between ROOM fuse terminal and PCM terminal 55. • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P1562 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1602
Except for GF4A-EL Models

DTC P1602	Immobilizer unit-PCM communication error
DETECTION CONDITION	• Command transmission from the PCM to the immobilizer unit exceeds limit. • No response from immobilizer unit
POSSIBLE CAUSE	• Immobilizer unit malfunction • Coil (immobilizer system) malfunction • Key (transponder) malfunction • PCM malfunction • Open circuit in wiring between immobilizer unit terminal A and PCM terminal 66 • Open circuit in wiring between immobilizer unit terminal B and body ground • Open circuit in wiring between immobilizer unit terminal F and coil terminal A • Open circuit in wiring between immobilizer unit terminal D and coil terminal C • Short to ground circuit in wiring between immobilizer unit terminal A and PCM terminal 1N • Short to ground circuit in wiring between immobilizer unit terminal F and coil terminal A • Short to ground circuit in wiring between immobilizer unit terminal D and coil terminal C



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY NO DTC DETECTED OR SOME DTCs DETECTED** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF and ON (Engine OFF). • Has DTC P1624 been detected?	Yes	Go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
3	**INSPECT POOR CONNECTION OF IMMOBILIZER UNIT CONNECTOR** • Turn ignition key to OFF. • Disconnect immobilizer unit connector. • Check for poor connection (damaged, pulled–out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 19.
		No	Go to next step.
4	**INSPECT GROUND CIRCUIT OF IMMOBILIZER UNIT FOR OPEN** • Measure resistance between immobilizer unit terminal B (harness-side) and body ground. • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 19.
5	**INSPECT COIL TERMINAL** • Disconnect coil connector. • Check for bent terminals. • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 19.
		No	Go to next step.
6	**INSPECT COIL FOR SHORT CIRCUIT** • Check continuity between coil terminal A (part-side) and body ground. • Is there any continuity?	Yes	Replace coil, then go to Step 19.
		No	Go to next step.
7	**INSPECT COIL CIRCUIT FOR SHORT** • Connect coil connector. • Check continuity between immobilizer unit terminal F (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to Step 19.
		No	Go to next step.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace harness, then go to Step 19.
		No	Go to next step.
9	**INSPECT COMMUNICATION LINE FOR OPEN CIRCUIT** • Measure continuity between immobilizer unit terminal A (harness-side) and PCM terminal 66. • Is there any continuity?	Yes	Go to step 19.
		No	Repair or replace harness, then go to Step 19.
10	**CLASSIFY MALFUNCTION BY ANOTHER DETECTED DTC** • Has DTC P1602 been detected?	Yes	Go to Step 14.
		No	Go to next step.
11	**INSPECT POOR CONNECTION OF COIL CONNECTOR** • Disconnect coil connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace harness, then go to Step 19.
		No	Go to next step.
12	**INSPECT COIL FOR OPEN** • Disconnect coil connector. • Measure resistance between coil terminals (part-side). • Is there any continuity?	Yes	Go to next step.
		No	Replace coil, then go to Step 19.
13	**INSPECT COIL CIRCUIT FOR OPEN** • Connect coil connector. • Measure the resistance between immobilizer connectors F and D (harness-side). • Is there any continuity?	Yes	Go to Step 19.
		No	Repair or replace harness, then go to Step 19.
14	**CLASSIFY MALFUNCTION BY ANOTHER DETECTED DTC** • Has immobilizer unit DTC 03 been detected?	Yes	Key has not transponder, change to registered key. Then go to Step 19.
		No	Go to next step.
15	**CLASSIFY MALFUNCTION BY ANOTHER DETECTED DTC** • Has immobilizer unit DTC 01 been detected?	Yes	Ignition key is not registered. Reprogram key or using another registered key, then go to next step. (See Section T)
		No	Go to next step.

STEP	INSPECTION		ACTION
16	**INSPECT POOR CONNECTION OF IMMOBILIZER UNIT CONNECTOR** • Turn ignition key to OFF. • Disconnect immobilizer unit connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
17	**INSPECT IMMOBILIZER UNIT POWER CIRCUIT FOR OPEN** • Turn ignition key to ON (Engine OFF). • Measure voltage between immobilizer connector J (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 19.
18	**INSPECT COMMUNICATION LINE FOR SHORT CIRCUIT** • Measure resistance between immobilizer unit terminal A (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
19	**VERIFY TROUBLESHOOTING OF DTC P1602 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
20	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1603
Except for GF4A-EL Models

DTC P1603	Key ID numbers are not registered in PCM
DETECTION CONDITION	• Key ID numbers are not registered in PCM.
POSSIBLE CAUSE	• Immobilizer system reprogram procedure (key IDs) was not performed after replacing PCM.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY DTC P1603 DETECTED AGAIN** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Perform key ID number reprogram procedure. (See Section T)
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF DTC P1603 COMPLETED** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1604
Except for GF4A-EL Models

DTC P1604	Code word is not registered in PCM
DETECTION CONDITION	• Code word is not registered in PCM.
POSSIBLE CAUSE	• Immobilizer system reprogram procedure (code word) was not performed after replacing PCM.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY DTC P1604 DETECTED AGAIN** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Perform code word reprogram procedure. (See Section T)
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF DTC P1604 COMPLETED** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1608
Except for GF4A-EL Models

DTC P1608	Malfunction in PCM circuit
DETECTION CONDITION	• If the PCM receives abnormal signal from output devices, the PCM determines that PCM has malfunction.
POSSIBLE CAUSE	• Short power circuit to output device control circuit (PRC solenoid valve, purge solenoid valve, EGR valve, and/or VICS solenoid valve). • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**INSPECT OUTPUT DEVICE CONTROL CIRCUIT FOR SHORT TO POWER** • Disconnect output device (PRC solenoid valve, purge solenoid valve, EGR valve, and/or VICS solenoid valve) connectors. • Measure voltage following connectors. — PRC solenoid valve terminal B (harness-side) and body ground — Purge solenoid valve terminal B (harness-side) and body ground — EGR valve terminal A (harness-side) and body ground — EGR valve terminal B (harness-side) and body ground — EGR valve terminal E (harness-side) and body ground — EGR valve terminal F (harness-side) and body ground — VICS solenoid valve terminal B (harness-side) and body ground • Are voltages **approx. 0 V**?	Yes	Go to next step
		No	Repair or replace harness, then go to next step.
3	**VERIFY TROUBLESHOOTING OF DTC P1608 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using NGS tester. • Turn ignition key to ON (Engine OFF) • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1621
Except for GF4A-EL Models

DTC P1621	Code word mismatch after engine cranking
DETECTION CONDITION	• Code word stored in PCM and immobilizer unit does not match.
POSSIBLE CAUSE	• Immobilizer system reprogram procedure (code word) was not performed correctly after replacing immobilizer unit or PCM.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY DTC P1621 DETECTED AGAIN** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Perform code word reprogram procedure. (See Section T)
		No	Go to next step.
3	**VERIFY TROUBLESHOOTING OF DTC P1621 COMPLETED** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure" (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1622
Except for GF4A-EL Models

DTC P1622	Key ID number mismatch
DETECTION CONDITION	• ID number stored in immobilizer unit and PCM does not match. This DTC is indicated only after immobilizer unit is replaced and reprogramming system.
POSSIBLE CAUSE	• Transformation of key ID number stored in PCM.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY DTC P1622 DETECTED AGAIN** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Go to next step.
		No	Go to Step 4.
3	**CHECK IF ENGINE STARTS NORMALLY USING ANOTHER REGISTERED KEY** • Does engine start with another registered key?	Yes	Previous key is defective. Discard it.
		No	Go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P1622 COMPLETED** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1623
Except for GF4A-EL Models

DTC P1623	Code word or key ID number read/write error in PCM
DETECTION CONDITION	• PCM internal EEPROM damaged.
POSSIBLE CAUSE	• PCM internal EEPROM damaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY DTC P1623 DETECTED AGAIN** • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
3	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1624
Except for GF4A-EL Models

DTC P1624	Immobilizer system communication counter = 0
DETECTION CONDITION	• PCM detected immobilizer system communication malfunction more than three times
POSSIBLE CAUSE	• Engine was attempted to start more than three times under malfunction. • Code word mismatch

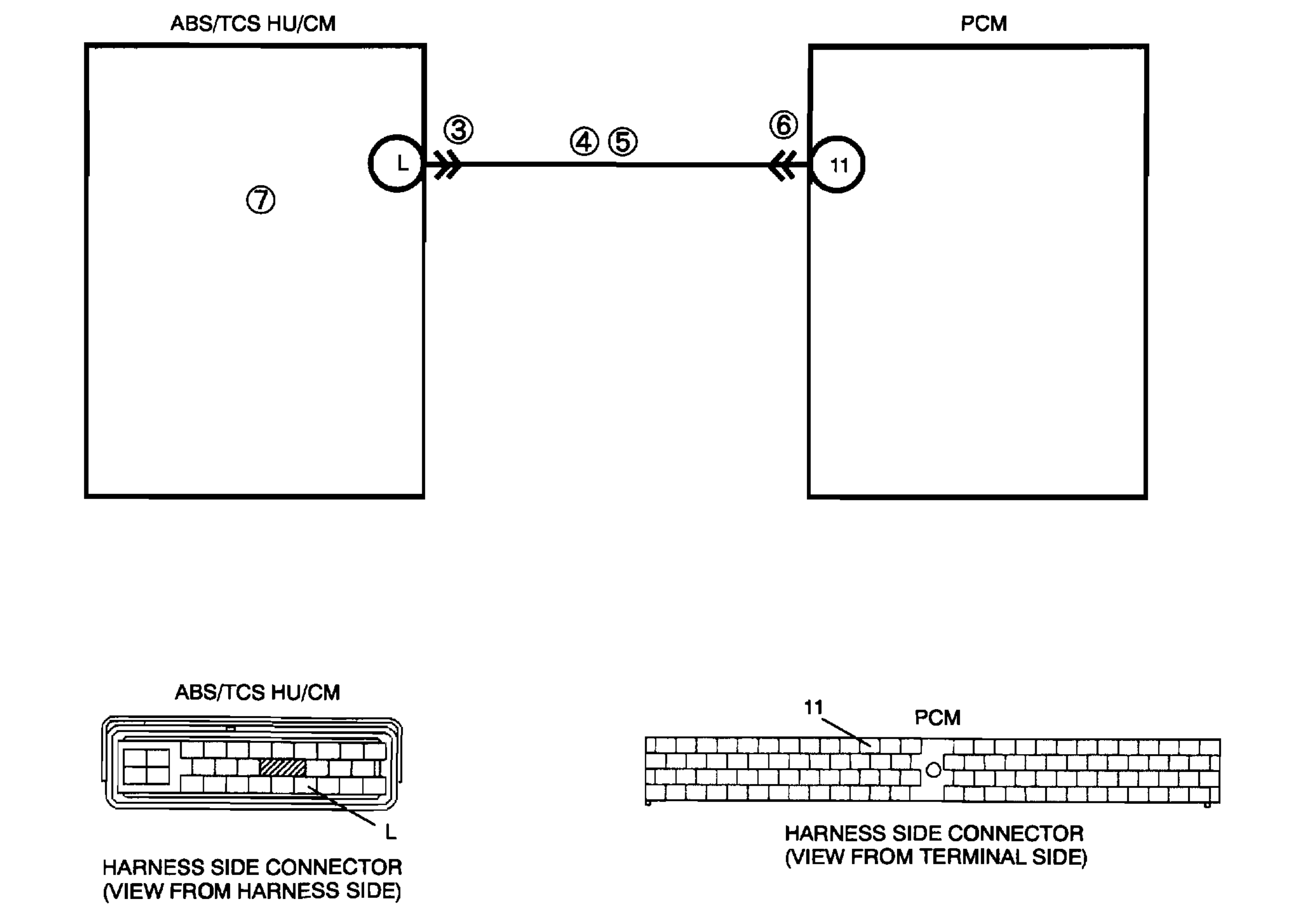
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**FOLLOW OTHER DETECTED DTC FIRST** • Turn ignition key to OFF, then START. • Has P1602 been detected?	Yes	Go to DTC P1602 inspection. (See F1-84 DTC P1602)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF IMMOBILIZER UNIT CONNECTOR** • Has DTC P1621 been detected?	Yes	Go to DTC P1621 inspection. (See F1-89 DTC P1621)
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**VERIFY TROUBLESHOOTING OF DTC P1624 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1627
Except for GF4A-EL Models

DTC P1627	PCM/TCS line—communication error
DETECTION CONDITION	• No pulse signal is input to PCM, or pulse shape is abnormal when vehicle is driven **above 5.6 km/h {3.7 mph}**.
POSSIBLE CAUSE	• ABS/TCS HU/CM malfunction • Open circuit or short to GND in wiring from ABS/TCS HU/CM terminal L to PCM terminal 11.

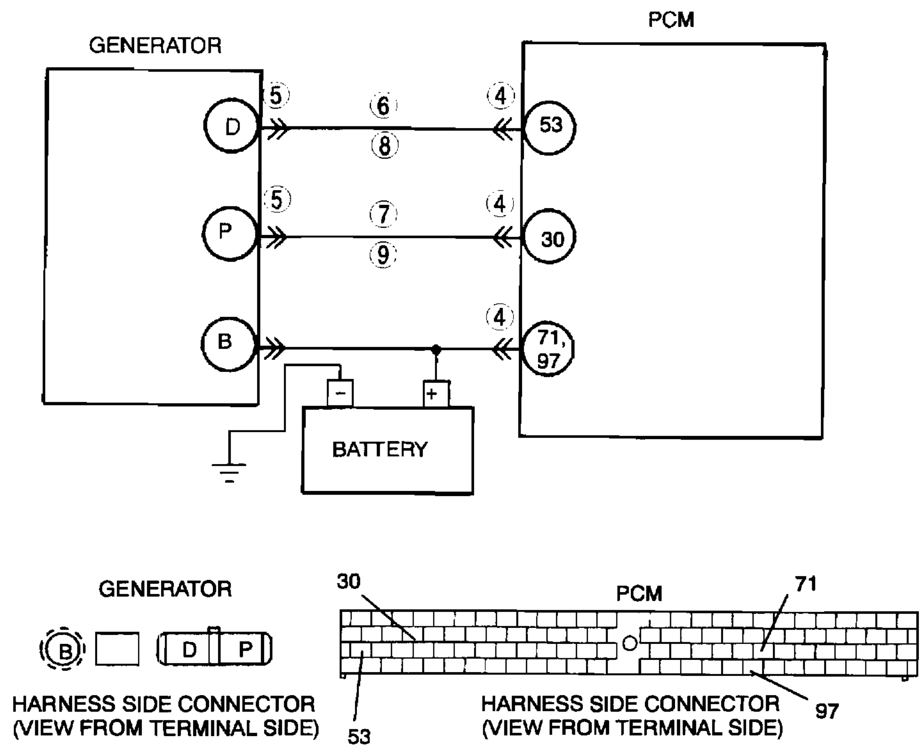


Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS — IS CONCERN INTERMITTENT OR CONSTANT** • Connect NGS tester to DLC. • Start engine. • Access VS PID using NGS tester. • Drive vehicle **above 5.6 km/h {3.7 mph}**. • Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**CHECK FOR POOR CONNECTION OF ABS/TCS HU/CM CONNECTOR** • Turn ignition key to OFF. • Disconnect ABS/TCS HU/CM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.
		No	Go to next step.
4	**INSPECT COMMUNICATION LINE FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between ABS/TCS HU/CM terminal L and body ground. • Is voltage **B+**	Yes	Repair or replace harness for short to ground, then go to Step 8.
		No	Go to next step.
5	**INSPECT COMMUNICATION LINE FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check for continuity between ABS/TCS HU/CM terminal **L** and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 8.
		No	Go to next step.
6	**CHECK FOR POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.
		No	Go to next step.
7	**INSPECT ABS/TCS HU/CM** • Inspect ABS/TCS HU/CM. (See Section P) • Is ABS/TCS HU/CM okay?	Yes	Go to next step.
		No	Replace ABS/TCS HU/CM, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P1627 COMPLETED** • Turn ignition key to ON (Engine OFF). • Access VS PID using NGS tester. • Drive vehicle **above 5.6 km/h {3.7 mph}**. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1631
Except for GF4A-EL Models

DTC P1631	Generator output voltage signal no electricity
DETECTION CONDITION	• PCM monitors input voltage from generator. If the PCM detects that generator output voltage is **below 8.5 V** for **5 seconds** while engine running, PCM determines that charging system has malfunction.
POSSIBLE CAUSE	• Open or short to ground circuit between the generator terminal P and the PCM terminal 30 • Open or short to ground circuit between the generator terminal D and the PCM terminal 53 • Cut drive belt off or came drive belt off • Generator malfunction — Rectifier circuit malfunction — Brush abrasion • PCM malfunction



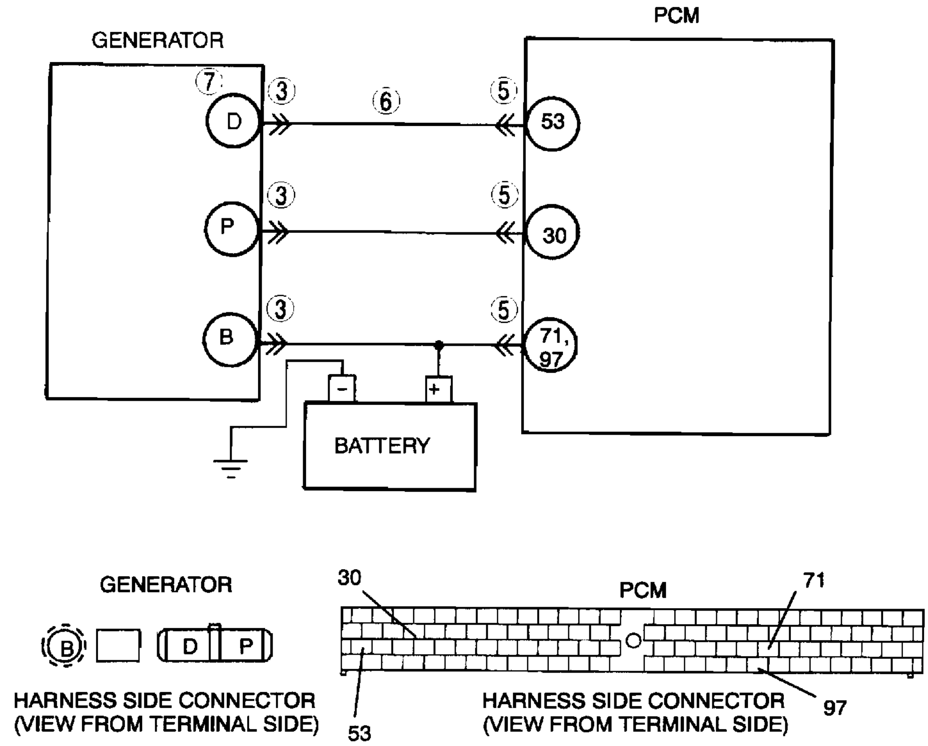
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to ON (Engine OFF). • Set NGS tester and monitor ALTT V PID. • Turn ignition key to START and let engine at idle. • Is ALTT V **below 8.5 V**?	Yes	Go to next step.
		No	Intermittent concern is existing. Go to **INTERMITTENT CONCERN** TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**INSPECT DRIVE BELT CONDITION** • Verify that drive belt tension within specification. (See Section B) • Is drive belt okay?	Yes	Go to next step.
		No	Replace and/or adjust drive belt, then go to Step 10.

STEP	INSPECTION		ACTION
4	**INSPECT POOR CONNECTION OF PCM CONNECTOR** ● Turn ignition key to OFF. ● Disconnect PCM connector. ● Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). ● Are there any malfunctions?	Yes	Repair terminals, then go to Step 10.
		No	Go to next step.
5	**INSPECT POOR CONNECTION OF GENERATOR CONNECTOR** ● Disconnect generator connector. ● Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). ● Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 10.
		No	Go to next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO GROUND** ● Check continuity between generator terminal D (harness-side) and body ground. ● Is there any continuity?	Yes	Repair or replace harness, then go to Step 10.
		No	Go to next step.
7	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR GROUND** ● Check continuity between generator terminal P (harness-side) and body ground. ● Is there any continuity?	Yes	Repair or replace harness, then go to Step 10.
		No	Go to next step.
8	**INSPECT GENERATOR CONTROL CIRCUIT FOR OPEN** ● Measure resistance between generator terminal D (harness-side) and PCM terminal 53. ● Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 10.
9	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR OPEN** ● Measure resistance between generator terminal P (harness-side) and PCM terminal 30. ● Is there any continuity?	Yes	Repair or replace generator, then go to next step.
		No	Repair or replace harness, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P1631 COMPLETED** ● Make sure to reconnect all disconnected connectors. ● Clear DTC from memory using NGS tester. ● Turn ignition switch to OFF, then start engine. ● Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** ● Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) ● Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1633
Except for GF4A-EL Models

DTC P1633	Battery overcharge
DETECTION CONDITION	• PCM monitors input voltage from generator and battery positive terminal. If PCM detects that generator output voltage is **above 16.5 V** or battery voltage **above 16.0 V** for **5 seconds** while engine running, PCM determines that charging system has malfunction.
POSSIBLE CAUSE	• Short to power circuit between the generator connector terminal D and the PCM connector terminal 1O • Generator malfunction • PCM malfunction



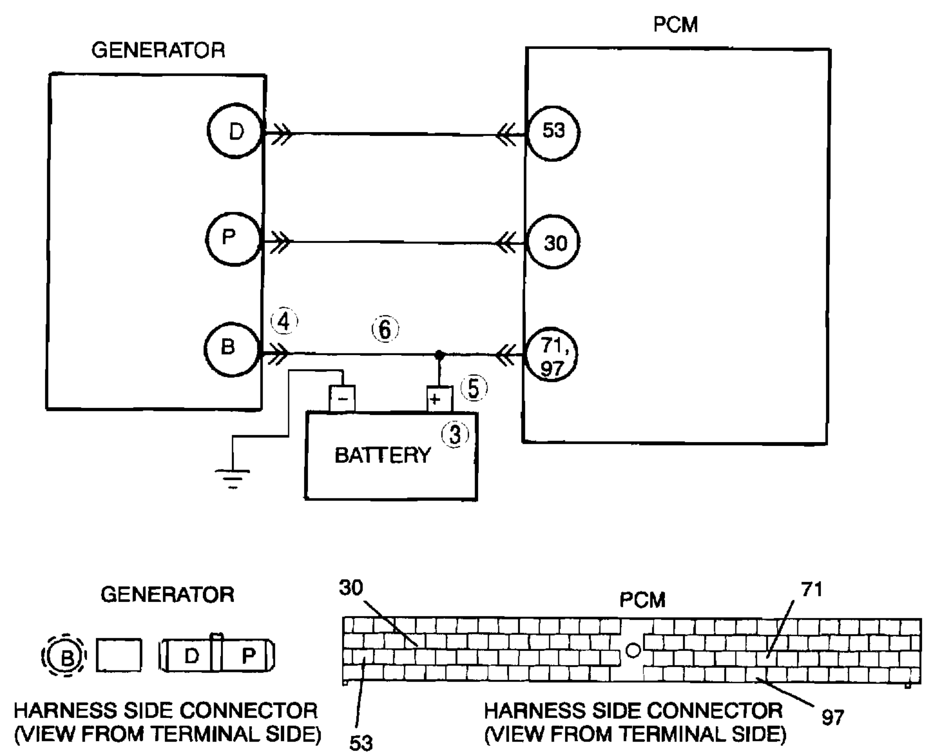
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Start engine. • Access ALTT V PID and B+ PID using NGS tester. • Is ALTT V PID **above 16.5 V** and B+ PID **below 16.0 V**?	Yes	Go to next step.
		No	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**INSPECT POOR CONNECTION OF GENERATOR CONNECTOR** • Turn ignition key to OFF. • Disconnect generator connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**CLASSIFY GENERATOR MALFUNCTION OR OTHER MALFUNCTION** • Turn ignition key to ON (Engine OFF). • Measure voltage between generator terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Malfunction at the generator. Go to Step 7.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.
		No	Go to next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between generator terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness, then go to Step 8.
		No	Go to Step 8.
7	**INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER** • Measure resistance between generator terminal D (part-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace generator, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P1633 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

DTC P1634
Except for GF4A-EL Models

DTC P1634	Generator terminal B circuit open
DETECTION CONDITION	• PCM monitors input voltage from generator and battery positive terminal. If PCM detected that generator output voltage is **above 18.5 V** and battery voltage **below 16.5 V** for **5 seconds** while engine running, PCM determines that charging system has malfunction.
POSSIBLE CAUSE	• Open circuit between the generator terminal B (harness-side) and the battery positive terminal • Battery malfunction • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Start engine. • Access ALTT V PID and B+ PID using NGS tester. • Is ALTT V PID **above 17.0 V** and B+ PID **below 11.0 V?**	Yes	Go to next step.
		No	Intermittent concern is existing. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F1-142 No.26 INTERMITTENT CONCERNS)
3	**INSPECT BATTERY** • Turn ignition key to OFF. • Inspect battery. (See Section G) • Is battery okay?	Yes	Replace battery, then go to Step 7.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT POOR INSTALLATION OF GENERATOR TERMINAL** • Turn ignition key to OFF. • Check for looseness of generator terminal B installation nut. • Is nut loose?	Yes	Tighten generator terminal B installation nut, then go to Step 7.
		No	Go to next step.
5	**INSPECT POOR INSTALLATION OF BATTERY POSITIVE TERMINAL** • Check for looseness of battery positive terminal. • Is terminal loose?	Yes	Connect battery positive terminal correctly, then go to Step 7.
		No	Go to next step.
6	**INSPECT BATTERY CHARGING CIRCUIT** • Start engine. • Disconnect battery positive terminal. • Does engine stall?	Yes	Repair or replace harness between generator terminal B and battery positive terminal, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P1634 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure." (See F1-36 AFTER REPAIR PROCEDURE) • Are any DTCs present?	Yes	Go to applicable DTC inspection. (See F1-37 DTC TABLE)
		No	Troubleshooting completed.

TROUBLESHOOTING

FOREWORD

- Before proceeding with the following troubleshooting.
  (1) Refer to Section GI to understand the basic troubleshooting procedure.
  (2) Perform the DTC inspection.
  (3) If the DTC is displayed, proceed with inspection steps for the code.
  (4) When the engine can be started, perform "ENGINE TUNE-UP".

TROUBLESHOOTING ITEM TABLE

- Confirm trouble symptom using the following diagnostic index, then go to appropriate troubleshooting chart.

No.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
1	Melting of main or other fuses		—	See F1-105 NO.1 MELTING OF MAIN OR OTHER FUSES
2	Will not crank		Starter does not work.	See F1-106 NO.2 WILL NOT CRANK
3	Hard to start/long crank/erratic start/ erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	See F1-107 NO.3 HARD START/LONG CRANK/ERRATIC START/ERRATIC CRANK
4	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle and/or after start.	See F1-109 NO.4 ENGINE STALLS—AFTER START/AT IDLE
5	Cranks normally but will not start		Starter cranks engine at normal speed but engine will not run.	See F1-113 NO.5 CRANKS NORMALLY BUT WILL NOT START
6	Slow return to idle		Engine takes more time than normal to return to idle speed.	See F1-116 NO.6 SLOW RETURN TO IDLE
7	Engine runs rough/rolling idle		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	See F1-117 NO.7 ENGINE RUNS ROUGH/ROLLING IDLE
8	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition switch is turned off.	See F1-120 NO.8 FAST IDLE/RUNS ON
9	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	See F1-120 NO.9 LOW IDLE/STALLS DURING DECELERATION
10	Engine stalls/ quits.	Acceleration/cruise	Engine stops unexpectedly at beginning of acceleration or during acceleration. Engine stops unexpectedly while cruising.	See F1-121 NO.10 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES
	Engine runs rough.	Acceleration/cruise	Engine speed fluctuates during acceleration or cruising.	
	Misses	Acceleration/cruise	Engine misses during acceleration or cruising.	
	Buck/jerk	Acceleration/cruise/ deceleration	Vehicle bucks/jerks during acceleration, cruising, or deceleration.	
	Hesitation/ stumble	Acceleration	Momentary pause at beginning of acceleration or during acceleration	
	Surges	Acceleration/cruise	Momentary minor irregularity in engine output	
11	Lack/loss of power	Acceleration/cruise	Performance is poor under load (e.g., power down when climbing hills).	See F1-125 NO.11 LACK/LOSS OF POWER—ACCELERATION/ CRUISE

No.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
12	Knocking/ pinging	Acceleration/cruise	Sound is produced when air/fuel mixture is ignited by something other than spark plug (e.g., hot spot in combustion chamber).	See F1-127 NO.12 KNOCKING/PINGING—ACCELERATION/CRUISE
13	Poor fuel economy		Fuel economy is unsatisfactory.	See F1-129 NO.13 POOR FUEL ECONOMY
14	Emissions compliance		Fails emissions test.	See F1-131 NO.14 EMISSION COMPLIANCE
15	High oil consumption/leakage		Oil consumption is excessive.	See F1-132 NO.15 HIGH OIL CONSUMPTION/LEAKAGE
16	Cooling system concerns	Overheating	Engine runs at higher than normal temperature / overheats.	See F1-133 NO.16 COOLING SYSTEM CONCERNS—OVERHEATI NG
17	Cooling system concerns	Runs cold	Engine does not reach normal operating temperature.	See F1-134 NO.17 COOLING SYSTEM CONCERNS—RUNS COLD
18	Exhaust smoke		Blue, black, or white smoke from exhaust system	See F1-135 NO.18 EXHAUST SMOKE
19	Fuel odor (in engine compartment)		Gasoline fuel smell or visible leakage	See F1-137 NO.19 FUEL ODOR (IN ENGINE COMPARTMENT)
20	Engine noise		Engine noise from under hood	See F1-138 NO.20 ENGINE NOISE
21	Vibration concerns (engine)		Vibration from under hood or driveline	See F1-138 NO.21 VIBRATION CONCERNS (ENGINE)
22	A/C does not work sufficiently.		A/C compressor magnetic clutch does not engage when A/C is turned on.	See F1-139 NO.22 A/C DOES NOT WORK SUFFICIENTLY.
23	A/C is always ON or A/C compressor runs continuously.		A/C compressor magnetic clutch does not disengage.	See F1-139 NO.23 A/C ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.
24	A/C does not cut off under WOT conditions.		A/C compressor magnetic clutch does not disengage under WOT.	See F1-140 NO.24 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS.
25	Exhaust sulphur smell		Rotten egg smell (sulphur) from exhaust	See F1-141 NO.25 EXHAUST SULPHUR SMELL
26	Intermittent concerns		Symptom occurs randomly and is difficult to diagnose.	See F1-142 NO.26 INTERMITTENT CONCERNS
27	Constant voltage		Incorrect constant voltage	See F1-142 NO.27 CONSTANT VOLTAGE
28	Spark plug condition		Incorrect spark plug condition	See F1-144 NO.28 SPARK PLUG CONDITION
29	Automatic transaxle (ATX) concerns	Upshift/downshift/ engagement	ATX concerns not relatea to engine performance	See Section K1 See Section K2

QUICK DIAGNOSIS CHART

No.	Troubleshooting item		Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch open	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel seized	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture improper	Cooling system malfunction (Radiator, hoses, over-flow system, thermostat, etc.)	Main cooling fan system malfunction	Engine or transmission mounts improperly installed	Add fan and / or main cooling fan system malfunction
1	Melts main or other fuse																				
2	Will not crank		○	○		○	○			○				○							
3	Hard start/long crank/erratic start/erratic crank																				
4	Engine stalls	After start/at idle						○	○	○											
5	Cranks normally but will not start							○	○	○											
6	Slow return to idle																		○		
7	Engine runs rough/rolling idle							○	○												
8	Fast idle/runs on																				
9	Low idle/stalls during deceleration																				
10	Engine stalls/quits	Acceleration/cruise						○	○												
	Engine runs rough	Acceleration/cruise						○	○												
	Misses	Acceleration/cruise						○	○												
	Buck/jerk	Acceleration/cruise/ deceleration						○	○												
	Hesitation/stumble	Acceleration						○	○												
	Surges	Acceleration/cruise						○	○												
11	Lack/loss of power	Acceleration/cruise						○	○												
12	Knocking/pinging	Acceleration/cruise						○										○			
13	Poor fuel economy							○	○							○		○	○		
14	Emissions compliance							○	○				○					○			
15	High oil consumption/leaks										○	○	○								
16	Cooling system concerns	Overheating													○	○	○	○	○		
17	Cooling system concerns	Runs cold																○	○		
18	Exhaust smoke												○					○			
19	Fuel odor (in engine compartment)																				
20	Engine noise				○								○		○						
21	Vibration concerns (engine)														○					○	○
22	A/C does not work sufficiently																				
23	A/C always ON or A/C compressor runs continuously																				
24	A/C does not cut off under wide open throttle conditions																				
25	Exhaust sulphur smell																				
26	Intermittent concerns					○															
27	Constant voltage																				
28	Spark plug condition							○			○		○				○				
29	Automatic transaxle concerns	Upshift/downshift/ engagement	See Section K1 See Section K2																		

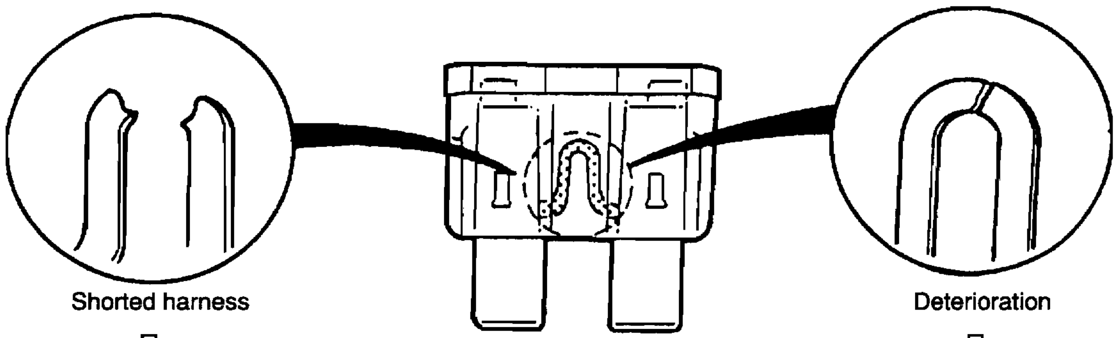
Troubleshooting Item		Possible factor	Accelerator cable free play misadjustment	Fuel quality	Engine overheating	Air cleaner element clogging or restriction	Air leakage from intake-air system (Loose tubes, cracks, gaskets breakage)	IAC valve improper operation	Throttle body malfunction	Vacuum leakage (Vacuum hose damage, misrouting)	Ignition coil malfunction (e.g. open, short or cracks)	Initial ignition timing misadjustment (CKP and crankshaft pulley misadjustment)	Spark plug malfunction	High-tension leads malfunction (Cracks, open, low resistance)	CKP sensor damaged e.g. open or short circuits)	Crankshaft pulley damaged	Improper gap between CKP sensor and crankshaft pulley	Fuel pump malfunction (Mechanical or electrical)	Pressure regulator malfunction
1	Melts main or other fuse																		
2	Will not crank																		
3	Hard start/long crank/erratic start/erratic crank			○		○	○			○			○	○	○	○	○	○	○
4	Engine stalls	After start/at idle		○	○	○	○	○		○	○	○	○	○	○	○	○	○	○
5	Cranks normally but will not start			○	○		○	○		○	○	○	○	○	○	○	○	○	○
6	Slow return to idle								○										
7	Engine runs rough/rolling idle			○	○		○	○		○		○	○	○	○	○	○	○	○
8	Fast idle/runs on		○																
9	Low idle/stalls during deceleration						○	○											
10	Engine stalls/quits	Acceleration/cruise		○	○	○	○		○	○			○		○	○	○	○	○
	Engine runs rough	Acceleration/cruise		○	○	○	○		○	○			○		○	○	○	○	○
	Misses	Acceleration/cruise		○	○	○	○		○	○			○		○	○	○	○	○
	Buck/jerk	Acceleration/cruise/deceleration		○	○	○	○		○	○			○		○	○	○	○	○
	Hesitation/stumble	Acceleration		○	○	○	○		○	○			○		○	○	○	○	○
	Surges	Acceleration/cruise		○	○	○	○		○	○			○		○	○	○	○	○
11	Lack/loss of power	Acceleration/cruise		○	○	○	○		○				○		○	○	○	○	○
12	Knocking/pinging	Acceleration/cruise			○													○	○
13	Poor fuel economy			○		○							○	○				○	○
14	Emissions compliance					○	○		○				○	○				○	○
15	High oil consumption/leaks																		
16	Cooling system concerns	Overheating																	
17	Cooling system concerns	Runs cold																	
18	Exhaust smoke					○							○	○				○	○
19	Fuel odor (in engine compartment)																		○
20	Engine noise						○			○									
21	Vibration concerns (engine)																		
22	A/C does not work sufficiently																		
23	A/C always ON or A/C compressor runs continuously																		
24	A/C does not cut off under wide open throttle conditions																		
25	Exhaust sulphur smell			○															
26	Intermittent concerns							○		○	○		○	○	○			○	○
27	Constant voltage																		
28	Spark plug condition			○		○							○					○	○
29	Automatic transaxle concerns	Upshift/downshift/engagement	See Section K1 See Section K2																

Fuel hoses restriction or clogging	Injectors malfunction (Leakage or clogging, inoperative)	Fuel leakage from fuel system (Including insulator, injector O-ring)	Fuel filters restriction or clogging	PRC solenoid valve improper operation	CMP sensor damaged (e.g. open or short circuit)	Camshaft damaged	Improper air/fuel mixture ratio control	Exhaust system restriction or clogging	Catalytic converter malfunction	EGR system malfunction	Evaporative emission control system malfunction	PCV valve malfunction	V-reference supply circuit malfunction	Main relay malfunction (Mechanical or electrical)	ECT sensor malfunction	TR switch misadjustment	P/N position switch in TR switch open	Brake switch and related circuit malfunction	Possible factor / Troubleshooting item		
																			Melts main or other fuse		1
																	○	○	Will not crank		2
○			○	○			○	○		○	○	○							Hard start/long crank/erratic start/erratic crank		3
○	○	○					○	○		○	○	○		○					After start/at idle	Engine stalls	4
○	○	○					○	○		○	○	○	○	○					Cranks normally but will not start		5
															○				Slow return to idle		6
○	○		○		○	○	○	○		○	○	○							Engine runs rough/rolling idle		7
															○				Fast idle/runs on		8
							○				○							○	Low idle/stalls during deceleration		9
○	○		○		○	○	○	○		○	○	○	○	○					Acceleration/cruise	Engine stalls/quits	10
○	○		○		○	○	○	○		○	○	○	○	○					Acceleration/cruise	Engine runs rough	
○	○		○		○	○	○	○		○	○	○	○	○					Acceleration/cruise	Misses	
○	○		○		○	○	○	○		○	○	○	○	○					Acceleration/cruise/deceleration	Buck/jerk	
○	○		○		○	○	○	○		○	○	○	○	○					Acceleration	Hesitation/stumble	
○	○		○		○	○	○	○		○	○	○	○	○					Acceleration/cruise	Surges	
○	○				○	○		○		○	○	○							Acceleration/cruise	Lack/loss of power	11
																			Acceleration/cruise	Knocking/pinging	12
○			○	○	○	○		○				○							Poor fuel economy		13
○			○		○	○	○	○	○	○	○	○							Emissions compliance		14
												○							High oil consumption/leaks		15
																			Overheating	Cooling system concerns	16
																			Runs cold	Cooling system concerns	17
○	○			○								○							Exhaust smoke		18
		○									○								Fuel odor (in engine compartment)		19
																			Engine noise		20
																			Vibration concerns (engine)		21
																			A/C does not work sufficiently		22
																			A/C always ON or A/C compressor runs continuously		23
																			A/C does not cut off under wide open throttle conditions		24
											○								Exhaust sulphur smell		25
	○			○					○	○	○			○	○	○	○	○	Intermittent concerns		26
																			Constant voltage		27
○	○						○								○				Spark plug condition		28
See section K1 See section K2																			Upshift/downshift/engagement	Automatic transaxle concerns	29

No.	Troubleshooting item		Neutral or clutch switch and related circuit malfunction	MAF sensor and related circuit malfunction	TP sensor and related circuit malfunction	TP sensor misadjustment (Including looseness)	Knock sensor and related circuit malfunction	PSP switch and related circuit malfunction	Improper refrigerant charging amount	A/C relay (A/C control signal) circuit malfunction	Condenser fan system malfunction	Improper load signal input	Clutch slippage	ATX related parts malfunction	VSS and related circuit malfunction	Improper ATF level	Brake dragging	Loose parts	Wheels and tires improper balance	Driveline malfunction	Suspension malfunction
1	Melts main or other fuse																				
2	Will not crank																				
3	Hard start/long crank/erratic start/erratic crank			○																	
4	Engine stalls	After start/at idle							○	○	○										
5	Cranks normally but will not start																				
6	Slow return to idle											○									
7	Engine runs rough/rolling idle							○	○	○	○	○									
8	Fast idle/runs on											○									
9	Low idle/stalls during deceleration		○	○	○	○				○											
10	Engine stalls/quits	Acceleration/cruise		○	○	○			○	○	○		○	○	○						
	Engine runs rough	Acceleration/cruise		○	○	○			○	○	○		○	○	○						
	Misses	Acceleration/cruise		○	○	○			○	○	○		○	○	○						
	Buck/jerk	Acceleration/cruise/deceleration		○	○	○			○	○	○		○	○	○						
	Hesitation/stumble	Acceleration		○	○	○			○	○	○		○	○	○						
	Surges	Acceleration/cruise		○	○	○			○	○	○		○	○	○						
11	Lack/loss of power	Acceleration/cruise							○	○	○		○	○	○		○				
12	Knocking/pinging	Acceleration/cruise		○			○														
13	Poor fuel economy										○					○	○				
14	Emissions compliance																				
15	High oil consumption/leaks																				
16	Cooling system concerns	Overheating							○	○	○										
17	Cooling system concerns	Runs cold									○										
18	Exhaust smoke																				
19	Fuel odor (in engine compartment)																				
20	Engine noise																	○			
21	Vibration concerns (engine)																		○	○	○
22	A/C does not work sufficiently								○	○	○										
23	A/C always ON or A/C compressor runs continuously									○	○										
24	A/C does not cut off under wide open throttle conditions				○	○															
25	Exhaust sulphur smell																				
26	Intermittent concerns		○	○	○		○	○		○				○							
27	Constant voltage																				
28	Spark plug condition			○																	
29	Automatic transaxle concerns	Upshift/downshift/engagement	See Section K1 See Section K2																		

NO.1 MELTING OF MAIN OR OTHER FUSES

1	Melting of main or other fuses
Inspect condition of fuse.	



Damaged Fuse	Damaged Fuse	Related Wiring Harness
MAIN (100 A)	MAIN (100 A)	**MAIN fuse** • Generator
IG KEY (60 A)	IG KEY (60 A)	**IG KEY fuse** • Ignition switch
INJ (30 A)	INJ (30 A)	**INJ fuse** • Main relay **Main relay** • PCM • Fuel pump relay • Fuel injectors • Purge solenoid valve • MAF sensor • VICS solenoid valve • VSS • PRC solenoid valve • EGR valve **Fuel pump relay** • Fuel pump
ROOM (10 A)	ROOM (10 A)	**ROOM fuse** • PCM
ENGINE (10 A)	ENGINE (10 A)	**ENGINE fuse** • Ignition coil • Condenser • HO2S • Main relay
METER (10 A)	METER (10 A)	**METER fuse** • TR switch (ATX)

NO.2 WILL NOT CRANK

2	**Will not crank**
DESCRIPTION	• Starter does not work.
POSSIBLE CAUSE	• Open circuit between ignition switch and starter • TR switch malfunction (ATX) • TR switch misadjustment (ATX) • Starter malfunction • Starter interlock switch malfunction (MTX: if equipped) • Seized/hydrolocked engine, flywheel or drive plate

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify following: • Battery connection • Battery condition • Transmission is in Park or Neutral (ATX). • Fuses Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Is click sound heard from starter when ignition switch is turned to START?	Yes	Go to next step.
		No	Go to Step 4.
3	Inspect starting system. (See Section G) Is starting system okay?	Yes	Inspect for seized/hydrolocked engine, flywheel or drive plate. (See Section H)
		No	Repair or replace components as required.
4	Do any other electrical accessories work?	Yes	Go to next step.
		No	Inspect charging system. (See Section G)
5	**NOTE** • Following test should be performed on ATX only. For MTX, go to next step. Connect NGS tester to DLC. Access TR SW PID. Turn ignition switch ON. Is TR SW PID indicated on when selecting P or N range?	Yes	Go to next step.
		No	Inspect adjustment of TR switch. If TR switch is adjusted properly, inspect for open circuit between TR switch and PCM or starter.
6	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is "NO CODES RECEIVED/SYSTEM PASSED" displayed?	Yes	**No DTC is displayed:** Inspect following: • START circuit in ignition switch • Open circuit between ignition switch and starter
		No	**DTC is displayed:** Go to appropriate DTC test. If communication error message is displayed on NGS tester, inspect for following: • Open circuit between main relay and PCM terminal 71, 97 • Open main relay GND circuit • Main relay is stuck open. • Open or poor GND circuit at PCM • Poor connection of vehicle body GND
7	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.3 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK

3	**Hard to start/long crank/erratic start/erratic crank**
DESCRIPTION	• Starter cranks engine at normal speed but engine requires excessive cranking time before start. • Battery is in normal condition.
POSSIBLE CAUSE	• Spark leakage from high-tension leads • Vacuum leakage • Poor fuel quality • Starting system malfunction • Spark plug malfunction • Air leakage from intake-air system • Erratic signal from CKP sensor • Air cleaner restriction • PCV valve malfunction • Inadequate fuel pressure • Purge solenoid valve malfunction • MAF sensor contamination • Restriction in exhaust system • EGR valve malfunction • Malfunction of pressure regulator control (PRC) system **Warning** • **Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** **—Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **—Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for following: • Vacuum leakage • Fuel quality (e.g. proper octane, contamination, winter/summer blend) • Loose bands on intake-air system • Cracks on intake-air system parts • Air cleaner restriction Are all items okay?	Yes	Go to next step.
		No	Service as necessary.
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting No.16 for "Cooling system concerns - Overheating".
		No	Go to next step.
4	Inspect for cracks on high-tension leads Is there any crack on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
5	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.

STEP	INSPECTION	RESULTS	ACTION
6	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
7	Measure gap between CKP sensor and teeth of crankshaft pulley. **Specification** **0.5—1.5 mm {0.020—0.059 In}** Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
8	Remove and inspect PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
9	Install fuel pressure gauge between fuel main pipe and fuel distributor. Connect a jumper wire between F/P terminal at DLC in engine compartment and GND. (See Section F) Turn ignition switch on. Is fuel line pressure correct? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. Inspect PRC solenoid and related vacuum hose and harnesses. **High:** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
10	Is fuel line pressure held after ignition switch is turned off? **Fuel line pressure** **More than 150 kPa {1.5 kgf/cm^2, 21 psi} for 5 min.**	Yes	Go to next step.
		No	Inspect pressure regulator diaphragm condition. If condition is okay, inspect fuel injector. If condition is not okay, replace pressure regulator.
11	Disconnect vacuum hose from pressure regulator and plug hose. Start engine. Does fuel line pressure remain within ±**20 kPa {0.21 kgf/cm^2, 3 psi}** while driving vehicle?	Yes	Go to next step.
		No	Inspect for clogged fuel filter.
12	Connect vacuum hose to pressure regulator. Install vacuum gauge to intake manifold. Start engine. Does fuel pressure gauge reading increase as vacuum gauge reading decreases and/or fuel pressure gauge reading decrease as vacuum gauge reading increases?	Yes	Go to next step.
		No	Connect vacuum pump to pressure regulator. Start engine. Verify fuel pressure gauge reading changes as vacuum changes. If changes, inspect vacuum line. If does not change, replace pressure regulator.
13	Disconnect a vacuum hose from purge solenoid valve and plug opening end of vacuum hose. Attempt to start engine. Is starting condition improved?	Yes	Inspect if purge solenoid valve is stuck open.
		No	Go to next step.
14	Inspect MAF sensor for contamination. Is there any contamination?	Yes	Replace MAF sensor.
		No	Go to next step.
15	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.
16	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
17	Inspect starting system. (See Section G) Is starting system normal?	Yes	Inspect for loose connectors or poor terminal contact. If okay, remove EGR valve and visually inspect for mechanically stuck EGR valve.
		No	Repair or replace components as required.
18	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.4 ENGINE STALLS - AFTER START/AT IDLE

4	**Engine stalls - after start/at idle**
DESCRIPTION	• Engine stops unexpectedly.
POSSIBLE CAUSE	• A/C system operation is improper. • Air leakage from intake-air system parts • Purge solenoid valve malfunction • Improper operation of IAC valve • EGR valve malfunction • No signal from CKP sensor due to sensor, related wire or wrong installation • Vacuum leakage • Low engine compression • Spark leakage from high-tension leads • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Electrical connector disconnection • Open or short circuit in fuel pump body and related harness • No battery power supply to PCM or poor GND • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Immobilizer system and/or circuit malfunction • Pressure regulator control (PRC) system malfunction **Warning** • **Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** —**Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** —**Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	**Note** • The following test should be performed on vehicles with immobilizer system. Go to Step 12 for vehicles without immobilizer system. Connect NGS tester to DLC. Do either of following conditions appear? • Engine is not completely started. • DTC P1624 is displayed.	Yes	**Both conditions appear:** Go to Step 4.
		No	**Either or other condition appears:** Go to next step.
2	Does engine stall after approx. 2 seconds since engine is started?	Yes	Go to next step.
		No	Immobilizer system is okay. Go to Step 12.
3	Is immobilizer unit connector securely connected to immobilizer unit?	Yes	Go to next step.
		No	Connect immobilizer unit connector securely. Return to Step 2.
4	Does immobilizer indicator light flash and indicate any of following immobilizer system DTCs? **DTC: 01, 02, 03, 11, 21**	Yes	Go to "ON-BOARD DIAGNOSTIC FUNCTION" of immobilizer system.
		No	Go to next step.
5	Does immobilizer indicator light illuminate?	Yes	Go to Step 8.
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
6	Does immobilizer indicator light flash and indicate either of following immobilizer system DTCs more than 135 seconds after ignition switch is turned on? **DTC: 24, 30**	Yes	Go to "ON-BOARD DIAGNOSTIC FUNCTION" of immobilizer system.
		No	Go to next step.
7	Turn ignition switch off. Disconnect immobilizer unit connector. Connect jumper wire between immobilizer unit connector terminal M and GND. Turn ignition switch on. Does immobilizer indicator light illuminate?	Yes	Reconnect immobilizer unit connector. Go to next step.
		No	Inspect for open circuit between immobilizer unit connector terminal M and instrument cluster. If okay, inspect immobilizer indicator light bulb. Repair or replace if necessary. Reconnect immobilizer unit connector, then return to Step 4.
8	Connect NGS tester to DLC and retrieve DTC. Are any of following DTCs displayed? **DTC: P1602, P1603, P1604, P1621, P1622, P1624**	Yes	Go to appropriate DTC test.
		No	Go to next step.
9	Is there continuity between PCM GND terminals 24, 51, 76, 77, 103 and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
10	Turn ignition switch on. Access B+ PID. Is B+ or VPWR PID okay? **B+ (VPWR) PID: Battery voltage**	Yes	Go to next step.
		No	Repair or replace wiring harness.
11	Disconnect immobilizer unit connector. Turn ignition switch on. Is there battery voltage at immobilizer unit connector terminal J?	Yes	Inspect for open circuit between PCM connector terminal 5 (for GF4A-EL models) or 66 (except for GF4A-EL models) and immobilizer unit connector terminal A.
		No	Repair or replace wiring harness between immobilizer unit connector terminal J and fuse panel.
12	Verify following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold (e.g. EGR valve, IAC valve.) • Ignition wiring • Fuel quality (e.g. proper octane, contamination, winter/summer blend) • Electrical connections • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 12.
13	Turn ignition switch on. Disconnect TP sensor connector. Measure voltage at TP sensor connector VREF terminal with ignition switch on. **Voltage: 4.5—5.5 V** Is voltage okay?	Yes	Go to next step.
		No	Go to symptom troubleshooting No.27 "Constant voltage".

STEP	INSPECTION	RESULTS	ACTION
14	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test. If communication error message is displayed on NGS tester, inspect for following: • Open circuit between main relay and PCM terminal 71 or 97 • Open main relay GND circuit • Main relay is stuck open. • Open PCM GND circuit (terminal 24, 51, 76, 77 or 103) • Poor connection of vehicle body GND
		No	**No DTC displayed:** Go to next step.
15	Attempt to start engine at part throttle. Does engine run smooth at part throttle?	Yes	Inspect IAC valve and wiring harness.
		No	Go to next step.
16	Connect NGS tester to DLC. Access RPM PID. Is RPM PID indicating engine speed during engine cranking?	Yes	Go to next step.
		No	Inspect for following: • Open or short circuit in CKP sensor • Open or short circuit between CKP sensor and PCM terminal 21 or 22 • Open or short circuit in CKP sensor harnesses If CKP sensor and harness are okay, go to next step.
17	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
18	Measure gap between CKP sensor and teeth of crankshaft pulley. **Specification** **0.5—1.5 mm {0.020—0.059 in}** Is gap within specifications?	Yes	Go to next step.
		No	Adjust CKP sensor.
19	Inspect for cracks on high-tension leads Is there any crack on high-tension leads?	Yes	Repair suspected high-tension lead.
		No	Go to next step.
20	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Go to next step. If symptom occurs with A/C on, go to Step 26.
		No	Inspect for following: • Ignition coil • Open or short circuit in ignition coil • Open circuit in high-tension leads • Open circuit between ignition coil connector GND terminal and body ground • Open circuit between ignition switch and ignition coil • Open circuit between ignition coil and PCM terminal 26 or 52
21	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
22	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
23	Is there any restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
24	Install fuel pressure gauge between fuel main pipe and fuel distributor. Connect jumper wire between F/P terminal at DLC in engine compartment and GND. Turn ignition switch on. Is fuel line pressure correct with ignition switch on? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. Inspect PRC solenoid, related vacuum hose and related harnesses. **High:** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
25	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service as necessary. Does fuel line pressure hold after ignition switch is turned off? **Fuel line pressure** **More than 150 kPa {1.5 kgf/cm^2, 21 psi} for 5 min.**	Yes	Go to next step.
		No	Inspect pressure regulator diaphragm condition. If condition is okay, inspect fuel injector. If condition is not okay, replace pressure regulator.
26	**Note:** • The following test is for stall concerns with A/C on. If other symptoms exist, go to next step. Connect pressure gauges to A/C low and high pressure side lines. Turn A/C on and measure low side and high side pressure. (See Section U) Are pressures within specifications?	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting No.23 "A/C is always ON or A/C compressor runs continuously". For other symptoms, inspect following: • Refrigerant charging amount • Condenser fan operation
27	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid side. Plug opening end of vacuum hose. Start engine. Is engine stall now eliminated?	Yes	Inspect if purge solenoid valve is stuck open. Inspect evaporative emission control system.
		No	Go to next step.
28	Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace.
		No	Go to next step.
29	Check engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
30	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for cause.
31	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.5 CRANKS NORMALLY BUT WILL NOT START

5	**Cranks normally but will not start**
DESCRIPTION	• Starter cranks engine at normal speed but engine will not run. • Refer to "Engine stalls" if this symptom appears after engine stall. • Fuel is in fuel tank. • Battery is in normal condition.
POSSIBLE CAUSE	• No battery power supply to PCM • Air leakage from intake-air system • Open PCM GND or vehicle body GND • Improper operation of IAC valve • EGR valve malfunction • No signal from CKP sensor due to sensor, related wire or incorrect installation • Low engine compression • Vacuum leakage • Spark leakage from high-tension leads • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Disconnected electrical connector • Open or short circuit in fuel pump body and related harness • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Fuel leakage from injector • Fuel injector is clogged. • Purge solenoid valve malfunction • Immobilizer system and/or related circuit malfunction • Pressure regulator control (PRC) system malfunction **Warning** • **Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** —**Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** —**Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	**Note** • The following test should be performed on vehicles with immobilizer system. Go to Step 12 for vehicles without immobilizer system. Connect NGS tester to DLC. Do either of following conditions appear? • Engine is not completely started. • DTC P1624 is displayed.	Yes	**Both conditions appear:** Go to Step 4.
		No	**Either or other condition appears:** Go to next step.
2	Does engine stall after approx. 2 seconds since engine is started?	Yes	Go to next step.
		No	Immobilizer system is okay. Go to Step 12.
3	Is immobilizer unit connector securely connected to immobilizer unit?	Yes	Go to next step.
		No	Connect immobilizer unit connector securely. Return to Step 2.
4	Does immobilizer indicator light flash and indicate any of following immobilizer system DTCs? **DTC: 01, 02, 03, 11, 21**	Yes	Go to "ON-BOARD DIAGNOSTIC FUNCTION" of immobilizer system.
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
5	Does immobilizer indicator light illuminate?	Yes	Go to Step 8.
		No	Go to next step.
6	Does immobilizer indicator light flash and indicate following immobilizer system DTCs more than 135 seconds after ignition switch is turned on? **DTC: 24, 30**	Yes	Go to "ON-BOARD DIAGNOSTIC FUNCTION" of immobilizer system.
		No	Go to next step.
7	Turn ignition switch off. Disconnect immobilizer unit connector. Connect jumper wire between immobilizer unit connector terminal M and GND. Turn ignition switch on. Does immobilizer indicator light illuminate?	Yes	Reconnect immobilizer unit connector. Go to next step.
		No	Inspect for open circuit between immobilizer unit connector terminal M and instrument cluster. If okay, inspect immobilizer indicator light bulb. Repair or replace if necessary. Reconnect immobilizer unit connector, then return to Step 4.
8	Connect NGS tester to DLC and retrieve DTC. Is any of following DTCs displayed? **DTC: P1602, P1603, P1604, P1621, P1622, P1624**	Yes	Go to appropriate DTC test.
		No	Go to next step.
9	Is there continuity between PCM GND terminals 24, 51, 76, 77 or 103 and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
10	Turn ignition switch on. Access B+ PID. Is B+ or VPWR PID okay? **B+ (VPWR) PID: Battery voltage**	Yes	Go to next step.
		No	Repair or replace wiring harness.
11	Disconnect immobilizer unit connector. Turn ignition switch on. Is there battery voltage at immobilizer unit connector terminal J?	Yes	Inspect for open circuit between PCM connector terminal 5 (for GF4A-EL models) 66 (except for GF4A-EL) and immobilizer unit connector terminal A.
		No	Repair or replace wiring harness between immobilizer unit connector terminal J and fuse panel.
12	Verify following: • Vacuum connection • External fuel shut off or accessory (kill switch, alarm etc.) • Fuel quality (e.g. proper octane, contamination, winter/summer blend) • No air leakage from intake-air system • Proper sealing of intake manifold and components attached to intake manifold: EGR valve, IAC valve • Ignition wiring • Electrical connections • Fuses • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 12.
13	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test. If communication error message is displayed on NGS tester, inspect for following: • Open circuit between main relay and PCM terminal 71 or 97 • Open main relay GND circuit • Main relay stuck open. • Open PCM GND circuit (PCM terminal 24, 51, 76, 77 or 103) • Poor connection of vehicle body GND
		No	**No DTC is displayed:** Go to next step.

STEP	INSPECTION	RESULTS	ACTION
14	Turn ignition switch on. Disconnect TP sensor connector. Measure voltage at TP sensor connector VREF terminal with ignition switch on. **Voltage** **4.5—5.5 V** Is voltage okay?	Yes	Go to next step.
		No	Go to symptom troubleshooting No.27 “Constant voltage”.
15	Does engine start with throttle closed?	Yes	Go to Step 31.
		No	Go to next step.
16	Will engine start and run smoothly at part throttle?	Yes	Inspect IAC valve and wiring harness.
		No	Go to next step.
17	Connect NGS tester to DLC. Access RPM PID. Is RPM PID indicating engine speed during engine cranking?	Yes	Go to next step.
		No	Inspect for following: • Open or short circuit in CKP sensor • Open or short circuit between CKP sensor and PCM terminal 21 • Open or short circuit in CKP sensor harnesses If CKP sensor and harness are okay, go to next step.
18	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
19	Measure gap between CKP sensor and teeth of crankshaft pulley. **Specification** **0.5—1.5 mm {0.020—0.059 in}** Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
20	Inspect for cracks on high-tension leads. Is there any crack on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
21	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Go to next step.
		No	Inspect for following: • Open or short circuit in ignition coil • Open circuit in high-tension leads • Open circuit between ignition coil connector GND terminal and GND • Open circuit between ignition switch and ignition coil • Open circuit between ignition coil and PCM terminal 26 or 52
22	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	If spark plug is wet or covered with carbon, inspect for fuel leakage from injector. If spark plug is grayish white, inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
23	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
24	Is there any restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
25	Install fuel pressure gauge between fuel main pipe and fuel distributor. Connect jumper wire between F/P terminal at DLC in engine compartment and GND. Turn ignition switch on. Is fuel line pressure correct when ignition switch is cycled on/off five times? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. Inspect PRC solenoid, related vacuum hose, and harnesses. **High :** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
26	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service as necessary. Is fuel line pressure held after ignition switch is turned off? **Fuel line pressure** **More than 150 kPa {1.5 kgf/cm^2, 21 psi} for 5 min.**	Yes	Go to next step.
		No	Inspect pressure regulator diaphragm condition. If condition is okay, inspect fuel injector. If condition is not okay, replace pressure regulator.
27	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Attempt to start engine. Is starting condition improved?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
28	Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace.
		No	Go to next step.
29	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
30	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for causes.
31	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.6 SLOW RETURN TO IDLE

6	**Slow return to idle**
DESCRIPTION	• Engine takes more time than normal to return to idle speed.
POSSIBLE CAUSE	• ECT sensor malfunction • Thermostat is stuck open. • Throttle body malfunction • Air leakage from intake-air system

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.

STEP	INSPECTION	RESULTS	ACTION
2	Remove thermostat and inspect operation. (See Section E) Is thermostat okay?	Yes	Engine coolant temperature and thermostat are okay. Go to next step.
		No	Access ECT V PID on NGS tester. Inspect for both ECT V and temperature gauge on instrument cluster readings. If temperature gauge on instrument cluster indicates normal range but ECT V is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates cold range but ECT V is normal, inspect temperature gauge and heat gauge unit.
3	Is throttle body free of contamination?	Yes	Inspect for air leakage from intake-air system components while racing engine to higher speed.
		No	Clean or replace throttle body.
4	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.7 ENGINE RUNS ROUGH/ROLLING IDLE

7	Engine runs rough/rolling idle
DESCRIPTION	• Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively. • Idle speed is too slow and engine shakes excessively.
POSSIBLE CAUSE	• Air leakage from intake-air system parts • A/C system operation is improper. • Spark leakage from high-tension leads • Purge solenoid valve malfunction • Improper operation of IAC valve • EGR valve malfunction • Erratic or no signal from CMP sensor • Low engine compression • Erratic signal from CKP sensor • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Disconnected electrical connectors • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Engine overheating • Vacuum leakage • Pressure regulator control (PRC) system malfunction **Warning** **• Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** **—Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **—Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** **• Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify following: • External fuel shut off or accessory • Fuel quality (e.g. proper octane, contamination, winter/summer blend) • No air leakage from intake-air system • Proper sealing of intake manifold and components attached to intake manifold; such as EGR valve, IAC valve • Ignition wiring • Electrical connections • Fuses • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting No.16 "Cooling system concerns - Overheating".
		No	Go to next step.
4	**Note** • Following test is for engine running rough idle with A/C on concerns. If other symptoms exist, go to next step. Connect pressure gauge to A/C low and high pressure side lines. Start engine and run it at idle. Turn A/C switch on. Measure low side and high side pressures. (See Section U) Are reading pressures within specifications?	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting No.23 "A/C is always ON or A/C compressor runs continuously". For other symptoms, inspect following: • Refrigerant charging amount • Condenser fan operation
5	**Note** • Following test is for engine running rough with P/S on. If other symptoms exist, go to next step. Start engine and run it at idle. Access PSP SW PID. Inspect if PSP SW PID is on while turning steering wheel right to left. Is PSP SW PID okay?	Yes	Go to next step.
		No	Inspect power steering pressure switch operation and wiring harness between power steering pressure switch connector and PCM connector terminal 31.
6	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
7	Measure gap between CKP sensor and teeth of crankshaft pulley. **Specification** **0.5—1.5 mm {0.020—0.059 in}** Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
8	Inspect for cracks on high-tension leads. Is there any crack on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
9	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.

STEP	INSPECTION	RESULTS	ACTION
10	Start engine and disconnect IAC valve connector. Does rpm drop or engine stall?	Yes	Go to next step.
		No	Inspect IAC valve and wiring harness.
11	Install fuel pressure gauge between fuel main pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm², 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump unit circuit • Inspect for open fuel pump body relief valve • Inspect for fuel leakage inside pressure regulator • Inspect for clogged main fuel line • Inspect PRC solenoid valve, related vacuum hose and harnesses **High:** • Inspect pressure regulator for high pressure cause • Inspect for clogged fuel return line
12	Visually inspect for fuel leakage at fuel injector, O-ring, and fuel line. Service as necessary. Does fuel line pressure hold after ignition switch is turned off? **Fuel line pressure** **More than 150 kPa {1.5 kgf/cm², 21 psi} for 5 min.**	Yes	Go to next step.
		No	Inspect pressure regulator diaphragm condition. If condition is okay, inspect fuel injector. If condition is not okay, replace pressure regulator.
13	Connect NGS tester to DLC. Start the engine and run it at idle. Access FHO2S or O2SII PID. Is FHO2S or O2SII PID okay? • More than 0.45 V when accelerator pedal is suddenly depressed: rich condition • Less than 0.45 V during fuel cut: lean condition	Yes	Go to next step.
		No	Inspect and repair or replace faulty HO2S, harness, connector or terminal, then go to next step.
14	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Start engine. Does engine condition improve?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
15	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
16	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.
17	Visually inspect CMP sensor and teeth of camshaft. Are CMP sensor and teeth of camshaft okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
18	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
19	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for causes.
20	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.8 FAST IDLE/RUNS ON

8	**Fast idle/runs on**
DESCRIPTION	• Engine speed continues at fast idle after warm-up. • Engine runs after ignition switch is turned off.
POSSIBLE CAUSE	• Engine coolant temperature malfunction • Air leakage from intake-air system • Throttle body malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect NGS tester to DLC. Access ECT PID. Start and warm up engine to normal operating temperature. Is ECT PID reading between 112°C (234°F) and 82°C (180°F) ?	Yes	Go to next step.
		No	**ECT PID is higher than 112°C (234°F) :** Go to symptom troubleshooting No.16 "Cooling system concerns - Overheating". **ECT PID is less than 82°C (180°F) :** Go to symptom troubleshooting No.17 "Cooling system concerns - Runs cold".
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is there air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace parts as necessary.
		No	Verify accelerator cable free play.
4	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.9 LOW IDLE/STALLS DURING DECELERATION

9	**Low idle/stalls during deceleration**
DESCRIPTION	• Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.
POSSIBLE CAUSE	• Vacuum leakage • IAC valve malfunction • Air leakage from intake-air system • MAF sensor or related circuit malfunction • TP sensor or related circuit malfunction • Brake switch or related circuit malfunction • Neutral/clutch switch or related circuit malfunction

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does engine idle rough?	Yes	Go to symptom troubleshooting No.7 for "Engine runs rough / Rolling idle".
		No	Go to next step.
2	Verify following: • Proper routing and no damage of vacuum lines • IAC valve is connected properly. • No air leakage from intake-air system Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 2.
3	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.

STEP	INSPECTION	RESULTS	ACTION
4	Does idle speed drop or stall when disconnecting IAC valve?	Yes	Go to next step.
		No	Inspect following: • Circuit from IAC valve to PCM connector terminal 20 (for GF4A-EL models)/54 (except for GF4A-EL models) or 83 for open and short • IAC valve for being stuck If okay, go to next step.
5	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Inspect evaporative emission control system.
		No	Go to next step.
6	Connect NGS tester to DLC. Access TP V, MAF V, VS, BRK SW, TR SW (ATX) and NL SW (MTX) PIDs. Monitor each PID while driving vehicle. **Except for GF4A-EL models** • TP V PID • MAF V PID • VS PID • BRK SW PID • TR SW PID • NL SW PID **For GF4A-EL models** • TP V PID • MAF V PID • VSS PID • BOO PID • TR PID • CPP/PNP PID Are PIDs okay? (See F1-25 PCM INSPECTION (except for GF4A-EL models)) (See Section F (for GF4A-EL models))	Yes	Go to symptom troubleshooting 26 for "Intermittent concerns".
		No	**TP V PID:** Inspect TP sensor. **MAF V (MAF) PID:** Inspect MAF sensor. **VS (VSS) PID:** Inspect VSS. **BRK SW (BOO) PID:** Inspect brake switch. **TR SW (TR) PID:** Inspect TR switch. **NL SW (CPP/PNP) PID:** Inspect neutral switch.
7	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO10. ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES

10	**Engine stalls/quits - accelaration/cruise** **Engine runs rough - accelaration/cruise** **Misses - acceleration/cruise** **Buck/jerk - acceleration/cruise/deceleration** **Hesitation/stumble - acceleration** **Surges - acceleration/cruise**
DESCRIPTION	• Engine stops unexpectedly at beginning of acceleration or during acceleration. • Engine stops unexpectedly while cruising. • Engine speed fluctuates during acceleration or cruising. • Engine misses during acceleration or cruising. • Vehicle bucks/jerks during acceleration, cruising or deceleration. • Momentary pause at beginning of acceleration or during acceleration. • Momentary minor irregularity in engine output.

POSSIBLE CAUSE	• A/C system operation is improper. • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Purge solenoid valve malfunction • Improper operation of IAC valve • EGR valve malfunction • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Spark leakage from high-tension leads • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out timing belt • Restriction in exhaust system • Intermittent open or short in fuel body pump circuit • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Intermittent open or short of MAF sensor, TP sensor and VSS • ATX malfunction • Clutch slippage **Warning** • **Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** —**Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** —**Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold; such as EGR valve, IAC valve • Ignition wiring • Fuel quality (e.g. proper octane, contamination, winter/summer blend) • Electrical connections • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	*Is engine overheating?*	Yes	Go to *symptom troubleshooting No.16 "Cooling* system concerns - Overheating".
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
4	Connect NGS tester to DLC. Access RPM PID, B+ PID, TP V PID, MAF V PID, and VS PID. **Except for GF4A-EL models** • RPM PID • B+ PID • TP V PID • MAF V PID • VS PID **For GF4A-EL models** • RPM PID • VPWR PID • TP V PID • MAF PID • VSS PID Drive vehicle with monitoring PIDs. Are PIDs within specification? (See F1-25 PCM INSPECTION (except for GF4A-EL models)) (See Section F (for GF4A-EL models))	Yes	Go to next step.
		No	**RPM PID:** Inspect CKP sensor and related harness for such as vibration, intermittent open/short circuit. **B+ (VPWR) PID:** Inspect for open circuit intermittently. **MAF V (MAF) PID:** Inspect for open circuit of MAF sensor and related wiring harness intermittently. **TP V PID:** Inspect if output signal from TP sensor changes smoothly. **VS (VSS) PID:** Inspect for open circuit of VSS and related wiring harness intermittently.
5	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
6	Measure gap between CKP sensor and teeth of crankshaft pulley. **Specification** **0.5—1.5 mm {0.020—0.059 in}** Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
7	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
8	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
9	Verify that throttle lever is resting on throttle valve stop screw and/or throttle valve orifice plug. Is lever in correct position?	Yes	Go to next step.
		No	Adjust as necessary.
10	Are there restrictions in the exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.
11	Install fuel pressure gauge between fuel main pipe and fuel distributor. Connect jumper wire between F/P terminal at DLC in engine compartment and GND. Turn ignition switch on. Is fuel line pressure correct with ignition switch on? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. Inspect pulsation damper. **High:** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.

STEP	INSPECTION	RESULTS	ACTION
12	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service as necessary. Does fuel line pressure hold after ignition switch is turned off? **Fuel line pressure** **More than 150 kPa {1.5 kgf/cm^2, 21 psi} for 5 min.**	Yes	Go to next step.
		No	Inspect pressure regulator diaphragm condition. If condition is okay, inspect fuel injector. If condition is not okay, replace pressure regulator.
13	Install vacuum gauge to intake manifold. Start engine. Does fuel pressure gauge reading increase as vacuum gauge reading decreases and/or does fuel pressure gauge reading decrease as vacuum reading increases?	Yes	Go to next step.
		No	Connect vacuum pump to pressure regulator. Start engine. Verify that fuel pressure gauge reading changes as vacuum changes. If changes, inspect vacuum line. If does not change, replace pressure regulator.
14	**Note** • The following test is for engine stalling with A/C on. If other symptoms exist, go to next step. Connect a pressure gauge to A/C low and high pressure side lines. Turn A/C on and measure low side and high side pressures. Are pressures within specifications? (See Section U)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting No.23 "A/C is always ON or A/C compressor runs continuously". For other symptoms, inspect following: • Refrigerant charging amount • Condenser fan operation
15	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
16	Visually inspect CMP sensor and tooth of camshaft. Are CMP sensor and tooth of camshaft okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	Inspect EGR system. (See Section F1-152 EGR Control Inspection) Is EGR system okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
18	Is engine compression correct?	Yes	Inspect following: • Valve timing • Automatic transaxle (ATX) • Clutch (MTX)
		No	Inspect for cause.
19	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.11 LACK/LOSS OF POWER - ACCELERATION/CRUISE

11	**Lack/loss of power - acceleration/cruise**
DESCRIPTION	• Performance is poor under load (e.g., power down when climbing hills).
POSSIBLE CAUSE	• Improper A/C system operation • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Purge control solenoid malfunction • EGR valve malfunction • Brake dragging • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Spark leakage from high-tension leads • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out of timing belt • Restriction in exhaust system • Intermittent open or short in fuel pump body circuit • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Intermittent open or short of MAF sensor, TP sensor and VSS • ATX malfunction • Clutch slippage **Warning** **• Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** **—Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **—Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** **• Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold; such as EGR valve, IAC valve • Fuel quality (e.g. proper octane, contamination, winter/summer blend) Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**No DTC is displayed:** Go to next step.
		No	**DTC is displayed:** Go to appropriate DTC test.
3	Is engine overheating?	Yes	Go to symptom troubleshooting No.16 "Cooling system concerns - Overheating".
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
4	Connect NGS tester to DLC. Access RPM PID, MAF V PID, TP V PID, and VS PID. **Except for GF4A-EL models** • RPM PID • MAF V PID • TP V PID • VS PID **For GF4A-EL models** • RPM PID • MAF PID • TP V PID • VSS PID Drive vehicle while monitoring PIDs. Are PIDs within specifications? (See F1-25 PCM INSPECTION (except for GF4A-EL models)) (See Section F (for GF4A-EL models))	Yes	Go to next step.
		No	**RPM PID:** Inspect CKP sensor and related harness for vibration and/or intermittent open/short circuit. **MAF V (MAF) PID:** Inspect for intermittent open circuit of MAF sensor and related wiring harness. **TP V PID:** Inspect if TP sensor output increases smoothly. **VS (VSS) PID:** Inspect for intermittent open circuit of VSS and related wire harness.
5	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
6	Measure gap between CKP sensor and teeth of crankshaft pulley. **Specification** **0.5—1.5 mm {0.020—0.059 in}** Is the gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
7	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
8	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
9	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.
10	Install fuel pressure gauge between fuel main pipe and fuel distributor. Connect jumper wire between F/P terminal at DLC in engine compartment and GND. Turn ignition switch on. Is fuel line pressure correct with ignition switch on? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. **High:** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
11	Install vacuum gauge to intake manifold. Start engine. Does fuel pressure gauge reading increase as vacuum gauge reading decreases and/or does fuel pressure gauge reading decrease as vacuum reading increases?	Yes	Go to next step.
		No	Connect vacuum pump to pressure regulator. Start engine. Verify that fuel pressure gauge reading changes as vacuum changes. If changes, inspect vacuum line. If does not change, replace pressure regulator.

STEP	INSPECTION	RESULTS	ACTION
12	**Note** • Following test is for engine stalling with A/C on concern. If other symptoms exist, go to next step. Connect pressure gauge to A/C low and high side pressure lines. Turn A/C on and measure low side and high side pressures. Are the pressure within specifications? (See Section U)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting No.23 "A/C is always ON or A/C compressor runs continuously". For other symptoms, inspect following: • Refrigerant charging amount • Condenser fan operation
13	Inspect for A/C cut-off operation. Does A/C cut-off work properly?	Yes	Go to next step.
		No	Inspect A/C cut-off system components.
14	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
15	Visually inspect CMP sensor and teeth of camshaft. Are CMP sensor and teeth of camshaft okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
16	Inspect EGR system. (See F1-152 EGR Control Inspection) Is EGR system okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	Is engine compression correct?	Yes	Inspect following: • Valve timing • Automatic transaxle (ATX) • Clutch (MTX) • Brake system for dragging
		No	Inspect for cause.
18	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.12 KNOCKING/PINGING - ACCELERATION/CRUISE

12	**Knocking/pinging - acceleration/cruise**
DESCRIPTION	• Sound is produced when air/fuel mixture is ignited by something other than spark plug (e.g., hot spot in combustion chamber).
POSSIBLE CAUSE	• Engine overheating due to cooling system malfunction • Inadequate engine compression • Inadequate fuel pressure • Knock sensor and related circuit malfunction **Warning** • **Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** **—Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **—Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect NGS tester to DLC. Access ECT PID. Verify ECT PID is less than 116°C {241°F} during driving. Is ECT PID less than specification?	Yes	Go to next step.
		No	Inspect cooling system for cause of overheating.
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is engine compression correct?	Yes	Go to next step.
		No	Inspect for cause.
4	Install fuel pressure gauge between fuel main pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm², 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. **High:** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
5	Install vacuum gauge to intake manifold. Start engine. Does fuel pressure gauge reading increase as vacuum gauge reading decreases and/or does fuel pressure gauge reading decrease as vacuum reading increases?	Yes	Go to next step.
		No	Connect vacuum pump to pressure regulator. Start engine. Verify that fuel pressure gauge reading changes as vacuum changes. If changes, inspect vacuum line. If does not change, replace pressure regulator.
6	Inspect knock sensor. (See Section F) Is knock sensor okay?	Yes	Inspect ignition timing.
		No	Replace knock sensor.
7	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.13 POOR FUEL ECONOMY

13	**Poor fuel economy**
DESCRIPTION	• Fuel economy is unsatisfactory.
POSSIBLE CAUSE	• Contaminated air cleaner element • Engine cooling system malfunction • Improper automatic transaxle fluid level • Weak spark • Poor fuel quality • Erratic or no signal from CMP sensor • Improper coolant level • Inadequate fuel pressure • Spark plug malfunction • PCV valve malfunction • Brake dragging • Improper valve timing due to jumping out of timing belt • Contaminated MAF sensor • Improper engine compression • Exhaust system clogging **Warning** **• Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** **—Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **—Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** **• Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect following: • Air cleaner element for contamination • Automatic transaxle fluid level • Fuel quality • Coolant level Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is "NO CODES RECEIVED/SYSTEM PASSED" displayed?	Yes	**No DTC is displayed:** Go to next step.
		No	**DTC is displayed:** Go to appropriate DTC test.
3	Connect NGS tester to DLC. Access ECT PID. Drive vehicle while monitoring PID. (See F1-25 PCM INSPECTION (except for GF4A-EL models)) (See Section F (for GF4A-EL models))	Yes	Go to next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operations or thermostat operation.

STEP	INSPECTION	RESULTS	ACTION
4	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect for following: • Spark plugs malfunction • Improperly installed CMP sensor • Trigger wheel damage on camshaft • Open or short circuit on CMP sensor • Open or short circuit between CMP sensor and PCM terminal 8 (for GF4A-EL models)/86 (except for GF4A-EL models) or 85 Repair or replace malfunctioning parts. If okay, go to next step.
		No	Inspect following: • High-tension leads • Ignition coil and connector
5	Install fuel pressure gauge between fuel main pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. **High:** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
6	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
7	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.
8	Is brake system functioning properly?	Yes	Go to next step.
		No	Inspect for cause.
9	Inspect MAF sensor for contamination. Is there any contamination?	Yes	Replace MAF sensor.
		No	Go to next step.
10	Is engine compression correct?	Yes	Inspect for valve timing.
		No	Inspect for cause.
11	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.14 EMISSION COMPLIANCE

14	**Emission compliance**
DESCRIPTION	• Emission compliance test is failed.
POSSIBLE CAUSE	• Vacuum lines leakage or blockage • Cooling system malfunction • Spark plug malfunction • Leakage from intake manifold • Erratic or no signal from CMP sensor • Inadequate fuel pressure • PCV valve malfunction or incorrect valve installation • EGR valve malfunction • Exhaust system clogging • Fuel tank ventilation system malfunction • Charcoal canister damage • Excessive carbon buildup in combustion chamber • Improper engine compression • Improper valve timing **Warning** • **Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** —**Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** —**Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect following: • Vacuum lines for leakage or blockage • Electrical connections • Proper maintenance schedule followed • Intake-air system and air cleaner element concerns: obstructions, leakage or dirt Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
3	Is any other drivability concern present?	Yes	Go to appropriate symptom troubleshooting.
		No	Go to next step.
4	Connect NGS tester to DLC. Access ECT PID. Warm up engine and run it at idle. Is ECT PID correct?	Yes	Go to next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operation or thermostat operation.

STEP	INSPECTION	RESULTS	ACTION
5	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect for following: • Spark plugs malfunction • Improperly installed CMP sensor • Damage of trigger wheel on camshaft • Open or short circuit on CMP sensor • Open or short circuit between CMP sensor and PCM terminal 8 (for GF4A-EL models)/86 (except for GF4A-EL models) or 85 Repair or replace malfunctioning parts. If okay, go to next step.
		No	Inspect following: • High-tension leads • Ignition coil and connector
6	Install fuel pressure gauge between fuel main pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. **High:** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
7	Does fuel line pressure remain within specification for 60 seconds when ignition switch is turned on? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	Inspect pressure regulator for high pressure cause.
8	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
9	Inspect for fuel saturation inside charcoal canister. Is excessive amount of liquid fuel present in canister?	Yes	Replace charcoal canister.
		No	Inspect fuel tank vent system. Then, go to next step.
10	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Inspect EGR system. (See F1-152 EGR Control Inspection)
11	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.15 HIGH OIL CONSUMPTION/LEAKAGE

15	**High oil consumption/leakage**
DESCRIPTION	• Oil consumption is excessive.
POSSIBLE CAUSE	• PCV valve malfunction • Improper dipstick • Improper engine oil viscosity • Engine internal parts malfunction

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
2	Inspect for following: • External leakage • Proper dipstick • Proper engine oil viscosity Are all items okay?	Yes	Inspect internal engine parts such as valves, valve guides, valve stem seals, cylinder head drain passage, and piston rings.
		No	Service as necessary. Repeat Step 2.

NO.16 COOLING SYSTEM CONCERNS—OVERHEATING

16	**Cooling system concerns overheating**
DESCRIPTION	• Engine runs at higher than normal temperature/Overheats.
POSSIBLE CAUSE	• Improper coolant level • Blown fuses • Coolant leakage • Excessive A/C system pressure • Improper water/anti-freeze mixture • Fans reverse rotation • Poor radiator condition • Thermostat malfunction • Radiator hoses damage • Condenser fan is inoperative. • Improper or damaged radiator cap • Main cooling fan is inoperative. • Coolant overflow system malfunction • Improper tension of drive belt • Drive belt damage

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect following: • Engine coolant level • Coolant leakage • Water and anti-freeze mixture • Radiator condition • Collapsed or restricted radiator hoses • Radiator pressure cap • Overflow system • Fan rotational direction • Fuses Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**No DTC is displayed:** Go to next step.
		No	**DTC is displayed:** Go to appropriate DTC test.
3	Start engine and run it at idle speed. Turn A/C switch on. Does A/C compressor engage?	Yes	Go to Step 5.
		No	Inspect following and repair or replace as necessary: • Refrigerant charging amount • Open circuit between A/C relay and PCM terminal 69 (for GF4A-EL models) or 96 (except for GF4A-EL models) • Seized A/C magnetic clutch • A/C magnetic clutch malfunction If all items are okay, go to next step.
4	Connect NGS tester to DLC. Access AC S/W or ACCS PID on NGS tester. Start engine and run it at idle speed. Turn A/C switch on. Does AC S/W or ACCS PID read on?	Yes	Go to next step.
		No	Inspect for following: • Refrigerant pressure switch operation • A/C switch is stuck open. • Open or short circuit between refrigerant pressure switch and PCM terminal 41 • Open circuit of blower motor fan switch and resistor (if blower motor does not operate) • Evaporator temperature sensor and A/C amplifier

STEP	INSPECTION	RESULTS	ACTION
5	Start engine and run it at idle speed. Turn A/C switch on. Do cooling fan and condenser fan operate?	Yes	Go to next step.
		No	**If cooling fan motor does not operate, inspect for following:** • Main cooling fan relay is stuck open. • Main cooling fan motor malfunction • Main cooling fan motor GND open • Open circuit between cooling fan motor and relay • Open circuit between cooling fan relay and PCM terminal 47 (except for GF4A-EL models) or 98 (for GF4A-EL models) Open battery power circuit for cooing fan relay **If condenser fan motor does not operate, inspect for following:** • Condenser fan relay is stuck open. • Condenser fan motor malfunction • Condenser fan motor GND open • Open circuit between condenser fan motor and relay • Open circuit between condenser fan relay and PCM terminal 17 (for GF4A-EL models) or 45 (except for GF4A-EL models) • Open battery power circuit for condenser fan relay
6	Is drive belt okay?	Yes	Go to next step.
		No	Replace drive belt.
7	Is there any leakage around heater unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to next step.
8	Are there any leakage at coolant hoses and/or radiator?	Yes	Replace malfunctioning parts.
		No	Go to next step.
9	Cool down the engine. Remove thermostat and inspect operation. (See Section E) Is thermostat okay?	Yes	Engine coolant temperature and thermostat are okay, inspect engine block for leakage or blockage.
		No	Access ECT V PID on NGS tester. Inspect for both ECT V and temperature gauge readings. If temperature gauge on instrument cluster indicates normal range but ECT V is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates overheating but ECT V is normal, inspect temperature gauge and heat gauge unit.
10	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.17 COOLING SYSTEM CONCERNS - RUNS COLD

17	Cooling system concerns - runs cold
DESCRIPTION	• Engine takes excessive period for reaching normal operating temperature.
POSSIBLE CAUSE	• Thermostat malfunction • Condenser fan system malfunction • Cooling fan system malfunction

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is customer complaint "Lack of passenger compartment heat" only?	Yes	Inspect A/C and heater system.
		No	Go to next step.

STEP	INSPECTION	RESULTS	ACTION
2	Does engine speed continue at fast idle?	Yes	Go to symptom troubleshooting No.8 “Fast idle/ runs on”.
		No	Go to next step.
3	Remove thermostat and inspect operation. (See Section E) Is thermostat okay?	Yes	Inspect condenser fan and main fan operation. If both or either fan operate abnormally, inspect for following: • Cooling fan relay is stuck closed. • Condenser fan relay is stuck closed. • Short to GND between cooling fan relay and PCM terminal 47 (except for GF4A-EL models) or 98 (for GF4A-EL models) • Short to GND between condenser fan relay and PCM terminal 17 (for GF4A-EL models) or 45 (except for GF4A-EL models) • Circuit between cooling fan relay and fan motor is shorted to battery supply line • Circuit between condenser fan relay and fan motor is shorted to battery supply line
		No	Access ECT V PID on NGS tester. Inspect for both ECT V and temperature gauge on instrument cluster readings. If temperature gauge on instrument cluster indicates normal range but ECT V is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates cold range but ECT voltage is normal, inspect temperature gauge and heat gauge unit.
4	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.18 EXHAUST SMOKE

18	Exhaust smoke
DESCRIPTION	• Blue, black, or white smoke from exhaust system
POSSIBLE CAUSE	**Blue smoke (Burning oil):** • PCV valve malfunction • Engine internal oil leakage **White smoke (Water in combustion):** • Cooling system (coolant loss) malfunction • Engine internal coolant leakage **Black smoke (Rich fuel mixture):** • Air cleaner restriction • Intake-air system is collapsed or restricted. • Fuel return line is restricted. • Excessive fuel pressure • Improper engine compression • Injector fuel leakage • Ignition system malfunction **Warning** • **Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** —**Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** —**Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete “BEFORE REPAIR PROCEDURE” and “AFTER REPAIR PROCEDURE”. (See Section F)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	What color is smoke coming from exhaust system?	Blue	Burning oil is indicated. Go to next step.
		White	Water in combustion is indicated. Go to Step 3.
		Black	Rich fuel mixture is indicated. Go to Step 4.
2	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Inspect for following: • Damaged valve guide, stems or valve seals • Blocked oil drain passage in cylinder head • Piston rings is not seated, seized or worn • Damaged cylinder bore If other drivability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Replace PCV valve.
3	Does cooling system hold pressure?	Yes	Inspect for following: • Cylinder head gasket leakage • Intake manifold gasket leakage • Cracked or porous engine block If other drivability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Inspect for cause.
4	Inspect for following: • Air cleaner restriction • Collapsed or restricted intake-air system • Restricted fuel return line Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 4.
5	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
6	Install fuel pressure gauge between fuel main pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump unit circuit. • Inspect for open fuel pump body relief valve. • Inspect for fuel leakage inside pressure regulator. • Inspect for clogged main fuel line. **High:** • Inspect pressure regulator for high pressure cause. • Inspect for clogged fuel return line.
7	Does fuel line pressure remain within specification for 60 seconds when ignition switch is turned on? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	Inspect pressure regulator for high pressure cause.
8	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect spark plugs and CMP sensor.
		No	Inspect following: • High-tension leads • Ignition coil and connector
9	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.19 FUEL ODOR (IN ENGINE COMPARTMENT)

19	**Fuel odor (in engine compartment)**
DESCRIPTION	• Gasoline fuel smell or visible leakage.
POSSIBLE CAUSE	• Excessive fuel pressure • Fuel tank vent system blockage • Charcoal canister malfunction **Warning** **• Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** **—Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **—Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** **• Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service as necessary. Install fuel pressure gauge between fuel main pipe and fuel distributor. Start engine and run it at idle. Then stop engine. Does fuel line pressure remain within specification for 60 seconds when ignition switch is turned on and off? **Fuel line pressure** **260—310 kPa {2.6—3.2 kgf/cm², 37—46 psi}**	Yes	Go to next step.
		No	Inspect pressure regulator for high pressure cause.
2	Inspect for blockage/restriction or open between engine vacuum port and charcoal canister. Inspect for blockage in fuel tank vent system. Is fault indicated?	Yes	Replace vacuum hose.
		No	Go to next step.
3	Inspect purge solenoid valve. (See Section F) Is solenoid operating properly?	Yes	Go to next step.
		No	Replace purge solenoid valve.
4	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Inspect charcoal canister for fuel saturation. If excessive amount of liquid fuel present, replace charcoal canister.
5	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.20 ENGINE NOISE

20	**Engine noise**
DESCRIPTION	• Engine noise from under hood
POSSIBLE CAUSE	**Squeal, click or chirp noise:** • Improper engine oil level • Improper drive belt tension **Rattle sound noise:** • Loose parts **Hiss sound noise:** • Vacuum leakage • Loose spark plug • Air leakage from intake-air system **Rumble or grind noise:** • Improper drive belt tension **Rap or roar sound noise:** • Exhaust system looseness **Other noise:** • Camshaft friction gear noise or MLA noise

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is squeal, click or chirp sound present?	Yes	Inspect engine oil level or drive belts.
		No	Go to next step.
2	Is rumble or grind sound present?	Yes	Inspect drive belt.
		No	Go to next step.
3	Is rattle sound present?	Yes	Inspect location of rattle for loose parts.
		No	Go to next step.
4	Is hiss sound present?	Yes	Inspect for following: • Vacuum leakage • Spark plug looseness • Intake-air system leakage
		No	Go to next step.
5	Is rap or roar sound present?	Yes	Inspect exhaust system for loose parts.
		No	Go to next step.
6	Is knock sound present?	Yes	Go to symptom troubleshooting No.12 "Knocking/pinging".
		No	If noise comes from engine internal, inspect for friction gear or HLA noise.
7	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.21 VIBRATION CONCERNS (ENGINE)

21	**Vibration concerns (engine)**
DESCRIPTION	• Vibration from under hood or driveline
POSSIBLE CAUSE	• Loose attaching bolts or worn parts • Components malfunction such as worn parts

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect following components for loose attaching bolts or worn parts: • Cooling fan • Drive belt and pulleys • Engine mounts All items okay?	Yes	Inspect following systems: • Wheels • Automatic transaxle • Driveline • Suspension
		No	Readjust or retighten engine mount installation position. Service as necessary for other parts.
2	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.22 A/C DOES NOT WORK SUFFICIENTLY.

22	**A/C does not work.**
DESCRIPTION	• A/C compressor magnetic clutch does not engage when A/C switch is turned on.
POSSIBLE CAUSE	• Improper refrigerant charging amount • Open A/C magnetic clutch • Open circuit between A/C relay and A/C magnetic clutch • Poor GND of A/C magnetic clutch • Refrigerant pressure switch is struck open. • A/C relay is stuck open. • Seized A/C compressor • Open circuit between A/C switch and PCM through both refrigerant pressure switch and A/C amplifier

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC Is displayed:** Go to next step.
2	Disconnect A/C compressor connector. Start engine and turn A/C switch on. Is there correct voltage at terminal of A/C compressor magnetic clutch connector? **Specification** **More than 10.5 V**	Yes	Inspect for GND condition of magnetic clutch on A/C compressor. If GND condition is okay, inspect for open circuit of magnetic clutch coil.
		No	Go to next step.
3	Disconnect refrigerant pressure switch connector. Connect jumper wire between terminals of A/C high pressure switch connector. Connect NGS tester to DLC. Access A/C SW or ACCS PID on NGS tester. Turn ignition switch on. Turn A/C switch on and set blower fan at any speed. Does A/C SW or ACCS PID read on?	Yes	Inspect refrigerant pressure switch operation. If switch is okay, go to next step.
		No	Inspect for following: • A/C switch is stuck open. • Open circuit between refrigerant pressure switch and PCM terminal 41 • Open circuit of blower motor fan switch and resister (if blower motor does not operate) • Evaporator temperature sensor and A/C amplifier • Open circuit between A/C amplifier and refrigerant pressure switch
4	Remove jumper wire from switch connector. Reconnect connector to refrigerant pressure switch. Start engine and turn A/C switch on. Does fan operate?	Yes	Inspect for stuck open A/C relay. Replace as necessary.
		No	Inspect following and repair or replace as necessary: • Refrigerant charging amount • A/C compressor for being seized
5	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.23 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.

23	**A/C is always on or A/C compressor runs continuously.**
DESCRIPTION	• A/C compressor magnetic clutch does not disengage.
POSSIBLE CAUSE	• Stuck engagement • A/C relay is stuck closed. • Short to GND between A/C switch and PCM • Short to GND circuit between A/C relay and PCM • A/C relay to magnetic clutch circuit is shorted to battery power

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.

STEP	INSPECTION	RESULTS	ACTION
2	Start engine and run it at idle. Turn A/C switch on. Remove A/C relay. Does A/C magnetic clutch disengage?	Yes	Inspect for following: • A/C relay is stuck closed. • Short to GND circuit between A/C relay and PCM terminal 69 (for GF4A-EL models) or 96 (except for GF4A-EL models) If both items okay, go to next step.
		No	Inspect if circuit between A/C relay and magnetic clutch is shorted to battery power circuit. If circuit is okay, inspect magnetic clutch stuck engagement or clearance.
3	Connect NGS tester to DLC. Access A/C SW or ACCS PID on NGS tester. Start the engine and turn A/C switch on. Read A/C SW or ACCS PID while disconnecting refrigerant pressure switch connector. **Note** • A/C SW or ACCS PID should read OFF when disconnecting connector. If A/C SW PID reading remains ON, short to GND circuit may be present. Does A/C SW or ACCS PID reading remain ON?	Yes	Inspect for short to GND circuit between refrigerant pressure switch and PCM terminal 41.
		No	Go to next step.
4	Reconnect refrigerant pressure switch connector. Read A/C SW PID while turning off A/C switch. **Note** • A/C SW PID should read off when turning A/C switch off. If A/C SW PID reading remains on, short to GND circuit may be present. Does A/C SW PID reading remain on?	Yes	Inspect for following: • Short to GND circuit between A/C switch and A/C amplifier • Short to GND circuit between A/C amplifier and refrigerant pressure switch
		No	Inspect for stuck closed A/C switch.
5	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.24 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS.

24	**A/C does not cut off under wide open throttle conditions.**
DESCRIPTION	• A/C compressor magnetic clutch does not disengage under WOT.
POSSIBLE CAUSE	• TP sensor malfunction • TP sensor misadjustment • TP sensor is loosely installed.

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does A/C compressor disengage when A/C switch is turned off?	Yes	Go to next step.
		No	Go to symptom troubleshooting No.23 "A/C is always ON or A/C compressor runs continuously".
2	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Inspect TP sensor for proper adjustment.
3	Verify test results. If okay, return to diagnostic index to service any additional symptoms.		

NO.25 EXHAUST SULPHUR SMELL

25	**Exhaust sulphur smell**
DESCRIPTION	• Rotten egg smell (sulphur) from exhaust
POSSIBLE CAUSE	• Electrical connectors are disconnected or connected poorly. • Charcoal canister malfunction • Vacuum lines are disconnected or connected improperly. • Improper fuel pressure **Warning** **• Following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system service:** **—Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **—Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** **• Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Are any drivability or exhaust smoke concerns present?	Yes	Go to appropriate flow chart.
		No	Go to next step.
2	Inspect following: • Electrical connections • Vacuum lines Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 2.
3	Connect NGS tester to DLC. Turn ignition switch on. Retrieve any DTC. Is any DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Go to next step.
4	Install fuel pressure gauge between fuel main pipe and fuel distributor. Start engine and run it at idle. Is fuel line pressure correct at idle? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** Inspect fuel pump unit circuit. Inspect for open fuel pump body relief valve. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. **High:** Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
5	Does fuel line pressure remain within specification for 60 seconds when ignition switch is turned on? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	Inspect pressure regulator for high pressure cause.
6	Inspect charcoal canister for fuel saturation. Is excessive amount of liquid fuel present in canister?	Yes	Replace charcoal canister.
		No	Inspect fuel tank vent system. If fuel tank vent system is okay, since sulfur content can vary in different fuels, suggest trying a different brand. If fuel tank vent system is not okay, repair or replace malfunctioning parts.

NO.26 INTERMITTENT CONCERNS

26	**Intermittent concerns**
DESCRIPTION	Symptom occurs randomly and is difficult to diagnose.

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Talk to customer. Retrieve vehicle service history. Does vehicle have a number of previous repairs and components replaced for a certain symptom?	Yes	Go to next step.
		No	Go to Symptom Index.
2	Connect NGS tester to DLC. If input is switch-type component, turn on manually. Turn ignition switch on. Access PIDs for suspect component. Lightly tap on suspect component, wiggle and pull each wire/connector at suspect component or PCM. Are any PID values out of range, or do they suddenly change and go back into range?	Yes	Inspect each wire for corrosion, bent or loose terminal crimps.
		No	Go to next step.
3	Start engine. Lightly tap on suspect component, wiggle and pull each wire/connector at suspect component or PCM. Are any PID values out of range, or do they suddenly change and go back into range?	Yes	Inspect each wire for corrosion, bent or loose terminal crimps.
		No	Go to next step.
4	Start engine. Accurately spray water on suspect component wire, component or vacuum line related to possible fault area. Are any PID values out of range, or suddenly change and go back into range, or was there a noticeable engine misfire/stumble?	Yes	**Fault occurred while spraying on component:** Replace part and verify repair. **Fault occurred while spraying wiring:** Inspect each wire for corrosion, bent or loose terminals and poor wire terminal crimps. **Fault occurred while spraying vacuum line:** Repair vacuum hoses.
		No	Inspect wire and connector at suspect component for corrosion, bent or loose terminals, poor wire terminal crimps and high tension of wire. Repair as necessary.

NO.27 CONSTANT VOLTAGE

27	**Constant voltage**
DESCRIPTION	Incorrect constant voltage
POSSIBLE CAUSE	• Constant voltage circuit malfunction **Note** • TP sensor use constant voltage.

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	Disconnect TP sensor connector. Turn ignition switch on. Measure voltage between following TP sensor connector terminals: • Constant voltage terminal - GND terminal Is constant voltage greater than 6.0 V?	Yes	Repair constant voltage circuit short to power in harness.
		No	Go to next step.
2	Is voltage across battery terminals greater than 10.5 V?	Yes	Go to next step.
		No	Inspect charging system.

STEP	INSPECTION	RESULTS	ACTION
3	Turn ignition switch off. Leave TP sensor connector disconnected. Measure voltage between battery positive terminal and GND circuit at TP sensor connector. Is voltage greater than 10.5 V and within 1.0 V of battery voltage?	Yes	Go to next step.
		No	Go to Step 8.
4	**Note** • The purpose of this step is to determine if NGS tester is communicating with PCM. Turn ignition switch on. Attempt to access ECT PID. Can ECT PID be accessed?	Yes	Go to Step 7.
		No	Go to next step.
5	Turn ignition switch off. Leave TP sensor connector disconnected. Disconnect PCM connector. Turn ignition switch on. Measure voltage between PCM connector terminals 71, 97 and 24. Is voltage greater than 10.5 V?	Yes	Go to next step.
		No	Repair open circuit between PCM terminal 71, 97 and main relay.
6	Leave TP sensor and PCM connectors disconnected. Disconnect NGS tester from DLC. Measure resistance between PCM connector terminals 24 and 91. Is resistance greater than 10,000 Ω?	Yes	Inspect constant voltage at TP sensor connector again. If constant voltage is still out of range, replace PCM.
		No	Repair constant voltage circuit short to GND.
7	Turn ignition switch off. Leave TP sensor disconnected. Disconnect PCM connector. Measure resistance between PCM connector terminal 3I and constant voltage circuit at appropriate sensor connector. Is resistance less than 5.0 Ω?	Yes	Inspect constant voltage at TP sensor connector again. If constant voltage is still out of range, replace PCM.
		No	Repair open constant voltage circuit.
8	**Note** • The purpose of this step is to determine if NGS tester is communicating with PCM. Reconnect TP sensor connector. Turn ignition switch on. Attempt to access ECT PID. Can ECT PID be accessed?	Yes	Go to next step.
		No	Go to Step 11.
9	Are DTCs present for two or more sensors connected to PCM terminal 90? Sensor connected to PCM terminal 90: • TP sensor (P0120) • ECT sensor (P0115) • IAT sensor (P0110) • HO2S (P0134, P1170)	Yes	Go to next step.
		No	Repair open GND circuit to sensor where constant voltage circuit inspection failed.
10	Turn ignition switch off. Disconnect NGS tester from DLC. Disconnect PCM connector. Measure resistance between GND circuit at appropriate sensor connector and PCM connector terminal 90. Is resistance less than 5.0 Ω?	Yes	Reconnect sensor connector. Go to appropriate DTC test.
		No	Repair open GND circuit.
11	Turn ignition switch off. Disconnect PCM connector. Measure resistance between battery negative terminal and PCM terminals 24, 51, 76, 77 and 103. Is each resistance less than 5.0 Ω?	Yes	Go to next step.
		No	Repair open GND circuit.

STEP	INSPECTION	RESULTS	ACTION
12	Turn ignition switch off. Measure resistance between GND circuit at following sensor connectors and GND: • TP sensor • ECT sensor • IAT sensor • HO2S Is each resistance less than 5.0 Ω?	Yes	GND circuits are okay. Inspect constant voltage at TP sensor connector again.
		No	Inspect for open GND circuit.

NO.28 SPARK PLUG CONDITION

28	Spark plug condition
DESCRIPTION	• Incorrect spark plug condition
POSSIBLE CAUSE	**Note** • Inspecting spark plugs condition can determine whether problem is related to a specific cylinder or to all cylinders. **Wet/carbon is stuck on specific plug:** • Spark—Weak, not visible • Air/fuel mixture—Excessive fuel injection volume • Compression—No compression, low compression • Faulty spark plug **Grayish white with specific plug:** • Air/fuel mixture—Insufficient fuel injection volume • Faulty spark plug **Wet/carbon stuck on all plugs:** • Spark—Weak • Air/fuel mixture—Too rich • Compression—Low compression • Clogging in intake/exhaust system **Grayish white with all plugs:** • Air/fuel mixture—Too lean **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE". (See Section F)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Remove all spark plugs. • Inspect spark plug condition. • Is spark plug condition okay?	Yes	Troubleshooting completed.
		No	**Specific plug is wet or covered with carbon:** • Go to next step. **Specific plug looks grayish white:** • Go to Step 7. **All plugs are wet or covered with carbon:** • Go to Step 9. **All plugs look grayish white:** • Go to Step 15.
2	• Is spark plug wet/covered with carbon by engine oil?	Yes	Working up and down, inspect all areas related to oil.
		No	Go to next step.
3	• Inspect spark plug for following. — Cracked insulator — Heat range — Air gap — Worn electrode • Is spark plug okay?	Yes	Go to next step.
		No	Replace spark plug.

STEP	INSPECTION		ACTION
4	• Inspect compression pressure at suspected faulty cylinder. • Is compression pressure correct? (See Section B)	Yes	Go to next step.
		No	Repair or replace malfunctioning part.
5	• Install all spark plugs. • Carry out spark test at suspected faulty cylinder. • Is strong blue spark visible? (Compare with normal cylinder.)	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
6	• Carry out fuel line pressure inspection. (See Section F) • Is fuel line pressure correct?	Yes	Inspect fuel injector for following: • Open or short circuit in injector • Leakage • Injection volume
		No	**Zero or low:** • Inspect fuel pump circuit. • Inspect for open fuel pump relief valve. • Inspect for fuel leakage inside pressure regulator. • Inspect for clogged main fuel line. • Inspect pulsation damper **High:** • Inspect pressure regulator for high pressure cause. • Inspect for clogged fuel return line.
7	• Inspect spark plug for following. — Heat range — Air gap • Is spark plug okay?	Yes	Go to next step.
		No	Replace spark plug.
8	• Remove suspected fuel injector. • Inspect following: — Resistance (See Section F) — Fuel injection volume (See Section F) • Are all above items okay?	Yes	Inspect for open circuit between suspected fuel injector connector terminal and following PCM connector terminals: • **For #1 cylinder:** 75 • **For #2 cylinder:** 101 • **For #3 cylinder:** 74 • **For #4 cylinder:** 100
		No	Replace fuel injector.
9	• Is air cleaner element free of restriction?	Yes	Go to next step.
		No	Replace air cleaner element.
10	• Carry out spark test. • Is strong blue spark visible at each cylinder?	Yes	Go to next step.
		No	Repair or replace malfunctioning part.
11	• Carry out fuel line pressure inspection. • Is fuel line pressure correct? **Fuel line pressure** **210—260 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**	Yes	Go to next step.
		No	**Zero or low:** • Inspect fuel pump circuit. • Inspect for open fuel pump relief valve. • Inspect for fuel leakage inside pressure regulator. • Inspect for clogged main fuel line. **High:** • Inspect pressure regulator for high pressure cause. • Inspect for clogged fuel return line.
12	• Inspect following PIDs. — ECT — ECT V — FHO2S or O2SII — MAF — MAF V • Are PIDs okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
13	• Carry out purge control inspection (when engine can be started). • Is purge control correct?	Yes	Go to next step.
		No	Repair or replace malfunctioning part.
14	• Carry out compression inspection. • Is compression correct?	Yes	Inspect for clogging in exhaust system.
		No	Repair or replace malfunctioning part.

<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">15</td><td rowspan="2">• When engine cannot be started, inspect intake-air system for air leakage.
• When engine can be started, carry out intake manifold vacuum inspection.
• Is air sucked in from intake-air system?</td><td>Yes</td><td>Repair or replace malfunctioning part.</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">16</td><td rowspan="2">• Carry out fuel line pressure inspection.
• Is fuel line pressure correct?

Fuel line pressure
210—260 kPa {2.1—2.6 kgf/cm², 30—36 psi}</td><td>Yes</td><td>Inspect following PIDs.
• ECT
• ECT V
• FHO2S or O2SII
• MAF
• MAF V
(See F1-25 PCM INSPECTION (except for GF4A-EL models))
(See Section F (for GF4A-EL models))
Inspect PCM GND condition.</td></tr>
<tr><td>No</td><td>Zero or low:
• Inspect fuel pump circuit.
• Inspect for open fuel pump relief valve.
• Inspect for fuel leakage inside pressure regulator.
• Inspect for clogged main fuel line.
• Inspect pulsation damper.
High:
• Inspect pressure regulator for high pressure cause.
• Inspect for clogged fuel return line.</td></tr>
<tr><td>17</td><td colspan="3">• Verify test results.
— If okay, return to diagnostic index to service any additional symptoms.
— If malfunction remains, inspect related Service Information and perform repair or diagnosis.
• If vehicle is repaired, troubleshooting completed.
• If vehicle is not repaired or additional diagnostic information is not available, replace PCM.</td></tr>
</table>

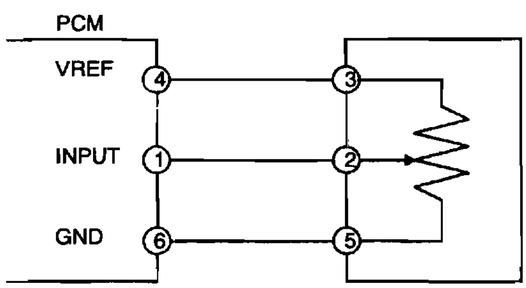
Finding unusual signals
While referring to the DTC inspection section of the on-board diagnostic system, use the PID/DATA MONITOR AND RECORD function to inspect the input signal system relating to the problem.

1. Turn the ignition on and idle the vehicle. You can assume that any signals that are out of specifications by a wide margin are unusual.
2. When recreating the problem, any sudden change in monitor input signals that is not consciously created by the driver can be judged as unusual.

Locating the source of unusual signals

Caution
- **Compare the NGS monitor voltage with the measurement voltage using the DIGITAL MEASUREMENT SYSTEM function. If you use another tester, misreading may occur.**
- **When measuring voltage, attach the tester ground to the GND of the PCM that is being tested, or to the engine itself. If this is not done, the measured voltage and actual voltage may differ.**
- **After connecting the pin to a waterproof coupler, confirming continuity and measuring the voltage, inspect the waterproof connector for cracks. If there are any, use sealant to fix them. Failure to do this may result in deterioration of the harness or terminal from water damage, leading to problems with the vehicle.**

Variable resistance type 1 (Throttle position (TP) sensor)

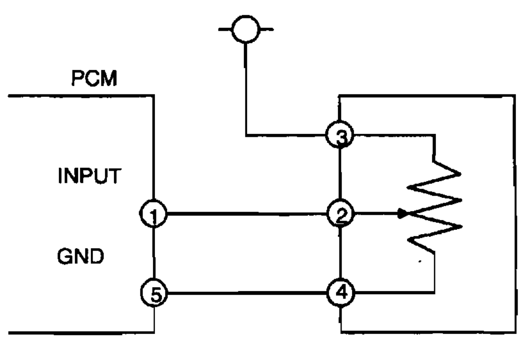


Investigate the input signal system
1. When you get an unusual signal, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the NGS monitor voltage are the same, proceed to the next step.
   - If there is a difference of 0.5V or more, inspect the following points concerning the PCM connector.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. When you get an unusual signal, measure the #2 sensor terminal voltage.
   - If there is a 0.5V or more difference between the sensor and NGS voltages, inspect the harness for open or short circuits.
   - If the sensor and NGS voltages are the same, inspect the following points concerning the sensor connector. If there are no problems, proceed to next investigation below.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

Investigate the standard power supply system
1. Confirm that the #3 terminal is at 5V.
   - If the measured voltage on the #3 terminal is 5V, inspect the following points on the sensor connector. If there is no problem, proceed to next investigation below.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
   - If the #3 terminal measures other than 5V, inspect for the following.
     — Open or short circuit in harness
     — Harness/pin crimp is loose or disconnected.

Investigate the GND system
1. Confirm that terminal sensor #5 is at 0V.
   - If it is at 0V, inspect for the sensor. If necessary, replace the sensor.
   - If not, inspect for the following.
     — Open or short circuit in harness
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

Variable resistance type 2 (Fuel tank level and mass air flow (MAF) sensors)



Investigate the input signal system

1. When you get an unusual signal, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the NGS monitor voltage are the same, proceed to the next step.
   - If there is a difference of 0.5V or more, inspect the following points concerning the PCM connector.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. When you get an unusual signal, measure the #2 sensor terminal voltage.
   - If there is a 0.5V or more difference between the sensor and NGS voltages, inspect the harness for open or short circuits.
   - If the sensor and NGS voltages are the same, inspect the following points concerning the sensor connector. If there are no problems, proceed to next investigation below.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

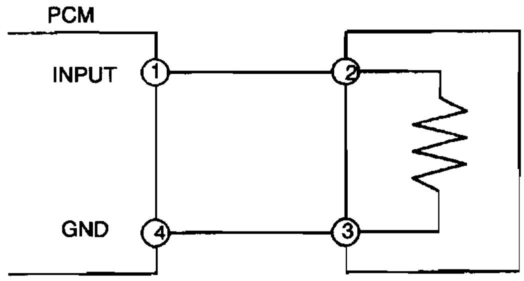
Investigate the electrical supply system

1. Confirm that the sensor #3 terminal is B+.
   - If the measured voltage on the #3 terminal is B+, inspect the following points on the sensor connector. If there is no problem, proceed to next investigation below.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
   - If the #3 terminal measures other than B+, inspect for the following.
     — Open or short circuit in harness
     — Harness/pin crimp is loose or disconnected.

Investigate the GND system

1. Confirm that terminal sensor #4 is at 0V.
   - If it is at 0V, inspect the sensor. If necessary, replace the sensor.
   - If not at 0V, inspect for the following.
     — Open circuit in harness
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

Thermistor type (Intake air temperature (IAT) and engine coolant temperature (ECT) sensors)



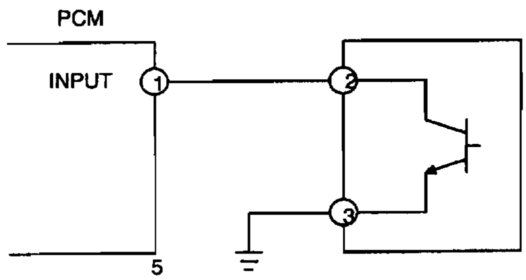
Investigate the input signal system

1. When you get an unusual signal, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the NGS monitor voltage are the same, proceed to the next step.
   - If there is a difference of 0.5V or more, inspect the following points concerning the PCM connector.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. When you get an unusual signal, measure the #2 sensor terminal voltage.
   - If there is a 0.5V or more difference between the sensor and NGS voltages, inspect the harness for open or short circuits.
   - If the sensor and NGS voltages are the same, inspect the following points concerning the sensor connector. If there are no problems, proceed to next investigation below.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

Investigate the GND system

1. Confirm that terminal sensor #3 is at 0V.
   - If it is at 0V, inspect the sensor. If necessary, replace the sensor.
   - If not, inspect the following.
     — Open circuit in harness
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

Vehicle speed sensor (VSS)



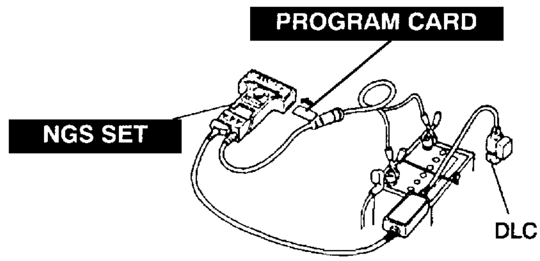
1. Measure the #1 PCM terminal voltage and confirm that it is at 0V or 5V when the ignition switch is on and the engine is at idle.
   - If it is at 0V or 5V, proceed to symptom troubleshooting No.26 "Intermittent Concerns".
   - If not, inspect the following points concerning the PCM connector. If there is no problems, proceed to next step.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage and confirm that it is at 0V or 5V when the ignition switch is on and the engine at idle.
   - If it is at 0V or 5V, proceed to symptom troubleshooting No.26 "Intermittent Concerns".
   - If not, inspect the following points concerning the sensor connector. If there are no problems, proceed to next step.
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
3. Confirm that the #3 terminal switch voltage is at 0V.
   - If it is at 0V, inspect the sensor. If necessary, replace the sensor.
   - If not, inspect for the following.
     — Open circuit in harness
     — Female terminal opening looseness
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.

ENGINE SYSTEM INSPECTION

Idle Air Control (IAC) Inspection

Engine coolant temperature (ECT) compensation inspection

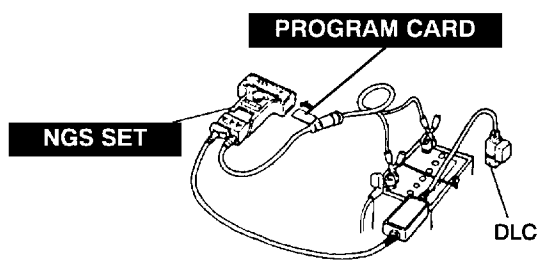
1. Connect the **SSTs** (NGS tester) to DLC.



2. Select the PID/DATA MONITOR AND RECORD function on the NGS display.
3. Select the following PIDs.
   - ECT
   - IACV
   - RPM
4. Verify that the engine is in cold condition, then start the engine.
5. Verify that the engine speed decreases as the engine warms up.
   - If the engine speed does not decrease or decreases slowly, carry out the following.
     — ECT sensor inspection
     — IAC valve inspection

Load compensation inspection

1. Start the engine and run at idle.
2. Disconnect the IAC valve connector and verify that the engine speed changes.
   - If the engine speed does not change, do as follows. For GF4A-EL models, go to (6).
     (1) Connect the IAC valve connector.
     (2) Connect the **SSTs** (NGS tester) to DLC.



     (3) Verify that DTC P1504 is not displayed. If DTC P1504 is shown, carry out DTC inspection.
     (4) Select the SIMULATION TEST function on the NGS display.
     (5) Change the duty value of the IAC valve to 100% using the IACV PID.
     (6) Verify that the engine speed increases.
       - If the engine speed increases, replace the PCM.
       - If the engine speed does not change, inspect the following.

— IAC valve air passage
— Open or short circuit between IAC valve connector terminals and PCM connector terminals 83 and 20 (for GF4A-EL models)/54 (except for GF4A-EL models)

3. Warm up the engine to normal operating temperature and run it at idle.
4. Select the PID/DATA MONITOR AND RECORD function on the NGS display.
5. Select the following PIDs.
   Except for wagon ATX
   - A/C SW
   - IACV
   - PSP SW
   - RPM

   For wagon ATX
   - ACCS
   - IAC
   - PSP
   - RPM
6. Turn the electrical loads on and verify that the engine speed is within the specification.
   - If not as specified, carry out the following.
     — A/C switch inspection
     — PSP switch inspection
     — IAC valve inspection

Note
- Excludes temporary idle speed drop just after the loads are turned on.

Specification

Load condition	Idle-up speed (rpm)*1		
	MTX	ATX	
		N,P position	D range
E/L ON*2	550—750	550—750	550—750
A/C ON*3	550—750	550—750	550—750
P/S ON*4	550—750	550—750	550—750

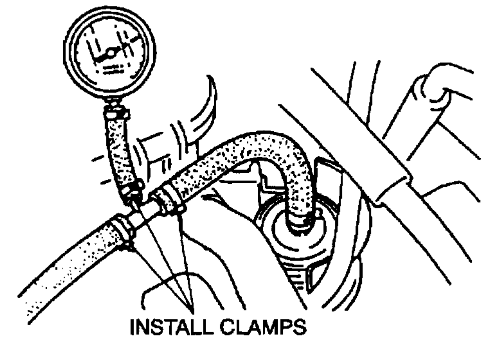
*1: Excludes temporary idle speed drop just after the electrical loads (E/L) are turned on.
*2: Equal load with
- Headlight
- Fan switch (3rd or higher)
- Cooling fan

*3: A/C switch and fan switch are turned ON.
*4: Steering wheel turned fully.

Pressure Regulator Control Inspection

Warning
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "BEFORE REPAIR PROCEDURE". (See Section F)**

1. Install the fuel pressure gauge.



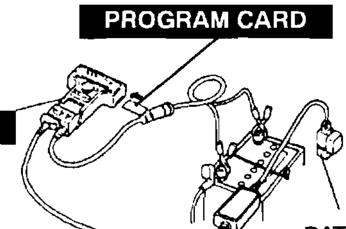
2. Measure the fuel pressure under the following conditions.
   - If the fuel pressure is not within the specification, carry out either Inspection 1 or Inspection 2 as required.

Specification

	Fuel pressure (kPa { kgf/cm², psi })		
Idling	210—260 {2.1—2.6, 30—36}	210—260 {2.1—2.6, 30—36}	260—310 {2.6—3.2, 37—46}
During 60 sec. of hot start*	260—310 {2.6—3.2, 37—46}		
After 60 sec. of hot start*	210—260 {2.1—2.6, 30—36}		
Judging	Normal	Not normal (Perform Inspection 1)	Not normal (Perform Inspection 2)

* Engine coolant temperature is above 90 °C {194 °F} and intake air temperature is above 90 °C {194 °F}

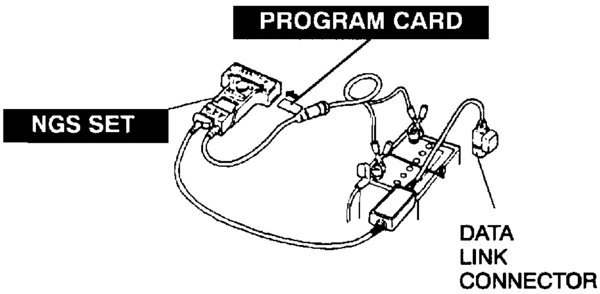
Inspection 1
1. Connect the **SSTs** (NGS) to DLC.



2. Access following PIDs:
   - ECT PID
   - IAT PID
   - TP V PID
3. Check the PID values.
   - If all checks okay, test:
     — Pressure regulator
     — PRC solenoid valve
     — Wiring between PRC solenoid valve and PCM terminal 95 (Open circuit)
     — Wiring between main relay and PRC solenoid valve (Open circuit)

Inspection 2

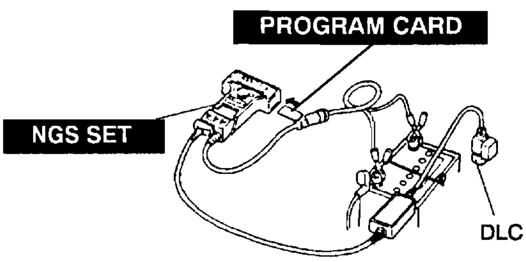
1. Connect the **SSTs** (NGS) to DLC.



2. Access following PIDs:
   - ECT PID
   - IAT PID
   - If all checks okay, test:
     — Loose or damaged vacuum hose between the pressure regulator, PRC solenoid valve, and intake manifold.
     — PRC solenoid valve.
     — Wiring between PRC solenoid valve and PCM terminal 95 (Short circuit).

Fuel Cut Control Inspection

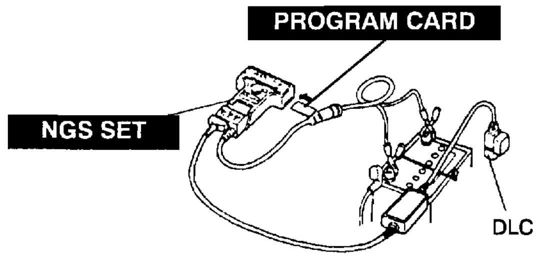
1. Warm up engine and let it idle.
2. Turn off the electrical loads and A/C switch.
3. Connect the **SSTs** (NGS tester) to the DLC.



4. Select the PID/DATA MONITOR AND RECORD function on the NGS display.
5. Select RPM and INJ or FUEL PW1 PIDs.
6. Press START.
7. Monitor both PIDs while performing the following steps.
   (1) Depress the accelerator pedal and increase the engine speed to 4000 rpm.
   (2) Release the accelerator pedal (brake pedal is not depressed) and verify that the fuel injector duration time is 0 msec., and 2—5 msec. when the engine speed drops below 2500 rpm.
   - If not as specified, carry out the following:
     — ECT sensor inspection
     — Neutral/clutch switch inspection (MTX)
     — TR switch inspection (ATX)

Fuel Pump Operation Inspection
Except for GF4A-EL models

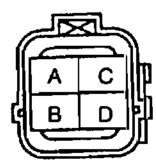
1. Connect the **SSTs** (NGS tester) to the DLC.



2. Remove the fuel-filler cap.
3. Turn the ignition switch on.
4. Select the SIMULATION TEST function on the NGS display.
5. Turn the fuel pump relay from off to on using the FP RLY PID and inspect if the operation sound is heard.
   - If no operation sound is heard, measure the voltage at harness side fuel pump unit connector terminal B.
   - If the voltage is as specified, inspect the following.
     — Fuel pump continuity
     — Fuel pump GND
     — Wiring harness between fuel pump relay and PCM terminal 4P.
   - If not as specified, inspect the following.
     — Fuel pump relay
     — Wiring harness and connector
     (Main relay - fuel pump relay - fuel pump unit)

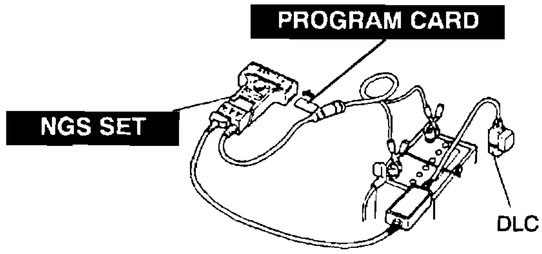
Specification
B+ (Ignition switch on)

FUEL PUMP UNIT

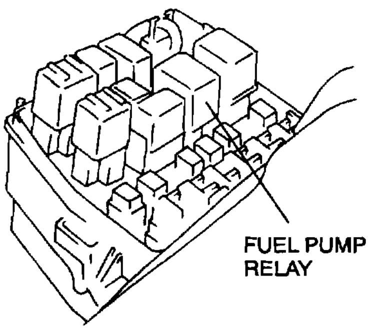


HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Fuel Pump Control Inspection
1. Connect the **SSTs** (NGS tester) to the DLC.

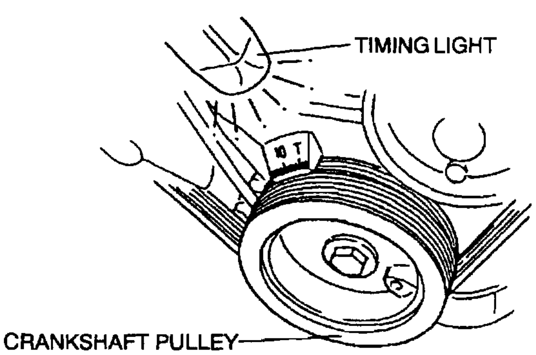


2. Turn the ignition switch on.
3. Select the SIMULATION TEST function on the NGS display.
4. Select IG ON TEST mode.
5. Select FP RLY PID.
6. Press START.
7. Turn the fuel pump relay from off to on and inspect if the operation sound of the fuel pump relay is heard.
   - If no operation sound is heard, inspect the fuel pump relay.
   - If the fuel pump relay is normal, inspect the following.
     — Wiring harnesses and connectors (Main relay - fuel pump relay - PCM)



Ignition Timing Control Inspection
1. Connect a timing light to the engine.
2. Crank the engine.
3. Verify that the timing mark (yellow) on the crankshaft pulley is within the specification.

Specification
BTDC 9°—11°(10° ± 1°)

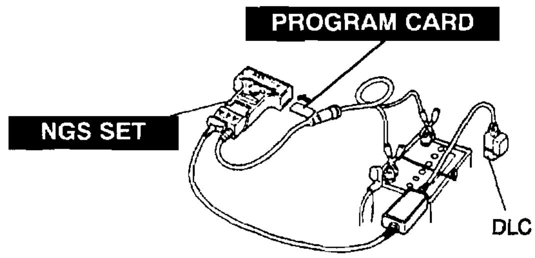


4. Increase the engine speed and verify the ignition timing is advanced.
   - If the ignition timing is not advanced, carry out the following.
     — CKP sensor inspection
     — MAF sensor inspection

EGR Control Inspection
1. Verify that EGR valve operation (initial operation) sound is heard when the ignition switch is turned on.
2. If the operation sound is not heard, connect the **SSTs** (NGS tester) to the DLC and verify that the DTC P1496, P1497, P1498, P1499 or P1409 are shown. Carry out troubleshooting of DTC P1496, P1497, P1498, P1499 or P1409.

For GF4A-EL models
- If no code is displayed, remove EGR valve and check if the valve is stuck.
  — If the valve is stuck, replace the EGR valve.

Except for GF4A-EL models
- Go to next step.



3. Start the engine and run it at idle.
4. Select the SIMULATION TEST function on the NGS display.
5. Increase the step value of EGR valve from 0 to 40 using SEGRP PID.
6. Operate the EGR valve and inspect if the engine speed becomes unstable or the engine stalls.
   - If the engine speed will not change, inspect as follows.
   (1) Stop the engine.
   (2) Remove the EGR valve.
   (3) Connect the EGR valve connector.
   (4) Turn the ignition switch on.
   (5) Select the SIMULATION TEST function on the NGS display.
   (6) Increase the step value of EGR valve from 0 to 40 using SEGRP PID.
   (7) Inspect the EGR operation.
      - If the EGR valve is operated, clean the EGR valve and reinspect from Step 3.
      - If the EGR valve will not operate, replace the EGR valve and reinspect from Step 3.
7. Warm up the engine to normal operating temperature.
8. On level ground, jack up the vehicle and support it evenly on safety stands or set the vehicle on the chassis roller.
9. Select the PID/DATA MONITOR AND RECORD function on the NGS display.

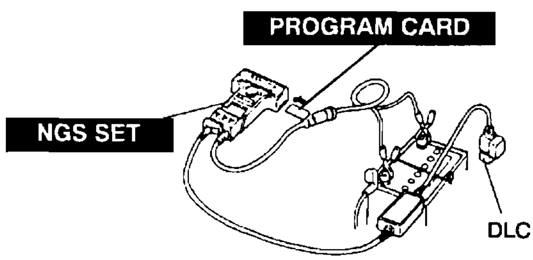
10. Select the following PIDs.
    - SEGRP
    - RPM
    - VS
    - TP V
    - ECT V
11. Let the vehicle idle and verify that the SEGRP value is 0.
12. Depress the accelerator pedal and verify that the SEGRP value increases.
    - If the SEGRP value will not increase, inspect the VS, TP V and ECT V PIDs (See F1-25 PID/DATA Monitor Table).
13. Stop the vehicle and verify that the SEGRP is returned 0.

Purge Control Inspection

1. Start the engine.
2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.
3. Put a finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.
    - If there is a vacuum, inspect the following.
        — Wiring harness and connectors (Purge solenoid valve - PCM terminal 67)
        — Purge solenoid valve

Note
- Following procedure is only for sedan and wagon MTX.

4. Warm up the engine to the normal operating temperature.
5. Stop the engine.
6. Connect the **SSTs** (NGS tester) to DLC.

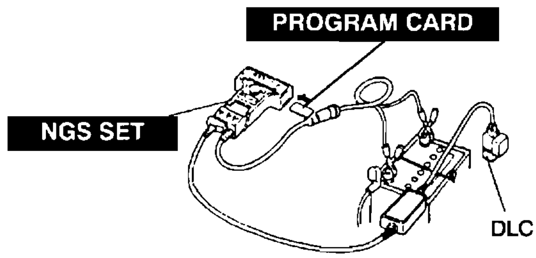


7. Turn the ignition switch on.
8. Select the PID/DATA MONITOR AND RECORD function on the NGS display.
9. Select ECT PID.
10. Verify that the engine coolant temperature is above 60°C {140°F}.
    - If the **SSTs** (NGS tester) indicates below 60°C {140°F}, carry out the ECT sensor inspection.
11. Select the SIMULATION TEST function on the NGS display.
12. Select PRGV PID.
13. Press START.
14. Increase the duty value of the purge solenoid valve to 50% and inspect if the operation sound of the valve is heard.
    - If the operation sound is heard, inspect for loose or damaged vacuum hose. (Intake manifold - purge solenoid valve - charcoal canister)
    - If the operation sound is not heard, carry out the purge solenoid valve inspection.

A/C Cut-off Control Inspection
For sedan and wagon MTX

1. Start the engine.
2. Turn the A/C switch and fan switch on.
3. Verify that the A/C compressor magnetic clutch actuates.
4. If it does not actuate, go to symptom troubleshooting No.22 "A/C does not work".
5. Fully open the throttle valve and verify that the A/C compressor magnetic clutch does not actuate for 2—5 seconds.
    - If it actuates, inspect the following.

(1) Connect the **SSTs** (NGS tester) to DLC.



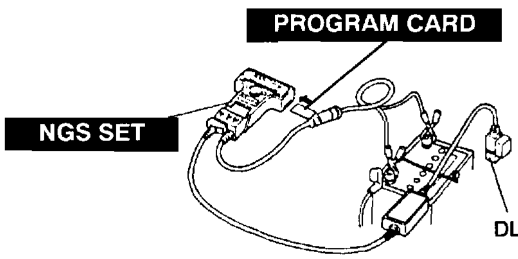
(2) Turn the A/C switch off.
(3) Turn the ignition switch on.
(4) Select the SIMULATION TEST function on the NGS display.
(5) Select IG ON TEST mode.
(6) Select A/C RLY PID
(7) Press START.
(8) Turn the A/C relay from off to on and inspect if the operation sound of the relay is heard.
    - If the operation sound is heard, inspect TP V PID.
    - If the operation sound is not heard, inspect the following.
        — A/C relay
        — Open or short to GND circuit in wiring harnesses and connectors (Main relay - A/C relay - PCM terminal 1S)
        — A/C related parts

Cooling Fan Control Inspection
Cooling fan operation
Except for GF4A-EL models

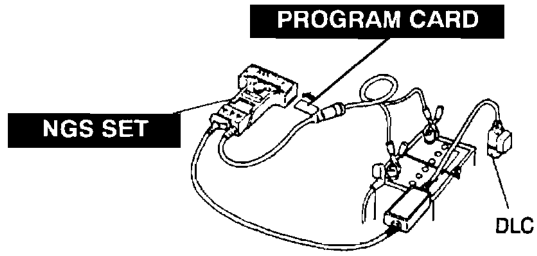
Engine condition	Cooling fan relay	Condenser fan relay
ECT below 97°C {207°F}	OFF	OFF
ECT above 97°C {207°F}	ON	OFF
ECT above 109°C {228°F}	ON	ON
A/C switch on	ON	ON
ECT sensor malfunction	ON	ON

Cooling fan

1. Verify that the engine is cold.
2. Turn the ignition switch on.
3. Verify the cooling fan is not operating.
   - If the cooling fan is operating:
   (1) Connect the **SSTs** (NGS tester) to the DLC.

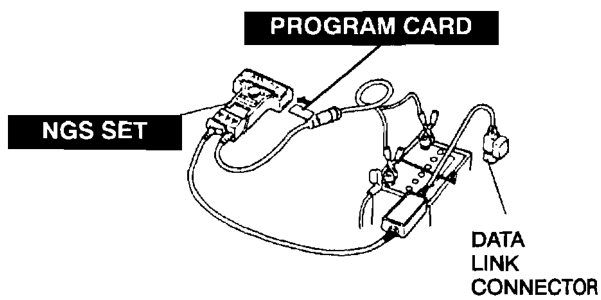


   (2) Select the SIMULATION TEST function on the NGS display.
   (3) Select IG ON TEST mode.
   (4) Select FAN 3 PID.
   (5) Send OFF and verify the cooling fan is off.
      - If the cooling fan is on, inspect the following.
         — Cooling fan relay stuck in closed position
         — Short to GND circuit between cooling fan relay and PCM terminal 1R
         — Short to power in circuit at cooling fan relay
         — DTCs for ECT sensor (P0117, P0118).
      - If the cooling fan is off, inspect the following.
         — DTCs for ECT sensor (P0117, P0118)
4. Start the engine.
5. Verify that the cooling fan is operating when engine is hot.
   - If the cooling fan does not operate, inspect as follows.
      (1) Connect the **SSTs** (NGS tester) to the DLC.

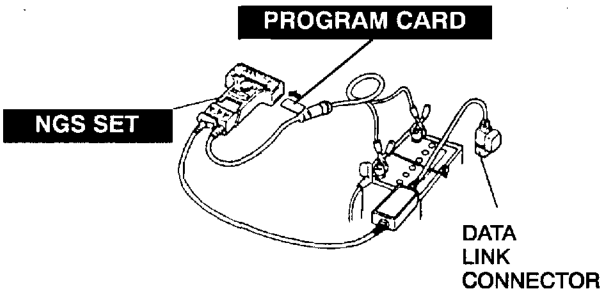


      (2) Select the SIMULATION TEST function on the NGS display.
      (3) Select IG ON TEST mode.
      (4) Select FAN 3 PID.
      (5) Press START.
      (6) Verify that the cooling fan is operating.
   - If the cooling fan operates, inspect the ECT sensor DTCs (P0117, 0118).
   - If the cooling fan does not operate, inspect as follows.
      ① Select FAN 3 PID. Operate cooling fan by selecting START, and verify that operation sound is heard from the cooling fan relay.
         - If the operation sound is heard, inspect the wiring harnesses, connectors and cooling fan motor.
         - If the operation sound is not heard, inspect cooling fan relay and open circuit in wiring harnesses and connectors.
6. Turn the A/C switch and fan switch on.
7. Verify that the cooling fan is operating.
   - If fan does not operate, inspect the A/C system.

For GF4A-EL models



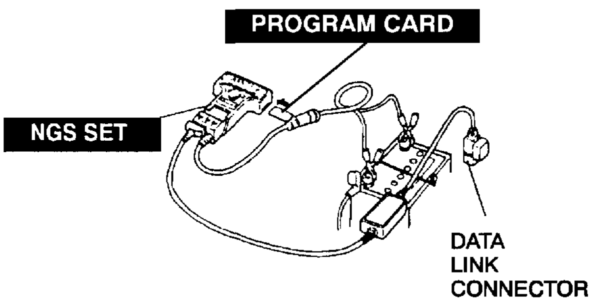
1. Verify that the engine is cold.
2. Verify that the A/C switch and the fan switch are OFF.
3. Turn the ignition switch to ON.
4. Verify that the cooling fan is not operating.
   - If the cooling fan is operating, inspect as follows.
   (1) Connect the **SSTs** (NGS) to the DLC.



(2) Select the "ACTIVE COMMAND MODE" and "OUTPUT TEST MODE" function on the NGS display.
(3) Select the "ALL OFF" and press "START". Verify that the cooling fan is OFF.
- If the cooling fan stays ON, check the following.
  - — Cooling fan relay
  - — Short to ground circuit between cooling fan relay and PCM
  - — Short to power circuit between cooling fan and cooling fan relay.
  - — ECT PID
  - — DLC for ECT sensor
- If the cooling fan is OFF, check the following.
  - — Cooling fan relay

5. Start the engine.
6. Verify that the cooling fan is operating when engine is hot.
   - If the cooling fan does not operate, inspect as follows.

(1) Connect the **SSTs** (NGS) to the DLC.



(2) Select the "ACTIVE COMMAND MODE".
(3) Select "OUTPUT TEST MODE" function.
(4) Select "ALL ON" mode.
(5) Press "START".
- If the cooling fan operates, check as following.
  - — DTC for ECT sensor
  - — ECT PID
- If the cooling fan does not operate, inspect as follows.
  - — Select "ALL ON" mode function as stated above. Operate cooling fan by selecting "START", and verify that operation sound is heard from the cooling fan relay.
- If the operation sound is heard, check the following.
  - — Wiring harness and connectors (Cooling fan relay–Cooling fan motor)
  - — Cooling fan motor
- If the operation sound is not heard, check the following.
  Cooling fan relay
  —Open circuit in wiring harness and
  —Connectors (Main relay–cooling fan relay–PCM)

7. Turn the A/C switch and fan switch ON.
8. Verify that the cooling fan is operating.
9. If does not operate, but operation sound is heard from A/C compressor electromagnetic clutch inspect as follows.
   - If the operating sound is heard, check for open circuit between cooling fan relay and PCM.
   - If the operation sound is heard, check the A/C system.

FUEL AND EMISSION CONTROL SYSTEMS (RF TURBO)

F2

FEATURES

SERVICE

OUTLINE

- The fuel and emission control systems of face-lifted 626 RF Turbo engine models are essentially carried over from the current 626 (GF, GW) RF Turbo engine models, except for the following features: (See 626, 626 Station Wagon Workshop Manual Supplement 1614-10-98D)

FEATURES

Improved serviceability

- By adding the PIDs "RPM DES" (target engine speed) and "TP2 V" (accelerator position signal voltage for monitoring) to the PID/DATA MONITOR items, serviceability has been improved.

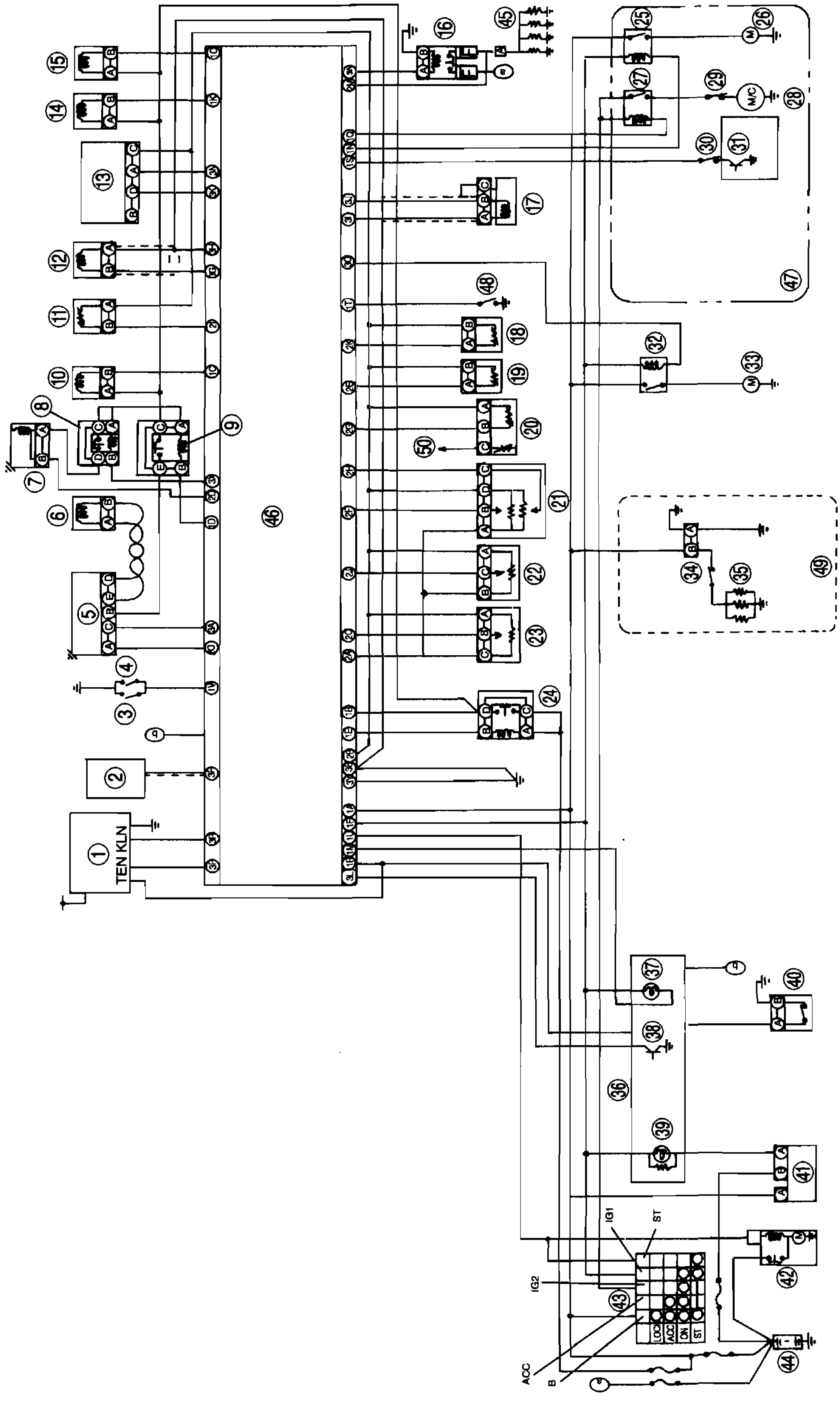
Improved Reliability

- A potentiometer-type (two-accelerator position signals circuit) accelerator position sensor has been adopted to improve the reliability of the accelerator position sensor. Due to the change of the accelerator position sensor type, a detection condition item has been added to DTC P0120 for accelerator position sensor signal circuit.

SPECIFICATIONS

Item		RF Turbo
Air cleaner element type		Wet type
Supercharger type		Turbocharger
Injection pump type		Electric distribution
Fuel tank capacity	(L {US qt, Imp qt})	64 {67.6, 56.3}
Glow plug type		Metal
EGR type		Duty control
Catalyst type		Oxidation catalyst
Evaporative emission control system		-
PCV system		Closed

SYSTEM WIRING DIAGRAM



1	DLC	26	Condenser fan motor
2	Immobilizer unit	27	A/C relay
3	Neutral switch	28	Magnetic clutch
4	Clutch switch	29	Refrigerant pressure switch
5	IDM	30	A/C pressure switch
6	Spill valve	31	A/C amplifier
7	FSO solenoid	32	Cooling fan relay
8	FSO solenoid relay	33	Cooling fan motor
9	Spill valve relay	34	Vacuum switch
10	TCV	35	Fuel warmer
11	Fuel temperature sensor	36	Instrument cluster
12	Pump speed sensor	37	Grow indicator light
13	Injection pump EPROM	38	VSS
14	EGR solenoid valve (vacuum)	39	Generator warning light
15	EGR solenoid valve (vent)	40	Sedimmentor switch
16	Glow plug relay	41	Generator
17	TDC sensor	42	Starter
18	IAT sensor No.2	43	Engine switch
19	IAT sensor No.1	44	Battery
20	ECT sensor	45	Glow plug
21	Accelerator position sensor	46	PCM
22	EGR position sensor	47	With A/C
23	Boost sensor	48	Idle switch
24	PCM control relay	49	With fuel warmer
25	Condenser fan relay	50	To instrument cluster

CONTROL SYSTEM

OUTLINE

- A potentiometer with two built-in signal circuits, which are the current main signal circuit and a newly utilized monitor signal circuit, has been created. The monitor signal regularly monitors the main signal and reliability has been improved.
- The differences in the control system parts between the new model with RF Turbo engine and current 626 (GF, GW) RF engine model are as follows.

Input Parts

×: Applied
–: Not applied

Item	Signal	New model with RF Turbo engine	Current 626 (GF, GW) with RF Turbo engine	Remark
ECT sensor	Engine coolant temperature	× (Installation position is different)		-
Accelerator position sensor (monitor)	Accelerator pedal position	×	-	-
Accelerator position sensor (main)	Accelerator pedal position	×	×	-
Idle switch	Accelerator pedal open or closed	×		-
IAT sensor	Intake air temperature	× (Two IAT sensors are equipped to measure IAT before and after supercharging)		-
Neutral/Clutch switch	Load/No load condition	×		-
Pump speed sensor	Engine speed	× (Function is different)		• Sensor name has been changed from NE sensor to pump speed sensor
TDC sensor	Crank angle standard position	× (Function is different)		-
Fuel temperature sensor	Fuel temperature	× (Installation position and shape are different)		-
Boost sensor	Intake air pressure	×		-
VSS	Vehicle speed	×		-
A/C switch, Refrigerant pressure switch, Fan switch	A/C	×		-
PCM control relay	Power voltage	×		• Relay name has been changed from main relay to PCM control relay
Injection pump EPROM	Calibration	×		• Resistance name has been changed from corrected resistance to injection pump EPROM
Immobilizer unit*1	Immobilizer system communication	×		-
EGR valve position sensor	EGR valve position	×		-

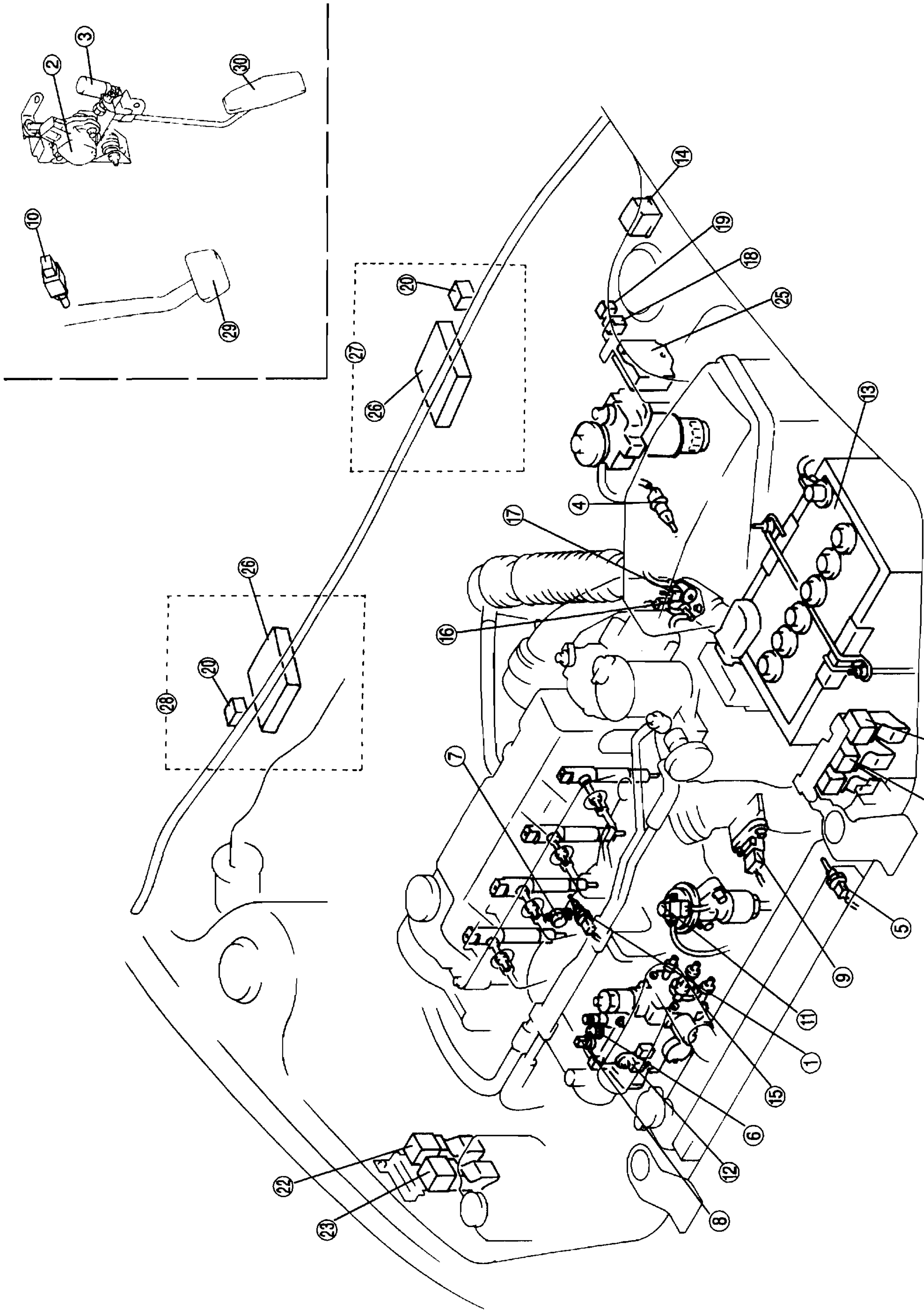
*1: Immobilizer unit is equipped.

Output Parts

×: Applied
–: Not applied

Item	Signal	New model with RF Turbo engine	Current 626 (GF, GW) with RF Turbo engine	Remark
TCV	TCV control	×		–
FSO solenoid relay	FSO solenoid drive	×		Power for driving FSO solenoid
Spill valve relay	IDM power	×		Power to IDM
IDM	Spill valve drive	×		Power for driving spill vavle
EGR solenoid valve (vacuum)	EGR valve drive	×		–
EGR solenoid valve (vent)	EGR valve drive	×		Opens/closes vacuum passage which acts on EGR valve diaphragm
Glow indicator light	Glow indicator light control	×		–
Glow plug relay	Glow plug drive	×		–
A/C relay	A/C control	×		–
Condenser fan relay	Condenser fan control	×		–
Cooling fan relay	Cooling fan control	×		–

COMPONENT LOCATION



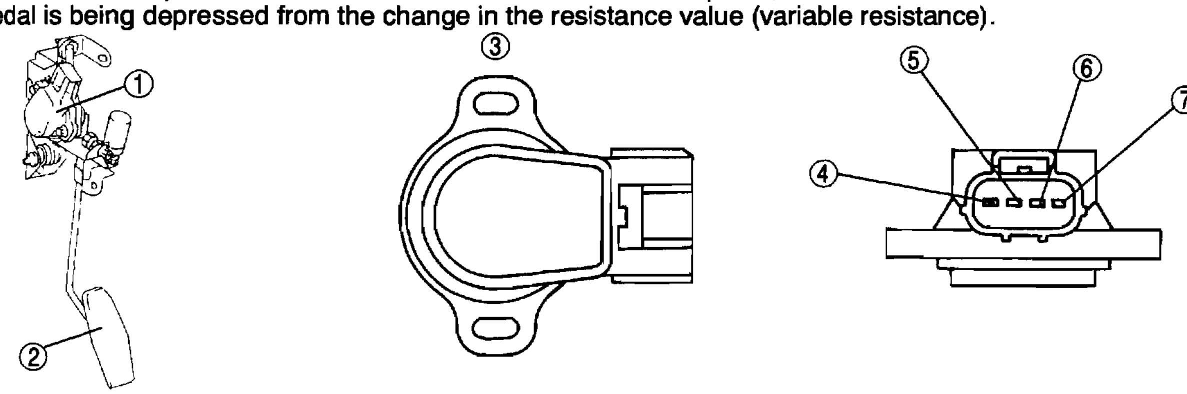
1	ECT sensor
2	Accelerator position sensor
3	Idle switch
4	IAT sensor No.1
5	IAT sensor No.2
6	Pump speed sensor
7	TDC sensor
8	Fuel temperature sensor
9	Boost sensor
10	Clutch switch
11	EGR valve position sensor
12	Injection pump EPROM
13	Battery
14	DLC
15	TCV

16	EGR solenoid valve (Vent)
17	EGR solenoid valve (Vacuum)
18	Spill valve relay
19	PCM control relay
20	FSO solenoid relay
21	Glow plug relay
22	A/C relay
23	Condenser fan relay
24	Cooling fan relay
25	IDM
26	PCM
27	R.H.D.
28	L.H.D.
29	Clutch pedal
30	Accelerator pedal

ACCELERATOR POSITION SENSOR

Function

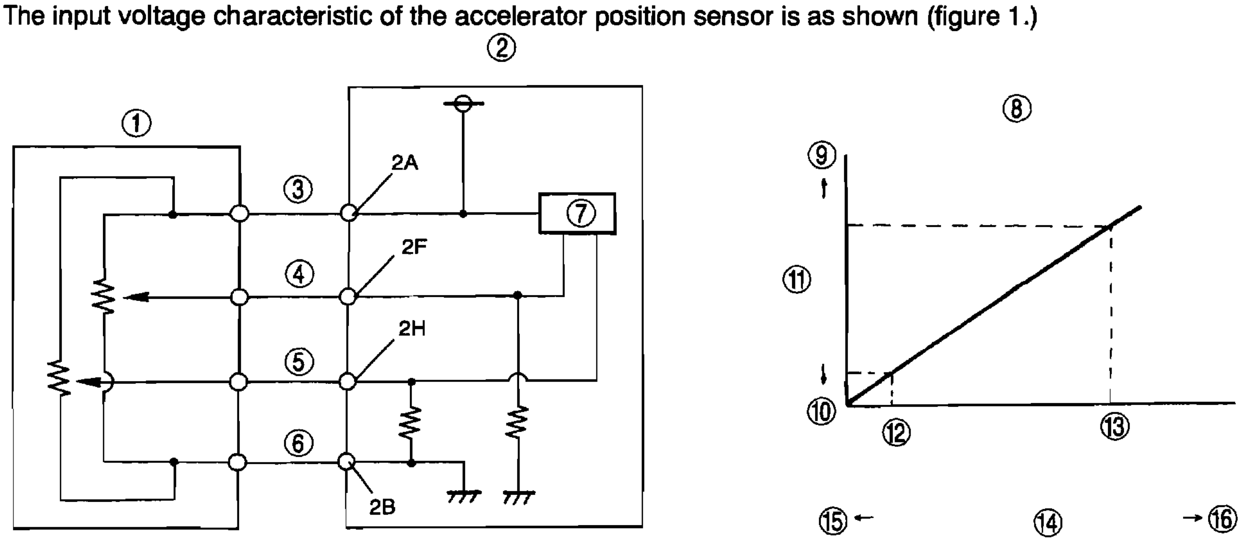
- The accelerator position sensor is installed on the accelerator pedal, and detects how much the accelerator pedal is being depressed from the change in the resistance value (variable resistance).



1	Accelerator position sensor	5	Accelerator position signal (monitor)
2	Accelerator pedal	6	Accelerator position signal (main)
3	External view	7	Power supply
4	GND		

Structure/Operation

- The accelerator position sensor is a potentiometer type and works is the same way as the throttle position sensor.
- The accelerator position sensor contains two circuits for detecting accelerator position: main circuit and monitor circuit. As in previous models, the main circuit is used for the controls operated by the PCM (e.g. fuel injection amount control). The monitor circuit is used for detecting malfunctions in the accelerator position sensor.
- When voltage difference between the main and monitor circuits increases, the PCM determines that the accelerator position sensor is malfunctioning and stores DTC P0120. Thus, a detection condition item has been added to DTC P0120.
- The input voltage characteristic of the accelerator position sensor is as shown (figure 1.)



1	Accelerator position sensor	9	High
2	PCM	10	Low
3	Power supply	11	Input voltage
4	Main (input)	12	Not accelerated
5	Monitor (input)	13	Fully accelerated
6	GND	14	Accelerator pedal position
7	CPU	15	Close (accelerator pedal)
8	Figure 1.	16	Open (accelerator pedal)

F2

ON-BOARD DIAGNOSTIC SYSTEM

OUTLINE

- Due to the change of the accelerator position sensor type, a detection condition item has been added to DTC P0120 for accelerator position sensor signal circuit.
- By using the "RPM DES" (target engine speed) for the PID/DATA MONITOR item, verification of target engine speed during A/C operation and inspection of idle-up speed have been made possible.
- By adopting the "TP2 V" for the PID/DATA MONITOR item, comparison between the accelerator position sensor TP V and TP2 V has been made possible, thus improving serviceability.

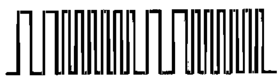
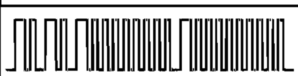
DTC

DTC Table

×: Applied
–: Not applied

DTC No.	Output pattern	Diagnosed circuit	Detection condition	Fail-safe	Memory function
P0105		Boost signal circuit	• Input voltage from boost sensor is above 4.9 V when engine switch is turned on. • Voltage more than 1.95 V is inputted from boost sensor to PCM when engine speed is above 2400 rpm and accelerator opening angle is more than 52 %.	• Fixes intake air pressure at 760 mmHg (2.65 V).	×
P0110		IAT No.1 signal circuit	• Input voltage from IAT No.1 sensor is below 0.142 V or above 4.915 V.	• Fixes intake air temperature No.1 at 40°C {104°F} (1.49 V).	×
P0115		ECT signal circuit	• Input voltage from ECT sensor is below 0.142 V or above 4.915 V.	• Fixes engine coolant temperature at 60°C {140°F}.	×
P0120		Accelerator position signal circuit	• Input voltage from accelerator position sensor is below 0.3 V or above 4.7 V when engine switch is turned on. • Input voltage from accelerator position sensor is above 1.35 V when idle switch is turned on. • Voltage difference between main and monitor accelerator position sensor signal is above 0.9 V.	• Fixes fuel injection amount.	×
P0180		Fuel temperature signal circuit	• Input voltage from fuel temperature sensor is below 0.142 V or above 4.915 V.	• Fixes fuel temperature at 30°C (1.91 V).	×
P0216		Injection timing system	• The actual injection timing deviates from the target injection timing by 7° continuously after the engine warm-up or while driving continuously for 20 sec.	–	×
P0219		Spill valve control signal circuit	• The engine speed signal above 5600 rpm is inputted to the PCM for 1.0 sec. • PCM cannot control engine though accelerator pedal is released.	• Turns spill valve relay off. • Turns FSO solenoid relay off. • Turns spill valve control signal off.	×

×: Applied
–: Not applied

DTC No.	Output pattern	Diagnosed circuit	Detection condition	Fail-safe	Memory function
P0335		Crankshaft position signal circuit	• Crankshaft position signal is not inputted to the PCM when the engine speed is above 400 rpm.	• Fixes TCV control signal (duty signal) at 2%.	×
P0380		Glow plug relay signal circuit	• When the glow plug relay is on, the current voltage signal of the relay below 1.0 V is inputted to the PCM continuously for more than 1.0 sec. • When the glow plug relay is off, the current voltage signal of the relay above 4.0 V is inputted to the PCM continuously for more than 1.0 sec.	• Turns glow plug relay off.	×
P0403		EGR system	• Difference of more than 20% between EGR lift sensor output value and EGR command signal sent from PCM is inputted continuously to PCM for more than 20 seconds.	• Turns EGR solenoid valve (vacuum, vent) off.	×
P0500		Vehicle speed signal circuit	• Vehicle speed signal is less than 0 km/h {0 mph} for more than 5.0 sec. while driving in following condition: — Engine speed is over 2800 rpm. — Neutral switch is off.	• Sets vehicle speed 0 km/h {0 mph}. • Operates A/C cut control.	×
P0510		Idle switch signal circuit	• PCM detects for more than 1.0 second that output voltage from accelerator position sensor is below 1.0 V with idle switch off.	–	×
P0606		PCM internal circuit	• PCM does not read DTC from output devices.	–	×
P1110		IAT No.2 signal circuit	• Input voltage from IAT No.2 sensor is below 0.142 V or above 4.915 V when continued for 0.5 sec.	• Fixes intake air temperature No.2 at 40°C (1.49 V)	×
P1182		FSO solenoid signal circuit	• PCM 2D terminal voltage stays under the preset voltage for more than 2.0 sec. after turning engine switch off.	• Turns spill valve relay off.	×
P1189		NE signal circuit	• PCM cannot detect NE signal though engine is rotating	–	×
P1196		Engine switch signal circuit	• Input signal from starter to PCM continues for more than 10 sec. while engine speed is over 1200 rpm.	• Turns starter signal off.	×
P1298		IDM internal circuit	• Command signal is output from PCM to IDM, but conformation signal is not output from IDM to PCM.	• Turns spill valve off. • Turns spill valve relay off.	×

×: Applied
–: Not applied

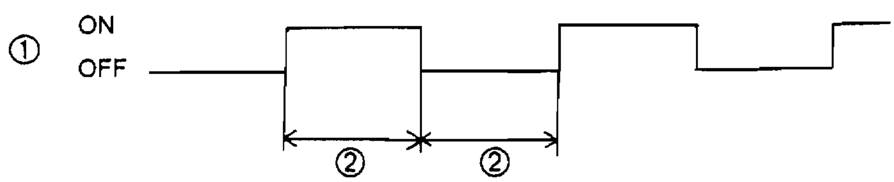
DTC No.	Output pattern	Diagnosed circuit	Detection condition	Fail-safe	Memory function
P1402		EGR valve position signal circuit	• Input voltage from EGR valve position sensor is below 0.1 V or above 4.9 V when continued for 1.0 sec.	• Turns EGR solenoid valve (vacuum vent) off.	×
P1602 (with immo-bilizer system)		Immobilizer unit–PCM communicati on line	• Command transmission from PCM to immobilizer unit exceeds limit. No response from immobilizer unit.	–	–
P1603 (with immo-bilizer system)		ID number is unregistered. (Immobilizer)	• Key ID is not registered in PCM.	–	–
P1604 (with immo-bilizer system)		Code word is unregistered. (Immobilizer)	• Code word numbers are not registered in PCM.	–	–
P1621 (with immo-bilizer system)		Code words do not match. (Immobilizer)	• Code word stored in PCM and immobilizer unit do not match.	–	–
P1622 (with immo-bilizer system)		ID numbers do not match. (Immobilizer)	• ID numbers stored in immobilizer unit and PCM do not match. (This DTC is indicated only after immobilizer unit is replaced and reprogramming system.)	–	–
P1623 (with immo-bilizer system)		Code word/ID number writing and reading error (Immobilizer)	• PCM internal EEPROM malfunction.	–	–
P1624 (with immo-bilizer system)		PCM does not receive unlock signal from immobilizer unit. (PCM is okay.)	• PCM detects immobilizer system malfunction more than three times.	–	–
P1649		PCM internal circuit	• PCM failed to communicate with injection pump EPROM. (User warning light flashes.)	–	×

DTC and user's warning display (glow indicator light) table

×: Applied
-: Not applied

DTC	Related part	Malfunction confirmation condition	User's warning display *2 (Glow indicate light)	
			Flash	Illuminate
P0105	Intake air pressure sensor	Engine is started or engine switch on.	×	-
P0110	IAT sensor No.1	Engine is started or engine switch on.	×	-
P0115	ECT sensor	Engine is started or engine switch on.	×	-
P0120	Accelerator position sensor	Engine is started or engine switch on.	×	-
P0180	Fuel temperature sensor	Engine is started or engine switch on.	×	-
P0216	Injection timing system	Engine is started.	×	-
P0219	Spill valve	Engine is started.	×	-
P0335	TDC sensor	Engine is started.	×	-
P0380	Glow plug relay	Engine is started or engine switch on.	×	-
P0403	EGR system	Engine is started.	×	-
P0500	VSS	Engine is started.	×	-
P0510	Idle switch	Engine is started or engine switch on.	×	-
P0606	PCM	Engine is started or engine switch on.	×	-
P1110	IAT sensor No.2	Engine is started or engine switch on.	×	-
P1182	FSO solenoid	Engine is started or engine switch on.	×	-
P1189	Pump speed sensor	Engine is started.	×	-
P1196	Engine switch	Engine is started.	×	-
P1298	IDM	Engine is started.	×	-
P1402	EGR valve position sensor	Engine is started or engine switch on.	×	-
P1602*1	Immobilizer	Engine is started or engine switch on.	-	-
P1603*1	Immobilizer	Engine is started or engine switch on.	-	-
P1604*1	Immobilizer	Engine is started or engine switch on.	-	-
P1621*1	Immobilizer	Engine is started or engine switch on.	-	-
P1622*1	Immobilizer	Engine is started or engine switch on.	-	-
P1623*1	Immobilizer	Engine is started or engine switch on.	-	-
P1624*1	Immobilizer	Engine is started or engine switch on.	-	-
P1649	Injection pump EPROM	Engine is started or engine switch on.	×	-
-	PCM	Engine is started or engine switch on.	-	×

*1: With immobilizer system.
*2: User's warning will be indicated as shown, when DLC TEN terminal is OFF.



1	Glow indicator light	2	1 sec.

PID/DATA MONITOR AND RECORD

- The monitor items with "*" are adopted for the new model with RF Turbo engine.

PID/DATA MONITOR Table

Monitor item (Display on NGS tester)	Monitoring item	Condition/unit		PCM terminal
A/C RLY	A/C relay	ON/OFF		1Q
A/C SW	A/C switch	ON/OFF		1S
B+	Battery positive voltage	V		1B
BARO	Barometric pressure	kPa	Hg	-
CTP SW	Idle switch	ON/OFF		1T
ECT	Engine coolant temperature	°C	°F	2G
ECT V	ECT signal voltage	V		2G
EGRP V	EGR valve position signal voltage	V		2J
EGRVAC	EGR solenoid valve (vacuum)	%		1K
EGRVENT	EGR solenoid valve (vent)	%		1O
FAN2	Condenser fan control	ON/OFF		1N
FAN3	Cooling fan control	ON/OFF		3Q
FLT	Fuel temperature sensor	°C	°F	2I
FLT V	Fuel temperature signal voltage	V		2I
IAT	IAT sensor No.1	°C	°F	2E
IAT V	IAT No.1 signal voltage	V		2E
IATDC	IAT sensor No.2	°C	°F	2K
IATDC V	IAT No.2 signal voltage	V		2K
IG SW	Engine switch	ON/OFF		1F
MAP	Boost sensor	kPa	Hg	2C
MAP V	Boost signal voltage	V		2C
NL SW	Load/no load condition signal	ON/OFF		1V
RPM	Engine speed	rpm		3G, 3H
RPM DES*	Target idle speed	rpm		—
TEN	TEN terminal (in DLC)	ON/OFF		3P
TP V	Accelerator position signal voltage	V		2F
TP2 V*	Accelerator position signal voltage for monitoring	V		2H
VS	Vehicle speed	KMH	KPH	3L

SUPPLEMENTAL SERVICE INFORMATION

- The following additions have been made since publication of the Mazda 626 Workshop Manual Supplement (1614-10-98D).

Accelerator pedal component
- Removal/Installation procedure has been added.
- Disassembly/Assembly procedure has been added.

Accelerator position sensor
- Inspection procedure has been added.
- Adjustment procedure has been added.

Idle switch
- Adjustment procedure has been added.

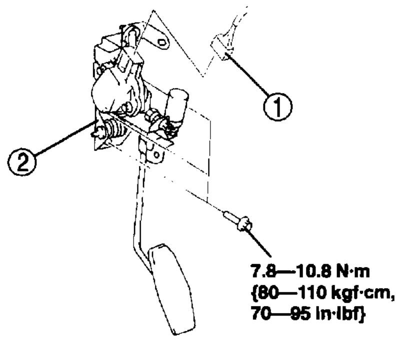
Fully open stopper
- Adjustment procedure has been added.

PCM
- Inspection procedure has been added.

INTAKE-AIR SYSTEM

ACCELERATOR PEDAL COMPONENT REMOVAL/INSTALLATION

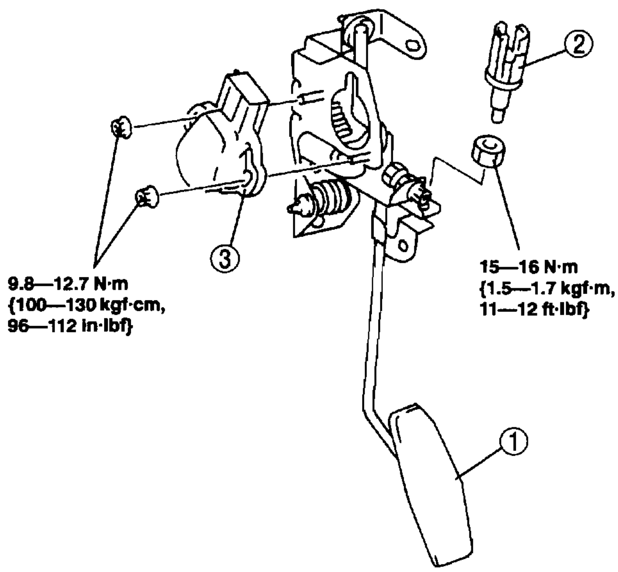
1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Perform "IDLE SPEED INSPECTION" (See Section F2.)



1	Accelerator position sensor connector
2	Accelerator pedal component

ACCELERATOR PEDAL DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.
3. Perform "IDLE SPEED INSPECTION" (See Section F2.)



1	Accelerator pedal See F2-16, FULLY OPEN STOPPER ADJUSTMENT
2	Idle switch See F2-16, IDLE SWITCH ADJUSTMENT
3	Accelerator position sensor See F2-16, ACCELERATOR POSITION SENSOR ADJUSTMENT

ACCELERATOR POSITION SENSOR ADJUSTMENT

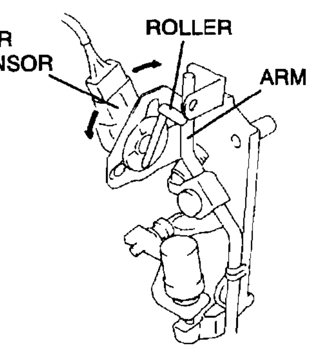
After assembling the accelerator position sensor and connecting the accelerator position sensor connector, perform the following.

1. Confirm that the accelerator pedal Is not depressed.
2. Confirm that the voltage of the PCM 2F terminal (accelerator position sensor) is within specification.
   - If as specified, perform "IDLE SWITCH ADJUSTMENT". (See F2-16 IDLE SWITCH ADJUSTMENT.)
   - If not as specified, adjust the installation position by moving the accelerator position sensor so that the voltage is within specification.
     - — If as specified, perform "IDLE SWITCH ADJUSTMENT".
     - — If not as specified, perform "ACCELERATOR POSITION SENSOR INSPECTION". (See F2-21, ACCELERATOR POSITION SENSOR INSPECTION.)

Specification
0.75—0.95 V

Note

- Make sure there is no space between the arm and roller.



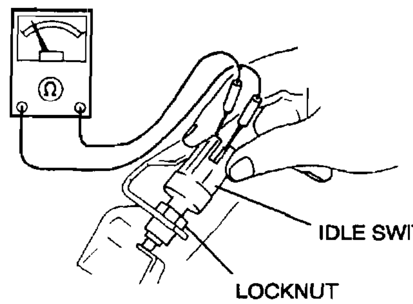
IDLE SWITCH ADJUSTMENT

After assembling the idle switch and connecting the idle switch connector, perform the following.

1. Perform steps in "ACCELERATOR POSITION SENSOR ADJUSTMENT".
2. Press the accelerator pedal by hand until the output voltage of the PCM 2F terminal (accelerator position sensor) is **1.0—1.2 V**.

3. Move the idle switch with the accelerator pedal as described in Step 2, and install a locknut where there is continuity in the idle switch.

Tightening torque
15—16 N·m {1.5—1.7 kgf·m, 11—12 ft·lbf}



4. Press the accelerator pedal gradually by hand and verify that the output voltage of the PCM 2F terminal (accelerator position sensor) is within the specification when the output voltage of the PCM 1T terminal (idle switch) changes to B+ from below 1.0 V.

Specification
1.0—1.2 V

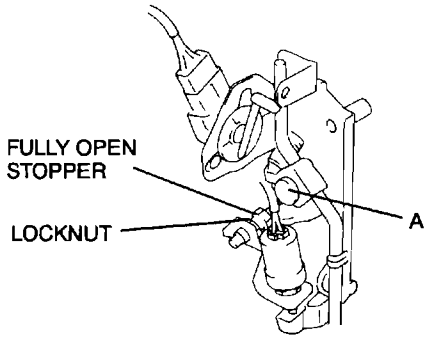
5. If not as specified, loosen the locknut, adjust the position of the idle switch, and verify again by following the procedure in Step 4.
6. If the output voltage of the PCM 2F terminal (accelerator position sensor) is still out of specification, perform the "IDLE SWITCH INSPECTION". (See F2-21, IDLE SWITCH INSPECTION.)
7. Release the accelerator pedal gradually and verify that the output voltage of the PCM 2F terminal (accelerator position sensor) is within the specification when the output voltage of the PCM 1T terminal (idle switch) changes to below 1.0 V from B+.
   - If not as specified, loosen the locknut, adjust the position of the idle switch, and verify again by following the procedure in Step 7.
     - — If the output voltage of the PCM 2F terminal (accelerator position sensor) is still out of specification, perform the "IDLE SWITCH INSPECTION". (See F2-21, IDLE SWITCH INSPECTION.)

Specification
1.0—1.2 V

FULLY OPEN STOPPER ADJUSTMENT

After assembling the accelerator pedal, perform the following.

1. Press the accelerator pedal by hand until the fully open stopper comes in contact with A shown in the figure.



2. Confirm that the voltage of the PCM 2F terminal (accelerator position sensor) is within specification.
   - If not as specified, loosen the locknut and adjust the position of the fully open stopper, so that the voltage of the PCM 2F terminal is within specification under the condition of Step 1.

Specification
3.60—3.88 V

3. Tighten the locknut.

Tightening torque
4.21—6.17 N·m
{43.0—62.9 kgf·cm, 37.4—54.5 in·lbf}

CONTROL SYSTEM

PCM INSPECTION

Using SST (NGS tester)

Note
- PIDs for the following parts are not available on this model. Go to the appropriate part inspection page.
  1. Water temperature sender unit (integrated with engine coolant temperature (ECT) sensor) (See Section F2.)
  2. PCM control relay (See Section F2.)
  3. FSO solenoid (See Section F2.)
  4. Spill valve (See Section F2.)
  5. Spill valve relay (See Section F2.)

1. Connect the NGS tester to the DLC. (See Section F2.)
2. Turn the engine switch on.
3. Select the “PID/DATA MONITOR AND RECORD” function on the NGS tester display and press TRIGGER. (See Section F2.)
4. Select the appropriate PID on the NGS tester display and press START.
5. Measure the PID value.
   - If PID value is not within the specification, follow the instruction in ACTION column.

Note
- When measuring the following PID value, inspect the following:
- TP V PID (See Section F2.)

Note
- Perform the SIMULATION TEST for the output device (A/C RLY, FAN2, FAN3, EGR PV, GLW RLY, GLW LP) after PID/DATA measurement is completed.

PID MONITOR Table

Monitor item (Definition)	Unit/ Condition		Condition/Specification	Action	PCM terminal
A/C RLY (A/C relay)	ON/OFF		Engine switch is on: OFF A/C switch is on and fan switch is on at idle: ON	Inspect following PIDs: RPM, TP V, ECT V, A/C SW. Inspect A/C relay. See Section U	1Q
A/C SW (A/C switch)	ON/OFF		A/C switch and fan switch is on at engine switch on: ON A/C switch is off at engine switch on: OFF	Inspect refrigerant pressure switch. See Section U	1S
B+ (Battery positive voltage)	V		Engine switch is on: B+	Inspect main relay. See Section F2 Inspect battery. See Section G	1B
BARO (Barometric pressure In PCM)	kPa	Hg	Below 400m {0.25 mile} above sea level: 100—103 kPa {29.5—30.4 inHg}	DTC P0105 is indicated. Follow DTC Troubleshooting See Section F2	-
CTP SW (Idle switch)	ON/OFF		Accelerator pedal is depressed:OFF Accelerator pedal is released: ON	Inspect idle switch. See F2-21 IDLE SWITCH INSPECTION	1T
ECT (Engine coolant temperature)	°C	°F	Engine coolant temperature is 20°C {68 °F}: 20 °C {68 °F} Engine coolant temperature is 60°C {140 °F}: 60 °C {140 °F}	Inspect ECT sensor. See Section F2	2G
ECT V (Engine coolant temperature signal voltage)	V		Engine coolant temperature is 20 °C {68 °F}: 2.9—3.1 V After warm up: Below 1.0 V	Inspect ECT sensor. See Section F2	2G
EGRP V (EGR valve position signal voltage)	V		Engine switch is on: 0.4—0.6 V Idle: 1.3—1.6 V	Inspect EGR valve position sensor. See Section F2	2J
EGRVAC (EGR solenoid valve (vacuum))	%		Engine switch is on: 0% Idle: 0—100%	Inspect EGR solenoid valve (vacuum). See Section F2	1K
EGRVENT (EGR solenoid valve (vent))	%		Engine switch is on: 0% Idle: 0—100%	Inspect EGR solenoid valve (vent). See Section F2	1O

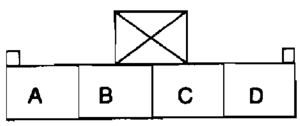
Monitor item (Definition)	Unit/ Condition		Condition/Specification	Action	PCM terminal
FAN2 (Condenser fan control)	ON/OFF		Engine coolant temperature is above 108 °C {226 °F }: ON Terminal TEN (DLC) is shorted to GND and accelerator pedal is depressed: ON A/C is operating: ON Others: OFF	Inspect following PIDs: RPM, TP V, ECT V, A/C SW, TEN. Inspect condenser fan relay. See Section U	1N
FAN3 (Cooling fan control)	ON/OFF		Engine coolant temperature is above 100 °C {212 °F}: ON Terminal TEN (DLC) is shorted to GND and accelerator pedal is depressed: ON A/C is operating: ON Others: OFF	Inspect following PIDs: RPM, TP V, ECT V, A/C SW, TEN. Inspect cooling fan relay. See Section E	3Q
FLT (Fuel temperature sensor)	°C	°F	Fuel temperature is 20 °C {68 °F}: 20 °C {68 °F}	Inspect fuel temperature sensor. See Section F2	2I
FLT V (Fuel temperature signal voltage)	V		Fuel temperature is 20 °C {68 °F}: 2.3 V Fuel temperature is 70 °C {158 °F}: 0.6 V	Inspect fuel temperature sensor. See Section F2	2I
IAT (IAT sensor No.1)	°C	°F	Intake air temperature is 20 °C {68 °F}: 20 °C {68 °F}:	Inspect IAT sensor. See Section F2	2E
IAT V (IAT signal No.1 voltage)	V		Intake air temperature is 20 °C {68 °F}: 2.2—2.5 V Intake air temperature is 30 °C {86 °F}: 1.7—1.9 V	Inspect IAT sensor. See Section F2	2E
IATDC (IAT sensor No.2)	°C	°F	Intake air temperature is 20 °C {68 °F}: 20 °C {68 °F}	Inspect IAT sensor. See Section F2	2K
IATDC V (IAT signal voltage No.2)	V		Intake air temperature is 20 °C {68 °F}: 2.2—2.5 V Intake air temperature is 30 °C {86 °F}: 1.7—1.9 V	Inspect IAT sensor. See Section F2	2K
IG SW (Engine switch)	ON/OFF		Engine switch is on: ON Cranking: ON	Inspect engine switch. See T-16 IGNITION SWITCH INSPECTION	1F
MAP (Boost sensor)	kPa	Hg	Engine switch is on: 100—103 kPa {29.5—30.4 inHg} Idle: 100—103 kPa {29.5—30.4 inHg}	Inspect boost sensor. See Section F2	2C
MAP V (Boost signal voltage)	V		Engine switch is on: 2.5—2.8 V Idle: 2.5—2.8 V	Inspect boost sensor. See Section F2	2C
NL SW (Load/no load condition signal)	ON/OFF		Neutral position or clutch pedal is depressed: ON Others: OFF	Inspect neutral switch. See Section F2 Inspect clutch switch. See Section F2	1V
RPM (Engine speed)	rpm		Idle: 800—850 rpm	Inspect crankshaft position sensor. See Section F2	3G, 3H
TEN (TEN terminal (in DLC))	ON/OFF		Terminal TEN (DLC) is shorted to GND: ON Terminal TEN (DLC) is open: OFF	Inspect wiring from DLC terminal TEN to PCM terminal 3P.	3P

Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
TP V (Accelerator position signal voltage)	V	Accelerator pedal is depressed: 3.1—3.5 V Accelerator pedal is released: 0.5—0.7 V	Inspect accelerator position sensor. See F2-21 ACCELERATOR POSITION SENSOR INSPECTION	2F
TP2 V (Accelerator position signal voltage for monitoring)	V	Accelerator pedal is depressed: 3.1—3.5 V Accelerator pedal is released: 0.5—0.7 V	Inspect accelerator position sensor. See F2-21 ACCELERATOR POSITION SENSOR INSPECTION	2H
VS (Vehicle speed)	KMH KPH	Vehicle speed is 20 km/h {12.5 mph}: 20 km/h {12.5 mph} Vehicle speed is 40 km/h {25 mph}: 40 km/h {25 mph}	Inspect VSS. See T-26 INSTRUMENT CLUSTER INSPECITON	3L

Not Using the SSTs (NGS tester) at Constant Voltage Terminal Inspection

1. Turn the engine switch to ON position.
2. Measure the voltage between the accelerator position sensor connector (vehicle side) terminal G and body GND using a voltmeter.
   (1) When measurement voltage is **0 V**.
      i. Turn the engine switch off.
      ii. Disconnect the accelerator position sensor connector (applied constant voltage).
      iii. Verify there is no continuity between the accelerator position sensor connector (vehicle side) terminal A and body GND using an ohmmeter.
         - If there is continuity, repair the related harnesses.

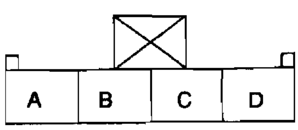
ACCELERATOR POSITION SENSOR



SHORT CORD SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

      iv. Verify there is continuity between the PCM connector (vehicle side) terminal 2A and accelerator position sensor connector (vehicle side) terminal A (applied constant voltage) using an ohmmeter.
         - If there is no continuity, repair the related harnesses.

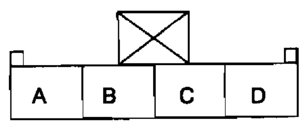
ACCELERATOR POSITION SENSOR



SHORT CORD SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

   (2) When measurement voltage is **B+**.
      i. Turn the engine switch off.
      ii. Disconnect the battery positive harness and battery negative harness.
      iii. Verify there is no continuity between the accelerator position sensor connector (vehicle side) terminal A and battery positive harness using an ohmmeter.
         - If there is continuity, repair the related harnesses.

ACCELERATOR POSITION SENSOR



SHORT CORD SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

   (3) When measurement voltage is approx. **5 V**.
      - Constant voltage terminal of PCM is okay.

Not Using the SSTs (NGS tester) at GND Terminal Inspection

1. Turn the engine switch off.
2. Disconnect the PCM connectors.
3. Inspect for continuity between the PCM GND terminals and body GND using an ohmmeter.
   - If there is no continuity, repair the related harnesses.

PCM GND terminal
3B
3Y

Not Using the SSTs (NGS Tester) at Power Supply Terminal Inspection

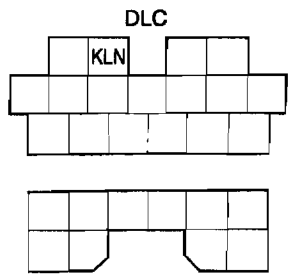
1. Turn the engine switch off.
2. Disconnect the PCM connectors.
3. Measure the voltage between the PCM battery power terminal connectors and body GND using an voltmeter.
   - If not as specified, repair the related harnesses and fuses.

Power supply terminal voltage: B+

Power supply terminal
1A

Not Using the SSTs (NGS Tester) at Serial Communication Terminal Inspection

1. Turn the engine switch off.
2. Disconnect the PCM connectors.
3. Verify there is continuity between PCM connector terminal 3R and DLC KLN terminal.
   - If there is no continuity, repair the related harnesses.



COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

IDLE SWITCH INSPECTION

On-vehicle Inspection

Note
- Perform the following test only when directed.

1. Verify that the accelerator pedal and idle switch are properly installed. (See F2–15, ACCELERATOR PEDAL DISASSEMBLY/ASSEMBLY)
2. Turn the engine switch on.
3. Monitor the voltage of PCM terminal 1T. Accelerate the accelerator pedal gradually and hold it at B+. Verify that the voltage of PCM terminal 2F is within the specification.
   - If not as specified, carry out the accelerator position sensor inspection or idle switch off-vehicle inspection.

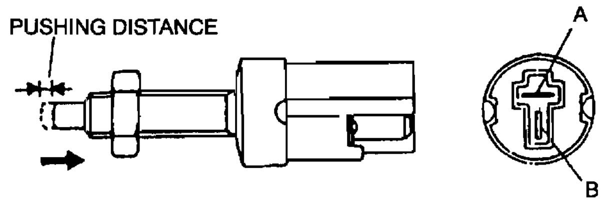
Specification
1.0—1.2 V

Off-Vehicle Inspection

1. Disconnect the negative battery cable.
2. Disconnect connector from the idle switch, located above the accelerator pedal.
3. Inspect for continuity between the idle switch terminals using an ohmmeter.
   - If the idle switch is okay, but PID value or PCM terminal voltage is out of specification, carry out the "Circuit Open/Short Inspection".
   - If not as specified, replace the idle switch.

Specification

Pushing distance (mm {in})	Continuity
Below 1.75 {0.069}	No (OFF)
Above 3.25 {0.127}	Yes (ON)



Circuit Open/Short Inspection

1. Inspect for an open or short circuit in the following wiring harnesses.
   - If there is an open or short circuit, repair or replace wiring harnesses.

Open circuit
- Power circuit (Idle switch connector terminal A and PCM connector terminal 1T through common connector)
- GND circuit (Idle switch connector terminal B and body GND)

Short circuit
- Power circuit (Idle switch connector terminal A and PCM connector terminal 1T through common connector to GND)

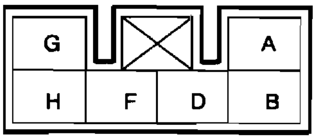
ACCELERATOR POSITION SENSOR INSPECTION

Note
- Perform the following test only when directed.

1. Verify that the accelerator pedal is properly installed and accelerator position sensor is adjusted. (See F2–15, ACCELERATOR PEDAL DISASSEMBLY/ASSEMBLY.) (See F2–16, ACCELERATOR POSITION SENSOR ADJUSTMENT.)
2. If as specified but PID value or PCM terminal voltage is out of specification, carry out the "Circuit Open/Short Inspection".

PCM—Short Cord (Including Short Cord) Inspection

SHORT CODE



HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Circuit Open/Short Inspection

1. Inspect for an open or short circuit in the following wiring harnesses.
   - If there is an open or short circuit, repair or replace wiring harnesses.

Open circuit

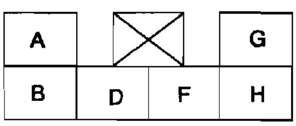
- Constant voltage circuit (PCM connector terminal 2A and short cord connector terminal A)
- Accelerator position signal circuit (PCM connector terminal 2F and short cord connector terminal B)
- Accelerator position signal circuit (PCM connector terminal 2H and short cord connector terminal F)
- GND circuit (PCM connector terminal 2B and short cord connector terminal D)

Short circuit

- Constant voltage circuit (PCM connector terminal 2A and short cord connector terminal A to GND)
- Accelerator position signal circuit (PCM connector terminal 2F and short cord connector terminal B to GND)
- Accelerator position signal circuit (PCM connector terminal 2H and short cord connector terminal F to GND)

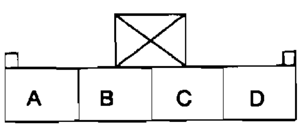
Short Cord—Accelerator Position Sensor Inspection

SHORT CORD



SHORT CORD SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

ACCELERATOR POSITION SENSOR



SHORT CORD SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Circuit Open/Short Inspection

1. Inspect for an open or short circuit in the following wiring harnesses.
   - If there is an open or short circuit, repair or replace wiring harnesses.

Open circuit

- Constant voltage circuit (Short cord connector terminal A and accelerator position sensor connector terminal A)
- Accelerator position signal circuit (Short cord connector terminal B and accelerator position sensor connector terminal B)
- Accelerator position signal circuit (Short cord connector terminal F and accelerator position sensor connector terminal C)
- GND circuit (Short cord connector terminal D and accelerator position sensor connector terminal D)

Short circuit

- Constant voltage circuit (Short cord connector terminal A and accelerator position sensor connector terminal A to GND)
- Accelerator position signal circuit (Short cord connector terminal B and accelerator position sensor connector terminal B to GND)
- Accelerator position signal circuit (Short cord connector terminal F and accelerator position sensor connector terminal C to GND)

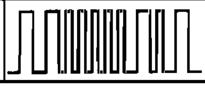
ON-BOARD DIAGNOSTIC

OUTLINE

- No change has been made from the current 626 (GF, GW) models, except for the following DTCs.

DTC INSPECTION

DTC Table

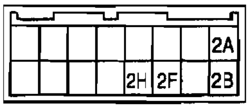
DTC No.	Output Pattern	Display on the NGS	Possible cause
P0120		TP-CIRCUIT MALFUNCTION	Accelerator position sensor malfunction
P0510		CLOSED THROTTLE POS SWITCH MALFUNCTION	Idle switch malfunction

DTC Troubleshooting

DTC P0120	ACCELERATOR POSITION SENSOR
DETECTION CONDITION	• Input voltage from accelerator position sensor is below 0.3 V or above 4.7 V when engine switch is turned to ON position. • Input voltage from accelerator position sensor is above 1.35 V when idle switch is turned on. • Voltage difference between main and monitor accelerator position snensor signal is above 0.9 V.
POSSIBLE CAUSE	• Accelerator position sensor malfunction • Open circuit in wiring from throttle position sensor terminal D to PCM terminal 2B • Open or short circuit in wiring from throttle position sensor terminal A to PCM terminal 2A • Open or short circuit in wiring from throttle position sensor terminal B to PCM terminal 2F • Open or short circuit in wiring from throttle position sensor terminal C to PCM terminal 2H • Idle switch malfunction • Accelerator position sensor or idle switch misadjustment

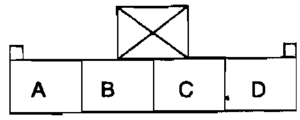
STEP	INSPECTION		ACTION
1	Does throttle position sensor connector or PCM connector have poor connection?	Yes	Repair or replace connector, then go to Step 10.
		No	Go to next step.
2	Implement PID/DATA MONITOR AND RECORD (TP V and TP2 V) of DIAGNOSTIC DATA LINK using NGS. Is the voltage as specified?	Yes	Go to next step.
		No	Go to Step 4.
3	Verify that the accelerator pedal and idle switch are properly installed. See F2–15 ACCELERATOR PEDAL DISASSEMBLY/ASSEMBLY	Yes	Go to Step 8.
		No	Go to Step 10.
4	Disconnect accelerator position sensor connector. Turn engine switch on. Is there 5 V at connector terminal A?	Yes	Go to next step.
		No	Inspect for open or short circuit in wiring harness. (PCM terminal 2A–accelerator position sensor terminal A)
5	Is there continuity between connector terminal B and PCM terminal 2F?	Yes	Go to next step.
		No	Repair or replace wiring harness, then go to Step 10.
6	Is there continuity between connector terminal C and PCM terminal 2H?	Yes	Go to next step.
		No	Repair or replace wiring harness, then go to Step 10.
7	Is there continuity between connector terminal D and PCM terminal 2B?	Yes	Replace throttle position sensor, then go to Step 10.
		No	Repair or replace wiring harness, then go to Step 10.
8	Is idle switch okay? See F2–21 IDLE SWITCH INSPECTION	Yes	Go to next step.
		No	Replace idle switch, then go to Step 10.
9	Clear diagnostic trouble code from memory. Is same code No. present after performing "After Repair Procedure"?	Yes	Go to Step 1.
		No	Intermittent poor connection in harness or connector. Repair connector and/or harness, then go to next step.
10	Clear diagnostic trouble code from memory. Is there any diagnostic trouble code present after performing "After Repair Procedure"?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

PCM



HARNESS SIDE 16 PIN CONNECTOR
(VIEW FROM HARNESS SIDE)

ACCELERATOR POSITION SENSOR

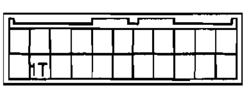


HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

DTC P0510	IDLE SWITCH MALFUNCTION
DETECTION CONDITION	• PCM detects for more than 1.0 second that output voltage from accelerator position sensor is below 1.0 V with idle switch off.
POSSIBLE CAUSE	• Idle switch malfunction • Accelerator position sensor and idle switch misadjustment • Idle switch misadjustment • Open or short circuit in wiring from idle switch terminal A to PCM terminal 1T • Open in wiring from idle switch terminal B to body ground

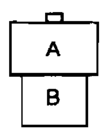
STEP	INSPECTION		ACTION
1	Does idle switch connector or PCM connector have poor connection?	Yes	Repair or replace connector.
		No	Go to next step.
2	Disconnect idle switch connector. Turn engine switch on. Is there 5V at idle switch terminal A?	Yes	Go to next step.
		No	Check for open or short circuit in wiring harness. (PCM terminal 1T–Idle switch terminal)
3	Is there continuity between idle switch connector terminal B and body earth?	Yes	Go to next step.
		No	Replace idle switch.
4	Inspect installation condition of idle switch and accelerator position sensor. Are they okay?	Yes	Go to next step.
		No	Adjust installation position of idle switch and accelerator position sensor.
5	Clear diagnostic trouble code from memory. Is same code No. Present after performing "After Repair Procedure"?	Yes	Go to Step 1.
		No	Intermittent poor connection in harness or connector. Repair connector and/or harness, then go to next step.
6	Clear diagnostic trouble code from memory. Is there any diagnostic trouble code present after performing "After Repair Procedure"?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

PCM



HARNESS SIDE 22 PIN CONNECTOR
(VIEW FROM HARNESS SIDE)

IDLE SWITCH



HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

ENGINE ELECTRICAL SYSTEM

FEATURES

SERVICE

G

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the engine electrical systems is essentially carried over from that of the current 626 (GF), 626 Station Wagon (GW) models, except for the following features. (See 626 Training Manual 3303-10-97D, 626 626 Station Wagon RF Turbo Workshop Manual Supplement 1614-10-98D.)

FEATURES

Modifications to match vehicle characteristics

- Battery type for cold area has been changed from 65D23L to 75D26L. (MTX for FP, FS, and FS (Hi-power))

Reduced Weight

- Battery box has been eliminated. (RF Turbo)

SPECIFICATIONS

Item			Specification			
			FP	FS	FS (Hi-power)	RF Turbo
Battery	Voltage (V)		12			
	Type and capacity (5-hour rate) (A·h)		55D23L(48), 75D26L(52)*1			95D31L(64), 115D31L(70) *1
Generator	Output (V-A)		12-80			
	Regulated voltage (V)		Controlled by PCM			14.1—14.7 [20 °C {68 °F}]
	Self-diagnosis function		Not equipped (Integrated in PCM)			Equipped
Ignition system	Type		DI			—
	Spark advance		Electronic			—
	Firing order		1—3—4—2 (1·4-3·2-4·1-2·3) Two cylinders fire simultaneously each			—
Spark plug	Type	DENSO	PKJ16CR8*2, PKJ20CR8*3			—
Starter	Type		Coaxial reduction			Eccentric reduction, Coaxial reduction*1
	Output (kW)		MTX:1.0*4, 1.1*5 ATX: 1.0			2.0, 2.2*1

*1: Cold area
*2: Standard plug
*3: Cold type plug
*4: MITSUBISHI
*5: VISTEON
▭ Indicates new specification

SUPPLEMENTAL SERVICE INFORMATION

The following changes and/or additions have been made since the publication of the 626 Workshop Manual (1577-10-97D) and 626 626 Station Wagon Workshop Manual Supplement RF Turbo (1614-10-98D).

Generator warning light

- Inspection procedure has been modified. (G25M-R MTX and FN4A-EL ATX)

CHARGING SYSTEM

GENERATOR INSPECTION

Generator Warning Light

G25M-R MTX and FN4A-EL ATX

1. Verify that the battery is fully charged.
   - Charge it if necessary.
2. Verify that the drive belt deflection/tension is within the specification. (See Section B1.)
   - Replace it if necessary.
3. Turn the ignition switch to ON and verify that the generator warning light illuminates.
   - If not as specified, inspect the generator warning light, wiring harnesses between the battery, generator warning light and PCM terminal 42.
     — When the generator warning light and the wiring harnesses are okay, replace the PCM.
4. Verify that the generator warning light turns off after the engine is started.
   - If not, inspect if any of the following DTCs are displayed: P0112, P0113, P1631, P1633, P1634. (See F1-37 DTC TABLE.)

MANUAL TRANSAXLE

FEATURES

J

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the manual transaxle of the face-lifted 626 (GF) and 626 Station Wagon (GW) is essentially carried over from that of the current 626 (GF) and 626 Station Wagon (GW). (See 626 Training manual 3303-10-97D, 626 Station Wagon Workshop Manual Supplement 1603-10-97K and 626, 626 Station Wagon Workshop Manual Supplement 1614-10-98D.) However, the 1st and 2nd gear ratio have been changed (FP, FS, and FS(Hi-power) models).

SPECIFICATIONS

<table>
<tr><th colspan="3">Item</th><th colspan="4">Specification</th></tr>
<tr><td colspan="3">Engine type</td><td>FP</td><td>FS</td><td>FS (Hi-power)</td><td>RF-Turbo</td></tr>
<tr><td colspan="3">Transaxle type</td><td colspan="4">G25M-R</td></tr>
<tr><td colspan="3">Transaxle control</td><td colspan="4">Floor-shift</td></tr>
<tr><td colspan="3">Operation system</td><td colspan="4">Rod</td></tr>
<tr><td colspan="3">Shift assist</td><td colspan="4">Forward: Synchromesh
Reverse: Selective sliding and synchromesh</td></tr>
<tr><td rowspan="6">Gear ratio</td><td colspan="2">1st</td><td colspan="3">3.666</td><td>3.454</td></tr>
<tr><td colspan="2">2nd</td><td colspan="3">1.842</td><td>1.833</td></tr>
<tr><td colspan="2">3rd</td><td colspan="4">1.310</td></tr>
<tr><td colspan="2">4th</td><td colspan="4">0.970</td></tr>
<tr><td colspan="2">5th</td><td colspan="3">0.755</td><td>0.717</td></tr>
<tr><td colspan="2">Reverse</td><td colspan="3">3.166</td><td>3.454</td></tr>
<tr><td colspan="3">Final gear ratio</td><td colspan="2">Except wagon : 3.619
Wagon : 3.850</td><td>4.105</td><td>Except wagon: 3.619
Wagon: 3.850</td></tr>
<tr><td rowspan="4">Oil</td><td colspan="2">Grade</td><td colspan="4">API Servise GL-4 or GL-5</td></tr>
<tr><td rowspan="2">Viscosity</td><td>All season</td><td colspan="4">SAE 75W-90</td></tr>
<tr><td>Above 10°C {50°F}</td><td colspan="4">SAE 80W-90</td></tr>
<tr><td colspan="2">Capacity (L{US qt, Imp qt})</td><td colspan="4">2.7{2.9, 2.4}</td></tr>
</table>

▭ Indicates new specification.

AUTOMATIC TRANSAXLE (GF4A-EL)

FEATURES

K1

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the GF4A-EL automatic transaxle of the face-lifted 626 Station Wagon (GW) is essentially carried over from that of the current 626 (GF), 626 Station Wagon (GW) except for the speedometer driven gear ratio. (Refer to 626 Training Manual 3303-10-97D, Mazda 626 workshop manual 1577-10-97D, and Mazda 626 station wagon workshop manual supplement 1603-10-97J)

SPECIFICATIONS

Item		Engine type	
		FS	FS (Hi-power)
Gear ratio	1gear	2.800	
	2gear	1.540	
	3gear	1.000	
	4gear	0.700	
	Reverse	2.333	
Final gear ratio		3.823	
Speedometer gear ratio (number of driven/drive gear teeth)		14, 15 inch wheel: 0.80 (20/25) 16 inch wheel: 0.84 (21/25)	
Automatic transaxle fluid (ATF)	Type	ATF M-III or equivalent (e.g. Dexron® II)	
	Capacity (L {Us qt, Imp qt})	8.0 {8.5, 7.0}	
Torque converter stall torque ratio		2.36	
Hydraulic system (Number of drive-driven plates)	Forward clutch	3/3	
	Coasting clutch	2/3	
	3—4clutch	4/4	
	Reverse clutch	2/2	
	Low and reverse clutch	4/4	
Band servo	Servo diameter (piston outerdia./ retainer inner dia.) (mm {in})	78.0/49.0 {3.07/1.93}	
Number of planetary gear teeth	Large sun gear	36	
	Small sun gear	30	
	Long piston gear	24	
	Short piston gear	22	
	Internal gear	84	
Number of output gear teeth		17	
Number of idle gear teeth		37	
Number of ring gear teeth		65	

▭ indicates new specification.

AUTOMATIC TRANSAXLE (FN4A-EL)

FEATURES

SERVICE

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the FN4A-EL type automatic transaxle of the face-lifted 626 (GF) is basically carried over from that of the current 323 (BJ), FN4A-EL automatic transaxle models except for the following featurs. (See 323 Training Manual 3324-10-98E.)

FEATURES

Improved Serviceability

- DTC numbers have been changed due to the subdivision of DTC.

SPECIFICATIONS

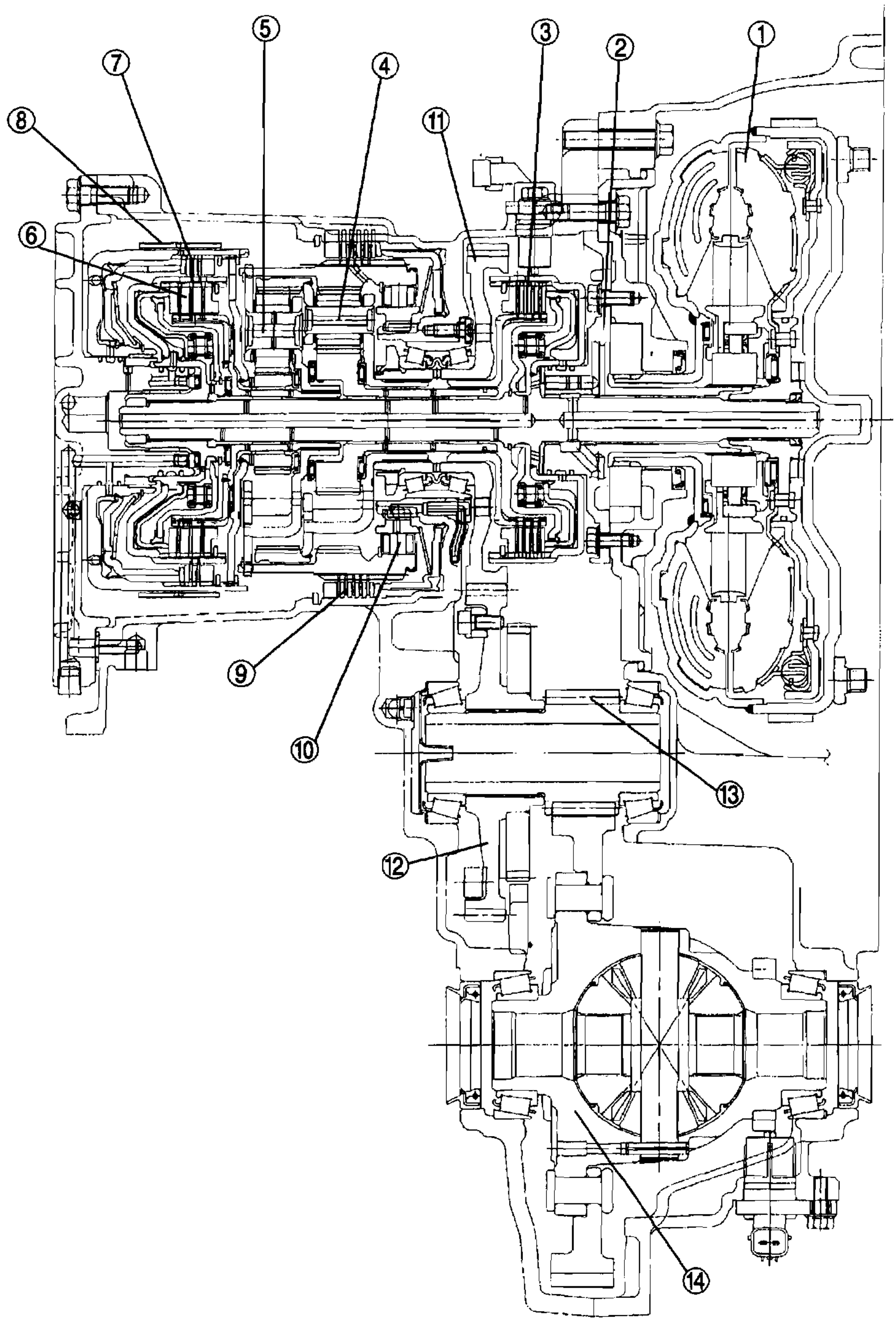
Item			323 (BJ)	626 (GF)
			ZL	FS
Transaxle type			FN4A-EL	←
Gear ratio		1GR	2.816	←
		2GR	1.497	←
		3GR	1.000	←
		4GR	0.725	←
		Reverse	2.648	←
Final gear ratio			3.904	←
ATF	Type		ATF M-III or equivalent (e.g. Dexron® II)	←
	Capacity L {US qt, Imp qt}		7.2 {7.6, 6.3}	←
Torque converter stall torque ratio			2.250	2.000
Hydraulic system	Forward clutch (number of drive/driven plates)		4/4	←
	3—4 clutch (number of drive/driven plates)		3/3	←
	Reverse clutch (number of drive/driven plates)		2/2	←
	Low and reverse brake (number of drive/driven plates)		5/5	←
Band servo	Servo diameter (piston outer dia.) mm {in}		64.6 {2.54}	←
Front planetary gear (number of teeth)	Front sun gear		49	←
	Front pinion gear		20	←
	Front internal gear		89	←
Rear planetary gear (number of teeth)	Rear sun gear		37	←
	Rear pinion gear		30	←
	Rear internal gear		98	←
Primary gear			86	←
Secondary gear			82	←
Output gear			21	←
Ring gear			86	←

AUTOMATIC TRANSAXLE

OUTLINE

- The FN4A-EL type automatic transaxle is used.
- The construction and operation of the FN4A-EL type automatic transaxle of the face-lifted 626 (GF) is carried over from that of the current 323 (BJ).

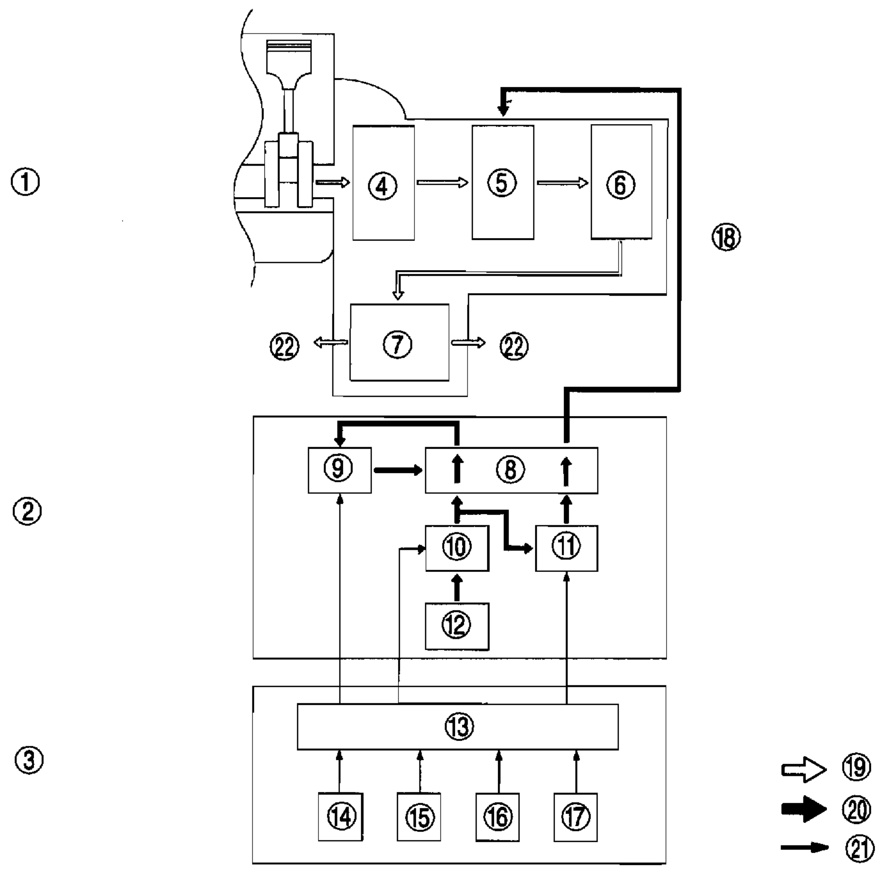
CROSS-SECTIONAL VIEW



1	Torque converter		8	2-4 brake band
2	Oil pump		9	Low and reverse brake
3	Forward clutch		10	One-way clutch
4	Front planetary gear		11	Primary gear
5	Rear planetary gear		12	Secondary gear
6	3-4 clutch		13	Output gear
7	Reverse clutch		14	Differential

OUTLINE OF OPERATION

- The operation of the electronic automatic transaxle is classified into three systems: the electronic control mechanism, the hydraulic pressure control mechanism, and the powertrain mechanism (includes the torque converter mechanism). The operation of each system is as follows:
  - — Electronic control mechanism
    - According to the signals from the switches and sensors in the input system, the PCM outputs the signal which matches the present driving condition to the linear type solenoid, ON/OFF type solenoids and the duty-cycle type solenoids in the hydraulic pressure control mechanism.
  - — Hydraulic pressure control mechanism
    - According to the signals from the PCM, each solenoid operates to switch the hydraulic passages in the control valve body and controls the clutch engagement pressure.
    - The line pressure is adjusted by the linear type pressure control solenoid. The hydraulic passages are switched by the ON/OFF type solenoids (shift solenoids D and E.) And the clutch engagement pressure is controlled by the duty-cycle type solenoids (shift solenoids A, B, and C).
  - — Powertrain mechanism
    - The driving force from the engine is transmitted through the torque converter to the transaxle.
    - The transmitted driving force operates each clutch and brake according to the clutch engagement pressure from the duty-cycle type solenoid, and the planetary gears change the gear ratio to the optimal driving force. The changed driving force is transmitted through the differential to the axle shaft and then the tires.



1	Powertrain mechanism
2	Hydraulic pressure control mechanism
3	Electronic control mechanism
4	Torque converter
5	Clutches, brakes
6	Planetary gear
7	Differential
8	Control valve body
9	Shift solenoid D, E (ON/OFF type)
10	Pressure control solenoid (linear type)
11	Shift solenoid A, B, C (duty-cycle type)

12	Oil pump
13	PCM
14	Vehicle speed
15	ATF temperature
16	Forward clutch drum revolution speed
17	Engine revolution speed
18	Clutches, brakes engagement, relase pressure
19	Powerflow
20	Hydraulic pressure control signal
21	Electronic signal
22	Tire

EC-AT OPERATION CHART

Position/Range	Mode	Gear position		Shift pattern: Shift	Shift pattern: TCC	Shift pattern: Engine brake	Transaxle: Forward clutch	Transaxle: 3-4 clutch	Transaxle: Reverse clutch	Transaxle: 2-4 brake band: Applied	Transaxle: 2-4 brake band: Released	Transaxle: Low and reverse brake	Transaxle: One-way clutch	Solenoid valve (duty-cycle type): Shift solenoid A	Solenoid valve (duty-cycle type): Shift solenoid B	Solenoid valve (duty-cycle type): Shift solenoid C	Solenoid valve (ON/OFF type): Shift solenoid D	Solenoid valve (ON/OFF type): Shift solenoid E
P	-	-	-	-										-	-	-	ON	OFF
R	-	Reverse	2.648	-		×			×			×		OPEN	OPEN	OPEN	OFF	OFF
N	-	-	-	-										-	-	-	ON	OFF
D	*1 POWER/ NORMAL	1GR	2.816				×						⊗	OPEN	CLOSED	CLOSED	OFF	OFF
		2GR	1.497			×	×			×				OPEN	OPEN	CLOSED	OFF	OFF
		3GR	1.000			×	×	×		×	×			OPEN	OPEN	OPEN	OFF	OFF
		4GR	0.725			×		×		×				CLOSED	OPEN	OPEN	ON	OFF
		4GR *2 TCC ON	0.725		×	×		×		×				CLOSED	OPEN	OPEN	ON	ON
	HOLD	2GR	1.497			×	×			×				OPEN	OPEN	CLOSED	OFF	OFF
		3GR	1.000			×	×	×		×	×			OPEN	OPEN	OPEN	OFF	OFF
		4GR*3	0.725			×		×		×				CLOSED	OPEN	OPEN	ON	OFF
S	Non-HOLD	1GR	2.816				×						⊗	OPEN	CLOSED	CLOSED	OFF	OFF
		2GR	1.497			×	×			×				OPEN	OPEN	CLOSED	OFF	OFF
		3GR	1.000			×	×	×		×	×			OPEN	OPEN	OPEN	OFF	OFF
		4GR*3	0.725			×		×		×				CLOSED	OPEN	OPEN	ON	OFF
	HOLD	2GR	1.497			×	×			×				OPEN	OPEN	CLOSED	OFF	OFF
		3GR*3	1.000			×	×	×		×	×			OPEN	OPEN	OPEN	OFF	OFF
		4GR*3	0.725			×		×		×				CLOSED	OPEN	OPEN	ON	OFF
L	Non-HOLD	1GR	2.816				×						⊗	OPEN	CLOSED	CLOSED	OFF	OFF
		2GR	1.497			×	×			×				OPEN	OPEN	CLOSED	OFF	OFF
		3GR*3	1.000			×	×	×		×	×			OPEN	OPEN	OPEN	OFF	OFF
		4GR*3	0.725			×		×		×				CLOSED	OPEN	OPEN	ON	OFF
	HOLD	1GR	2.816			×	×					×	⊗	OPEN	OPEN	CLOSED	ON	ON
		2GR*3	1.497			×	×			×				OPEN	OPEN	CLOSED	OFF	OFF
		3GR*3	1.000			×	×	×		×	×			OPEN	OPEN	OPEN	OFF	OFF
		4GR*3	0.725			×		×		×				CLOSED	OPEN	OPEN	ON	OFF

*1: Automatically switches between POWER and NORMAL modes according to accelerator pedal depressing speed.
*2: Performs TCC operation in NORMAL mode.
*3: To prevent engine overspeed, inhibits downshift until the engine speed is reduced to the preset speed.
×: Operating
⊗: Transmits the torque only when driving.
OPEN: Engages the line pressure to the clutch pressure.
CLOSED: Drains the clutch pressure.
ON: Engages the output port and the supply port (Solenoid reducing pressure).
OFF: Engages the output port and the drain port (Drains the output port).

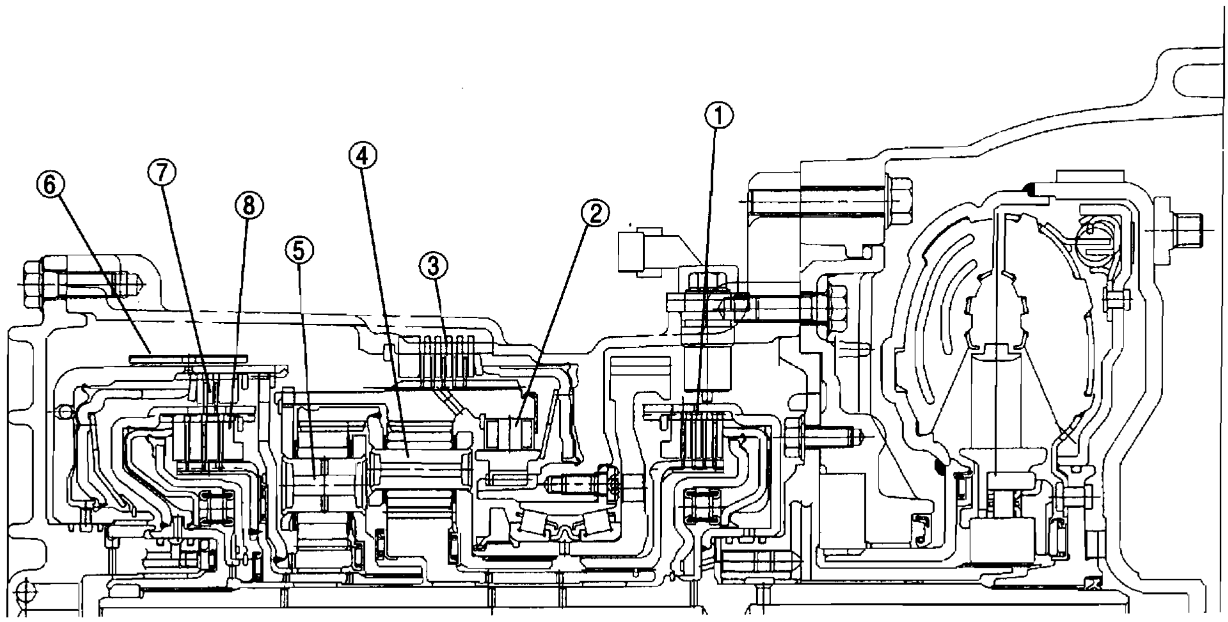
POWERFLOW

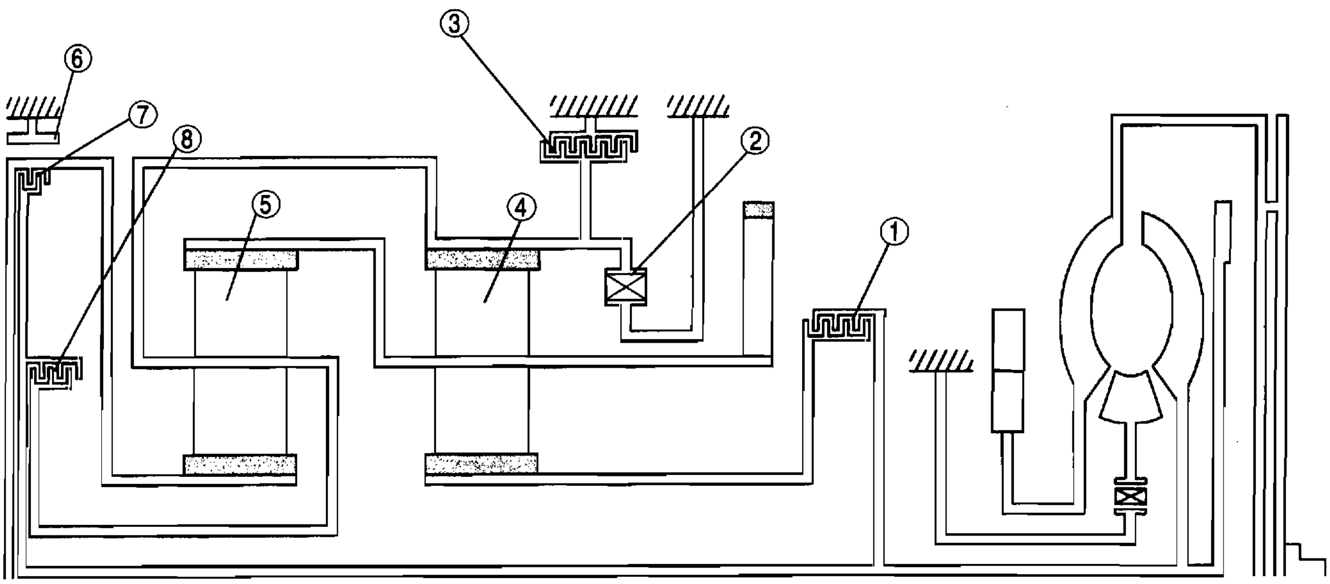
Outline

- In the powertrain mechanism, hydraulic pressure is transported from the control valves or shift solenoid A, B or C (duty cycle type) to operate the clutches and brakes and the planetary gear changes the gear ratio according to the vehicle driving condition.

Structure

- The powertrain mechanism of the FN4A-EL type consists of three pairs of clutches, brake, band brake, one-way clutch, and two pairs of single type planetary gears.





1	Forward clutch		5	Rear planetary gear	
2	One-way clutch		6	2—4 brake band	
3	Low and reverse brake		7	Reverse clutch	
4	Front planetary gear		8	3—4 clutch	

Operation

Component description

Component	Function
Forward clutch	• Transmits input torque from turbine shaft to front sun gear • Operates in forward range of first, second, or third gear position
3—4 clutch	• Transmits input torque from turbine shaft to rear planetary carrier • Operates in forward range of third or fourth gear position
Reverse clutch	• Transmits input torque from turbine shaft to rear sun gear • Operates when vehicle is backing
2—4 brake band	• Locks rotation of reverse drum, and fixes rear sun gear • Operates in second or fourth gear position
Low and reverse brake	• Fixes rotation of front internal gear • Operates when vehicle is backing or in first gear position (L range, HOLD)
One-way clutch	• Locks counterclockwise rotation of front internal gear in first gear position
Planetary gear	• The planetary gear functions as a transmission due to the engagement/disengagement of clutches and/or brakes, converts the transmitted driving force of the turbine shaft and transmits it to the output gear.

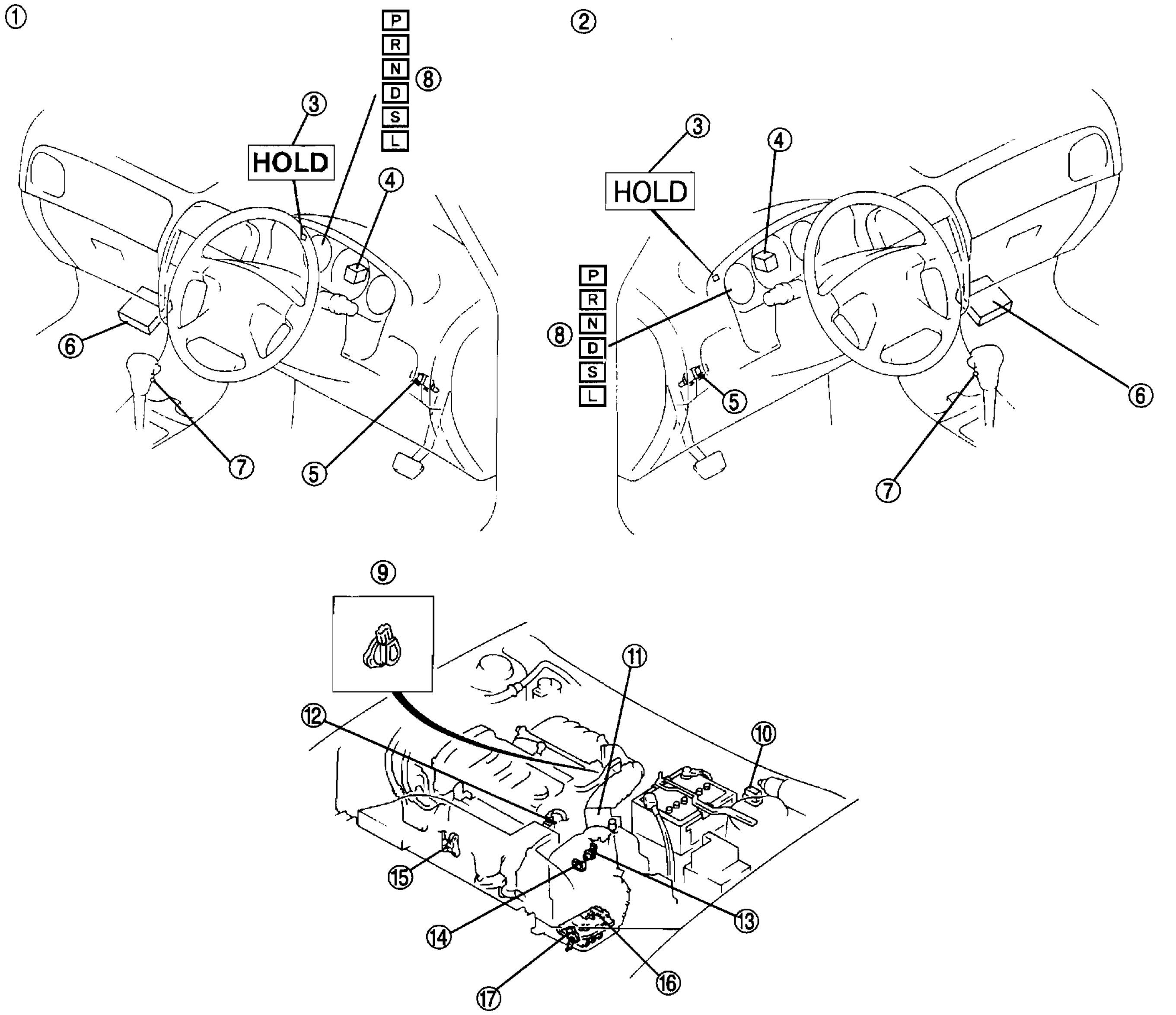
Note
- All directions of rotation are viewed from the torque converter.

ELECTRONIC CONTROL SYSTEM

OUTLINE

- The PCM, which is integrated with the PCM for engine control, is adopted for transaxle control. The PCM outputs the control signal to the engine and the transaxle according to the signal from each sensor and/or switch.
- Due to the adoption of the line pressure adjusting control by the linear type pressure control solenoid and the clutch engaging pressure control by duty-cycle type shift solenoids A, B, and C, excellent shift quality is obtained.
- This system is the same as that of the current 323 (BJ).

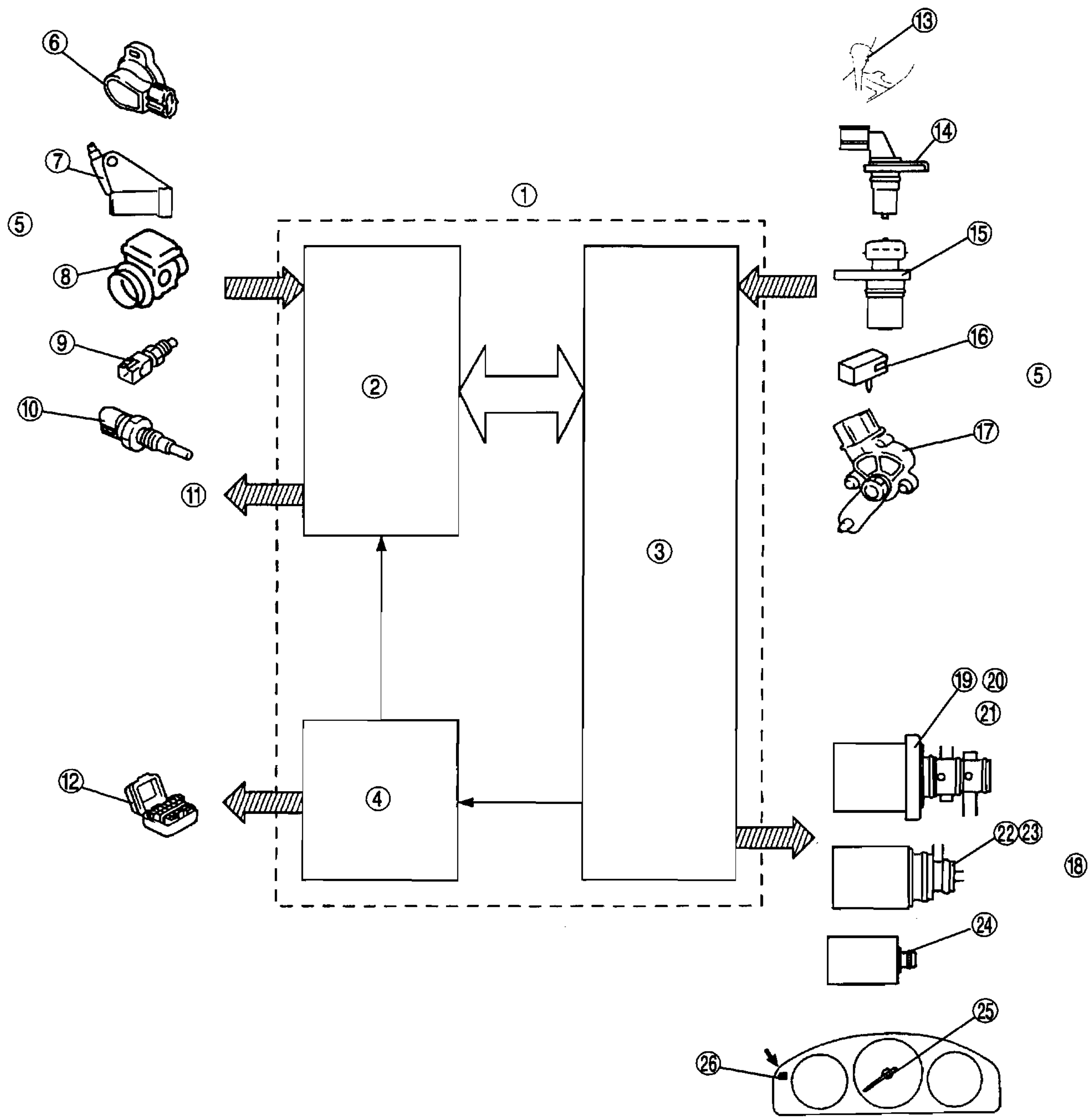
CONSTRUCTION



1	R.H.D.
2	L.H.D.
3	HOLD indicator light
4	Speedometer
5	Brake swich
6	PCM
7	HOLD switch
8	Selector indicator light
9	TP sensor

10	DLC
11	MAF sensor
12	ECT sensor
13	VSS
14	Input /turbine speed sensor
15	CKP sensor
16	Control valve (With transaxle fluid temperature sensor and solenoid valves)
17	TR switch

BLOCK DIAGRAM



1	PCM
2	Engine control system
3	Transaxle control system
4	On-board diagnostic system
5	Input signals
6	TP sensor
7	CKP sensor
8	MAF sensor
9	Brake switch
10	ECT sensor
11	Engine control output signals
12	DLC
13	HOLD switch

14	Input/turbine speed sensor
15	VSS
16	TFT sensor
17	TR switch
18	Output signals
19	Shift solenoid A
20	Shift solenoid B
21	Shift solenoid C
22	Shift solenoid D
23	Shift solenoid E
24	Pressure control solenoid
25	Speedometer signal
26	HOLD indicator light

ELECTRONIC CONTROL SYSTEM

ELECTRONIC CONTROL ITEMS AND CONTENTS

Item	Content
Line pressure control	• With linear type pressure control solenoid, adjusts to suitable line pressure for engine load condition and vehicle driving condition
Shift control	• Detects engine load condition and vehicle speed, and switches to the most suitable gear position according to the preset shift diagram • Selects HOLD mode by switching HOLD switch • In D range, automatically switches between POWER and NORMAL modes according to accelerator pedal depressing speed
Clutch pressure direct control (Direct electric shift control)	• With duty-cycle type shift solenoids A, B, and C, directly performs electronic control for clutch engagement pressure suitable for engine load condition and vehicle driving condition
Feedback control	• Performs real-time feedback correction for clutch engagment pressure to achieve target shifts • Performs optimal correction for clutch engagement pressure to reduce changes in engine performance and/or elapsed transaxle
Engine-transaxle total control	• Optimally controls engine output torque when shifting • Operates optimal clutch engagement pressure corresponding to engine output torque
TCC control	• According to preset TCC point, performs TCC operation via smooth TCC
Slope mode control	• Changes the shift point to prevent frequent shifting up/down when climbing or descending hills
On-board diagnostic system	• Detects and/or memorizes failure of input/output part and transaxle condition

COMPONENT DESCRIPTIONS (ELECTRONIC CONTROL)

Part name			Function
Input system	HOLD switch		• Selects driving modes (HOLD) and changes driving patterns
	TR switch		• Detects selector lever ranges/positions
	TP sensor		• Detects throttle valve opening angle
	Input/turbine speed sensor		• Detects forward clutch drum (input) revolution speed
	VSS		• Detects differential gear case (output) revolution speed
	Brake switch		• Detects use of service brake
	TFT sensor		• Detects the ATF temperature
	ECT sensor		• Detects the engine coolant temperature
	CKP sensor		• Detects the engine revolution speed
	MAF sensor		• Detects intake air amount
Output system	Linear type	Pressure control solenoid	• Adjusts line pressure
	Duty-cycle type	Shift solenoid A	• Controls clutch engagement pressure
		Shift solenoid B	• Controls clutch engagement pressure
		Shift solenoid C	• Controls clutch engagement pressure
	ON/OFF type	Shift solenoid D	• Switches hydraulic passages for bypass valve and 3—4 shift valve
		Shift solenoid E	• Switches hydraulic passages for low and reverse shift valve, TCC, and control valve
	HOLD indicator light		• By switching HOLD switch, illuminates to indicate that it is in HOLD mode • Flashes when failure is detected by diagnosis function
	Speedometer signal		• Outputs vehicle speed signal to speedometer

INPUT/OUTPUT SIGNALS AND RELATED CONTROLS

Component		Control item							
		Line pressure control	Shift control	Clutch pressure direct control (Direct electric shift control)	Feedback control	Engine-transaxle total control	Torque converter clutch control	Control of climbing or descending hill	On-board diagnostic function
Input	HOLD switch		×						
	TR switch	×	×	×					×
	TP sensor	×	×	×			×		×
	Input/turbine speed sensor	×	⊗	×	×		×		×
	VSS	×	×	×			×	×	×
	Brake switch							×	
	TFT sensor	×	×	×	×		×		×
	ECT sensor						×		×
	CKP sensor	×		×		×	×		×
	MAF sensor	×		×	×	×		×	×
Output	Pressure control solenoid	×							×
	Shift solenoid A		×	×	×		×	×	×
	Shift solenoid B		×	×	×				×
	Shift solenoid C		×	×	×				×
	Shift solenoid D		×					×	×
	Shift solenoid E		×				×		×
	HOLD indicator light		×						×
	Speedometer signal								

×:Available
⊗:Back up

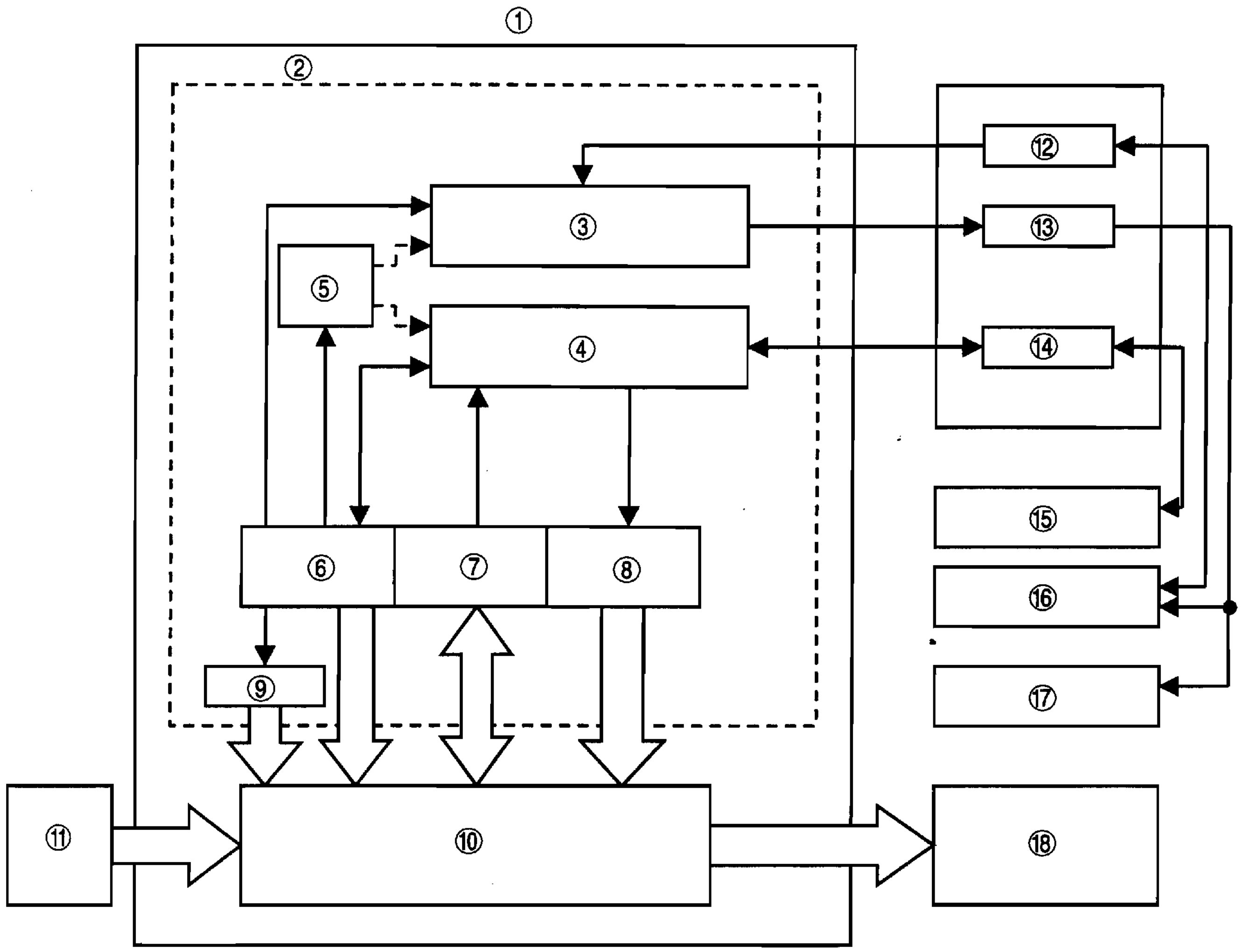
ON-BOARD DIAGNOSTIC SYSTEM

OUTLINE

The on-board diagnostic system has the following functions:

- Failure detection function: Detects failure in the input/output signal
- PID/DATA MONITOR AND RECORD: Reads specified input/output signal
- Simulation test: Drives output system parts
- Diagnostic support procedure: Diagnoses accoding to the procedures displayed on the NGS tester
- The NGS tester is connected to the DLC, and is used for the on-board diagnostic system. Also, it is possible to read DTCs only with a self-diagnosis checker or a voltmeter.

BLOCK DIAGRAM



1	PCM
2	On-boad diagnostic system
3	Failure indication function
4	Serial communication
5	Memory function
6	Failure detection function
7	Data monitor function
8	Simulation function
9	Fail-safe function

10	Engine/transaxle control system
11	Input system
12	TEN
13	FEN
14	KLN
15	NGS
16	Self-diagnosis checker
17	Voltmeter
18	Output system

DTC COMPARISON LISTS

Part Name	626 (GF)		323 (BJ)	
	DTC	Definition	DTC	Definition
VSS	P0500	VSS circuit malfunction	P0500	VSS circuit malfunction
TR switch	P0705	Transaxle range (TR) switch circuit malfunction (Short circuit)	N/A	N/A
	P0706	Transaxle range (TR) switch circuit malfunction (Open circuit)		
TFT sensor	P0710	Transaxle fluid temperature (TFT) sensor circuit malfunction (open or short)	P0710	Transaxle fluid temperature (TFT) sensor circuit malfunction
	P0711	Transaxle fluid temperature (TFT) sensor circuit range performannce (Stuck)		
Input/turbine speed sensor	P0715	Input/turbine speed sensor circuit malfunction	P0715	Input/turbine speed sensor circuit malfunction
—	P0731	Gear 1 incorrect	P0730	Incorrect gear ratio
	P0732	Gear 2 incorrect		
	P0733	Gear 3 incorrect		
	P0734	Gear 4 incorrect		
TCC system	P0741	Torque converter clutch (TCC) (stuck off)	N/A	N/A
	P0742	Torque converter clutch (TCC) (stuck on)		
Pressure control solenoid	P0745	Pressure control solenoid valve malfunction	P0745	Pressure control solenoid valve malfunction
Shift solenoid A	P0751	Shift solenoid A malfunction (stuck off)	P0753	Shift solenoid A malfunction (electrical)
	P0752	Shift solenoid A malfunction (stuck on)		
	P0753	Shift solenoid A malfunction (electrical)		
Shift solenoid B	P0756	Shift solenoid B malfunction (stuck off)	P0758	Shift solenoid B malfunction (electrical)
	P0757	Shift solenoid B malfunction (stuck on)		
	P0758	Shift solenoid B malfunction (electrical)		
Shift solenoid C	P0761	Shift solenoid C malfunction (stuck off)	P0763	Shift solenoid C malfunction (electrical)
	P0762	Shift solenoid C malfunction (stuck on)		
	P0763	Shift solenoid C malfunction (electrical)		
Shift solenoid D	P0766	Shift solenoid D malfunction (stuck off)	P0768	Shift solenoid D malfunction (electrical)
	P0767	Shift solenoid D malfunction (stuck on)		
	P0768	Shift solenoid D malfunction (electrical)		
Shift solenoid E	P0771	Shift solenoid E malfunction (stuck off)	P0773	Shift solenoid E malfunction (electrical)
	P0772	Shift solenoid E malfunction (stuck on)		
	P0773	Shift solenoid E malfunction (electrical)		

FAILURE DETECTION FUNCTION

- The failure detection function detects input/output devices and system components operation to normal condition values pre-programmed in the PCM.
- If a failure is detected, the HOLD indicator light flashes to warn the driver of a malfunction in the powertrain system components or sensors/switches.
- The stored DTCs in the PCM are retrieved using the NGS.
- The failures are detected according to the following detection conditions. Detection conditions of the TP sensor malfunction (P0122, P0123) are mentioned in the F1 section. (See F1-53 DTC P0122, F1-55 DTC P0123.)

Transaxle Range (TR) Switch Short Circuit (P0705)

- Two or more input signals from the TR switch to the PCM or when input battery voltage remains after engine speed **530 rpm or above** during failure detection period.

Transaxle Range (TR) Switch Open Circuit (P0706)

- Input voltage from TR switch to PCM maintains **0 V** when engine speed is **530 rpm or above** and vehicle is **20 km/h {12 mph} or above** during failure detection period.

Transaxle Fluid Temperature (TFT) Sensor Open or Short (P0710)

- Input voltage from TFT sensor to PCM is **0.06 V or below or 4.67 V or above** when vehicle speed is **20 km/h {12 mph}** or above during failure detection period.

Transaxle Fluid Temperature (TFT) Sensor Stuck (P0711)

- Fluctuation value of TFT sensor output voltage to PCM is **below 0.06 V** in normal condition during failure detection period.

Input/Turbine Speed Sensor Circuit Malfunction (P0715)

- No input/turbine speed sensor signal is inputs to PCM when vehicle speed is **40 km/h {25 mph} or above** and shift lever position is at D, S or L during failure detection period.

Shift or Pressure Control Solenoid Valve Circuit Malfunction

- If there is still voltage in the solenoid valve control terminal of the PCM when solenoid valve operates according to the PCM calculation, OBD system judges "circuit malfunction".

— **Shift solenoid A (P0753)**
  - There is still voltage in shift solenoid A control terminal 82 of PCM when solenoid valve operates according to PCM calculation.

— **Shift solenoid B (P0758)**
  - There is still voltage in shift solenoid B control terminal 99 of PCM when solenoid valve operates according to PCM calculation.

— **Shift solenoid C (P0763)**
  - There is still voltage in shift solenoid C control terminal 102 of PCM when solenoid valve operates according to PCM calculation.

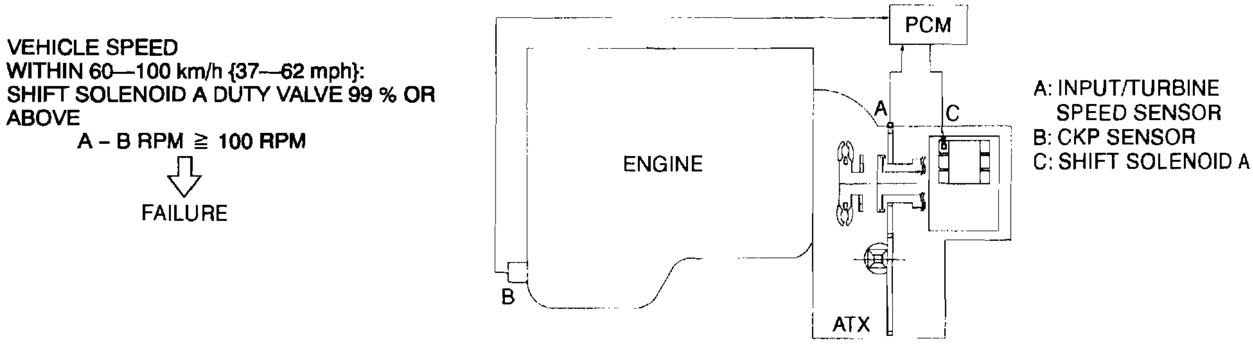
— **Shift solenoid D (P0768)**
  - There is still voltage in shift solenoid D control terminal 27 of PCM when solenoid valve operates according to PCM calculation.

— **Shift solenoid E (P0773)**
  - There is still voltage in shift solenoid E control terminal 1 of PCM when solenoid valve operates according to PCM calculation.

— **Pressure control solenoid (P0745)**
  - There is still voltage in pressure control solenoid control terminal 44 and 81 of PCM when solenoid valve operates according to PCM calculation.

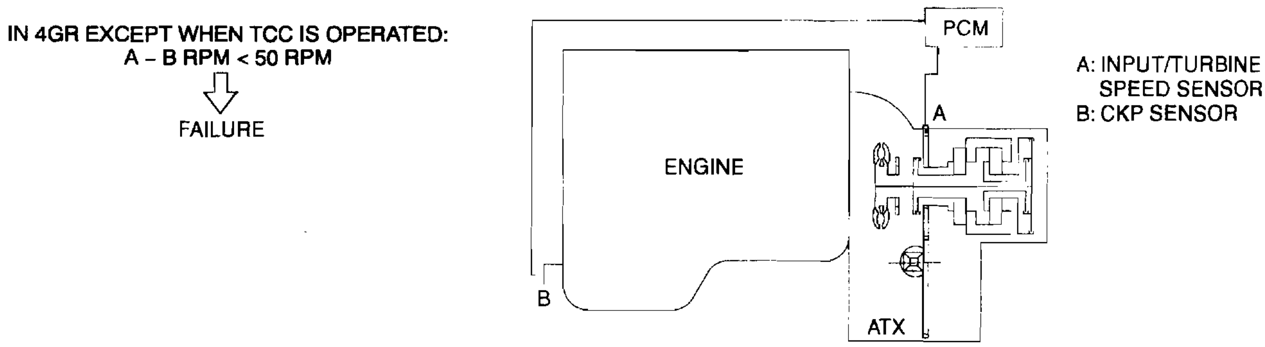
Torque Converter Clutch (TCC) Stuck Off (P0741)

- Slip amount of engine revolution and forward clutch drum revolution is **above 100 rpm** and shift solenoid A duty value is **99 % or above** when vehicle speed is within **60—100 km/h {37—62 mph}** in TCC operation range during failure detection period.



Torque Converter Clutch (TCC) Stuck On (P0742)

- Slip amount of engine revolution and forward clutch drum revolution is **below 50 rpm** for set amount of time when in 4GR except when TCC is operated.



Shift Solenoid Valves Stuck On or Off

- Determines malfunctioning solenoid valve based on combination of detected DTCs incorrect gear (P0731, P0732, P0733 or P0734) and TCC malfunction (P0741, P0742).

  — **Shift solenoid A stuck off (P0751)**
    - When detected gear 4 incorrect (P0734).

  — **Shift solenoid A stuck on (P0752)**
    - Forward clutch drum revolution does not drop when vehicle stops in shift position D. (Can not engage any gear to start vehicle)

  — **Shift solenoid B stuck off (P0756)**
    - When detected gear 1 incorrect (P0731).

  — **Shift solenoid B stuck on (P0757)**
    - When detected gear 2 incorrect (P0732) and gear 4 incorrect (P0734).

  — **Shift solenoid C stuck off (P0761)**
    - When detected gear 1 incorrect (P0731) and gear 2 incorrect (P0732).

  — **Shift solenoid C stuck on (P0762)**
    - When detected gear 3 incorrect (P0733) and gear 4 incorrect (P0734).

  — **Shift solenoid D stuck off (P0766)**
    - When detected gear 4 incorrect (P0734).

  — **Shift solenoid D stuck on (P0767)**
    - When detected gear 3 incorrect (P0733).

- **Shift solenoid E stuck off (P0771)**
  - When detected TCC stuck off (P0741).

- **Shift solenoid E stuck on (P0772)**
  - When detected TCC stuck on (P0742).

Gear Incorrect

- If the RPM difference between the forward clutch drum (Input/turbine speed sensor signal) and diferential gear case (VSS signal) exceeds or falls below the pre-programmed RPM difference in the PCM while driving in each gear, the OBD system judges "gear incorrect".

1ST: $\frac{A}{B} < 2.157$

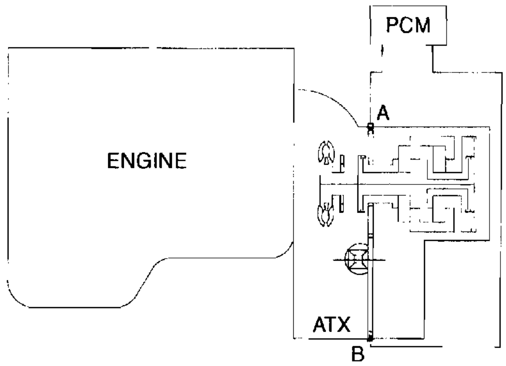
2ND: $\frac{A}{B} < 1.249$ or $\frac{A}{B} \geqq 2.157$

3RD: $\frac{A}{B} < 0.863$ or $\frac{A}{B} \geqq 1.249$

4TH: $\frac{A}{B} < 0.6$ or $\frac{A}{B} \geqq 1.249$

⇩

FAILURE



A: INPUT/TURBINE SPEED SENSOR
B: VSS

- **Gear 1 incorrect (P0731)**
  - Revolution ratio of forward clutch drum revolution to differencial gear case revolution is below 2.157 while in 1GR.

- **Gear 2 incorrect (P0732)**
  - Revolution ratio of forward clutch drum revolution to differencial gear case revolution is below 1.249 or 2.157 or above while in 2GR.

- **Gear 3 incorrect (P0733)**
  - Revolution ratio of forward clutch drum revolution to differencial gear case revolution is below 0.863 or 1.249 or above while in 3GR.

- **Gear 4 incorrect (P0744)**
  - Revolution ratio of forward clutch drum revolution to differencial gear case revolution is below 0.6 or 1.249 or above while in 4GR.

MEMORY FUNCTION

- When failure detected, DTCs are stored in the PCM memory. The memories are not erased even if ignition switch is turned off (LOCK position).
- To clear the memorized failure information, disconnect the negative battery cable or use the NGS. However, DTCs will be stored in the memory again if failures are still present.

FAIL-SAFE FUNCTION

- In the fail-safe function, minimum vehicle drivability is obtained by changing the signals that are determined to be malfunctioning by the failure detection function to present values, and limiting the PCM control.

DTC No.	Definition	Fail-safe	TCC
P0122	TP circuit low input	Throttle valve opening angle is fixed at the time in order to determine shift	Inhibition
P0123	TP circuit high input		Inhibition
P0500	VSS malfunction	-	Available
P0705	TR switch circuit malfunction (short circuit)	Inhibits gear shifting and maximizes line pressure	Inhibition
P0706	TR switch circuit malfunction (open circuit)	Inhibits gear shifting and maximizes line pressure	Inhibition
P0710	TFT sensor circuit malfunction (open or short)	Sets temperature to cold condition	Inhibition
P0711	TFT sensor circuit range/performance (stuck)	-	Inhibition
P0715	Input/turbine speed sensor circuit malfunction	Inhibits 4GR	Inhibition
P0731	Gear 1 incorrect	Inhibits 1GR	Available
P0732	Gear 2 incorrect	Inhibits 2GR and maximizes line pressure	Available
P0733	Gear 3 incorrect	-	Available
P0734	Gear 4 incorrect	Inhibits 4GR and maximizes line pressure	Available
P0741	TCC (stuck off)	Inhibits TCC and maximizes line pressure	Inhibition
P0742	TCC (stuck on)	Inhibits TCC and maximizes line pressure	Inhibition
P0745	Pressure control solenoid valve malfunction	-	Available
P0751	Shift solenoid A malfunction (stuck off)	Inhibits 4GR and TCC and maximizes line pressure	Inhibition
P0752	Shift solenoid A malfunction (stuck on)	Inhibits 1GR, 2GR and 3GR and maximizes line pressure	Available
P0753	Shift solenoid A malfunction (electrical)	Inhibits 4GR and TCC and maximizes line pressure	Inhibition
P0756	Shift solenoid B malfunction (stuck off)	Inhibits 1GR and 4GR and maximizes line pressure	Available
P0757	Shift solenoid B malfunction (stuck on)	Inhibits 2GR and 4GR and maximizes line pressure	Available
P0758	Shift solenoid B malfunction (electrical)	Inhibits 1GR and 4GR and maximizes line pressure	Available
P0761	Shift solenoid C malfunction (stuck off)	Inhibits 1GR and 2GR and maximizes line pressure	Available
P0762	Shift solenoid C malfunction (stuck on)	Inhibits 3GR and 4GR and maximizes line pressure	Available
P0763	Shift solenoid C malfunction (electrical)	Inhibits 1GR and 2GR and maximizes line pressure	Available
P0766	Shift solenoid D malfunction (stuck off)	Inhibits 4GR and maximizes line pressure	Available
P0767	Shift solenoid D malfunction (stuck on)	Inhibits 2GR, 4GR and TCC and maximizes line pressure	Inhibition
P0768	Shift solenoid D malfunction (electrical)	inhibits 4GR and maximizes line pressure	Available
P0771	Shift solenoid E malfunction (stuck off)	Inhibits TCC and maximizes line pressure	Inhibition
P0772	Shift solenoid E malfunction (stuck on)	Inhibits 1GR and maximizes line pressure	Available
P0773	Shift solenoid E malfunction (electrical)	Inhibits TCC and maximizes line pressure	Inhibition

PARAMETER IDENTIFICATION (PID) ACCESS

- The PID mode allows access to certain data values, analog and digital input and output, calculated values, and system states information.

Monitor Item Table

Display on the NGS tester	Definition	Unit/Condition	PCM terminal
1GR	Calculated gear range in PCM (1st gear)	ON/OFF	–
2GR	Calculated gear range in PCM (2nd gear)	ON/OFF	–
3GR	Calculated gear range in PCM (3rd gear)	ON/OFF	–
4GR	Calculated gear range in PCM (4th gear)	ON/OFF	–
ATFT	ATF temperature	°C or °F	37
ATFT V	ATF temperature signal voltage	V	37
D SW	TR switch (D range switch)	ON/OFF	6
HOLD LP	HOLD indicator control signal in PCM	ON/OFF	43
HOLD SW	HOLD switch	ON/OFF	29
L SW	TR switch (L range switch)	ON/OFF	7
LINE	Pressure control solenoid control signal in PCM	A	44,81
R SW	TR switch (R position switch)	ON/OFF	32
S SW	TR switch (S range switch)	ON/OFF	9
SHIFT A	Shift solenoid A control signal in PCM	%	82
SHIFT B	Shift solenoid B control signal in PCM	%	99
SHIFT C	Shift solenoid C control signal in PCM	%	102
SHIFT D	Shift solenoid D control signal in PCM	ON/OFF	27
SHIFT E	Shift solenoid E control signal in PCM	ON/OFF	1
THOP	TP signal in PCM	%	89
TR SW	TR switch (P and N position switches)	ON/OFF	64
TURBINE	Turbine speed	RPM	23,84
VS	Vehicle speed	KPH/MPH	58

SIMULATION TEST

- Using the SIMULATION TEST function (NGS tester), output devices can be operated regardless of the PCM control while the ignition switch is on or the engine is running.

×: Applied
-: Not applied

Simulation Test Table

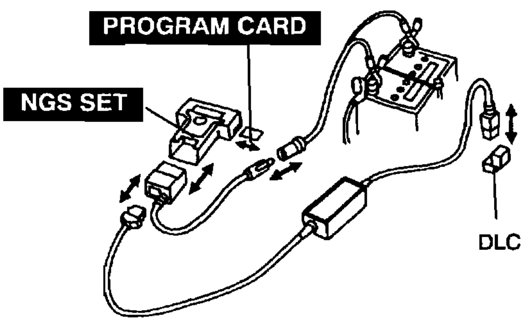
Simulation item	Full name	Practicable operation	Test condition		PCM terminal
			IG ON	Idle	
LINE*1	Pressure control solenoid	Actuates at any current up to 1A (0—100%)	×	×	44, 81
SHIFT A	Shift solenoid A	Actuates at any duty value (0—100%)	×	-	82
SHIFT B	Shift solenoid B	Actuates at any duty value (0—100%)	×	-	99
SHIFT C	Shift solenoid C	Actuates at any duty value (0—100%)	×	-	102
SHIFT D*2	Shift solenoid D	ON or OFF	×	-	27
SHIFT E*2	Shift solenoid E	ON or OFF	×	-	1

*1: When the ignition switch is on, line pressure is not generated because the oil pump does not operate.
*2: A simulation test can be performed but inspection is not possible, as the line pressure does not change and solenoid valve is barely audible.

DIAGNOSTIC SUPPORT PROCEDURE

- Diagnosis for the TR switch and/or TR switch circuits is possible by performing the following procedure.

1. Connect the NGS to the DLC.



2. Select and perform the "TR, SHIFT SW TEST" in the "DIAGNOSTIC SUPPORT PROCEDURE".
3. Operate the selector lever according to the instructions displayed on the screen.

Diagnostic Support Procedure Table

Diagnostic table	Remark
READ/CLEAR DIAGNOSTIC TEST RESULTS	Diagnose according to the procedures displayed on the NGS tester.
TPS, CTP SW TEST	
TR, SHIFT SW TEST	
MAF/VAF TEST	
BASIC SW TEST	

AUTOMATIC TRANSAXLE

MECHANICAL SYSTEM TEST

Mechanical System Test Preparation

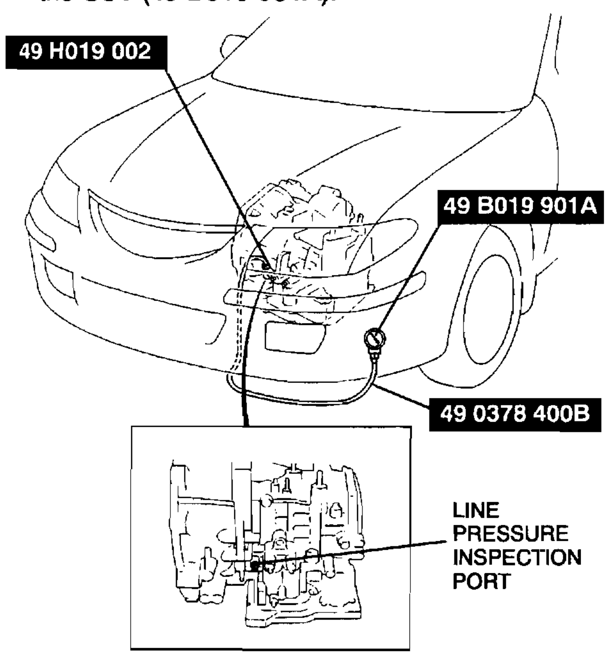
1. Engage the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant. (See Section E.)
3. Inspect the engine oil. (See Section D.)
4. Inspect the ATF levels. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, ATF Level Inspection.)
5. Inspect the IG timing. (See F1-21 IGNITION TIMING INSPECTION.)
6. Inspect the idle speed. (See F1-23 IDLE SPEED INSPECTION.)

Line Pressure Test

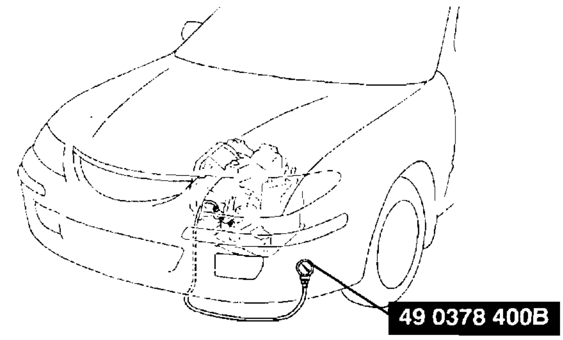
1. Perform mechanical system test preparation. (See K2-21 MECHANICAL SYSTEM TEST, Mechanical System Test Preparation.)

Warning
- **Removing the square-head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square-head plug, allow the ATF to cool.**

2. Connect the **SSTs** (49 H019 002 and, 49 0378 400B) to the line pressure inspection port, then replace the gauge of the **SST** (49 0378 400B) with the **SST** (49 B019 901A).



3. Start the engine, then warm up the automatic transaxle.
4. Shift the selector lever to D range.
5. Read the line pressure at idle engine speed for the D range.
6. Read the line pressure at idle engine speed for the D (HOLD), S, S (HOLD), L, L (HOLD) ranges and R positions in the same manner as in Steps 4—5.
7. Stop the engine, then replace the **SST** (49 B019 901A) with the gauge of the **SST** (49 0378 400B).



8. Start the engine.
9. Firmly depress the brake pedal with the left foot.
10. Shift the selector lever to D range position.

Caution
- **If the accelerator pedal is pressed for longer than 5 seconds while the brake pedal is pressed, the transaxle could be damaged. Therefore, perform Steps 11 and 12 within 5 seconds each.**

11. Gradually depress the accelerator pedal with the right foot.
12. When the engine speed no longer increases, quickly read the line pressure and release the accelerator pedal.
13. Shift the selector lever to N position and let the engine idle for **1 minute or more** to cool the ATF.
14. Read the line pressure at the engine stall speed for the D, D (HOLD), S, S (HOLD), L, L(HOLD) ranges and R position in the same manner as in Steps 9—13.

Specified line pressure

Position /range	Line pressure kPa{kgf/cm², psi}	
	Idle	Stall
D, S, L*	330—470 {3.4—4.8, 48—68}	1,158—1,323 {11.8—13.5, 168—191}
R	490—710 {5.0—7.2, 71—102}	1,913—2,128 {19.5—21.7, 278—308}

* Includes each HOLD mode

Warning
- **Removing the SSTs when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the SSTs, allow the ATF to cool.**

15. Remove the **SSTs**.
16. Install a new square head plug in the inspection port.

Tightening torque
5. 0—9.8 N·m {50—100 kgf·cm, 44—86 in·lbf}

Evaluation of line pressure test

Line pressure	Possible cause
Low pressure in all position/range	Worn oil pump
	Oil leaking from oil pump, control valve body, and/or transaxle case
	Pressure regulator valve is stuck.
	Pressure control solenoid malfunction
	Solenoid reducing valve is stuck.
Low pressure in D, S, L only	Oil leaking from hydraulic circuit of forward clutch
Low pressure in D (HOLD), S (HOLD) only	Oil leaking from hydraulic circuit of 2—4 brake band
Low pressure in L (HOLD), R only	Oil leaking from hydraulic circuit of low and reverse brake
Low pressure in R only	Oil leaking from hydraulic circuit of reverse clutch
Higher pressure in all position/range	Pressure control solenoid malfunction
	Pressure regulator valve is stuck.

Stall Test

1. Perform mechanical system test preparation. (See K2–21 MECHANICAL SYSTEM TEST, Mechanical System Test Preparation.)
2. Start the engine.
3. Firmly depress the brake pedal with the left foot.
4. Shift the selector lever to D range.

Caution
- **If the accelerator pedal is pressed for longer than 5 seconds while the brake pedal is pressed, the transaxle could be damaged. Therefore, perform Steps 5 and 6 within 5 seconds of each other.**

5. Gently depress the accelerator pedal with the right foot.
6. When the engine speed no longer increases, quickly read the speed and release the accelerator pedal.
7. Shift the selector lever to N and let the engine idle for **1 minute or more** to cool the ATF.
8. Perform a stall test of D (HOLD), S, S (HOLD), L, L (HOLD) and R range positions in the same manner as in Steps 3—7.
9. Turn the ignition switch off.

Engine stall speed
D, D (HOLD), S, S (HOLD), L, L (HOLD) range, R position: 2,200—2,500 rpm

Evaluation of stall test

<table>
<tr><th>Condition</th><th colspan="2">Possible cause</th></tr>
<tr><td rowspan="9">Above specification</td><td rowspan="5">Insufficient line pressure, torque converter pressure</td><td>Worn oil pump</td></tr>
<tr><td>Oil leaking from oil pump, control valve, and/or transaxle case</td></tr>
<tr><td>Pressure regulator valve is stuck</td></tr>
<tr><td>Converter relief valve is stuck</td></tr>
<tr><td>Pressure control solenoid malfunction</td></tr>
<tr><td>In forward ranges</td><td>Forward clutch slipping</td></tr>
<tr><td>In D (HOLD) and S (HOLD) ranges</td><td>2—4 brake band slipping</td></tr>
<tr><td>In L (HOLD) range and R position</td><td>Low and reverse brake slipping</td></tr>
<tr><td>In R position</td><td>Perform road test to determine whether problem is in low and reverse brake or reverse clutch
● Engine braking felt in L range (HOLD). Reverse clutch slipping.
● Engine braking not felt in L range (HOLD). Low and reverse brake slipping.</td></tr>
<tr><td colspan="2">Below specification</td><td>Engine out of tune</td></tr>
</table>

Time Lag Test

1. Perform mechanical system test preparation. (See K2-21 MECHANICAL SYSTEM TEST, Mechanical System Test Preparation.)
2. Use a stopwatch to measure the time it takes from shifting until shock is felt when shifting the selector lever from N position to D range (non-HOLD mode). Take three measurements for each test and take the average from the results using the following formula.

   Formula: $\text{Average time lag} = \dfrac{\text{Time 1} + \text{Time 2} + \text{Time 3}}{3}$

3. Perform the test for the following shifts in the same manner as Step 2.
   - N position→D range (HOLD mode)
   - N position→R position

Time lag
N position→D range: 0.4—0.7 sec
N position→R position: 0.4—0.7 sec

Evaluation of time lag test

Condition		Possible cause
N→D shift	More than specification	Insufficient line pressure
		Forward clutch slipping
		Oil leaking from forward clutch fluid circuit
		Shift solenoid A not operating properly
	Less than specification	Forward accumulator not operating properly
		Shift solenoid A not operating properly
		Excessive line pressure
N→D (HOLD) shift	More than specification	Insufficient line pressure
		Forward clutch slipping
		Shift solenoid A not operating properly
	Less than specification	Forward accumulator not operating properly
		Shift solenoid A not operating properly
		Excessive line pressure
N→R shift	More than specification	Insufficient line pressure
		Low and reverse brake slipping
		Reverse clutch slipping
		Shift solenoid B not operating properly
	Less than specification	Servo apply accumulator not operating properly
		Shift solenoid B not operating properly
		Excessive line pressure

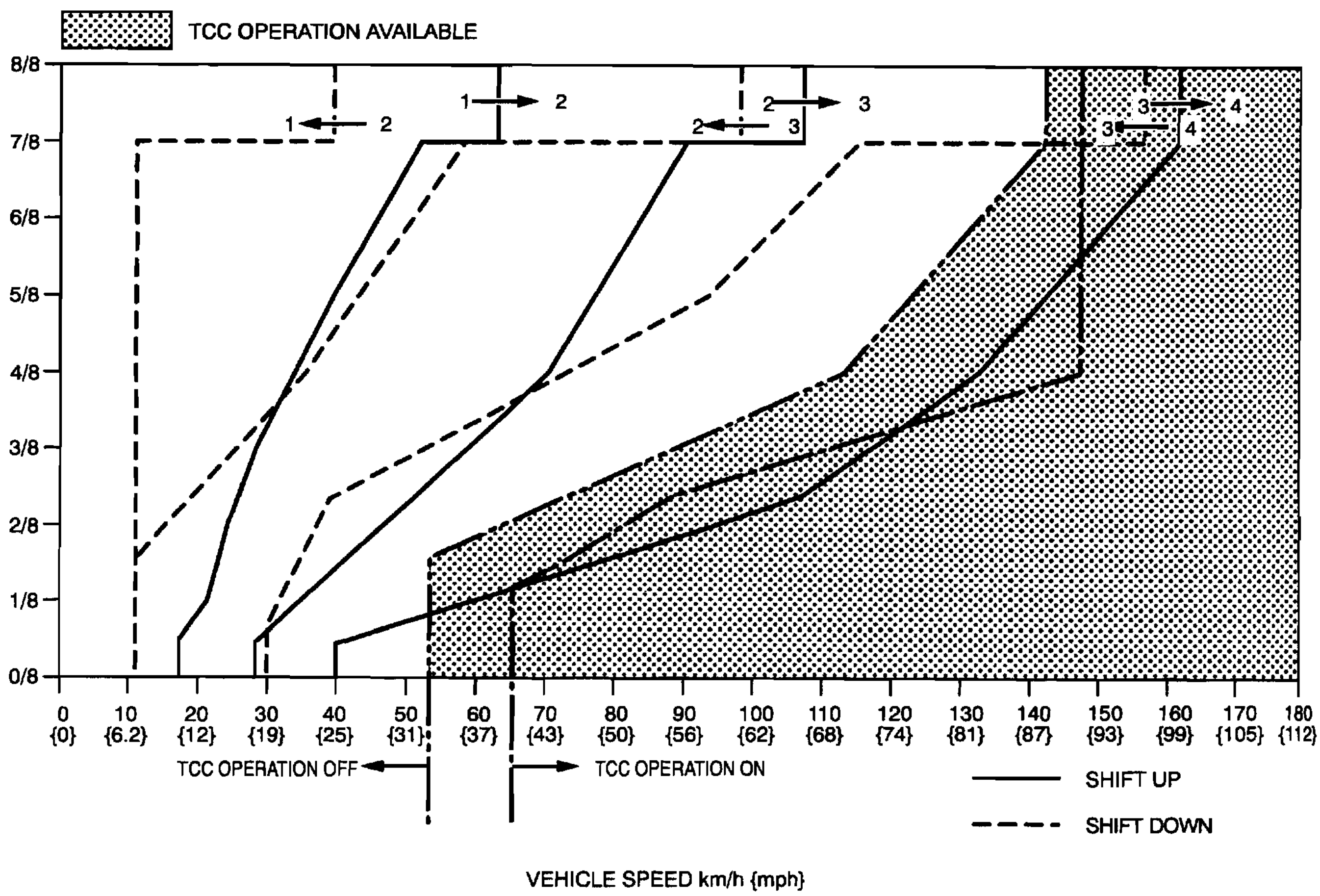
ROAD TEST

Warning
- **When performing a road test, be aware of other vehicles, people, impediments, etc. to avoid an accident.**

Note
- When the legal speed limit must be exceeded, use a chassis dynamomenter instead of performing a road test.

Road Test Preparation
1. Inspect the engine coolant levels. (See Section E.)
2. Inspect the engine oil levels. (See Section D.)
3. Inspect the ATF levels. (See K2-28 AUTOMATIC TRANSAXLE FLUID(ATF) INSPECTION, ATF Level Inspection.)
4. Inspect the IG timing. (See F1-21 IGNITION TIMING INSPECTION.)
5. Inspect the idle speed. (See F1-23 IDLE SPEED INSPECTION.)

Shift Diagram
D range (normal mode)



D Range Test

1. Perform road test preparation. (See K2–24 ROAD TEST, Road Test Preparation.)
2. Shift the selector lever to D range.
3. Accelerate the vehicle at half and WOT, then verify that 1→2, 2→3, and 3→4 upshifts. The shift points must be as shown in the table below.
   - If not as specified, inspect the PCM and ATX.
     (See K2–136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
4. Drive the vehicle in 4GR, 3GR, and 2GR and verify that kickdown occurs for 4→3, 3→2, 2→1 downshifts, and that the shift points are as shown in the table below.
   - If not as specified, inspect the PCM and ATX.
     (See K2–136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
5. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR, and 4GR.
   - If not as specified, inspect the PCM and ATX.
     (See K2–136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
6. Drive the vehicle and verify that TCC operation is obtained. The operation points must be as shown in the table below.
   - If not as specified, inspect the PCM and ATX.
     (See K2–136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
7. Select HOLD mode.
8. Accelerate the vehicle at half throttle and WOT, and verify that 4→3, 3→2 and 2→3 shifts are obtained. The shift points must be as shown in the table below.
   - If not as specified, inspect the PCM and ATX.
     (See K2–136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
9. Drive the vehicle in 4GR, 3GR, 2GR and verify that kickdown does not occur.
   - If not as specified, inspect the PCM and ATX.
     (See k2–136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
10. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR, and 4GR.
    - If not as specified, inspect the PCM and ATX.
      (See k2–136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)

Shift point table

Range/Mode		Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
D	NORMAL	WOT	$D_1 \rightarrow D_2$	56—62 {35—38}	5550—6100
			$D_2 \rightarrow D_3$	105—113 {66—70}	5550—5900
			$D_3 \rightarrow D_4$	158—168 {98—104}	5550—5850
			TCC ON (D_4)	158—168 {98—104}	4050—4250
		Half throttle	$D_1 \rightarrow D_2$	32—40 {20—24}	3150—3950
			$D_2 \rightarrow D_3$	61—77 {38—47}	3250—4050
			$D_3 \rightarrow D_4$	120—143 {75—88}	4200—5000
			TCC ON (D_4)	129—156 {80—96}	3300—3950
		CTP	$D_4 \rightarrow D_3$	27—33 {17—20}	700—800
			$D_3 \rightarrow D_2$	8—14 {5—8}	300—450
			$D_2 \rightarrow D_1$	8—14 {5—8}	450—700
			$D_3 \rightarrow D_1$	8—14 {5—8}	300—450
		Kickdown (WOT)	$D_4 \rightarrow D_3$	151—161 {94—99}	3850—4050
			$D_3 \rightarrow D_2$	94—102 {59—63}	3350—3550
			$D_2 \rightarrow D_1$	36—42 {23—26}	1900—2200
	POWER	WOT	$D_1 \rightarrow D_2$	56—62 {35—38}	5550—6100
			$D_2 \rightarrow D_3$	105—113 {66—70}	5550—5900
			$D_3 \rightarrow D_4$	158—168 {98—104}	5550—5850
		Half throttle	$D_1 \rightarrow D_2$	43—51 {27—31}	4250—5100
			$D_2 \rightarrow D_3$	84—100 {53—62}	4400—5250
			$D_3 \rightarrow D_4$	134—157 {84—97}	4700—5500
		CTP	$D_4 \rightarrow D_3$	37—43 {23—26}	950—1050
			$D_3 \rightarrow D_2$	8—14 {5—8}	300—450
			$D_2 \rightarrow D_1$	8—14 {5—8}	450—700
			$D_3 \rightarrow D_1$	8—14 {5—8}	300—450
		Kickdown (WOT)	$D_4 \rightarrow D_3$	151—161 {94—99}	3850—4050
			$D_3 \rightarrow D_2$	94—102 {59—63}	3350—3550
			$D_2 \rightarrow D_1$	36—42 {23—26}	1900—2200
	HOLD	ALL round	$D_2 \rightarrow D_3$	15—25 {10—15}	800—1300
			$D_4 \rightarrow D_3$	158—164 {98—101}	4050—4150
			$D_3 \rightarrow D_2$	7—13 {5—8}	250—450

S Range Test

1. Perform road test preparation. (See K2-24 ROAD TEST, Road Test Preparation.)
2. Shift the selector lever to S range.
3. Accelerate the vehicle at half throttle and WOT, then verify that 1→2 and 2→3 upshifts. The shift points must be as shown in the table below.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
4. Drive the vehicle in 2GR, 3GR, 4GR and verify that kickdown occurs for 4→3, 3→2, 2→1 downshift, and that the shift point is as shown in the table below.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
5. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR and 4GR.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
6. Select HOLD mode.
7. Accelerate the vehicle in 2GR at half throttle and WOT, and verify that 2GR is held.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
8. Decelerate the vehicle and verify that engine braking effect is felt.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)

Shift point table

Range/Mode		Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
S	NORMAL	WOT	$S_1 \to S_2$	56—62 {35—38}	5550—6100
			$S_2 \to S_3$	105—113 {66—70}	5550—5900
		Half throttle	$S_1 \to S_2$	43—51 {27—31}	4250—5100
			$S_2 \to S_3$	84—100 {53—62}	4400—5250
		CTP	$S_4 \to S_3$	158—164 {98—101}	4050—4150
			$S_3 \to S_2$	8—14 {5—8}	300—450
			$S_2 \to S_1$	8—14 {5—8}	450—700
		Kickdown (WOT)	$S_4 \to S_3$	156—166 {97—102}	4000—4200
			$S_3 \to S_2$	94—102 {59—63}	3350—3550
			$S_2 \to S_1$	39—45 {25—27}	2100—2350
	HOLD	All round	$S_4 \to S_3$	158—164 {98—101}	4050—4150
			$S_3 \to S_2$	104—110 {65—68}	3700—3850

L Range Test

1. Perform road test preparation. (See K2-24 ROAD TEST, Road Test Preparation.)
2. Shift the selector lever to L range.
3. Accelerate the vehicle at half throttle and WOT, then verify that 1→2 upshift. The shift points must be as shown in the table below.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
4. Drive the vehicle in 2GR and verify that kickdown occurs for 2→1 downshift, and that the shift point is as shown in the table below.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
5. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR and 4GR.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
6. Select HOLD mode.
7. Accelerate the vehicle in 1GR at half throttle and WOT, and verify that 1GR is held.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)
8. Decelerate the vehicle and verify that engine braking effect is felt.
   - If not as specified, inspect the PCM and ATX. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)

Shift point table

Range/Mode		Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
L	NORMAL	WOT	$L_1 \rightarrow L_2$	56—62 {35—38}	5550—6100
		Half throttle	$L_1 \rightarrow L_2$	43—51 {27—31}	4250—5100
		CTP	$L_4 \rightarrow L_3$	158—164 {98—101}	4050—4150
			$L_3 \rightarrow L_2$	104—110 {65—68}	3700—3850
			$L_2 \rightarrow L_1$	8—14 {5—8}	450—700
		Kickdown (WOT)	$L_4 \rightarrow L_3$	156—166 {97—102}	4000—4200
			$L_3 \rightarrow L_2$	103—111 {64—68}	3650—3850
			$L_2 \rightarrow L_1$	36—42 {23—26}	1900—2200
	HOLD	All round	$L_4 \rightarrow L_3$	158—164 {98—101}	4050—4150
			$L_3 \rightarrow L_2$	104—110 {65—68}	3700—3850
			$L_2 \rightarrow L_1$	42—48 {27—29}	2250—2500

P Position Test

1. Shift into P position on a gentle slope. Release the brake and verify that the vehicle does not roll.

AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION

ATF Condition Inspection

1. One way of determining whether the transaxle should be disassembled is by noting:
   - If the ATF is muddy or varnished.
   - If the ATF smells strange or unusual.

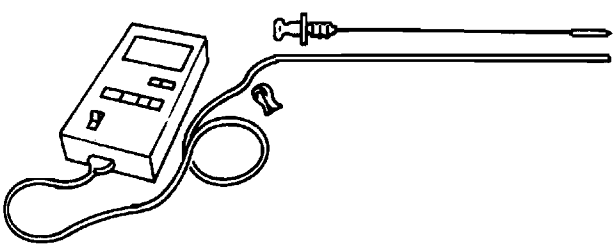
ATF condition

Condition			Possible cause
Clear red		Normal	—
Light red: pink		Contaminated with water	• Broken oil cooler inside of radiator • Poor breather hose installation: Problem could be occurring to parts inside the transaxle by water contamination. It is necessary to overhaul transaxle and detect defected parts. If necessary, exchange transaxle.
Reddish brown	Has burnt smell and metal specks are found	Deteriorated ATF	Defect powertrain components inside of transaxle: Specks cause wide range of problems by plugging up in oil pipe, control valve body and oil cooler in radiator. • When large amount of metal specks are found, overhaul transaxle and detect defected parts. If necessary, exchange transaxle. • Implement flushing operation as there is a possibility to have specks plugging up oil pipe and/or oil cooler inside of radiator.
	Has no burnt smell	Normal	• Discoloration by oxidation

ATF Level Inspection

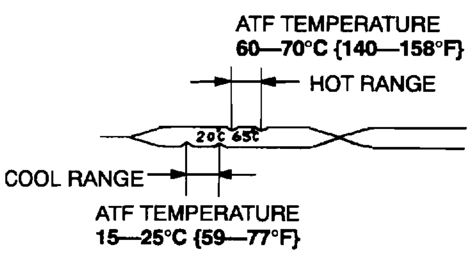
Caution
- **The ATF amount varies according to ATF's temperature. Therefore, when checking the ATF level or replacing the ATF, use a thermometer to measure the temperature then adjust the ATF amount to the specified level according to the specified temperature.**

1. Park the vehicle on level ground.
2. Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
3. Adjust the length or thermistor probe to measure the same depth as the depth gauge and hold the probe with a paper holder. Insert into the filler tube and measure the temperature.
   - If necessary, inspect the ATF before warming up the engine. In this case, use the cool range **(15—25°C {59—77 °F})**.



4. Warm up the engine until the ATF reaches **60—70°C {140—158°F}**.
5. Shift the selector lever and pause momentarily in each range (D-L) while depressing the brake pedal.
6. Shift the selector lever to P position.
7. Verify that the ATF level is in the HOT range **(65°C{149°F})** while the engine is idling.
   - If necessary, add ATF to the specification.

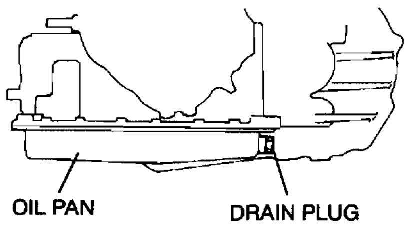
ATF type
M-III or equivalent (e.g. Dexron® II)



AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT

Warning
- **When the transaxle and ATF are hot, they can badly burn you. Turn off the engine and wait until they are cool before replacing the ATF.**

1. Remove the dipstick.
2. Remove the drain plug and washer.



3. Drain the ATF into a container.
4. Install a new washer and the drain plug.

Tightening torque
30—41 N·m {3.0—4.2 kgf·m, 22—30 in·lbf}

5. Add the specified ATF until ATF level reaches lower notch of dipstick type of ATF through the oil filler tube.

ATF type
M-III or equivalent (e.g. Dexron® II)

6. Ensure that the ATF level is in the HOT range **(65°C{149°F})**.
   - Add ATF to the specified level if necessary.

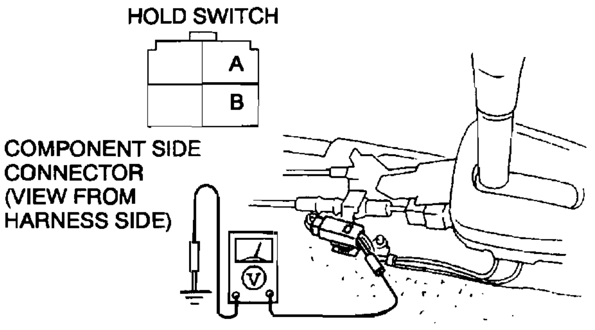
HOLD SWITCH INSPECTION

Operating Inspection
1. Turn the ignition switch to ON (engine OFF).
2. Verify that the HOLD indicator light is not illuminated. Depress the HOLD switch and verify that the HOLD indicator light illuminates.
   - If not as specified, inspect the terminal voltage of the HOLD switch.

Voltage Inspection
1. Remove the center console.(See S-23 CONSOLE REMOVAL/INSTALLATION.)
2. Turn the ignition switch to ON (engine OFF).
3. Measure the voltage at the HOLD switch connector.
   - If not as specified, inspect for continuity at the HOLD switch.

Specification

HOLD switch position	Connector terminal	
	A	B
Normal	B+	0
Depressed	0	0



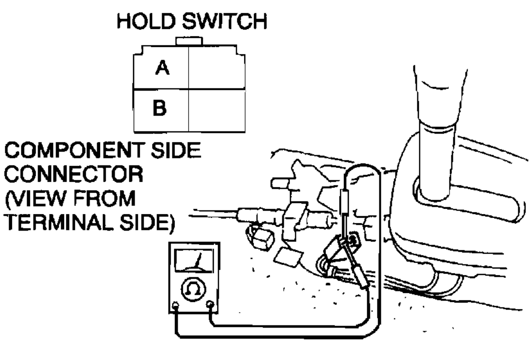
Continuity Inspection

1. Disconnect the negative battery cable.
2. Remove the center console.
3. Disconnect the HOLD switch connector.
4. Inspect for continuity at the HOLD switch.
   - If the switch is okay, inspect the wiring harness. (HOLD switch — PCM, HOLD switch — Body ground.)
   - If not as specified, replace the HOLD switch. (See K2-30 HOLD SWITCH REMOVAL/INSTALLATION.)

Specification

O—O : Continuity

HOLD switch position	Connector terminal	
	A	B
Normal		
Depressed	O——	——O



5. Install the center console.
6. Connect the negative battery cable.

HOLD SWITCH REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the center console.
3. Disconnect the connector and remove the HOLD switch terminals. (See K2-58 SELECTOR LEVER DISASSEMBLY/ASSEMBLY.)
4. Remove the selector lever knob component.
5. Remove the HOLD switch.
6. Install the HOLD switch to selector lever knob component.
7. Install selector lever knob component.

Tightening torque
2.0—2.9 N·m {20—30 kgf·cm, 18—26 in·lbf}

8. Install the HOLD switch terminals and connect the connector.
9. Install the center conlsole.
10. Connect the negative battery cable.

TRANSAXLE RANGE (TR) SWITCH INSPECTION

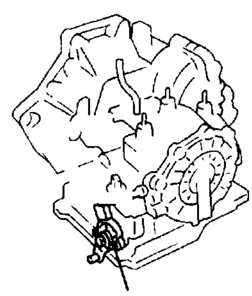
Operating Inspection

1. Verify that the starter operates only when the ignition switch is at the START position with the selector lever in P or N position.
   - If not as specified, adjust the TR switch.
2. Verify that the back-up lights illuminate when shifted to R position with the ignition switch at the ON position.
   - If not as specified, adjust the TR switch.
3. Verify that the indication on the indicator light meets the lever position in each range when shifting the selector lever from P position to L range. (For vehicles with AT indicator light)
   - If not as specified, adjust the TR switch.

Continuity Inspection

Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

1. Disconnect the negative battery cable.
2. Remove the fresh-air duct and air cleaner component. (See Section F1.)
3. Disconnect the TR switch connector.

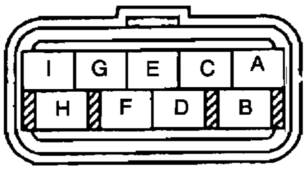


4. Inspect for continuity at the TR switch.
   - If not as specified, adjust the TR switch and go to Step 5.

O—O : Continuity

Position	Connector terminal								
	A	B	C	D	E	F	G	H	I
P		O	—	—	—	—	—	O	
	O	—	—	—	—	—	—	—	O
R			O	—	—	—	—	—	O
N		O	—	—	—	—	—	O	
				O	—	—	—	—	O
D							O	—	O
S						O	—	—	O
L					O	—	—	—	O

TR SWITCH

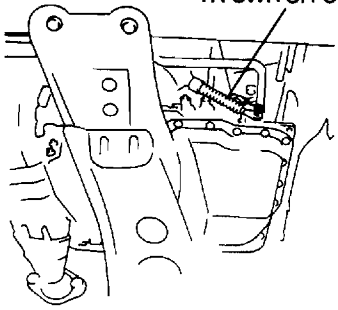


COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

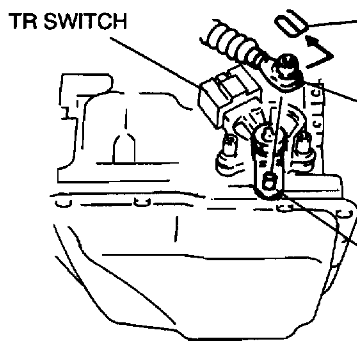
5. Reinspect for continuity at TR switch.
   - If not as specified, replace the TR switch. (See K2-31 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION.)
6. Connect the TR switch connector.
7. Install the air cleaner component and fresh-air duct. (See Section F1.)
8. Connect the negative battery cable.

TRANSAXLE RANGE (TR) SWITCH REMOVAL/ INSTALLATION

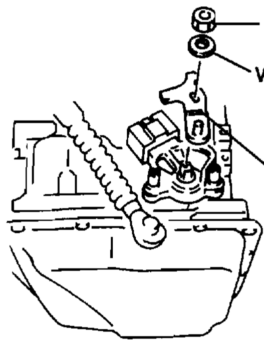
1. Disconnect the negative battery cable.
2. Remove the fresh-air duct and air cleaner component. (See Section F1.)
3. Remove the splash shield.
4. Disconnect the TR switch connector.



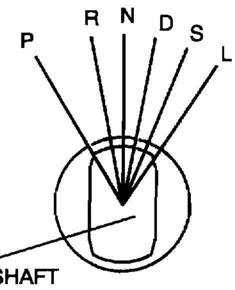
5. Remove the clip and disconnect the selector cable.



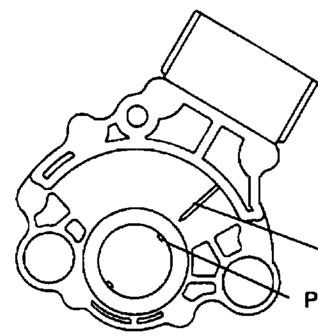
6. Remove the manual shaft nut, washer and manual shaft lever.



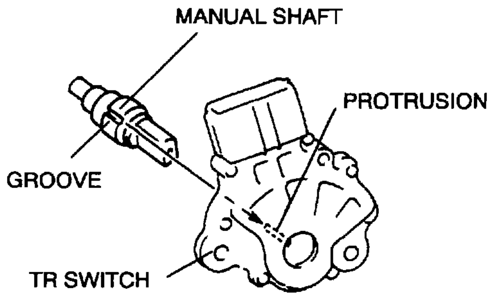
7. Remove the TR switch.
8. Rotate the manual shaft to the converter housing side fully, then return 2 notches to set the N position.



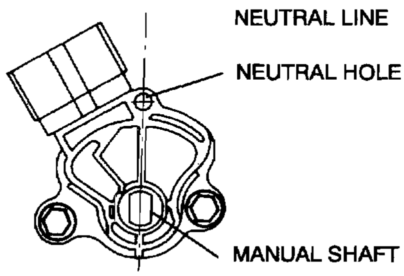
9. Align the protrusion and mark as shown.



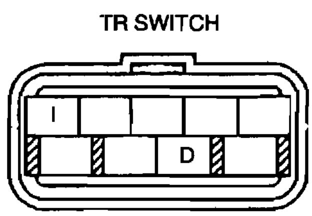
10. Install the TR switch while aligning the protrusion and groove as shown.



11. Turn the TR switch so that the neutral hole is in line with the flat, straight surfaces on either side of the manual shaft.



12. Hand-tighten the TR switch mounting bolts.
13. Connect an ohmmeter between terminals D and I.



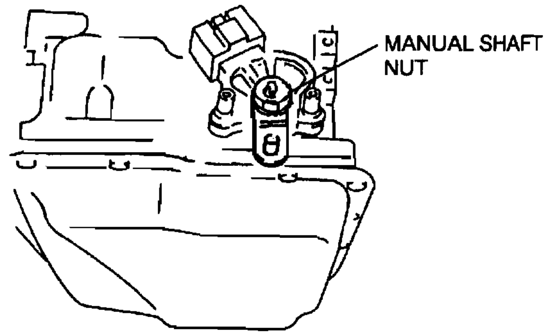
COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

14. Adjust the switch to the point where there is continuity between the terminals.
15. Tighten the TR switch mounting bolts.

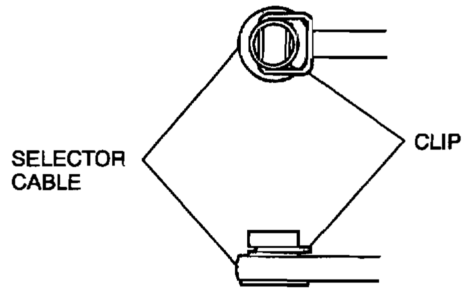
Tightening torque
7.9—10.7 N·m
{80—110 kgf·cm, 69.5—95.4 in·lbf}

16. Tighten the manual shaft nut.

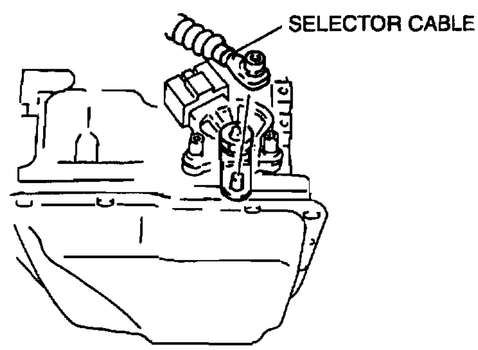
Tightening torque
32—46 N·m {3.2—4.7 kgf·m, 24—33 ft·lbf}



17. Install the clip to the SELECTOR CABLE as shown in the figure.



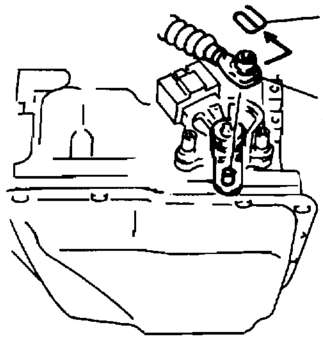
18. Shift the selector lever to P position.
19. Turn the manual shaft lever to P position.
20. Connect the selector cable.



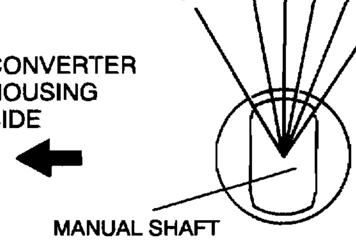
21. Inspect for continuity at the TR switch. (See TRANSAXLE RANGE (TR) SWITCH INSPECTION, Continuity Inspection.)
    - If not as specified, readjust the TR switch. (See K2-33 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT.)
22. Connect the TR switch connector.
23. Install the splash shield.
24. Install the air cleaner component and fresh-air duct. (See Section F1.)
25. Connect the negative battery cable.
26. Inspect operation of the TR switch. (See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION, Operating Inspection.)
    - If not as specified, readjust the TR switch. (See K2-33 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT.)

TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT

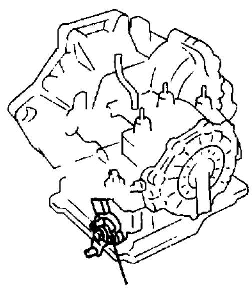
1. Disconnect the negative battery cable.
2. Remove the fresh-air duct and air cleaner component. (See Section F1.)
3. Remove the splash shield.
4. Remove the clip and disconnect the selector cable.



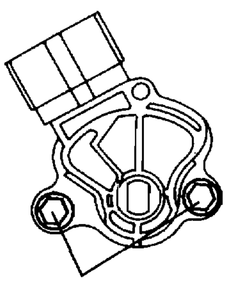
5. Rotate the manual shaft to the converter housing side fully, then return 2 notches to set the N position.



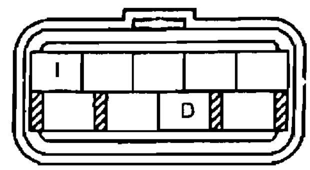
6. Disconnect the TR switch connector.



7. Loosen the TR switch mounting bolts.



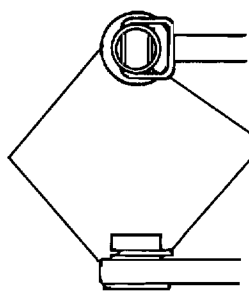
8. Connect an ohmmeter between terminals D and I.



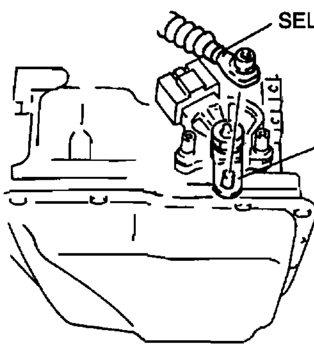
9. Adjust the switch to the point where there is continuity between the terminals.
10. Tighten the TR switch mounting bolts.

Tightening torque
7.9—10.7 N·m
{80—110 kgf·cm, 69.5—95.4 in·lbf}

11. Select the selector lever to N position and TR switch are aligned.
12. Connect the TR switch connector.
13. Install the clip to the selector cable as shown in the figure.



14. Connect the selector cable to the manual shaft lever as shown in the figure.



15. Inspect operation of the TR switch. (See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION, Operating Inspection.)
    - If not as specified, readjust the TR switch. (See K2-33 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT.)
16. Install the splash shield.
17. Install the air cleaner component and fresh-air duct. (See Section F1.)
18. Connect the negative battery cable.

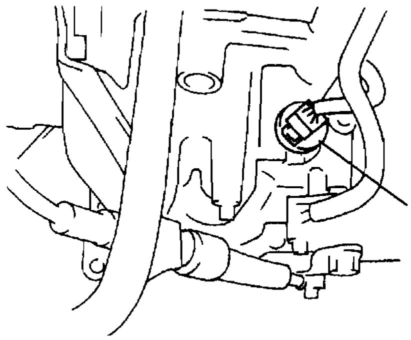
TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION

On-Vehicle Inspection

1. Disconnect the negative battery cable.
2. Remove the fresh-air duct and air cleaner component. (See Section F1.)

Caution
- **Water or foreign objects entering the connector can cause poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

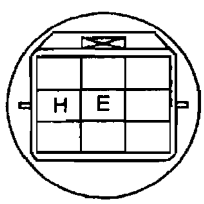
3. Disconnect the transaxle connector.



4. Measure the resistance between the terminals E and H.
   - If it is out of specification, perform the off-vehicle inspection of TFT sensor. (See K2-35 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)

ATF temperature (°C {°F})	Resistance (kΩ)
-20 {-4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98

TRANSAXLE CONNECTOR



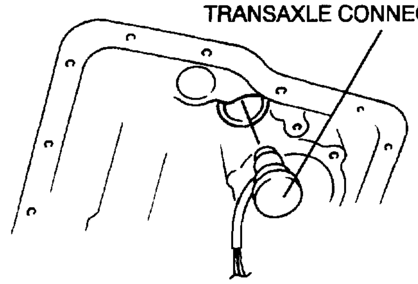
COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

5. Connect the transaxle connector.
6. Install the air cleaner component and fresh-air duct. (See Section F1.)
7. Connect the negative battery cable.

Off-Vehicle Inspection

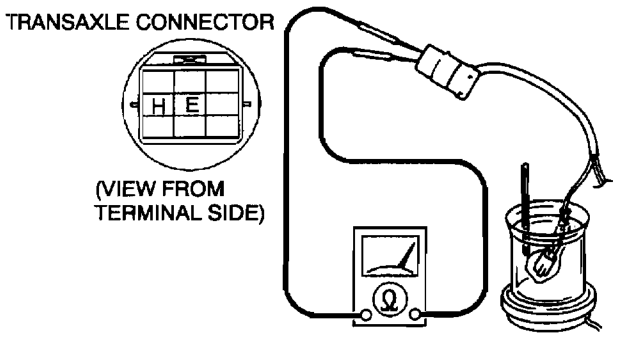
Warning
- **When the transaxle and ATF are hot, they can badly burn. Turn off the engine and wait until they are cool before replacing ATF.**

1. Remove the control valve body. (See K2-46 CONTROL VALVE BODY REMOVAL, On-Vehicle Removal.)
2. Remove the transaxle connector.



3. Remove the TFT sensor from the strainer, and connect it to the transaxle connector.
4. Place the TFT sensor and a thermometer in ATF as shown, and heat the ATF gradually.
5. Measure the resistance between the terminals of the TFT sensor.
   - If not as specified, replace the TFT sensor. (See K2-35 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)

ATF temperature (°C {°F})	Resistance (kΩ)
-20 {-4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98

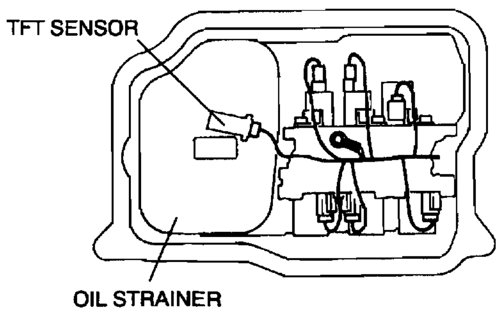


6. Disconnect the TFT sensor from the transaxle connector, and install it to the oil strainer.
7. Install the transaxle connector.
8. Install the control valve body. (See K2-46 CONTROL VALVE BODY INSTALLATION, On-Vehicle Installation.)

TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION

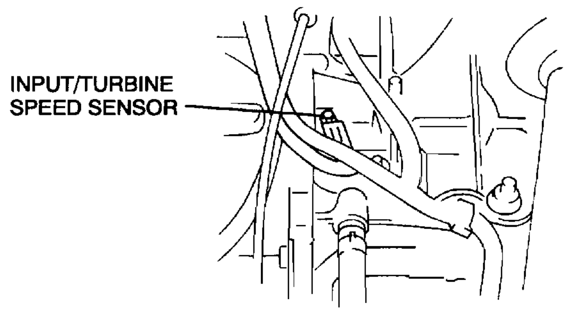
Warning
- **When the transaxle and ATF are hot, they can badly burn. Turn off the engine and wait until they are cool before replacing the ATF.**

1. Remove the oil pan. (See K2-46 CONTROL VALVE BODY REMOVAL, On-Vehicle Removal.)
2. Disconnect the TFT sensor connector.
3. Remove the TFT sensor.



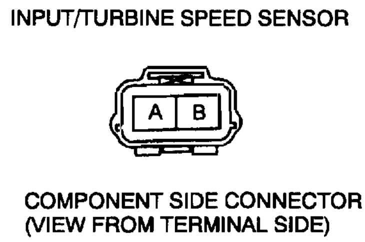
4. Install a new TFT sensor.
5. Connect the TFT sensor connector.
6. Install the oil pan. (See K2-46 CONTROL VALVE BODY INSTALLATION, On-Vehicle Installation.)
7. Carry out the mechanical system test. (See K2-21 MECHANICAL SYSTEM TEST.)

INPUT/TURBINE SPEED SENSOR INSPECTION
Resistance Inspection
1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See Section F1.)
3. Disconnect the input/turbine speed sensor connector.



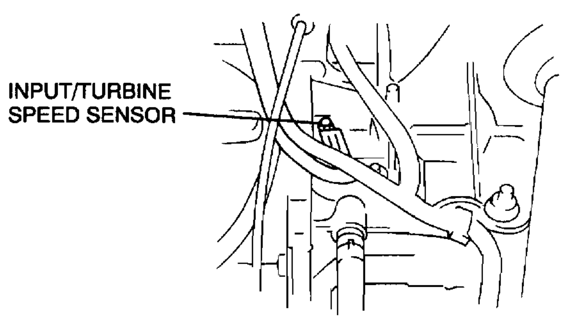
4. Measure the resistance between the terminals of the input/turbine speed sensor.
   - If not as specified, replace the input/turbine speed sensor.

Resistance
250—600 Ω (ATF temperature: -40—160°C {-40—320°F})



5. Connect the input/turbine speed sensor connector.
6. Install the air cleaner component. (See Section F1.)

INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION
1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See Section F1.)
3. Disconnect the input/turbine speed sensor connector.



4. Remove the input/turbine speed sensor.
5. Apply ATF to a new O-ring and install it on a new input/turbine speed sensor.
6. Install the input/turbine speed sensor.

Tightening torque
7.9—10.7 N·m
{80—110 kgf·cm, 69.5—95.4 in·lbf}

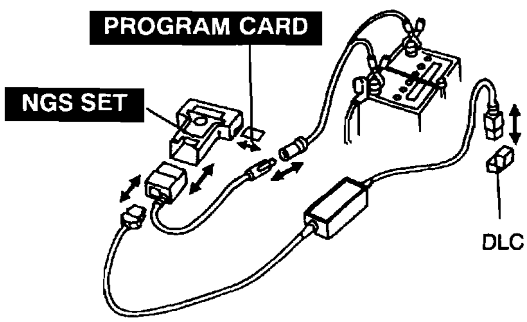
7. Connect the input/turbine speed sensor connector.
8. Install the air cleaner component. (See Section F1.)
9. Connect the negative battery cable.

VEHICLE SPEED SENSOR (VSS) INSPECTION

Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

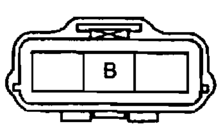
Visual Inspection
1. Remove the VSS. (See K2–38 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION.)
2. Make sure that the sensor is free of any metallic shavings or particles. If any are found on the sensor, clean them off.
3. Install the VSS. (See K2–38 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION.)

Frequency Inspection
Using the NGS
1. Connect the NGS to the DLC.



2. Connect NGS test lead (+) to the VSS connector B terminal.

VSS



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

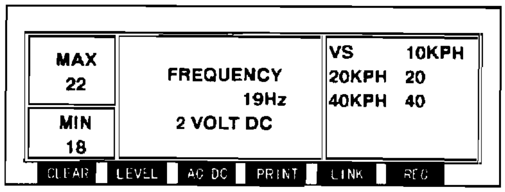
3. Start the engine.
4. Select the "FREQUENCY METER" function on the NGS display and press TRIGGER.
5. Press the LINK key to select VS PID.
6. Select the "PID/DATA MONITOR" function on the NGS display and press TRIGGER.
7. Select the "PCM" on the NGS display and press TRIGGER.
8. Select the "VS" on the NGS display and press START.
9. The FREQUENCY METER screen will be displayed.

Note
- The selected threshold voltage indicated on the FREQUENCY METER SCREEN should be 2 VOLTS DC. If an incorrect threshold voltage is selected, the calculated frequency value will be incorrect.
- Threshold voltage should be in the DC range. Press AC/DC key to select DC range.

10. Check frequency value and VSS PID.

Specifications

VSS PID	FREQUENCY
10 KPH	Approximately 37 Hz
20 KPH	Approximately 74 Hz
30 KPH	Approximately 111 Hz

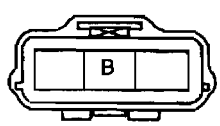


11. Press LEVEL key to change the threshold voltage to 6 VOLTS.
12. Make sure that the FREQUENCY indicates 0 Hz.
    - If FREQUENCY value is out of specification, perform the "Open or short circuit" inspection below and repair or replace parts as necessary.

Power supply voltage inspection
1. Disconnect the VSS connector.
2. Turn the ignition switch to ON (engine OFF).
3. Measure voltage at VSS connector terminal B.
    - If voltage is okay, go to "Open circuit" and "Short circuit".
    - If voltage is wrong, repair wiring harness between VSS connector terminal B and PCM.

Specification
4.5-5.5 V

VSS

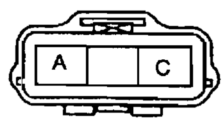


HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Open circuit inspection

1. Inspect the following circuit for open.
   - Power circuit (VSS connector terminal A to main relay terminal D)
   - Ground circuit (VSS connector terminal C to GND)
     — If an open circuit is found, repair the malfunctioning wiring harness.
     — If there is no open circuit, perform the sensor rotor inspection.

VSS

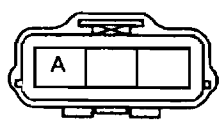


HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Short circuit inspection

1. Inspect the following circuit for short.
   - Power circuit (VSS connector terminal A to main relay terminal D)
     — If a short circuit is found, repair the malfunctioning wiring harness.
     — If there is no short circuit, perform the sensor rotor inspection.

VSS



HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Sensor rotor inspection

1. Remove the VSS. (See K2–38 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION.)
2. Shift the selector lever to N position.
3. Check sensor rotor surface via VSS installation hole while rotating the front tire manually.
   — Is sensor rotor free of damage and cracks?
   - If sensor rotor is okay, replace the VSS.

   — Is sensor rotor free of any metallic shavings or particles?
   - If there is a problem, clean or replace the sensor rotor.

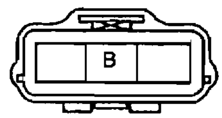
Without Using the NGS

Open or short circuit

1. Disconnect the VSS connector.
2. Turn the ignition switch to ON (engine OFF).
3. Measure voltage at VSS connector terminal B.
   - If voltage is okay, go to “Open circuit” and “Short circuit”.
   - If voltage is wrong, repair wiring harness between the VSS and PCM.

Specification: 4.5–5.5 V

VSS

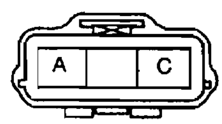


HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Open circuit inspection

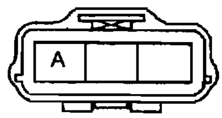
1. Inspect the following circuit for open.
   - Power circuit (VSS connector terminal A to main relay terminal D)
   - Ground circuit (VSS connector terminal C to GND)
     — If an open circuit is found, repair the malfunctioning wiring harness.
     — If there is no open circuit, perform the sensor rotor inspection.

VSS



HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Short circuit inspection
1. Inspect the following circuit for short.
   - Power circuit (VSS connector terminal A to main relay terminal D)
     - — If a short circuit is found, repair the malfunctioning wiring harness.
     - — If there is no short circuit, perform the sensor rotor inspection.

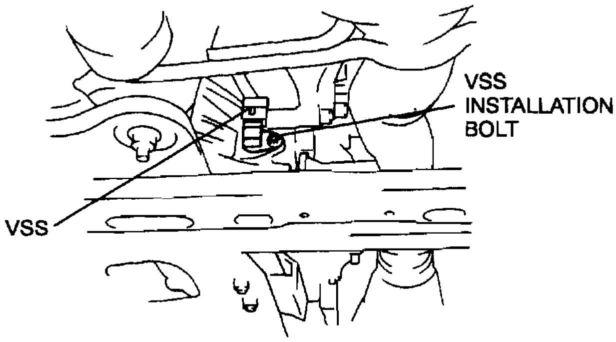


Sensor rotor inspection
1. Remove the VSS. (See K2-38 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION.)
2. Shift the selector lever to N position.
3. Check sensor rotor surface via VSS installation hole while rotating the front tire manually.
   (1) Is sensor rotor free of damage and cracks?
   (2) Is sensor rotor free of any metallic shavings or particles?
   - If sensor rotor is okay, replace VSS.
   - If there is a problem, clean or replace sensor rotor.

VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION

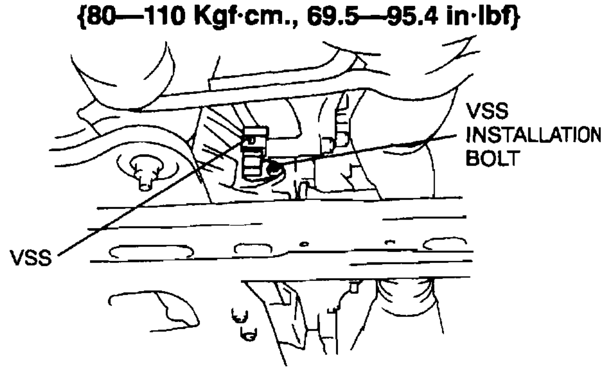
Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**
- **If foreign materials are stuck to the VSS, disturbance by magnetic flux can cause sensor output to be abnormal and there by negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the VSS during installation.**

1. Disconnect the negative battery cable.
2. Disconnect the VSS connector.
3. Remove the VSS.



4. Apply ATF to a new O-ring and install it on a new VSS.
5. Install the VSS.

Tightening torque
7.9—10.7 N·m
{80—110 Kgf·cm., 69.5—95.4 in·lbf}

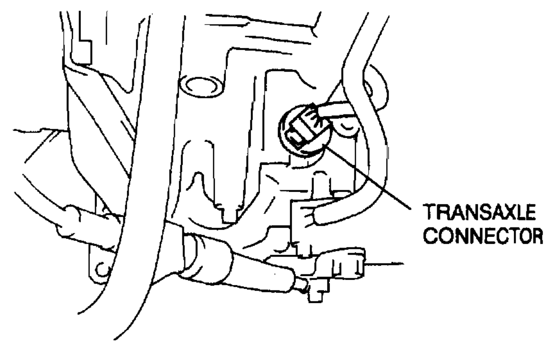


6. Connect the VSS connector.
7. Connect the negative battery cable.

SOLENOID VALVES INSPECTION
Resistance Inspection (On-Vehicle Inspection)

Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not drop water or foreign objects on the connector when disconnecting it.**

1. Disconnect the negative battery cable.
2. Remove the fresh-air duct and air cleaner component. (See Section F1.)
3. Disconnect the transaxle connector.

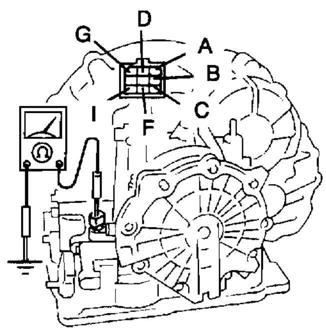


Note
- When inspecting the pressure control solenoid, connect the ground connection to the ground terminal (I terminal) of the pressure control solenoid inside the solenoid valve connector.

4. Measure the resistance between the following terminals.
   - If not as specified, inspect the ground, then perform the operating inspection.

Terminal	Solenoid valve	Resistance (Ω)
A-GND	Shift solenoid A	1.0—4.2
B-GND	Shift solenoid D	10.9—26.2
C-GND	Shift solenoid B	1.0—4.2
D-I	Pressure control solenoid	2.4—7.3
F-GND	Shift solenoid E	10.9—26.2
G-GND	Shift solenoid C	1.0—4.2

*: ATF temperature: -40—150°C {-40—302°F}



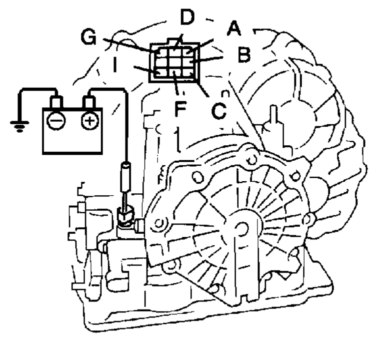
5. Connect the transaxle connector.
6. Install the air cleaner component and fresh-air duct. (See Section F1.)
7. Connect the negative battery cable.

Operating Inspection
1. Disconnect the transaxle connector.

Caution
- **Do not apply battery position voltage to terminals A, B, C, D, F and G for more than three seconds.**

Note
- Because the operation sound of the valves is small, perform inspection in a quiet place.

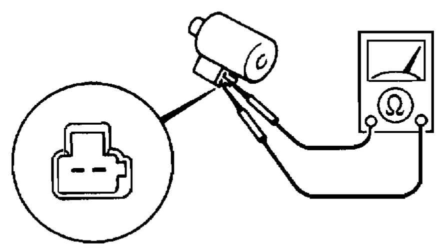
2. Apply battery positive voltage to terminals A,B,C, F or G and battery negative voltage to GND, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If the transaxle harness is okay, perform the resistance inspection (off-vehicle inspection).
     — If there is a problem, repair or replace the transaxle harness.
3. Apply battery positive voltage to terminal D and battery negative voltage to terminal I, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If transaxle harness is okay, perform the resistance inspection (off-vehicle inspection)
     — If there is a problem, repair or replace the transaxle harness.



Resistance Inspection (Off-Vehicle Inspection)
1. Remove the control valve body. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)
2. Measure the resistance of each solenoid valve individually.
   - If not as specified, replace the solenoid valve.
3. Install the control valve body. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)

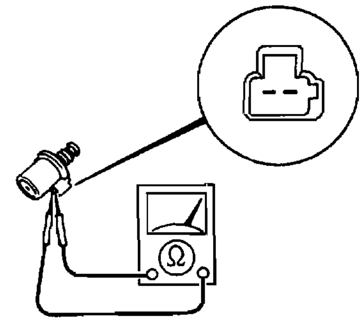
Pressure control solenoid

Resistance
2.4—7.3 Ω
(ATF temperature: -40—150°C {-40—302°F})



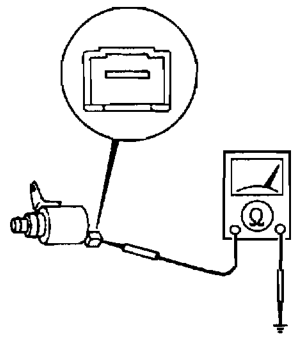
Shift solenoid A, B, C

Resistance
1.0—4.2 Ω
(ATF temperature: -40—150°C {-40—302°F})



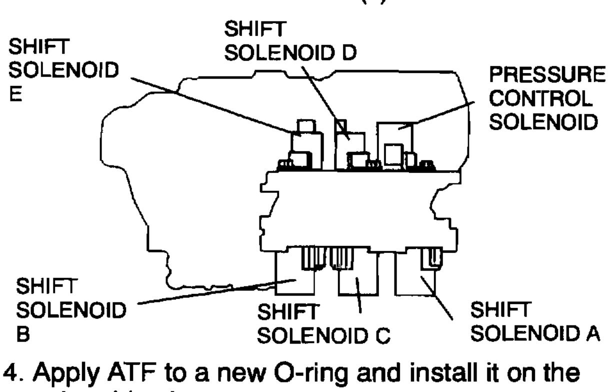
Shift solenoid D, E

Resistance
10.9—26.2 Ω
(ATF temperature: -40—150°C {-40—302°F})



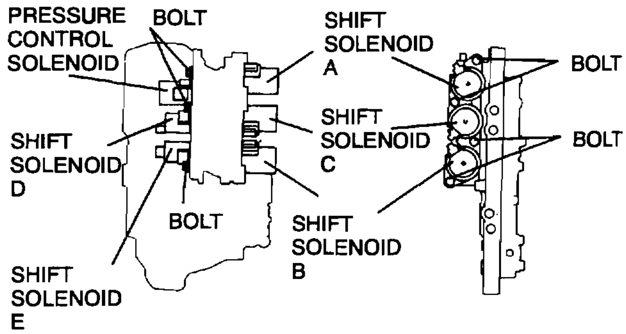
SOLENOID VALVES REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the control valve body. (See K2–46 CONTROL VALVE BODY REMOVAL, On-Vehicle Removal.)
3. Remove the solenoid valve(s).



4. Apply ATF to a new O-ring and install it on the solenoid valve.
5. Install the solenoid valve in the control valve body.

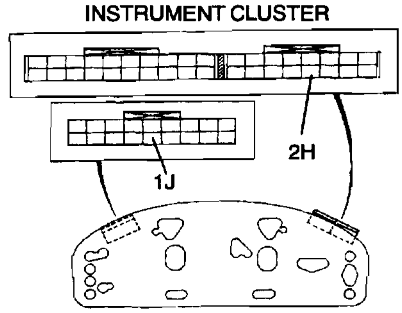
Tightening torque
7.9—10.7 N·m
{80—110 Kgf·cm., 70—95.4 in·lbf}



6. Install the control valve body. (See K2–46 CONTROL VALVE BODY INSTALLATION, On-Vehicle Installation.)
7. Add in ATF and, with the engine idling, inspect the ATF level and inspect for leakage. (See K2–38 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, ATF Level Inspection.)
8. Carry out the mechanical system test. (See K2–21 MECHANICAL SYSTEM TEST.)
9. Carry out the road test. (See K2–24 ROAD TEST.)

HOLD INDICATOR LIGHT INSPECTION

1. Disconnect the negative battery cable.
2. Remove the instrument cluster. (See Section T.)
3. Inspect for continuity between terminals 1J and 2H.
   - If not as specified, replace the HOLD indicator light.



4. Install the instrument cluster. (See Section T.)
5. Connect the negative battery cable.

PCM INSPECTION

1. Inspect the PCM. (See Section F1.)

PCM REMOVAL/INSTALLATION

1. Remove the PCM. (See Section F1.)

AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the battery and battery carrier. (See Section G.)
3. Remove the fresh-air duct and air cleaner component. (See Section F1.)
4. Remove the fuel filter installation nut.
5. Remove the front tires and splash shield.
6. Drain the ATF. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)

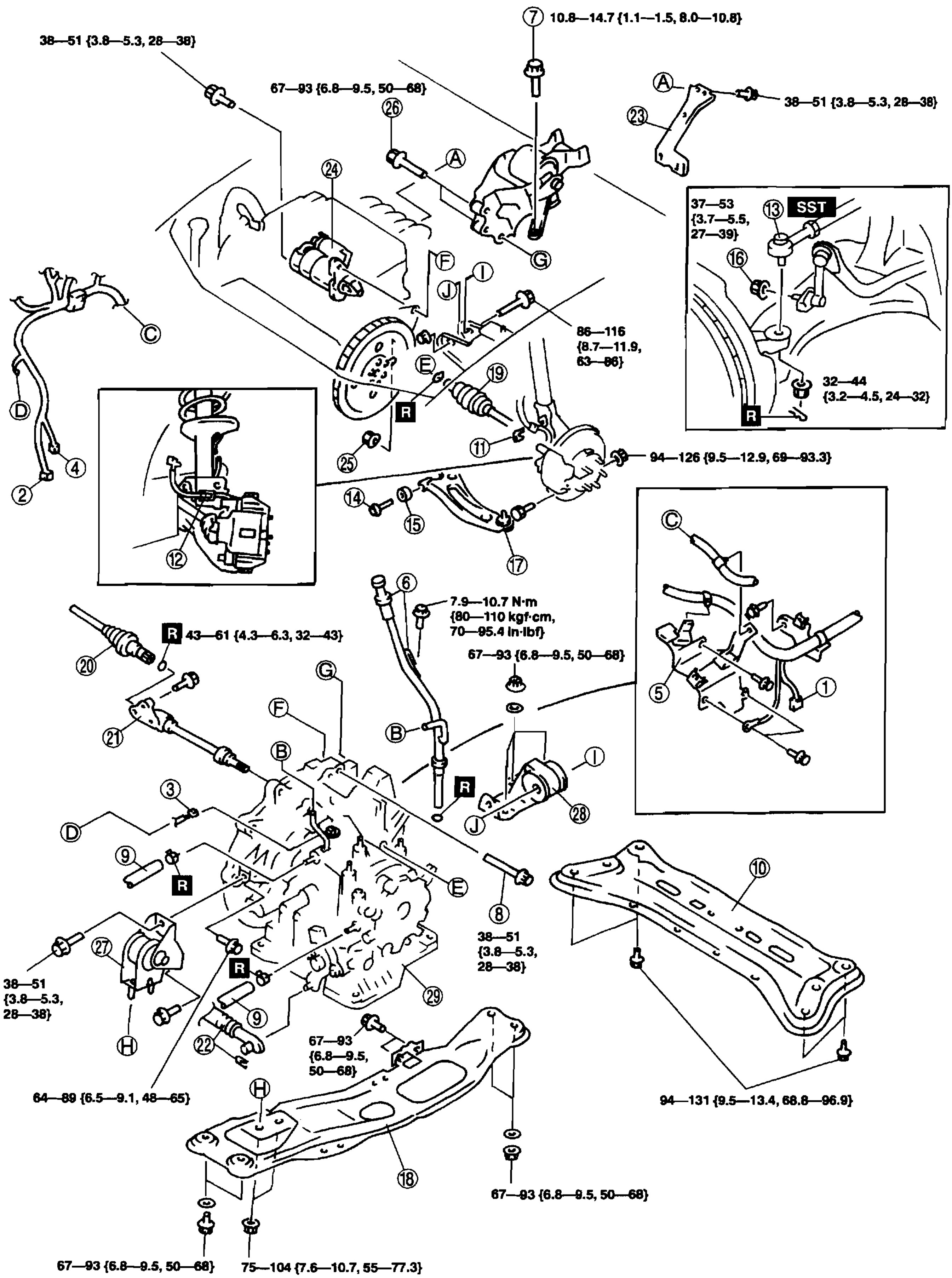
Warning
- **Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.**

7. Remove in the order shown in the figure.
8. Install in the reverse order of removal.
9. Add ATF to the specified level. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
10. Carry out the mechanical system test. (See K2-21 MECHANICAL SYSTEM TEST.)

Service item	Test item		
	Line pressure test	Stall test	Time lag test
ATX replacement	O		
ATX overhaul	O	O	O
Torque converter replacement	O	O	
Oil pump replacement	O		
Clutch system replacement	O		

O: Test to be performed after the service work

11. Carry out the road test. (See K2-24 ROAD TEST.)

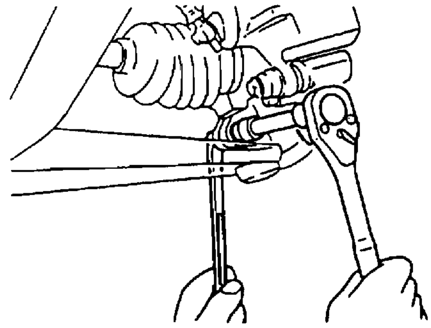


7 10.8—14.7 {1.1—1.5, 8.0—10.8}
38—51 {3.8—5.3, 28—38}
67—93 {6.8—9.5, 50—68}
26
A
38—51 {3.8—5.3, 28—38}
23
24
G
F
I
J
C
86—116
{8.7—11.9,
63—86}
37—53
{3.7—5.5,
27—39}
13 SST
16
32—44
{3.2—4.5, 24—32}
E
19
R
D
11
25
94—126 {9.5—12.9, 69—93.3}
4
2
14
15
12
17
6
7.9—10.7 N·m
{80—110 kgf·cm,
70—95.4 in·lbf}
R 43—61 {4.3—6.3, 32—43}
20
67—93 {6.8—9.5, 50—68}
1
5
21
B
28
3
9
10
8
38—51
{3.8—5.3,
28—38}
27
29
H
22
67—93
{6.8—9.5,
50—68}
64—89 {6.5—9.1, 48—65}
94—131 {9.5—13.4, 68.8—96.9}
18
67—93 {6.8—9.5, 50—68}
75—104 {7.6—10.7, 55—77.3}
N·m {kgf·m, ft·lbf}

1	VSS connector
2	TR switch connector
3	Input/turbine speed sensor connector
4	Transaxle connector
5	Harness bracket
6	Oil dipstick and filler tube
7	No.1 engine mount stay bolt
8	Starter installation bolt
9	Oil hose See K2–49 OIL COOLER REMOVAL/INSTALLATION, Oil Hose Installation Note
10	Transverse member
11	Brake hose clip
12	ABS sensor bracket See Section P
13	Outer boll joint See N–4 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION
14	Front lower arm installation bolt
15	Dynamic danper
16	Front stabilizer control link nut See Section R
17	Lower arm boll joint See K2–43 Lower Arm Boll Joint Removal Note
18	Engine mounting member See K2–43 Engine Mounting Member Removal Note See K2–45 Engine Mounting Member Installation Note
19	Drive shaft (L.H.) See Section M
20	Drive shaft (R.H.) See Section M
21	Joint shaft (R.H.) See Section M
22	Selector cable
23	Intake manifold stay
24	Starter See Section G
25	Torque converter installation nuts See K2–43 Torque Converter Installation Nuts Removal Note
26	No.1 engine mount bolts See K2–45 No.1 Engine Mount Bolts Installation Note
27	No.2 engine mount
28	No.4 engine mount See K2–44 No.4 Engine Mount Installation Note
29	Transaxle See K2–44 Transaxle Removal Note See K2–44 Transaxle Installation Note

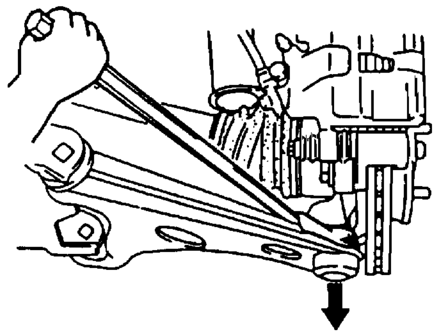
Lower Arm Boll Joint Removal Note

1. Remove the clinch bolt and nut from the lower arm ball joint.



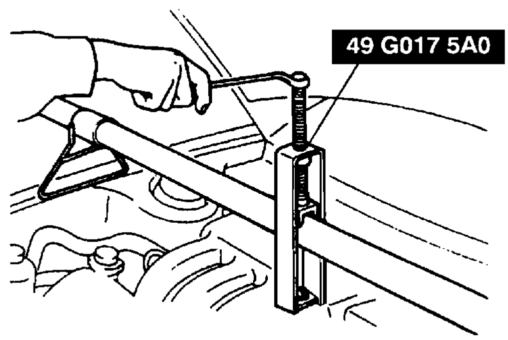
Caution
- **Wrap a rag around the ball joint dust seal to protect it from damage.**

2. Pry the lower arm out of the knuckle



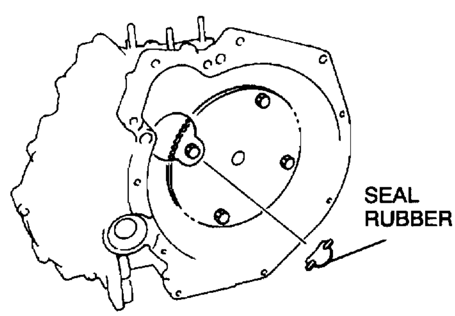
Engine Mount Member Removal Note

1. Support the engine using the **SST** before removing the engine mounting member.
2. Remove the engine mount member.

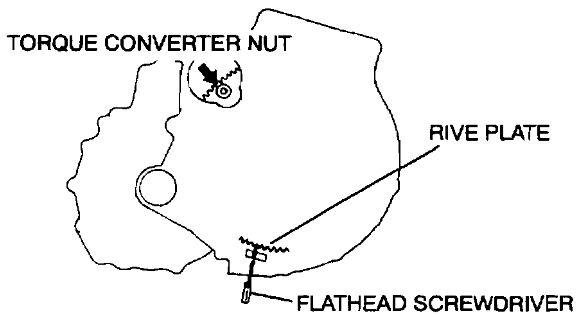


Torque Converter Installation Nuts Removal Note

1. Remove the seal rubber from the end plate.

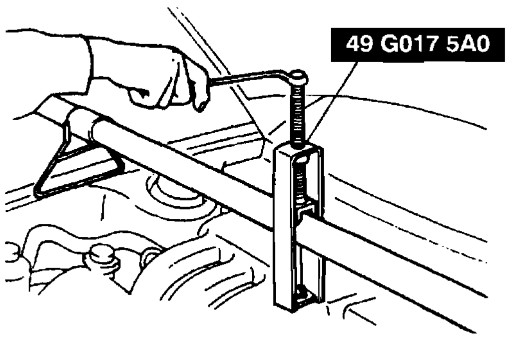


2. Using a flathead screwdriver to prevent the drive plate from rotating, remove the torque converter nuts.



Transaxle Removal Note

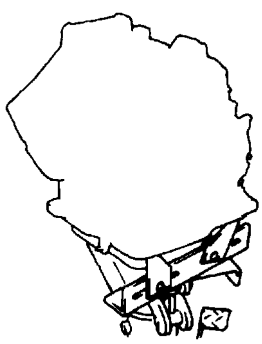
1. Loosen the **SST** (engine support) and lean the engine toward the transaxle.



2. Support the transaxle on a jack.

Warning
- **Do not allow the transaxle to fall from the jack.**

3. Remove the transaxle mounting bolts.
4. Remove the transaxle.

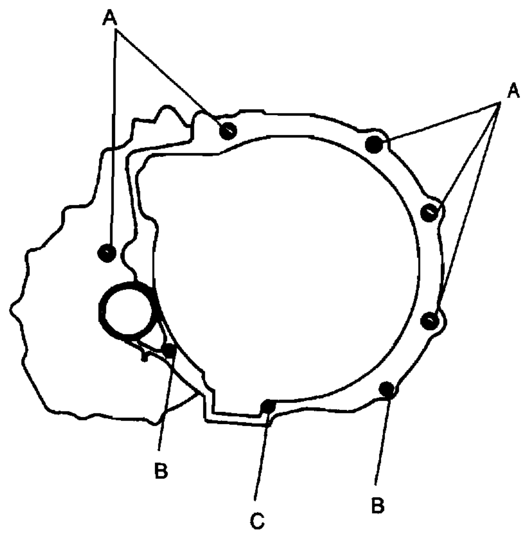


Transaxle Installation Note

Warning
- **Do not allow the transaxle to fall from the jack.**

1. Set the transaxle on a jack and lift it.
2. Install the transaxle mounting bolts.

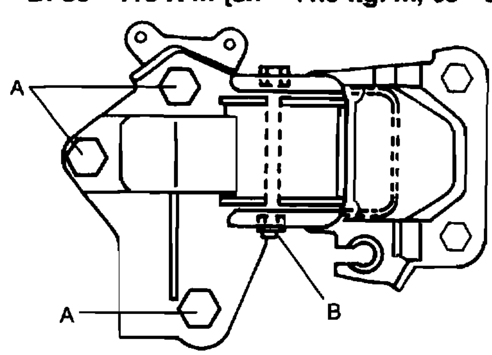
Tightening torque
A:90—116 N·m {9.1—11.9 kgf·m, 66—86 ft·lbf}
B:38—51 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}
C:19—25 N·m {1.9—2.6 kgf·m, 14—18 ft·lbf}



No.4 Engine Mount Installation Note

1. Install the No.4 engine mount bracket by passing it through the stud bolt on the transaxle.
2. Match the positions of the No.4 engine mount bracket and the rubber, then temporarily tighten installation bolt A.
3. Tighten installation nut A, then tighten bolt B.

Tightening torque
A: 67—93 N·m {6.8—9.5 kgf·m, 50—68 ft·lbf}
B: 86—116 N·m {8.7—11.9 kgf·m, 63—86 ft·lbf}

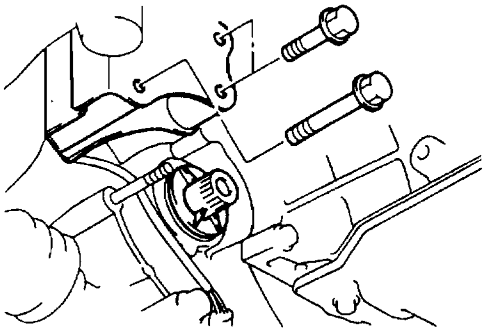


No. 1 Engine Mount Bolts Installation Note

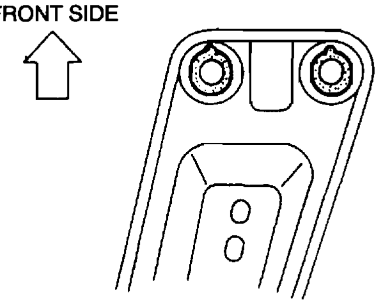
Caution
- **Misaligning the bolts may cause damage to the bolt holes.**

1. Use the **SST (engine support)** verify the transaxle bolt holes and No. 1 engine mount alignment.
2. Tighten the bolts to the specified torque.

Tightening torque
67—93 N·m {6.8—9.5 kgf·m, 50—68 ft·lbf}



Engine Mounting Member Installation Note
1. Verify that the engine mounting rubbers are installed as shown.

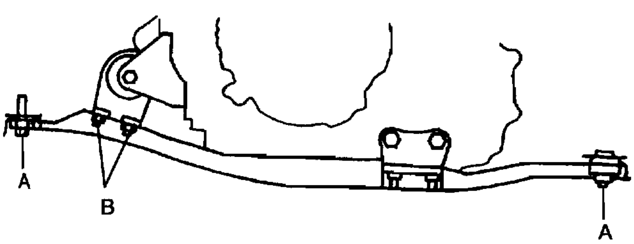


2. Install the No.2 engine mount to the transaxle.
3. Put the No.2 engine mount stud bolts in the installing holes when installing the engine mounting member.
4. Install the bolts and nuts A as shown.

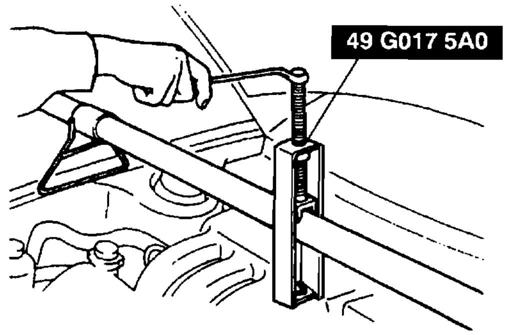
Tightening torque
67—93 N·m {6.8—9.5 kgf·m, 50—68 ft·lbf}

5. Tighten the nuts B as shown.

Tightening torque
75—104 N·m {7.6—10.7 kgf·m, 55—77.3 ft·lbf}



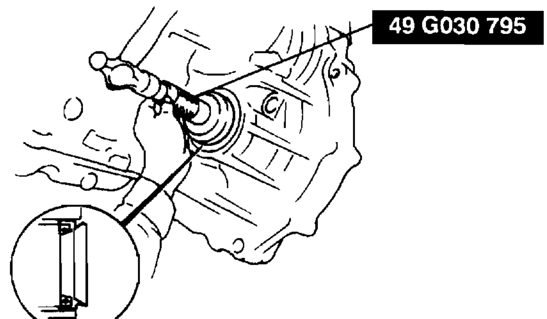
6. Remove the **SST**.



OIL SEAL (TRANSAXLE) REPLACEMENT
1. Drain the ATF. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)

Caution
- **The oil seal is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the oil seal.**

2. Remove the drive shaft. (See Section M.)
3. Remove the oil seal.
4. Using the **SST** and a hammer, tap a new oil seal in evenly until the **SST** contacts the transaxle case.



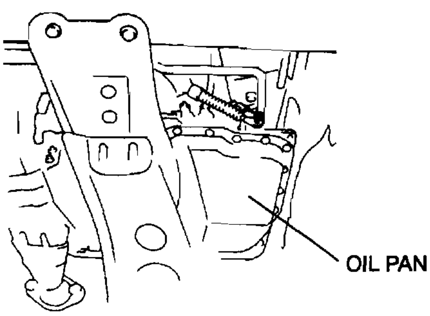
5. Coat the lip of the oil seal with transaxle oil.
6. Install the drive shaft. (See Section M.)
7. Add ATF to the specified level. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
8. Carry out the mechanical system test. (See K2-21 MECHANICAL SYSTEM TEST.)

CONTROL VALVE BODY REMOVAL
On-Vehicle Removal

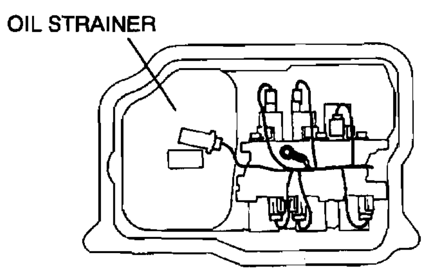
Warning
- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.**

Caution
- **Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvents before removal.**
- **If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle. Remove any old sealant from the transaxle case and oil pan, and clean with cleaning fluids.**

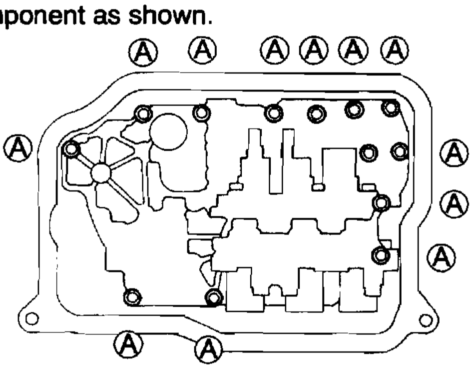
1. Disconnect the negative battery cable.
2. Drain the ATF into a separate suitable container. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3. Remove the splash shield.
4. Remove the oil pan.



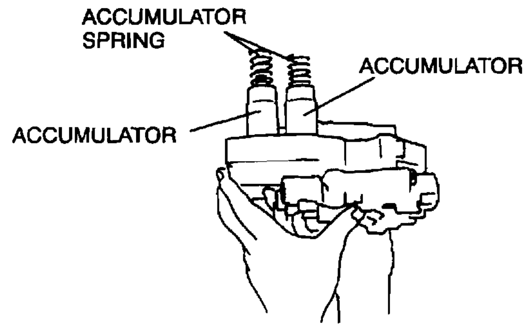
5. Disconnect the transaxle connectors and transaxle fluid temperature (TFT) sensor connector.
6. Remove the oil strainer.



7. Remove the control valve body installation bolts A as shown, then remove the control valve body component as shown.

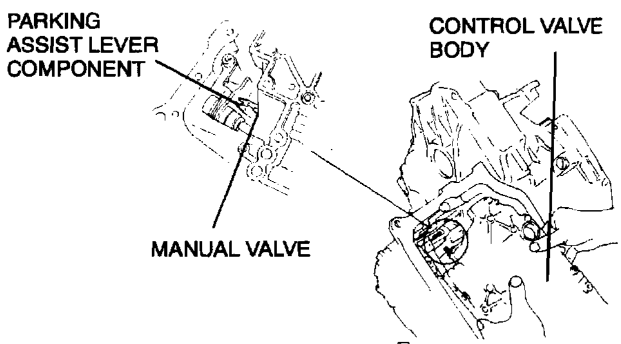


8. Remove the accumulators and accumulator springs.



CONTROL VALVE BODY INSTALLATION
On-Vehicle Installation

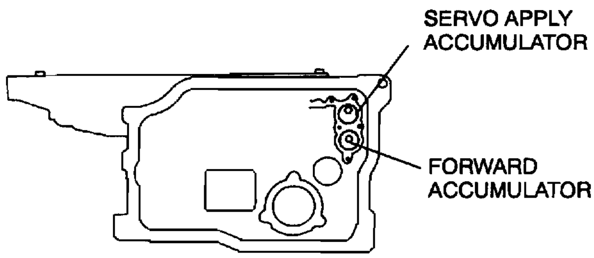
Caution
- **Be sure to align the parking rod and the manual valve.**

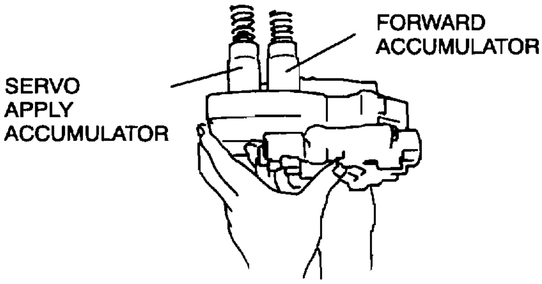


1. Install the accumulator springs and accumulators into the transaxle case.

Accumulator springs specification

Spring	Outer diameter (mm {in})	Free length (mm {in})	No. of coils	Wire diameter (mm {in})
Servo apply accumulator large spring	21.0 {0.827}	67.8 {2.669}	10.3	3.5 {0.138}
Servo apply accumulator small spring	13.0 {0.512}	67.8 {2.669}	17.1	2.2 {0.087}
Forward accumulator large spring	21.0 {0.827}	75.0 {2.953}	10.7	2.3 {0.091}
Forward accumulator small spring	15.6 {0.614}	55.0 {2.165}	12.9	2.4 {0.094}

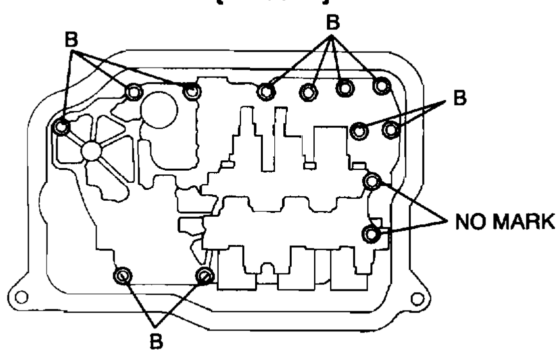




2. Install the control valve body component.

Tightening torque
7.9—10.7 N·m
{80—110 kgf·cm, 70—95.4 in·lbf}

Bolt length (measured from below the head)
B: 40 mm {1.575 in}
No mark: 70 mm {2.756 in}

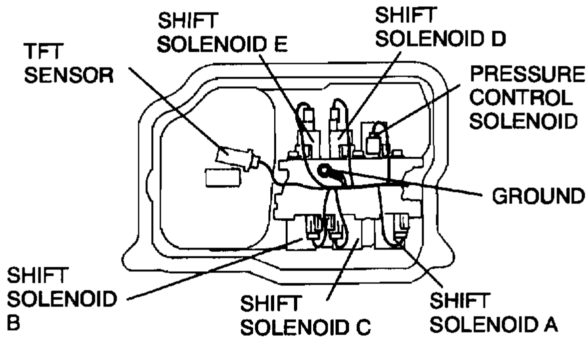


3. Install the oil strainer.
4. Match the harness colors, then connect the solenoid connector and TFT sensor connector.

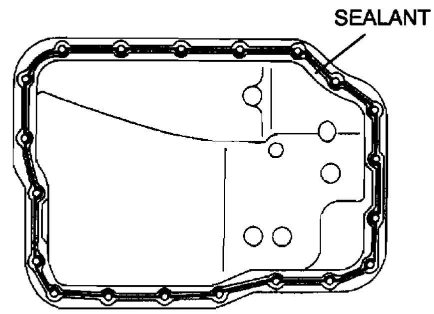
Solenoid valve	Color of connector (harness side)
Pressure control solenoid	Black
Shift solenoid A	White
Shift solenoid B	Blue
Shift solenoid C	Green
Shift solenoid D	White
Shift solenoid E	Black

5. Install the ground.

Tightening torque
7.9—10.7 N·m {80—110 kgf·cm, 70—95.4 in·lbf}

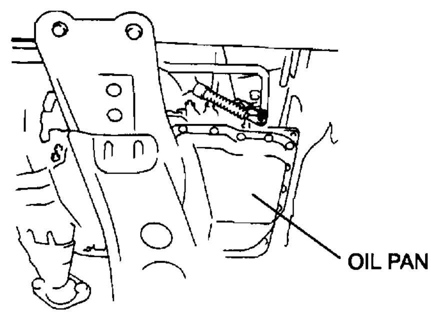


6. Apply a light coat of silicon sealant to the contact surfaces of the oil pan and transaxle case.



7. Install the oil pan.

Tightening torque
5.9—7.8 N·m
{60—80 kgf·cm, 53—69 in·lbf}

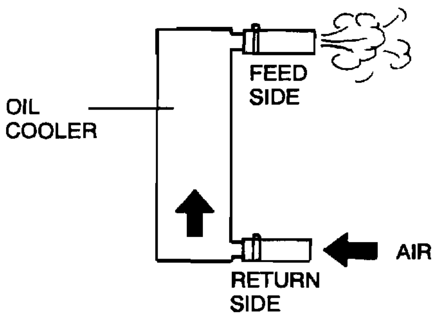


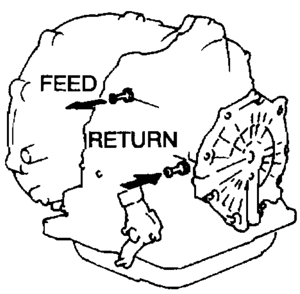
8. Install the splash shield.
9. Connect the negative battery cable.
10. Add ATF and with the engine idling, inspect the ATF level. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
11. Carry out the mechanical system test. (See K2-21 MECHANICAL SYSTEM TEST.)
12. Carry out the road test. (Refer to K2-24 ROAD TEST.)

OIL COOLER FLUSHING

Note
- The contaminated cooler line (oil pipes and hoses) and auxiliary cooler (if equipped) must be flushed completely when ATX is overhauled or replaced.

1. Remove the two oil cooler line hoses and apply air pressure of **196 kPa {2.0 kgf/cm^2, 28 psi}** from the return hose (pipe) side.





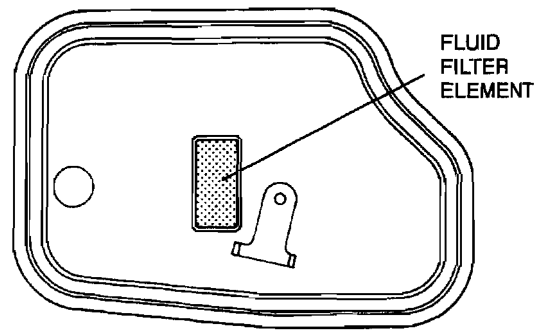
Caution
- **Power flushing should be performed very carefully when removing the accumulated debris from the fluid baffle, otherwise the debris cannot be removed or the problem becomes even worse.**

2. If there is no ventilation, flush the oil cooler lines using the power-flushing tool. (See K2-48 OIL COOLER FLUSHING, Power Flushing)

Recommended Power-flushing Manufacturer

Manufacturer	Part number	Description
Kent More	J35944-AMAZ	Flushing kit or equivalent
OTC	60081	Portable torque converter, oil cooler cleaner or equivalent

3. If there is ventilation, carry out the following steps.
   (1) Remove the oil pan and inspect the fluid filter element from the front filter.



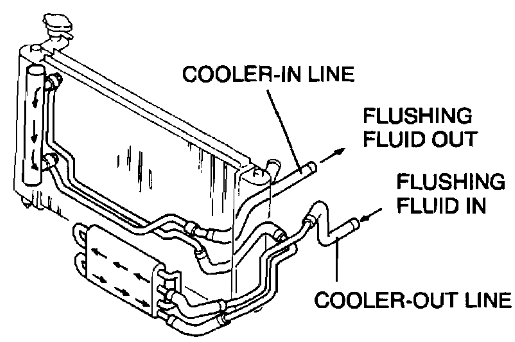
   (2) If the element is covered with too much debris or particles and cannot be seen, replace the oil cooler. (See K2-49 OIL COOLER REMOVAL/INSTALLATION.) (See K2-51 OIL COOLER DISASSEMBLY/ASSEMBLY.)
   (3) If the element can be seen, flush the oil cooler lines using the power-flushing tool.
   - Performing back and reverse power flushing two times each does not work because debris or particles flow out from the feed pipe side of ATX.

Power Flushing
Repair procedure
1. Before power flushing, inspect the hoses/lines and clamps. Power flushing must begin with back flushing followed by forward flushing to quickly dislodge the restriction. If back flushing is not performed before forward flushing, the restriction could further reduce the ATF flow through the internal mesh type baffle of the cooler and flushing will not be effective or possible.

Inspecting oil lines & clamps
1. Be sure to inspect the lines (hoses/pipes) for cuts, crimps (pinched), cracks or any other damage before reusing them.
   - If any problems exist, replace lines and clamps.

Caution
- **Always use new clamps when replacing hoses.**

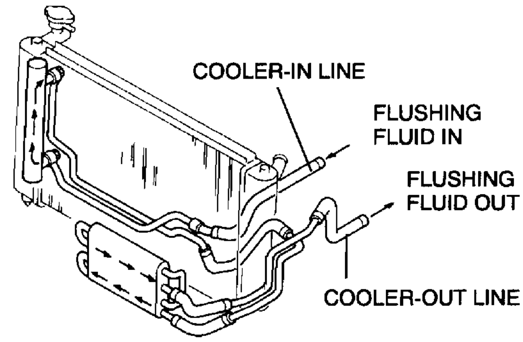
Back flushing
1. Using the power flushing equipment manufacturer's instructions, connect equipment so the flushing fluid flows in the opposite direction of normal fluid flow.



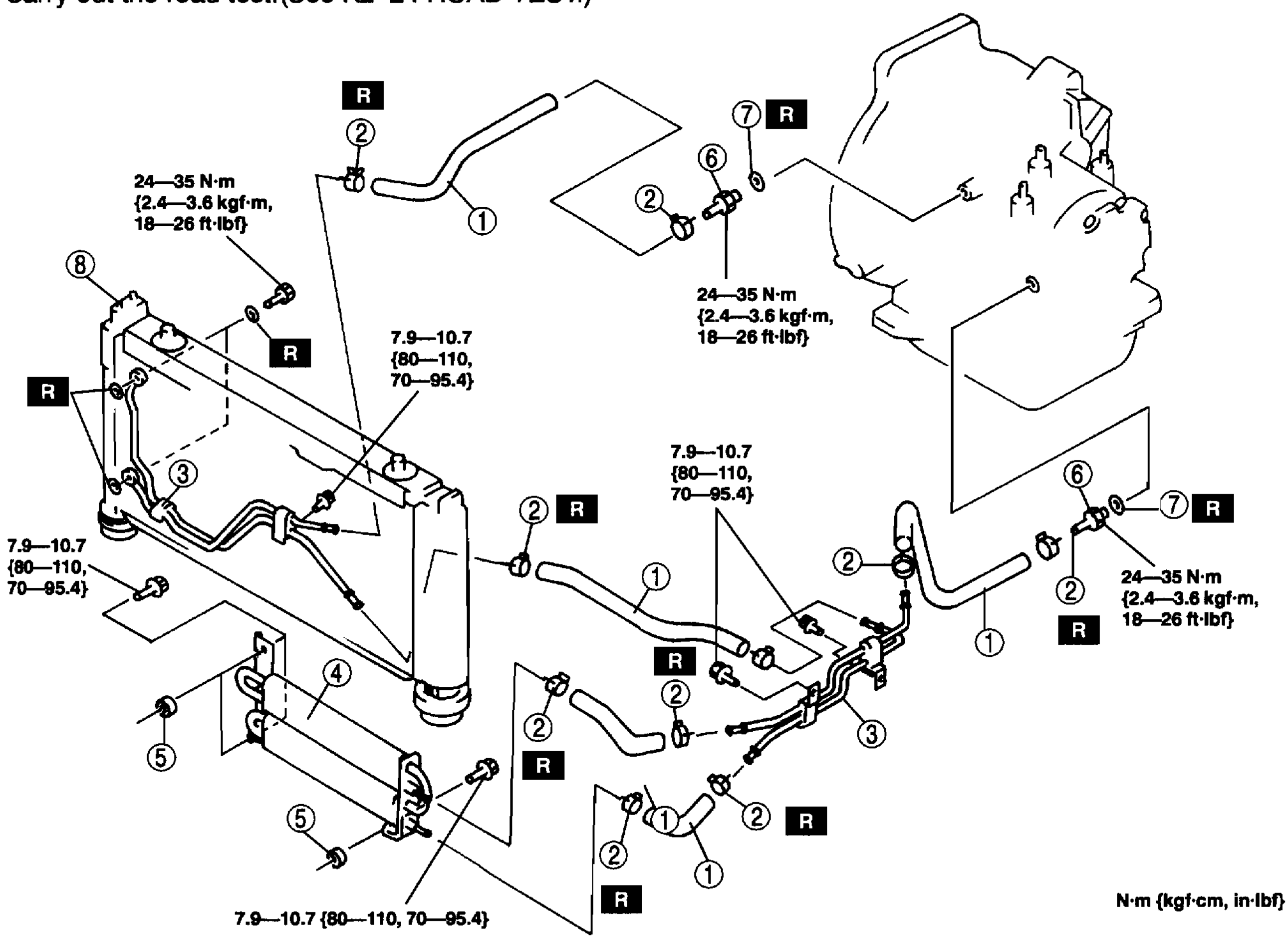
2. Flush oil cooler/lines until discharge fluid is clean.

Caution
- **If the cooler can not be properly flushed using recommended equipment, send the radiator out for sublet cleaning or replace.**

Forward flushing
1. Connect power flushing equipment so the flushing fluid flows in the direction of normal fluid flow.
2. Flush oil cooler/lines until discharge fluid is clean.



OIL COOLER REMOVAL/INSTALLATION
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.
3. Add ATF to the specified level.(See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4. Carry out the mechanical system test. (See K2-21 MECHANICAL SYSTEM TEST.)
5. Carry out the road test.(See K2-24 ROAD TEST.)



1	Oil hose See K2-50 Oil Pipe, Hose Clamp, Oil Hose Installation Note	4	Oil cooler
2	Hose clamp See K2-50 Oil Pipe, Hose Clamp, Oil Hose Installation Note	5	Rubber
3	Oil pipe See K2-50 Oil Pipe, Hose Clamp, Oil Hose Installation Note	6	Connector bolt
		7	O-ring
		8	Radiator (In tank oil cooler) See K2-50 Radiator (In Tank Oil Cooler) Installation Note

Radiator (In Tank Oil Cooler) Installation Note

1. The automatic transaxle oil cooler flushing must be performed whenever a transaxle is removed for service because the existing fluid may be contaminated, and to prevent contamination of new fluid.

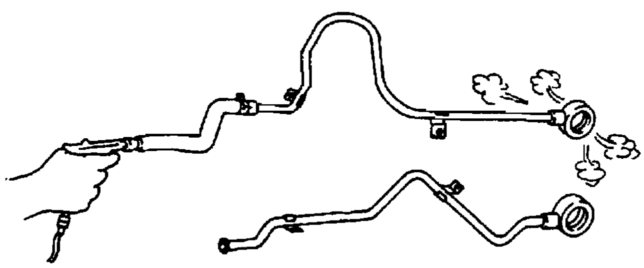
Note

- The flushing must be performed after installation of the overhauled or replacing transaxle.

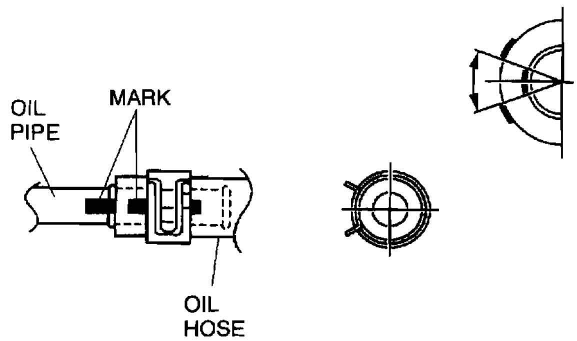
2. Follow the instructions in the manufacturer's publication for flushing operation.

Oil Pipe, Hose Clamp, Oil Hose Installation Note

1. Apply compressed air to cooler-side opening, and blow any remaining grime and foreign material from the cooler pipes. Compressed air should be applied for no **less than one minute**.



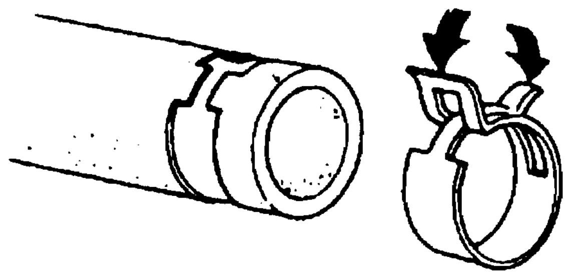
2. Align the marks, and slide the oil hose onto the oil pipe until it is fully seated as shown.



Note

- If reusing the hose, install the new hose clamp exactly on the mark left by the previous hose clamp.Then apply force to the hose clamp in the direction of the arrow in order to fit the clamp in the place.

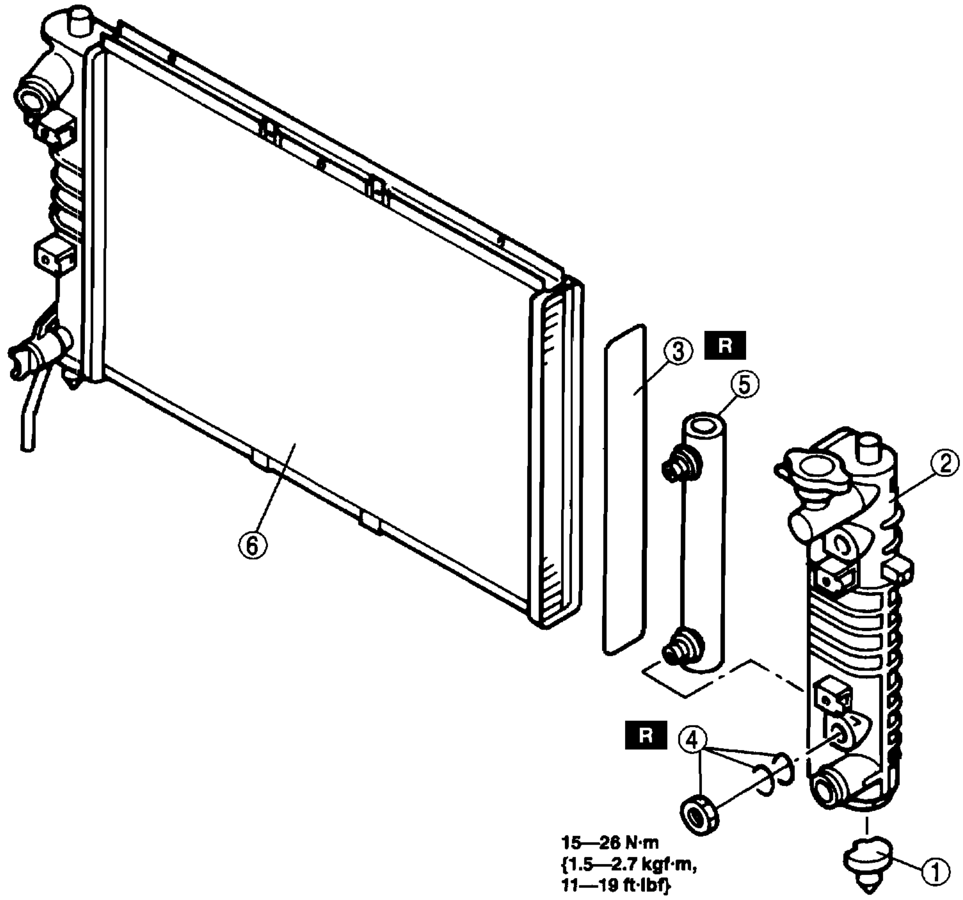
3. Install the new hose clamp onto the hose.



4. Verify that the hose clamp does not interfere with any other components.

OIL COOLER DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

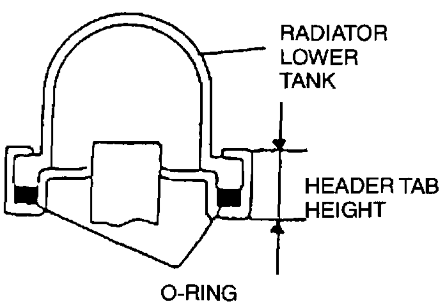


1	Mount rubber
2	Radiator outer tank (in tank oil cooler) See K2-51 Radiator Outer Tank (In Tank Oil Cooler) Removal Note See K2-52 Radiator Outer Tank (In Tank Oil Cooler) Installation Note

3	O-ring
4	Nut set
5	ATF cooler
6	Radiator

Radiator Outer Tank (In Tank Oil Cooler) Removal Note

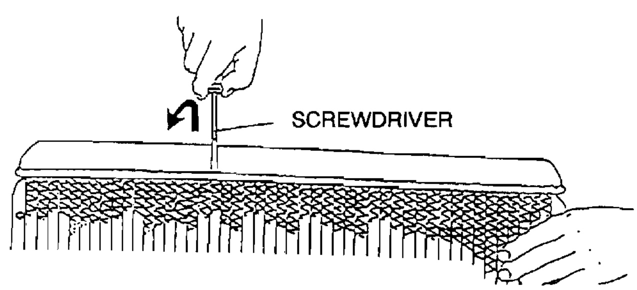
1. Inspect the height of the header tabs.



2. Insert the end of a medium tip screwdriver between the end of the header tab and the outer tank.

Note
- Do not open more tabs than necessary for tank removal.

3. Pivot the screwdriver to pry the tab away from the tank and repeat the procedure for each tab.



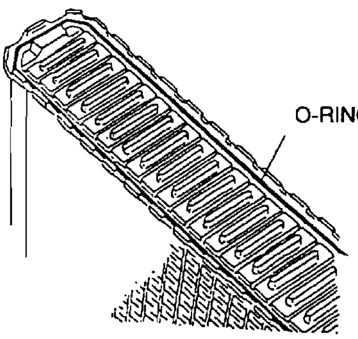
4. Remove the radiator outer tank and O-ring (gasket) from the core header when all of the tabs are opened.

Note
- If any header tabs are missing from the core, replace the radiator.

5. Inspect the gasket surface of the radiator core header to ensure it is clean and free of foreign material or damage.
6. Inspect the radiator outer tank for warping. If it is warped, replace radiator tank.

Radiator Outer Tank (In Tank Oil Cooler) Installation Note
1. Install a new O-ring and ensure it is not twisted.

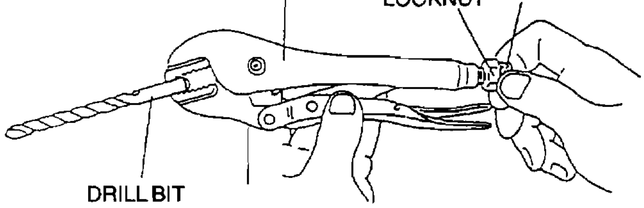
Note
- The old O-ring must be replaced.



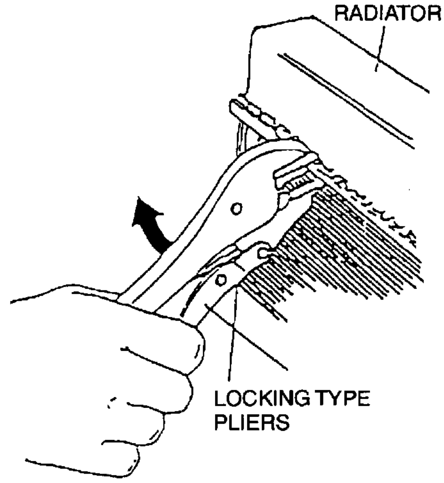
2. Position the radiator tank in the original direction to the core using care not to scratch the tank sealing surface with the header tabs.

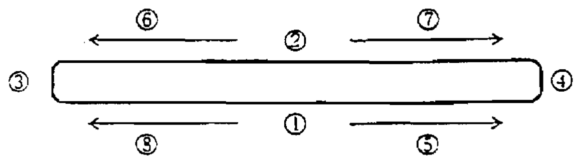
Note
- Step 3 will set jaw opening to the correct specification.

3. With the jaws of locking-type pliers (vise grips) closed and locked, turn the adjusting screw to position the jaws against the drill bit with the diameter measured (height) in removal procedure 1. Tighten the lock nut on the adjusting screw against the handle to lock the adjustment in place.

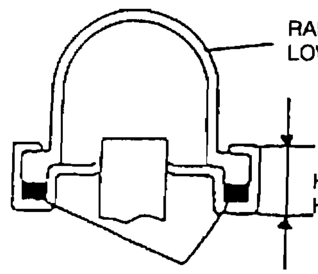


4. Squeeze the header tabs down in order as shown against the lip of radiator outer tank base with locking-type pliers while rotating the pliers toward the tank.



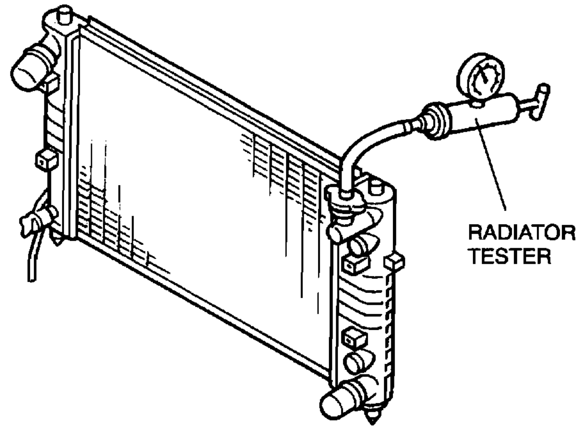


5. Verify the height of the header tabs is same as the height before removal.

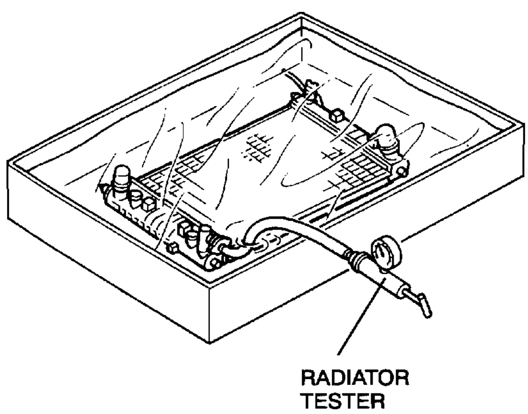


6. Inspect for leakage from radiator according to the following procedure.
   (1) Cover the radiator inlet and outlet.
   (2) Cover the ATF cooler inlet and outlet.
   (3) Cover the reservoir inlet.
   (4) Connect a radiator tester.

(5) Apply pressure of **145 kPa {1.5 kgf/m², 21 psi}** and verify that the pressure is held.



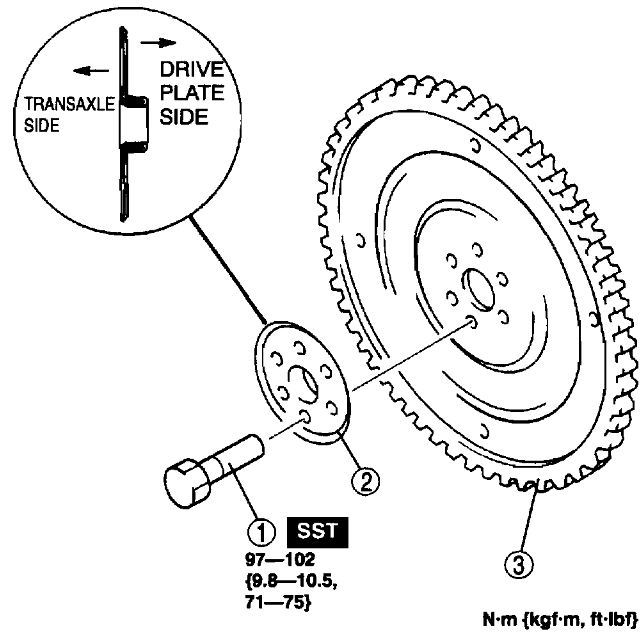
(6) Put the radiator into water slowly with the radiator tester connected.



(7) Inspect for air leakage.

DRIVE PLATE REMOVAL/INSTALLATION

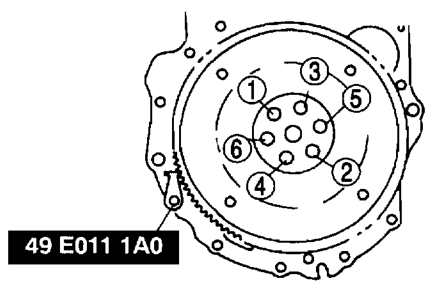
1. Remove the transaxle.(See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



1	Drive plate mounting bolts See K2-53 Drive Plate Mounting Bolts Removal Note	
2	Adapter	
3	Drive plate See K2-53 Drive Plate Installation Note	

Drive Plate Mounting Bolts Removal Note

1. Set the **SST** or equivalent against the drive plate.



2. Remove the drive plate mounting bolts.

Drive Plate Installation Note

Caution
- **If the bolts are reused, remove the oil sealant from the bolt threads. Tightening a bolt that has old sealant on it can cause thread damage.**

1. Remove the sealant from the bolts hole in the crankshaft and from the drive plate mounting bolts.

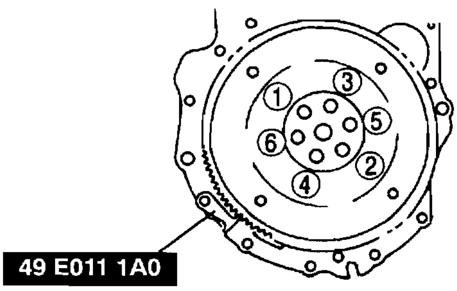
Note
- If all the previous sealant cannot be removed from a bolt, replace the bolts.
- Do not apply sealant if a new bolts is used.

2. Install the drive plate.
3. Install the adapter.
4. Apply sealant to the drive plate mounting bolts and install them.
5. Set the **SST** or equivalent against the drive plate.

Caution
- **When installing sealant covered bolts, tighten them immediately. Leaving these bolts in a half installed condition could cause them to be stuck that way, due to the natural hardening or the sealant.**

6. Tighten the drive plate installation bolts in two or three steps as shown.

Tightening torque
97—102 N·m {9.8—10.5 kgf·m,71—75 ft·lbf}

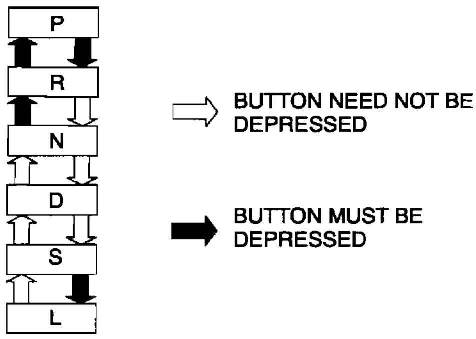


7. Install the transaxle. (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)

SHIFT MECHANISM

SELECTOR LEVER INSPECTION (ON-VEHICLE INSPECTION)

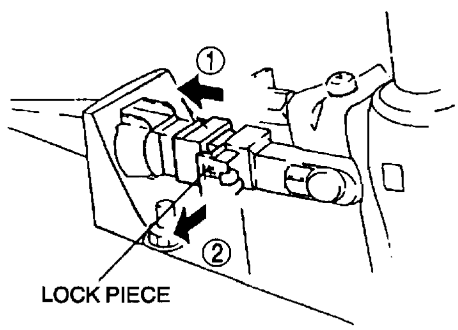
1. Turn the ignition switch to ON (engine OFF).
2. With the brake pedal depressed, verify that there is a "click" at each range when shifted.
3. Verify that the selector lever can be shifted.
4. Verify that there is a "click" at each position when shifted from P position to L range.



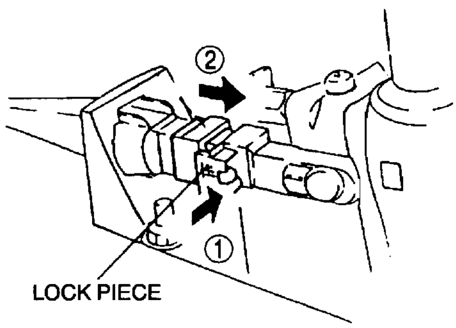
5. Verify that the positions of the selector lever and the indicator are aligned.
6. Verify that the position of the selector lever is aligned.
   - If not as specified, adjust the TR switch.(See K2-33 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT.)
7. Verify that the vehicle operates in each selected range.

SELECTOR CABLE ADJUSTMENT

1. Remove the center console.
2. Shift the selector lever to P position.
3. Unlock the lock piece of the selector cable (selector lever side) in the order shown in the figure.



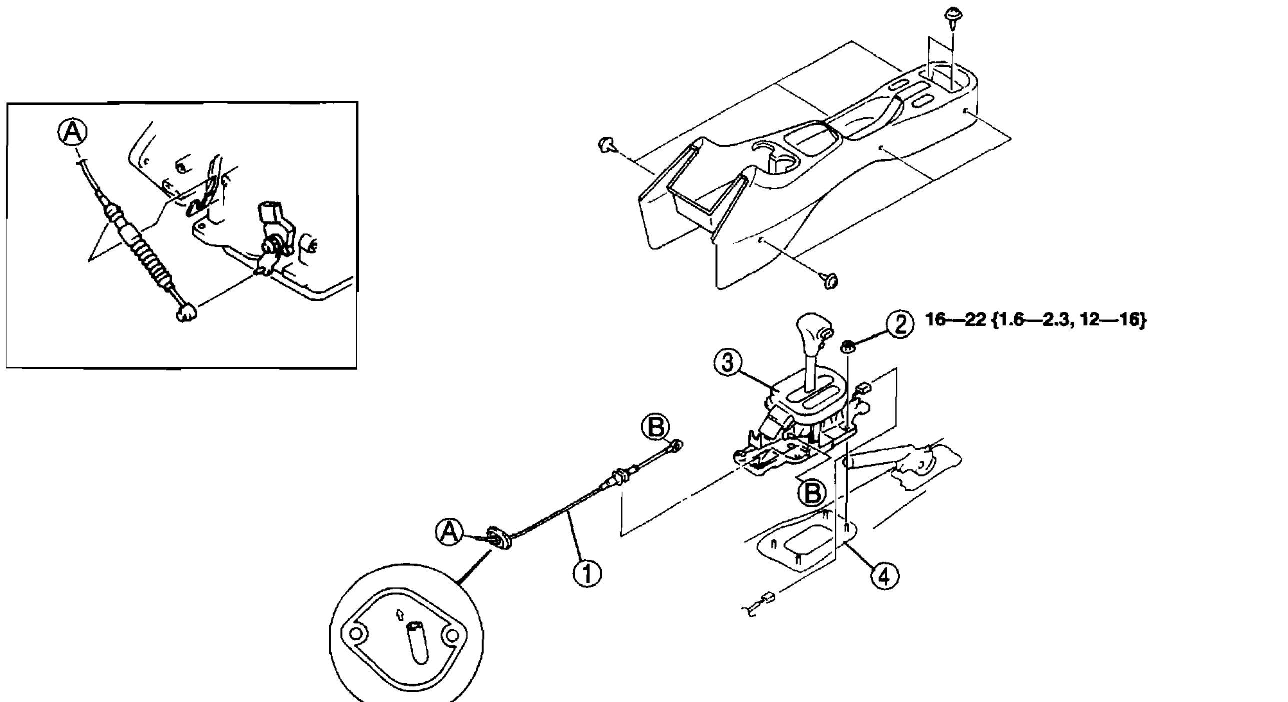
4. Verify that the manual shaft is in P position.
5. Lock the lock piece of the selector cable (selector lever side) in the order shown in the figure.



6. Install the center console.
7. Shift the selector lever from P position to L range, and make sure that there are no other components in that area to interfere the lever.

SELECTOR LEVER REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the center console.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.
5. Install the center console.



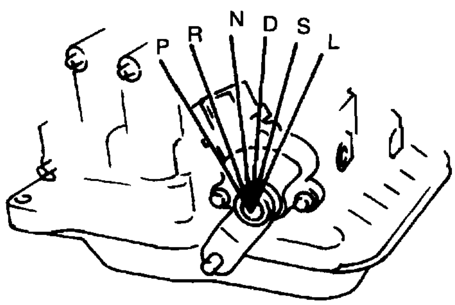
N·m {kgf·m, ft·lbf}

1	Selector cable See K2-56 Selector Cable Installation Note
2	Nut

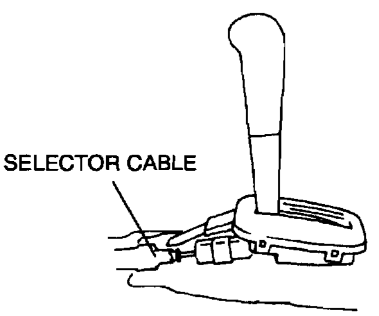
3	Selector lever
4	Seal rubber

Selector Cable Installation Note

1. Shift the manual shaft to P position.



2. Install the selector cable to the selector lever.

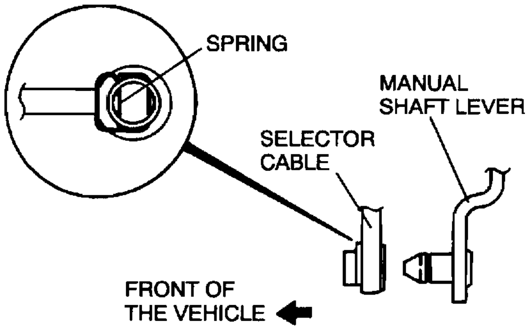


Caution

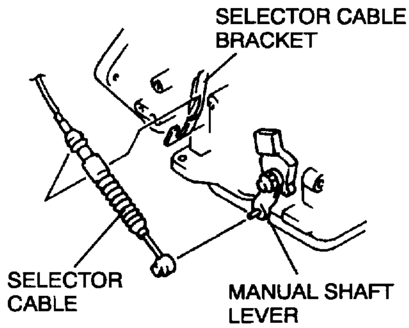
- **Bending the selector cable in the manner shown in the figure will damage the cable and it may become loose when shifted. When installing the selector cable, hold it straight.**

Note

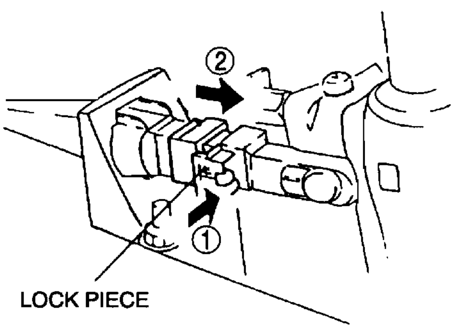
- Install the selector lever to the manual shaft lever with the spring side of the selector cable end facing the front of the vehicle.



3. Install the selector lever to the manual shaft lever in such a way that the selector cable does not bear a load.
4. Confirm that the end of the manual shift lever sticks out of the end of the selector cable.
5. Install the selector cable to the selector cable bracket.



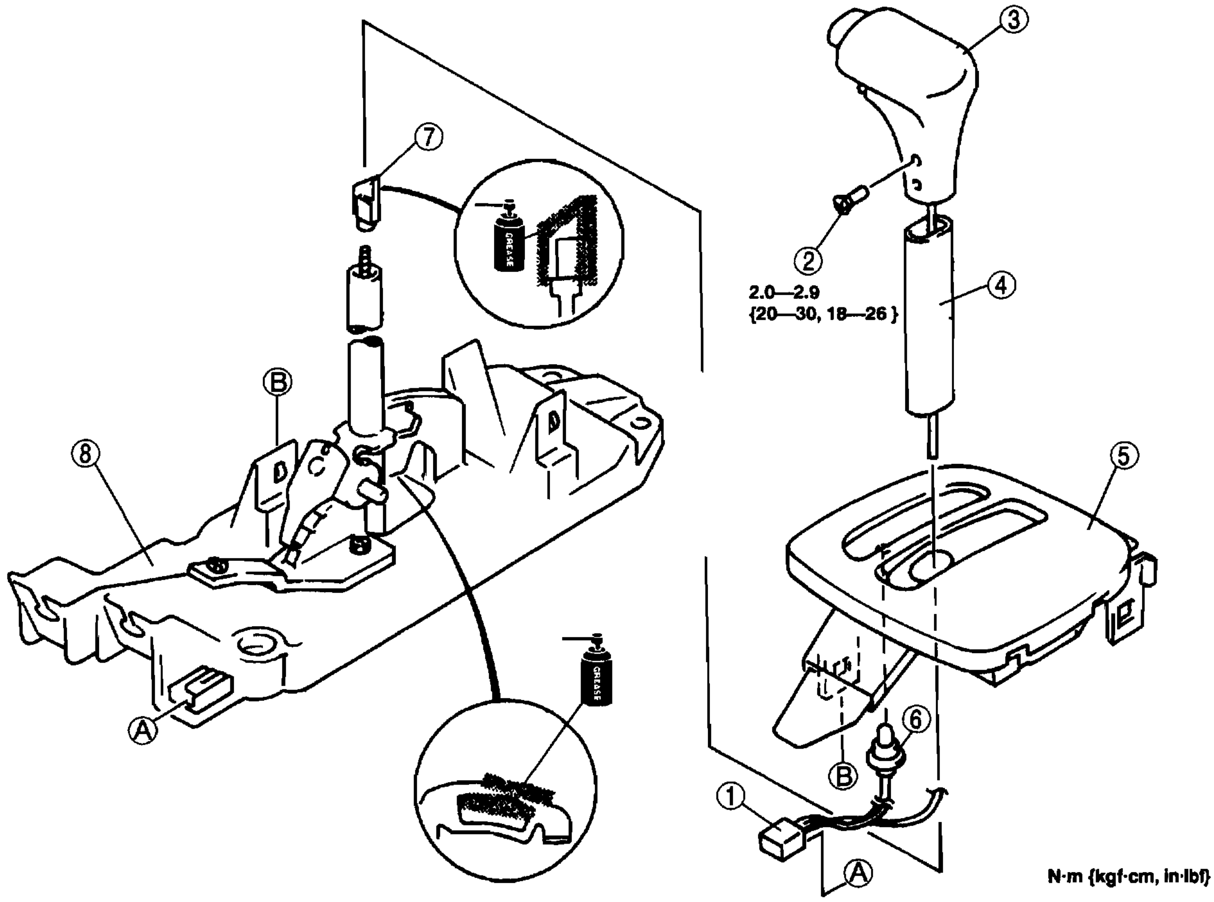
6. Verify that the selector lever to P position.
7. Unlock the lock piece of the selector cable (selector lever side) in the order shown in the figure.



8. Shift the selector lever from P position to L range, and make sure that other components that area to there is no interfere the lever.

SELECTOR LEVER DISASSEMBLY/ASSEMBLY

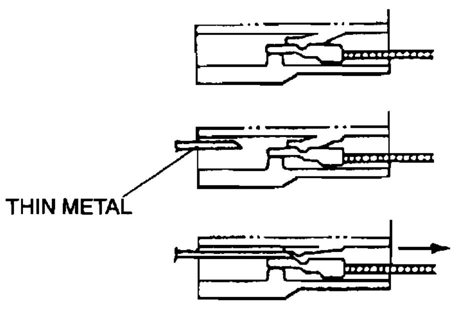
1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



1	Connector See K2-58 Connector Disassembly Note
2	Screw
3	Selector lever knob component
4	Cover
5	Indicator panel
6	Selector illumination light
7	Cam See K2-58 Cam Assembly Note
8	Selector lever

Connector Disassembly Note

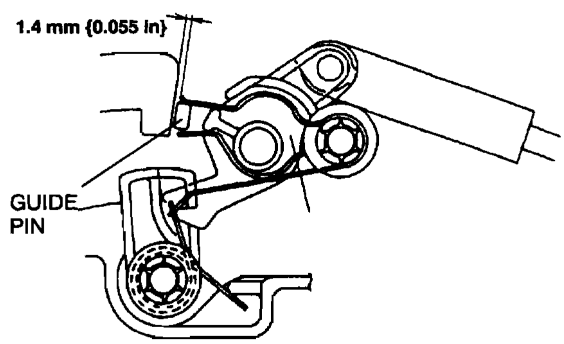
1. Insert a thin metal from the terminal side of the connector, and press down the terminal locking tab.



2. Pull the terminal out of the connector.

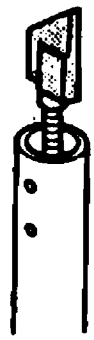
Cam Assembly Note

1. Loosely install the cam to the push rod.
2. Adjust the clearance between the guide plate and the guide pin by turning the cam.



3. Clearance can be reduced by turning the cam clockwise.
4. Install the selector lever knob and verify that the clearance is as specified.
   - If not as specified, repeat from Step 2.
5. Remove the selector lever knob.

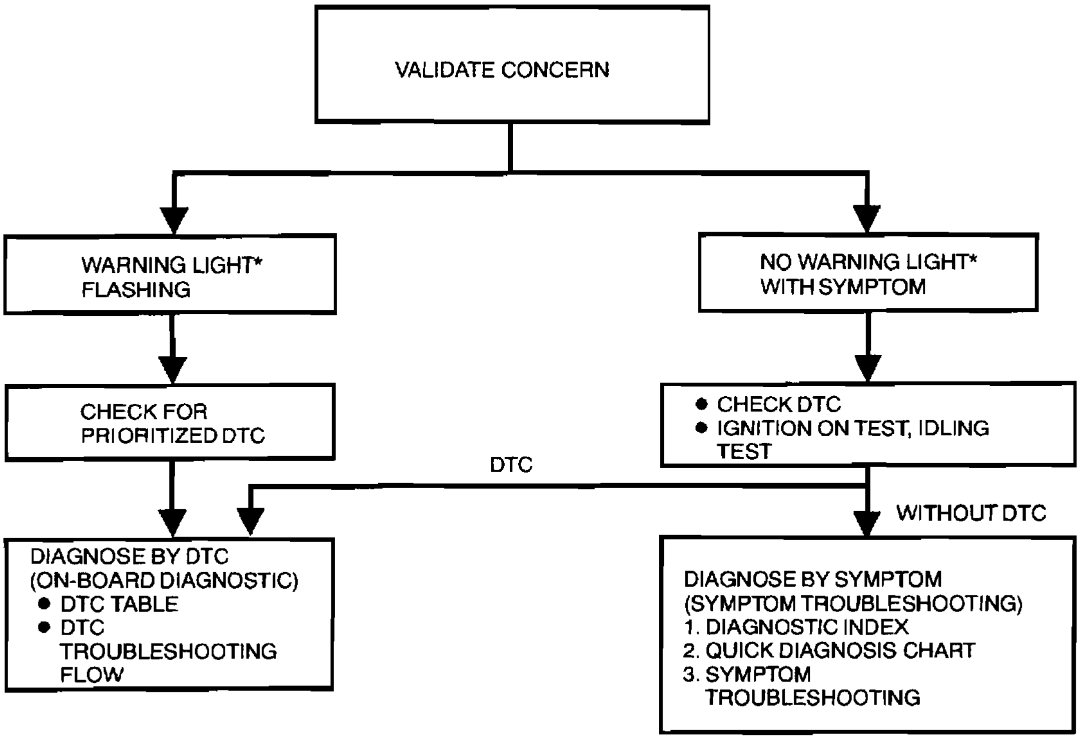
6. Apply grease to the cam as shown.



ON-BOARD DIAGNOSTIC

FOREWORD

- When the customer reports a vehicle malfunction, check the HOLD indicator light flashing, and PCM memory for diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - If the DTC exists, diagnose the applicable DTC. (See K2-62 DTC TABLE.)
  - If the DTC does not exist and the HOLD indicator light flashes, diagnose the applicable symptom troubleshooting. (See K2-136 SYMPTOM TROUBLESHOOTING ITEM TABLE.)



*:HOLD indicator light

AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION

DTC Reading Procedure

(See Section F1.)

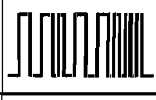
AFTER REPAIR PROCEDURE

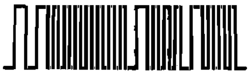
Caution

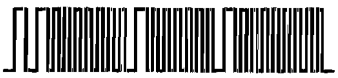
- **After repairing a malfunction, perform this procedure to verify that the malfunction has been corrected.**
- **When this procedure is carried out, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.**

1. Connect the **SSTs** (NGS tester) to the DLC.
2. Turn the ignition key to ON (engine OFF).
3. Select the clear code function and clear the DTC.
4. Perform the following trouble code inspections to ensure that the DTC has been resolved:
   - For P0500
     - i. Start the engine.
     - ii. Warm up the engine coolant temperature **60 ° C {140 ° F} or above**.
     - iii. Access ECT, D SW, 1GR, and TURBINE, PIDs using the **SSTs** (NGS tester).
     - iv. Drive vehicle under following conditions for **4.5 seconds or more** while monitoring PIDs.
       - — ECT PID: **60 ° C {140 ° F} or above**
       - — D SW PID: ON
       - — 1GR PID: ON
       - — TURBINE PID: **1,500 rpm or above**
     - v. Go to Step 5.
   - For P0705
     - i. Start the engine.
     - ii. Access RPM, D SW, S SW, L SW, R SW, and NL SW PIDs using **SSTs** (NGS tester).
     - iii. Drive vehicle in each range (P, R, N, D, S, and L) for **100 seconds or more** under following condition.
       - — RPM PID: **530 rpm or above**
     - iv. Go to Step 5.
   - For P0706
     - i. Start the engine.
     - ii. Access RPM, VS, D SW, S SW, and L SW PIDs using **SSTs** (NGS tester).
     - iii. Drive vehicle in each range (D, S, and L) for **100 seconds or more** while monitoring PIDs.
       - — RPM PID: **530 RPM or above**
       - — VS PID: **20 km/h {12 mph} or above**
     - iv. Go to Step 5.
   - For P0710
     - i. Start the engine.
     - ii. Access VS PID using **SSTs** (NGS tester).
     - iii. Drive vehicle under following for condition **150 seconds or more** while monitoring PID.
       - — VS PID: **20 km/h {12 mph} or above**
     - iv. Go to Step 5.
   - For P0711
     - i. Decrease ATF temperature to **20 ° C {68 ° F} or below.**
     - ii. Start the engine.
     - iii. Access VS PID using **SSTs** (NGS tester).
     - iv. Drive vehicle under following condition for **330 seconds or more** while monitoring PIDs.
       - — VS PID: **60 km/h {37 mph} or above**
     - v. Go to Step 5.
   - For P0715
     - i. Start the engine.
     - ii. Access VS PID using **SSTs** (NGS tester).
     - iii. Drive vehicle under following condition for **1 second or more** while monitoring PID.
       - — VS PID: **40 km/h {25 mph} or above**
     - iv. Go to Step 5.
   - For P0731, P0732, P0734, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0772, P0773
     - i. Start the engine.
     - ii. Warm up the engine and ATX.
     - iii. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR.
     - iv. Go to Step 5.
   - For P0741
     - i. Start the engine.
     - ii. Warm up the engine and ATX.
     - iii. Drive the vehicle in D range and make sure that the TCC is operated. (Verify the engine speed fluctuation at TCC.)
   - Go to Step 5.
   - For P0742
     - i. Start the engine.
     - ii. Warm up the engine and ATX.
     - iii. Verify the TCC is not engaged in TCC off range and 4GR.
     - iv. Go to Step 5.
   - For P0745
     - i. Make sure to wait **more than 1 second** after turning ignition key to ON.
     - ii. Go to Step 5.
5. Gradually slow down and stop the vehicle.
6. Make sure that the repaired DTC does not recur.

DTC TABLE

DTC No.	Output Pattern	Condition	HOLD indicator light flashes	Page
P0102		MAF circuit low input	(See F1-41 DTC P0102.)	
P0103		MAF circuit high input	(See F1-43 DTC P0103.)	
P0112		IAT circuit low input	(See F1-45 DTC P0112.)	
P0113		IAT circuit high input	(See F1-47 DTC P0113.)	
P0117		ECT circuit low input	(See F1-49 DTC P0117.)	
P0118		ECT circuit high input	(See F1-51 DTC P0118.)	
P0122		TP circuit low input	(See F1-53 DTC P0122.)	
P0123		TP circuit high input	(See F1-55 DTC P0123.)	
P0134		HO2S circuit no activity detected	(See F1-57 DTC P0134.)	
P0135		HO2S heater circuit malfunction	(See F1-59 DTC P0135.)	
P0328		Knock sensor circuit high input	(See F1-61 DTC P0328.)	
P0335		CKP sensor circuit malfunction	(See F1-62 DTC P0335.)	
P0443		Evaporative emission control system purge solenoid valve circuit malfunction	(See F1-64 DTC P0443.)	
P0500		VSS circuit malfunction	YES	(See K2-66 DTC P0500.)
P0705		Transaxle range (TR) switch circuit malfunction (Short circuit) (ATX)	YES	(See K2-69 DTC P0705.)
P0706		Transaxle range (TR) switch circuit malfunction (Open circuit)	YES	(See K2-72 DTC P0706.)
P0710		Transaxle fluid temperature (TFT) sensor circuit malfunction (open or short)	YES	(See K2-75 DTC P0710.)

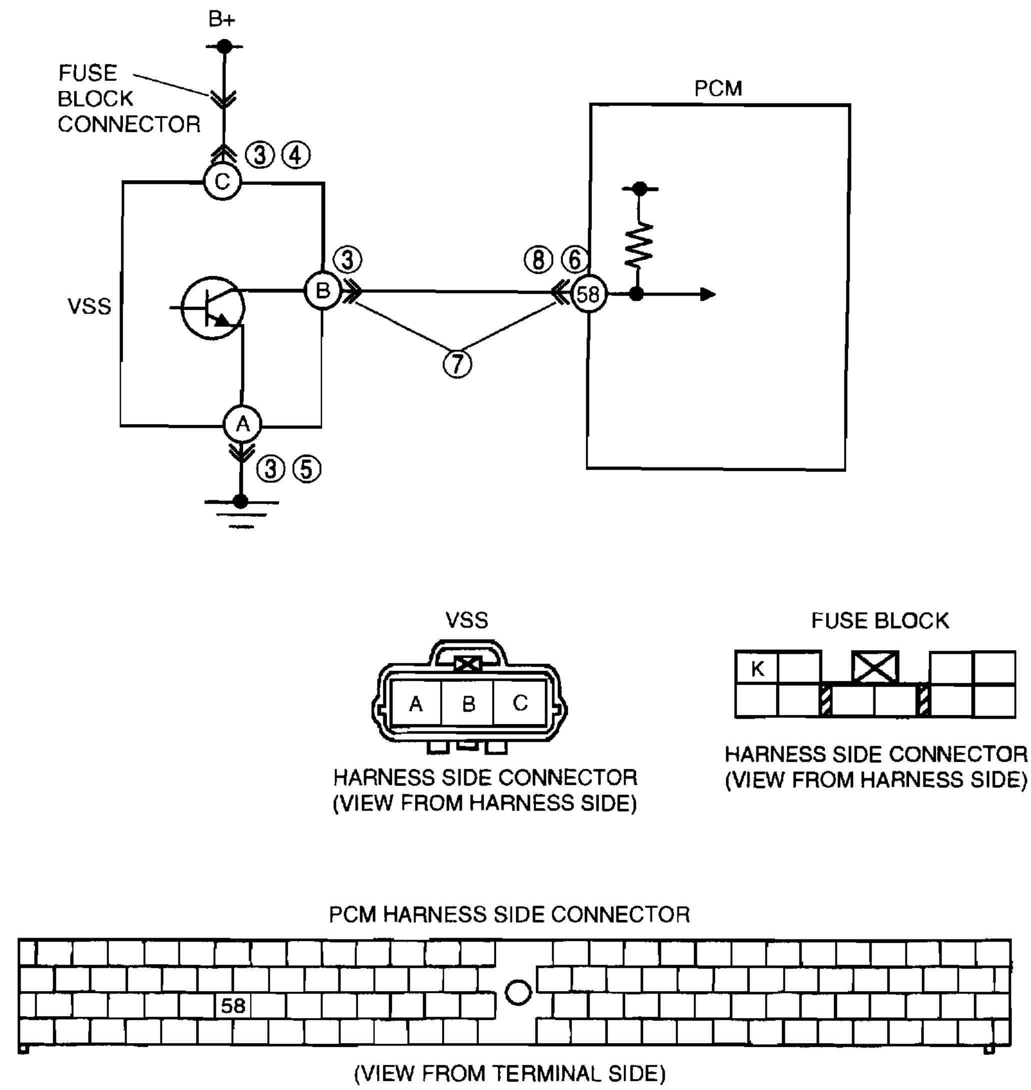
DTC No.	Output Pattern	Condition	HOLD indicator light flashes	Page
P0711		Transaxle fluid temperature (TFT) sensor circuit range performance (Stuck)	NO	(See K2-78 DTC P0711.)
P0715		Input/turbine speed sensor circuit malfunction	YES	(See K2-79 DTC P0715.)
P0731		Gear 1 incorrect	YES	(See K2-82 DTC P0731.)
P0732		Gear 2 incorrect	YES	(See K2-84 DTC P0732.)
P0733		Gear 3 incorrect	YES	(See K2-86 DTC P0733.)
P0734		Gear 4 incorrect	YES	(See K2-88 DTC P0734.)
P0741		Torque converter clutch (TCC) (stuck off)	YES	(See K2-90 DTC P0741.)
P0742		Torque converter clutch (TCC) (stuck off)	YES	(See K2-92 DTC P0742.)
P0745		Pressure control solenoid valve malfunction	YES	(See K2-94 DTC P0745.)
P0751		Shift solenoid A malfunction (stuck off)	YES	(See K2-97 DTC P0751.)
P0752		Shift solenoid A malfunction (stuck on)	YES	(See K2-99 DTC P0752.)
P0753		Shift solenoid A malfunction (electrical)	YES	(See K2-101 DTC P0753.)
P0756		Shift solenoid B malfunction (stuck off)	YES	(See K2-104 DTC P0756.)
P0757		Shift solenoid B malfunction (stuck on)	YES	(See K2-106 DTC P0757.)
P0758		Shift solenoid B malfunction (electrical)	YES	(See K2-108 DTC P0758.)
P0761		Shift solenoid C malfunction (stuck off)	YES	(See K2-111 DTC P0761.)
P0762		Shift solenoid C malfunction (stuck on)	YES	(See K2-113 DTC P0762.)

DTC No.	Output Pattern	Condition	HOLD indicator light flashes	Page
P0763		Shift solenoid C malfunction (electrical)	YES	(See K2-115 DTC P0763.)
P0766		Shift solenoid D malfunction (stuck off)	YES	(See K2-118 DTC P0766.)
P0767		Shift solenoid D malfunction (stuck on)	YES	(See K2-120 DTC P0767.)
P0768		Shift solenoid D malfunction (electrical)	YES	(See K2-122 DTC P0768.)
P0771		Shift solenoid E malfunction (stuck off)	YES	(See K2-125 DTC P0771.)
P0772		Shift solenoid E malfunction (stuck on)	YES	(See K2-127 DTC P0772.)
P0773		Shift solenoid E malfunction (electrical)	YES	(See K2-129 DTC P0773.)
P1170		HO2S no inversion	(See F1-66 DTC P1170.)	
P1250		Pressure regulator control (PRC) valve circuit malfunction	(See F1-68 DTC P1250.)	
P1345		CKP sensor circuit malfunction	(See F1-70 DTC P1345.)	
P1496		EGR valve motor coil 1 open or short	(See F1-72 DTC P1496.)	
P1497		EGR valve motor coil 2 open or short	(See F1-74 DTC P1497.)	
P1498		EGR valve motor coil 3 open or short	(See F1-76 DTC P1498.)	
P1499		EGR valve motor coil 4 open or short	(See F1-78 DTC P1499.)	
P1504		IAC valve circuit malfunction	(See F1-80 DTC P1504.)	
P1562		Battery voltage circuit malfunction	(See F1-82 DTC P1562.)	
P1602		Immobilizer unit-PCM communication error	(See F1-84 DTC P1602.)	

DTC No.	Output Pattern	Condition	HOLD indicator light flashes	Page
P1603		Key ID numbers are not registered in PCM	(See F1-87 DTC P1603.)	
P1604		Code word is not registered in PCM	(See F1-87 DTC P1604.)	
P1608		Malfunction in PCM circuit	(See F1-88 DTC P1608.)	
P1621		Code word mismatch after engine cranking	(See F1-89 DTC P1621.)	
P1622		Key ID number mismatch	(See F1-89 DTC P1622.)	
P1623		Code word or key ID number read/write error in PCM	(See F1-90 DTC P1623.)	
P1624		Immobilizer system communication counter=0	(See F1-90 DTC P1624.)	
P1627		PCM/TCM line-communication error	(See F1-91 DTC P1627.)	
P1631		Generator output voltage signal no electricity	(See F1-93 DTC P1631.)	
P1633		Battery overcharge	(See F1-95 DTC P1633.)	
P1634		Generator terminal B circuit open	(See F1-97 DTC P1634.)	

DTC P0500

DTC P0500	Vehicle speed sensor (VSS) malfunction
DETECTION CONDITION	• Vehicle speed signal not input after following conditions are met and **4.5 seconds or more** have passed. — **D, S, or L range switch ON.** — P and N position switch OFF. — Engine coolant temperature **60 ° C {140 ° F} or above.** — Turbine speed **1,500 rpm or above.**
POSSIBLE CAUSE	• VSS malfunction • Open circuit between VSS terminal B and PCM terminal 58 • Short to ground between VSS terminal B and PCM terminal 58 • Open circuit between VSS terminal C and fuse block connector terminal K • Open circuit between VSS terminal A and body ground • Damaged connectors between VSS and PCM • PCM malfunction



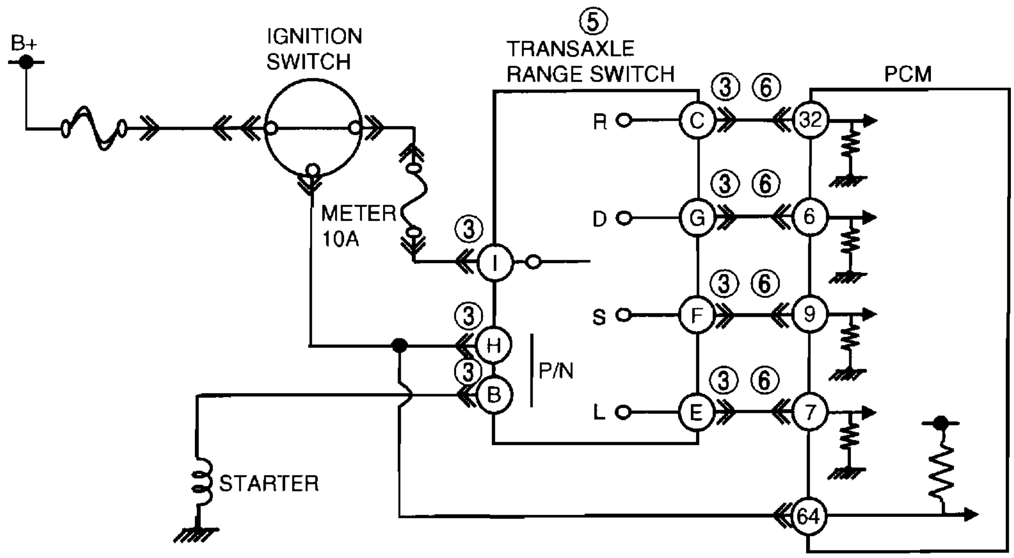
Diagnostic procedure

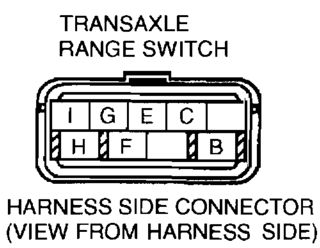
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Start engine. • Access VS PID using NGS tester. — Vehicle speed **20 km/h {12 mph}: 20 km/h {12 mph}** — Vehicle speed **40 km/h {25 mph}: 40 km/h {25 mph}** • Are PID readings within specification?	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF VSS CONNECTOR** • Turn ignition key to OFF. • Disconnect VSS connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace pin or connector, then go to Step 9.
4	**INSPECT VSS POWER CIRCUIT FOR OPEN** • Verify that VSS connector is disconnected. • Turn ignition key to ON (Engine OFF). • Check voltage between VSS terminal C (harness-side) and ground • Is battery voltage reading **B+**?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 9.
5	**INSPECT VSS GROUND CIRCUIT FOR OPEN** • Turn ignition key to OFF. • Verify that VSS connector is disconnected. • Check for continuity between VSS terminal A (harness-side) and ground • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 9.
6	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace pin or connector, then go to Step 9.
7	**INSPECT VSS SIGNAL CIRCUIT FOR OPEN** • Disconnect PCM connector and VSS connector. • Inspect for continuity between VSS terminal B and PCM terminal 58. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 9.
8	**INSPECT VSS SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verity that VSS connector and PCM connector are disconnected. • Inspect for continuity between PCM terminal 58 and body ground. • Is there continuity?	Yes	Repair or replace harness, then go to next step.
		No	Repair VSS, then go to next step.

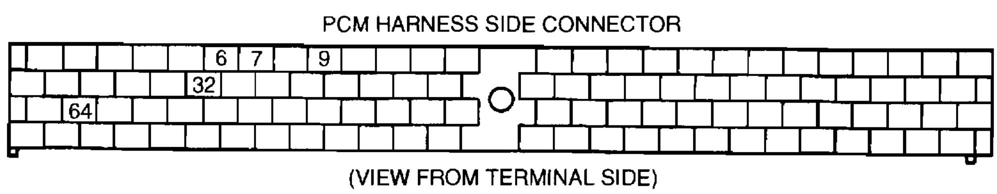
STEP	INSPECTION		ACTION
9	**VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Warm up engine. • Access TURBINE, 1GR, ECT, D SW, TR SW and D SW PIDs using NGS tester. • Drive vehicle under following conditions for **4.5 seconds or more** while monitoring PIDs. — ECT PID: **60 °C {140 °F} or above** — D SW PID: ON — TR SW PID: OFF — 1GR PID: ON — TURBINE PID: **1,500 rpm or above** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0705

DTC P0705	Transaxle range (TR) switch circuit malfunction (short circuit)
DETECTION CONDITION	• When all conditions below satisfied and **100 seconds or more** have passed: — Any of D, S or L range switch ON. — Engine speed **530 rpm or above**. — P/N position switch or R position switch ON.
POSSIBLE CAUSE	• TR switch malfunction • Short to power between TR switch terminal C and PCM terminal 32 • Short to power between TR switch terminal G and PCM terminal 6 • Short to power between TR switch terminal F and PCM terminal 9 • Short to power between TR switch terminal E and PCM terminal 7 • Damaged connector between TR switch and PCM • PCM malfunction







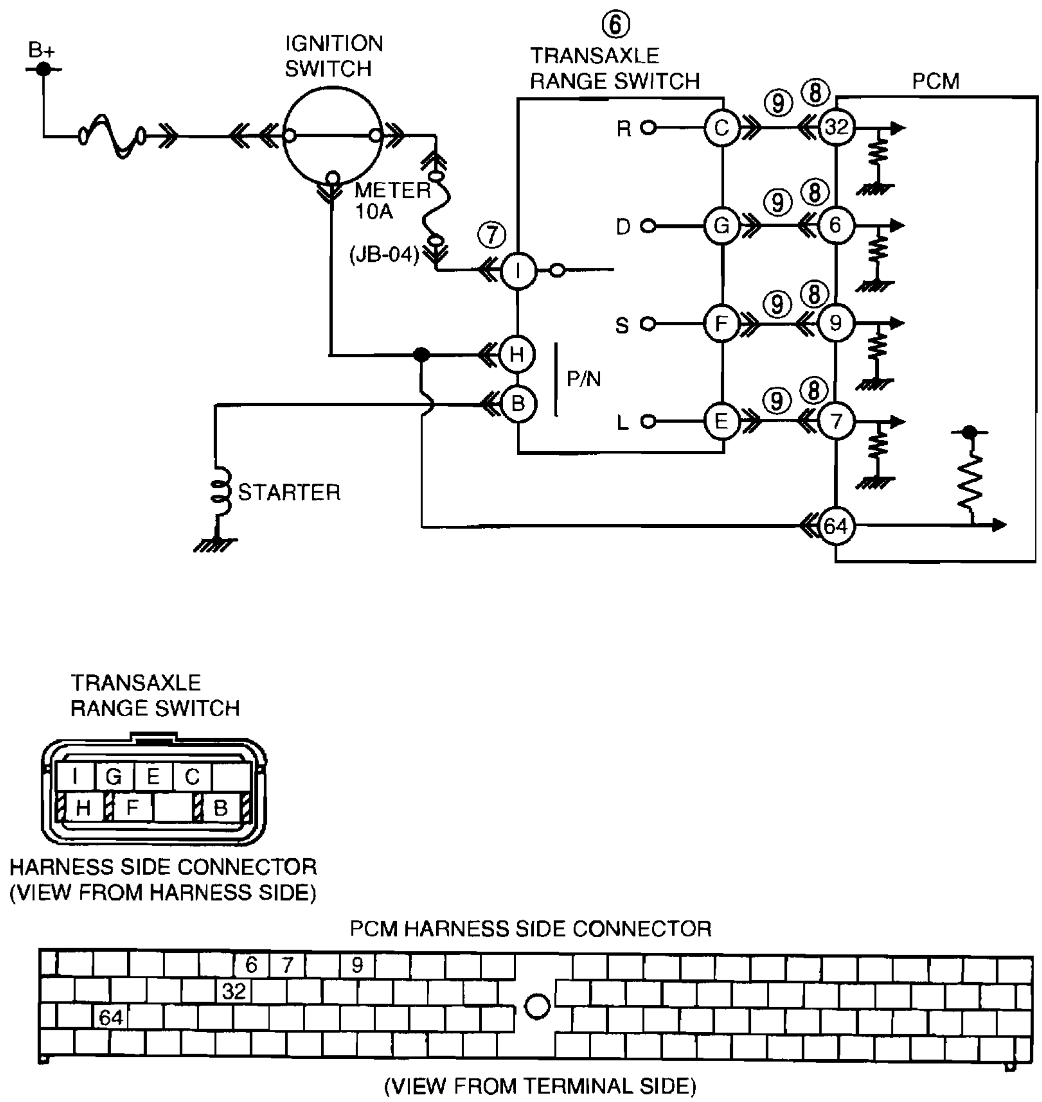
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access TR SW, D SW, S SW, L SW, and R SW PIDs using NGS tester. — TR SW • N or P position: ON • Other positions and all ranges: OFF — R SW • R position: ON • Other positions and all ranges: OFF — D SW • D range: ON • Other ranges and all positions: OFF — S SW • S range: ON • Other ranges and all positions: OFF — L SW • L range: ON • Other ranges and all position: OFF • Are two or more of above PIDs ON at the same time when shifting selector lever from P position to L range?	Yes	Go to next step.
		No	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
3	**INSPECT TR SWITCH CONNECTOR** • Turn ignition key OFF. • Disconnect TR switch connector. • Inspect for bent terminals of pins using mirror. • Are TR switch terminals okay?	Yes	Go to next step.
		No	Repair terminals or replace TR switch, then go to Step 7. (See K2-31 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION.)
4	**INSPECT TR SWITCH CIRCUIT MALFUNCTION** • Turn ignition key to ON (engine OFF). • Access TR SW, D SW, S SW, L SW, and R SW PIDs using NGS tester. • Does PIDs change from ON to OFF when TR switch connector is disconnected?	Yes	Go to next step.
		No	Go to Step 6.
5	**INSPECT TR SWITCH CONTINUITY** • Turn ignition key to OFF. • Disconnect TR switch connector. • Inspect TR switch for continuity in positions/ranges failed in Step 2. • Is there continuity between TR switch terminals (part-side)? (See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)	Yes	Go to Step 7.
		No	Replace TR switch, then go to Step 7. (See K2-31 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION.)
6	**INSPECT TR SWITCH CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (engine OFF). • Measure voltage at TR switch terminals C, E, F and G (harness-side). • Is there **0 V** at TR switch harness side connector?	Yes	Go to next step.
		No	Repair or replace wiring, then go to next step.

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0705 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Run engine at **530 rpm or above**. • Access RPM, D SW, S SW, L SW, R SW, and TR SW PIDs using NGS tester. • Drive vehicle in each range (R, D, S, and L) for **100 seconds or more** under following condition. — RPM PID: **530 rpm or above** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0706

DTC P0706	Transaxle range (TR) switch circuit malfunction (open circuit)
DETECTION CONDITION	• When all conditions below satisfied and **100 seconds or more** have passed. — D, S, L, or R range switch not input. — Engine speed **530 rpm or above.** — Vehicle speed **20 km/h {12 mph} or above.**
POSSIBLE CAUSE	• Charging system malfunction • TR switch malfunction • TR switch misadjustment • Open circuit between TR switch terminal G and PCM terminal 6 • Open circuit between TR switch terminal F and PCM terminal 9 • Open circuit between TR switch terminal E and PCM terminal 7 • Open circuit between TR switch terminal I and dash harness (JB-04) terminals • Damaged connectors between TR switch and PCM • PCM malfunction



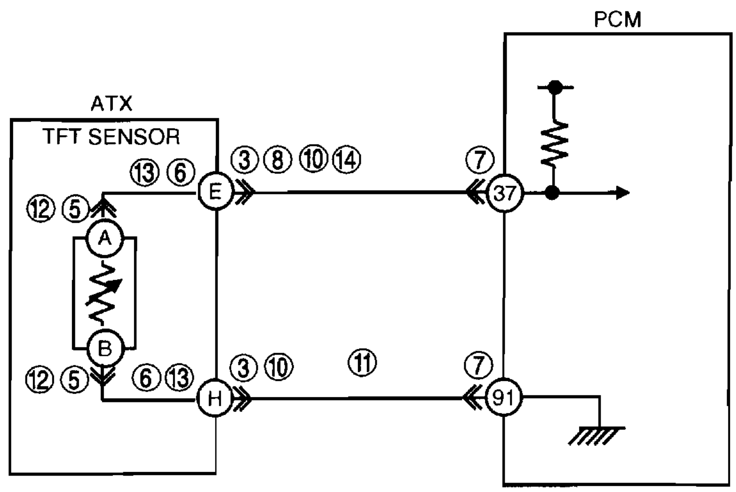
Diagnostic procedure

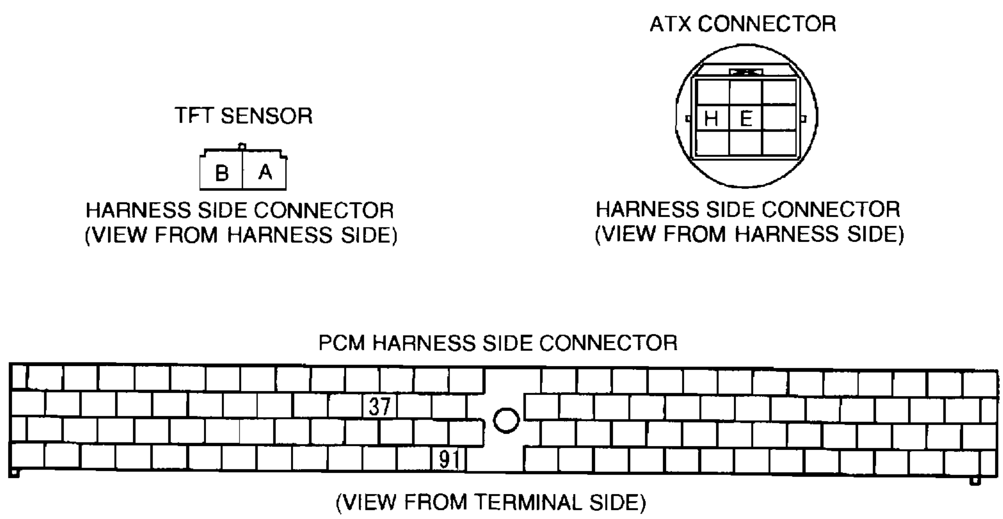
<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">VERIFY RELATED REPAIR INFORMATION AVAILABILITY
• Check for related Service Information availability.
• Is any related Service Information available?</td><td>Yes</td><td>Perform repair or diagnosis according to available repair information.
• If vehicle is not repaired, go to next step.</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT
• Turn ignition key to OFF.
• Connect NGS tester to DLC.
• Turn ignition key to ON (engine OFF).
• Access D SW, S SW, and L SW PIDs using NGS tester.
— D SW
• D range: ON
• Other ranges and all positions: OFF
— S SW
• S range: ON
• Other ranges and all positions: OFF
— L SW
• L range: ON
• Other ranges and all positions: OFF
— R SW
• R position: ON
• Other ranges and all positions: OFF
• Is there any PID that is out of specification?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Go to intermittent concern troubleshooting procedure.
(See F1-142 INTERMITTENT CONCERN.)</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">INSPECT TR SWITCH CIRCUIT
• Access D SW, S SW, and L SW PIDs using NGS.
— D SW
• D range: ON
• Other ranges and all position: OFF
— S SW
• S range: ON
• Other ranges and all position: OFF
— L SW
• L range: ON
• Other ranges and all position: OFF
— R SW
• R position: ON
• Other ranges and all positions: OFF
• Are any of following PIDs turned on for even a moment while shifting selector lever slowly from P position to L range?</td><td>Yes</td><td>Adjust TR switch, then go to Step 10.
(See K2-33 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT.)</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">INSPECT TR SWITCH CONNECTOR CONNECTION
• Does PID change when TR switch harness is moved?</td><td>Yes</td><td>Repair or replace TR switch connector and/or terminal, then go to Step 10.</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">INSPECT TR SWITCH CIRCUIT
• Turn ignition key to OFF.
• Disconnect TR switch connector.
• Turn ignition key to ON (engine OFF).
• Access D SW, S SW, and L SW PIDs using NGS tester.
• Connect harness side connector power line and signal line using jumper wire.
— D range: I and G
— S range: I and F
— L range: I and E
— R position: I and C
• Inspect if PID changes OFF to ON.
• Does PID change?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Go to Step 7.</td></tr>
</table>

STEP	INSPECTION		ACTION
6	**INSPECT TR SWITCH FOR OPEN** • Turn ignition key to OFF. • Disconnect TR switch connector. • Inspect for continuity between TR switch terminals (part-side). — D range: I and G — S range: I and F — L range: I and E — R position: I and C • Is there continuity between TR switch terminals (part-side)? (See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)	Yes	Go to Step 10.
		No	Replace TR switch, then go to Step 10. (See K2-31 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION.)
7	**INSPECT TR SWITCH POWER CIRCUIT FOR OPEN** • Inspect voltage at TR switch terminal I (harness-side). • Is there B+ at TR switch terminal I (harness-side)?	Yes	Go to next step.
		No	Inspect main fuse. • If okay, repair or replace wiring, then go to Step 10.
8	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 10.
9	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR OPEN** • Inspect for continuity between TR switch terminals (harness-side) and PCM terminals (harness-side). — D range: G to 6 — S range: F to 9 — L range: E to 7 — R position: C to 32 • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0706 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Access RPM, VS, D SW, S SW, L SW, and R SW, PIDs using NGS tester. • Drive vehicle in each range (D, S, L, and R) for **100 seconds or more** under following conditions while monitoring PIDs. — RPM PID: **530 rpm or above** — VS PID: **20 km/h {12 mph} or above** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0710

DTC P0710	**Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground/open circuit)**
DETECTION CONDITION	• If PCM detects either of following conditions for **150 seconds or more**, PCM determines that TFT sensor circuit has a malfunction. — TFT sensor voltage is **0.06 V or below** and vehicle speed **20 km/h {12 mph} or above**. — TFT sensor voltage is **4.67 V or above** and vehicle speed **20 km/h {12 mph} or above**.
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit between TFT sensor terminal A and ATX connector terminal E • Short to ground between TFT sensor terminal A and ATX connector terminal E • Open circuit between TFT sensor terminal B and ATX connector terminal H • Short to ground between TFT sensor terminal B and ATX connector terminal H • Open circuit between ATX connector terminal E and PCM terminal 37 • Short to ground between ATX connector terminal E and PCM terminal 37 • Open circuit between ATX connector terminal H and PCM terminal 91 • Damaged connectors between TFT sensor and PCM • PCM malfunction





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS – IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to OFF. • Connect **NGS** tester to DLC. • Turn ignition key to ON (engine OFF). • Access ATFT V PID using **NGS**. • Are PID readings **within 0.06—4.67 V**?	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
		No	Voltage **0.06 V or below**: go to Step 10. Voltage **4.67 V or above**: go to next step.
3	**INSPECT POOR CONNECTION OF ATX CONNECTOR** • Turn ignition key to OFF. • Inspect ATX connector connection. • Disconnect ATX connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 15.
4	**INSPECT TFT SENSOR CIRCUIT** • Turn ignition key to ON (engine OFF). • Access ATFT V PID using **NGS** tester. • Connect between ATX connector terminals E and H (vehicle harness-side) using jumper wire. • Verify if ATFT V PID changes to **0.06 V or below**. • Does ATFT V PID change?	Yes	Go to next step.
		No	Go to Step 7.
5	**INSPECT POOR CONNECTION OF TFT SENSOR CONNECTOR CONNECTION** • Turn ignition key to OFF. • Remove valve body cover. • Disconnect TFT sensor connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal or replace TFT sensor, then go to Step 15. (See K2-35 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)
6	**INSPECT TFT SENSOR CIRCUIT FOR OPEN** • Check for continuity between TFT sensor terminals (harness-side) and ATX connector terminals (transaxle case side). — ATX connector terminal E and TFT sensor terminal A — ATX connector terminal H and TFT sensor terminal B • Is there continuity?	Yes	Replace TFT sensor, then go to Step 15. (See K2-35 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)
		No	Repair or replace harness, then go to Step 15.
7	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 15.
8	**INSPECT HARNESS FOR OPEN CIRCUIT** • Disconnect ATX connector. • Connect the PCM connector. • Turn ignition key to ON (engine OFF). • Inspect voltage at ATX connector terminal E (vehicle harness-side). • Is voltage **5 V**?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 15.

STEP	INSPECTION		ACTION
9	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN** ● Turn ignition key to OFF. ● Inspect continuity between ATX connector terminal H (vehicle harness-side) and body ground. ● Is there continuity?	Yes	Go to Step 15.
		No	Repair or replace harness, then go to Step 15.
10	**INSPECT TERMINAL CONDITION** ● Turn ignition key to OFF. ● Disconnect ATX connector. ● Inspect for bent terminals. ● Are the terminals bent?	Yes	Repair or replace terminals, then go to Step 15. ● If terminals cannot be repaired, replace harness, then go to Step 15.
		No	Go to next step.
11	**INSPECT TFT SENSOR CIRCUIT** ● Turn ignition key to ON (engine OFF). ● Verify if ATFT V PID changes to **4.67 V or above** when ATX connector is disconnected. ● Does ATFT V PID change?	Yes	Go to next step.
		No	Go to Step 14.
12	**INSPECT TFT SENSOR TERMINALS CONDITION** ● Turn ignition key to OFF. ● Disconnect TFT sensor connector. ● Inspect for bent TFT sensor terminals. ● Are the terminals bent?	Yes	Repair terminals or replace TFT sensor, then go to Step 15. (See K2-35 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)
		No	Go to next step.
13	**INSPECT TFT SENSOR CIRCUIT FOR SHORT TO GROUND** ● Inspect for continuity between TFT sensor terminals (harness-side) and body ground. — A and body ground — B and body ground ● Is there any continuity?	Yes	Repair or replace harness, then go to Step 15.
		No	Replace TFT sensor, then go to Step 15. (See K2-35 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)
14	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO GROUND** ● Turn ignition key to OFF. ● Inspect for continuity between ATX connector terminal E (vehicle harness-side) and body ground. ● Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
15	**VERIFY TROUBLESHOOTING OF DTC P0710 COMPLETED** ● Make sure to reconnect all disconnected connectors. ● Clear DTC from memory using NGS tester. ● Access VS PID using NGS tester. ● Drive vehicle under following condition for **150 seconds or more** while monitoring PID. — VS PID: **20 km/h {12 mph}** ● Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
16	**VERIFY AFTER REPAIR PROCEDURE** ● Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) ● Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0711

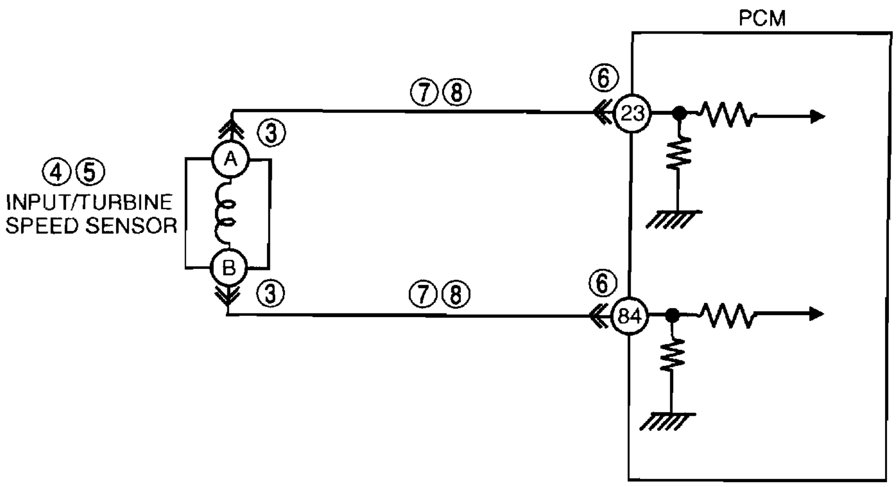
DTC P0711	Transaxle fluid temperature (TFT) sensor circuit malfunction (stuck)
DETECTION CONDITION	• When all conditions below satisfied and **150 seconds or more** have passed. — Start engine and **180 seconds or more** have passed. — Vehicle speed **60 km/h {37 mph} or above**. — P0710 not output. — Variation in ATF voltage **below 0.06 V**.
POSSIBLE CAUSE	• TFT sensor malfunction • Connector corrosion • PCM malfunction

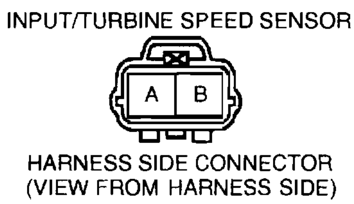
Diagnostic procedure

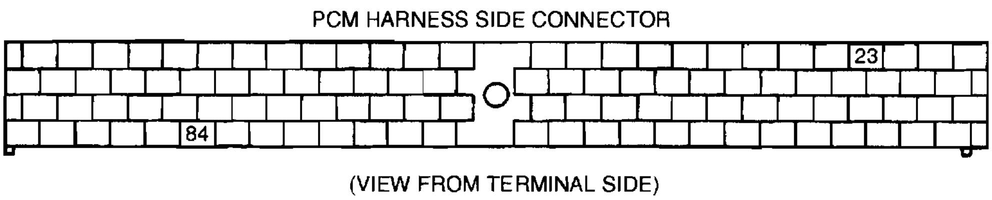
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**INSPECT TFT SENSOR VOLTAGE** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access ATFT V PID using NGS tester. • Record ATF sensor voltage. • Start engine. • Drive vehicle at **60 km/h {37 mph} or above** for **330 seconds or more**. • Record ATF sensor voltage again. • Is variation in voltage **0.06V or above?**	Yes	Go to Step 4.
		No	Go to next step.
3	**INSPECT POOR CONNECTOR OF ATX CONNECTOR** • Turn ignition key to OFF. Inspect ATX connector connection. • Disconnect ATX connector. • Check for poor connector (damaged/ pulled-out terminals, corrosion etc.) • Is connection okay?	Yes	Go to next step.
		No	Repair or replace terminals, then go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Access VS and ATFT PID using NGS tester. • Decrease ATF temperature to **20 °C {68 °F} or below.** • Drive vehicle under following condition for **330 seconds or more** while monitoring PID. — VS PID: **60 km/h {37 mph}** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0715

DTC P0715	**Input/turbine speed sensor circuit malfunction**
DETECTION CONDITION	• When both conditions below satisfied and **0.7 seconds or more** have passed. — Driving vehicle with vehicle speed **40 km/h {25 mph} or above**. — Input/turbine speed sensor signal not input.
POSSIBLE CAUSE	• Input/turbine speed sensor malfunction • Short to ground between input/turbine speed sensor terminal B and PCM terminal 84 • Short to ground between input/turbine speed sensor terminal A and PCM terminal 23 • Open circuit between input/turbine speed sensor terminal B and PCM terminal 84 • Open circuit between input/turbine speed sensor terminal A and PCM terminal 23 • Damaged connectors between input/turbine speed sensor and PCM • PCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Start engine. • Access TURBINE PID using NGS tester. — IG ON: **0 rpm** — Idle: **Within 600—700 rpm** (P, N position) • Are TURBINE PID readings within specifications?	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF INPUT/TURBINE SPEED SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect input/turbine speed sensor connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 9.
4	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure resistance between input/turbine speed sensor terminals (part-side). • Is resistance **within 250—600 Ω** between input/turbine speed sensor terminals (part-side)? (See K2-35 INPUT/TURBINE SPEED SENSOR INSPECTION.)	Yes	Go to next step.
		No	Replace input/turbine speed sensor, then go to Step 9. (See K2-35 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION.)
5	**INSPECT INPUT/TURBINE SPEED SENSOR** • Remove input/turbine speed sensor. • Is there iron powder stuck on input/turbine speed sensor? (See K2-35 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION.)	Yes	Clean input/turbine speed sensor, then go to Step 9.
		No	Go to next step.
6	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 9.
7	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR OPEN** • Inspect input/turbine speed sensor terminals (harness-side) and PCM terminals (harness-side). — A and 23 — B and 84 • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 9.
8	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect input/turbine speed sensor terminal (harness-side) and body ground. — A and body ground — B and body ground • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
9	**VERIFY TROUBLESHOOTING OF DTC P0715 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Access VS PID using NGS tester. • Drive vehicle with vehicle speed **40 km/h {25 mph} or above** for **0.7 second or more** while monitoring PID. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0731

DTC P0731	Gear 1 incorrect
DETECTION CONDITION	• When all conditions below satisfied with ignition key turned to ON (start engine). — ATF temperature 20 °C {68 °F} or above. — Driving in 1GR at D range. — Engine speed 450 rpm or above. — Turbine speed within 225—4,988 rpm. — Throttle opening angle 6.25 % or above. — Differential gear case (output) revolution speed 35 rpm or above. — Revolution ratio of forward clutch drum revolution to differential gear case revolution below 2.157. — Any of DTC P0500, P0705, P0706, P0710, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, or P0773 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E and pressure control solenoid stuck • Line pressure low • Forward clutch slipping • One-way clutch slipping • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 9. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**CLICK TEST OF SOLENOID VALVES** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access SHIFT A, SHIFT B, SHIFT C, SHIFT D, SHIFT E, and LINE PIDs using NGS tester. • Verify click sound of shift solenoids A, B, C, D, E and pressure control solenoids. • Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to next step.
		No	Replace shift solenoids A, B, C, D, E or pressure control solenoid, then go to Step 9. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm², 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm², 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 9. (See K2-46 CONTROL VALVE BOBY REMOVAL.) (See K2-46 CONTROL VALVE BOBY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 9. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
6	**INSPECT STALL SPEED** • Measure stall speed at D range. **Specification** **2,200—2,500 rpm** • is stall speed within specification? (See K2-21 MECHANICAL SYSTEM TEST, Stall Test.)	Yes	Go to next step.
		No	Go to Step 8.
7	**INSPECT TURBINE SPEED WHEN DRIVING WITH VEHICLE SPEED 20 KM/H IN D RANGE** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Start engine. • Access VS,1GR, D SW, TURBINE, and THOP PIDs using NGS tester. • Drive vehicle while monitoring PIDs. — VS PID: **20 km/h {12 mph}** — D SW PID: ON — 1GR PID: ON — THOP PID: **25 %** • Is TURBINE PID okay? TURBINE PID: **Approx. 2,039 rpm**	Yes	Go to next step.
		No	Replace control valve body, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.)
8	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.)
9	**VERIFY TROUBLESHOOTING OF DTC P0731 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up ATX. • Access ATFT, 1GR, D SW, RPM, TURBINE, THOP, and VS PIDs using NGS tester. • Drive vehicle under following condition for **15 seconds or more** while monitoring PIDs. — ATFT PID: **20° C {68 ° F} or above** — 1GR PID: ON — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — THOP PID: **6.25 % or above** (FP engine) — THOP PID: **3.91 % or above** (ZM engine) — VS PID: **3.9 km/h {2.4 mph} or above** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0732

DTC P0732	Gear 2 incorrect
DETECTION CONDITION	• When all conditions below satisfied with ignition key turned to ON (start engine). — ATF temperature **20 °C {68 °F} or above**. — Driving in 2GR at D range. — Engine speed **450 rpm or above**. — Turbine speed **within 225—4,988 rpm**. — Differential gear case (output) revolution speed **35 rpm or above**. — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 1.249 or 2.157 or above**. — Any of DTC P0500, P0705, P0706, P0710, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, or P0773 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • Forward clutch slipping • 2-4 brake band slipping • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 9. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**CLICK TEST OF SOLENOID VALVES** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access SHIFT A, SHIFT B, SHIFT C, SHIFT D, SHIFT E, and LINE PIDs using NGS tester. • Verify click sound of shift solenoids A, B, C, D, E and pressure control solenoids. • Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to next step.
		No	Replace shift solenoids A, B, C, D, E or pressure control solenoid, then go to Step 9. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm^2, 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step **9**. (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 9. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)
6	**INSPECT STALL SPEED** • Measure stall speed at D range. **Specification** **2,200—2,500 rpm** • Is stall speed within specification? (See K2-21 MECHANICAL SYSTEM TEST, Stall Test.)	Yes	Go to next step.
		No	Go to Step 8.
7	**INSPECT TURBINE SPEED WHEN DRIVING WITH VEHICLE SPEED 40 KM/H IN D RANGE** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Start engine. • Access VS, D SW, 2GR, THOP, and TURBINE PIDs using NGS tester. • Drive vehicle while monitoring PIDs. — VS PID: **40 km/h {24 mph}** — D SW PID: ON — 2GR PID: ON — THOP PID: **25 %** • Is TURBINE PID okay? TURBINE PID: **Approx. 2,173 rpm**	Yes	Go to next step.
		No	Replace control valve body, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.)
8	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step. (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
9	**VERIFY TROUBLESHOOTING OF DTC P0732 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up ATX. • Access ATFT, 2GR, D SW, RPM, TURBINE, THOP, and VS PIDs using NGS tester. • Drive vehicle under following conditions for **15 seconds or more** while monitoring PIDs. — ATFT PID: **20 °C {68 °F} or above** — 2GR PID: ON — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — THOP PID: **6.25 % or above.** — VS PID: **3.9 km/h {2.4 mph} or above** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.

STEP	INSPECTION		ACTION
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0733

DTC P0733	Gear 3 incorrect
DETECTION CONDITION	• When all conditions below satisfied with ignition key turned to ON (start engine). — ATF temperature **20 ° C {68 ° F} or above.** — Driving in 3GR at D range. — Engine speed **450 rpm or above.** — Turbine speed **within 225—4,988 rpm.** — Differential gear case (output) revolution speed **35 rpm or above.** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.863 or 1.249 or above.** — Any of DTC P0500, P0705, P0706, P0710, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, or P0773 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • Forward clutch slipping • 3-4 clutch slipping • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 9. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**CLICK TEST OF SOLENOID VALVES** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access SHIFT A, SHIFT B, SHIFT C, SHIFT D, SHIFT E, and LINE PIDs using NGS tester. • Verify click sound of shift solenoids A, B, C, D, E and pressure control solenoids. • Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to next step.
		No	Replace shift solenoids A, B, C, D, E or pressure control solenoid, then go to Step 9. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)

<table>
<tr><th>STEP</th><th>INSPECTION</th><th></th><th>ACTION</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">INSPECT LINE PRESSURE
● Start engine.
● Measure line pressure.
Specification
Idle: 334—470 kPa {3.4—4.8 kgf/cm²,
49—68 psi}
Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm²,
168—191 psi}
● Is line pressure within specification?
(See MECHANICAL SYSTEM TEST, Line Pressure Test.)</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>● All ranges: Replace oil pump or control valve body, then go to Step 9.
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)
(See ATX Workshop Manual FN4A-EL [1623-10-98E].)
● Any ranges: Replace ATX, then go to Step 9.
(See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">INSPECT STALL SPEED
● Measure stall speed at D range.
Specification
2,200—2,500 rpm
● Is stall speed within specification?
(See K2-21 MECHANICAL SYSTEM TEST, Stall Test.)</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Go to Step 8.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">INSPECT TURBINE SPEED WHEN DRIVING WITH VEHICLE SPEED 20 KM/H IN D RANGE
● Turn ignition key to OFF.
● Connect NGS tester to DLC.
● Start engine.
● Access VS, D SW, 3GR, TURBINE, THOP and TURBINE PIDs using NGS tester.
● Drive vehicle while monitoring PIDs.
— VS PID: 60 km/h {37 mph}
— D SW PID: ON
— 3GR PID: ON
— THOP PID: 25 %
● Is TURBINE PID okay?
TURBINE PID:
Approx. 2,173 rpm</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Replace control valve body, then go to next step.
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">CHECK OPERATION OF EACH VALVE AND EACH SPRING
● Turn ignition key to OFF.
● Remove control valve body.
● Disassemble control valve body.
● Is each valve operation okay and is return spring okay?
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)
(See ATX Workshop Manual FN4A-EL [1623-10-98E].)</td><td>Yes</td><td>Replace ATX, then go to next step
(See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)</td></tr>
<tr><td>No</td><td>Repair or replace shift valve and return spring, then go to next step.
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)
(See ATX Workshop Manual FN4A-EL [1623-10-98E].)</td></tr>
<tr><td rowspan="2">9</td><td rowspan="2">VERIFY TROUBLESHOOTING OF DTC P0733 COMPLETED
● Make sure to reconnect all disconnected connectors.
● Clear DTC from memory using NGS tester.
● Start engine.
● Warm up ATX.
● Access ATFT, 3GR, D SW, RPM, TURBINE, THOP, and VS PIDs using NGS tester.
● Drive vehicle under following conditions for 15 seconds or more while monitoring PIDs.
— ATFT PID: 20 °C {68 °F} or above
— 3GR PID: ON
— D SW PID: ON
— RPM PID: 450 rpm or above
— TURBINE PID: within 225—4,988 rpm
— THOP PID: 6.25 % or above.
— VS PID: 3.9 km/h {2.4 mph} or above
● Is same DTC present?</td><td>Yes</td><td>Replace PCM, then go to next step.
(See Section F1.)</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
</table>

STEP	INSPECTION		ACTION
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0734

DTC P0734	Gear 4 Incorrect
DETECTION CONDITION	• When all conditions below satisfied with ignition key turned to ON (start engine). — ATF temperature **20 °C {68 °F} or above**. — Driving in 4GR at D range. — Engine speed **450 rpm or above**. — Turbine speed **within 225—4,988 rpm**. — Differential gear case (output) revolution speed **35 rpm or above.** — Vehicle speed **50 km/h {31 mph} or above**. — Throttle opening angle closed throttle position. — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.6 or 1.249 or above**. — Any of DTC P0500, P0705, P0706, P0710, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, or P0773 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 9. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**CLICK TEST OF SOLENOID VALVES** • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access SHIFT A, SHIFT B, SHIFT C, SHIFT D, SHIFT E, and LINE PIDs using NGS tester. • Verify click sound of shift solenoids A, B, C, D, E and pressure control solenoids. • Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to next step.
		No	Replace shift solenoids A, B, C, D, E or pressure control solenoid, then go to Step 9. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm^2, 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 9. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 9. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)
6	**INSPECT STALL SPEED** • Measure stall speed at D range. **Specification** **2,350—2,650 rpm** • Is stall speed within specification? (See K2-21 MECHANICAL SYSTEM TEST, Stall Test.)	Yes	Go to next step.
		No	Go to Step 8.
7	**INSPECT TURBINE SPEED WHEN DRIVING WITH VEHICLE SPEED 80 KM/H IN D RANGE** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Start engine. • Access VS, D SW, 4GR, TURBINE, THOP and TURBINE PIDs using NGS tester. • Drive vehicle while monitoring PIDs. — VS PID: **80 km/h {49 mph}** — D SW PID: ON — 4GR PID: ON — THOP PID: **17 %** • Is TURBINE PID okay? TURBINE PID: **Approx. 2,100 rpm**	Yes	Go to next step.
		No	Replace control valve body, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.)
8	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See ATX Workshop Manual FN4A-EL.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
9	**VERIFY TROUBLESHOOTING OF DTC P0734 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up ATX. • Access ATFT, 4GR, D SW, RPM, TURBINE, VS, and THOP PIDs using NGS tester. • Drive vehicle under following condition for **15 seconds or more** while monitoring PIDs. — ATFT PID: **20 °C {68 °F} or above** — 4GR PID: ON — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — VS PID: **50 km/h {31 mph} or above.** — THOP PID: **0 %.** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.

STEP	INSPECTION		ACTION
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0741

DTC P0741	Torque converter clutch (TCC) stuck OFF
DETECTION CONDITION	• When all conditions below satisfied. — ATF temperature **20 °C {68 °F} or above**. — Driving in 4GR at D range. — Engine speed **450 rpm or above**. — Turbine speed **within 225—4,988 rpm.** — Vehicle speed **within 60—100 km/h {37—62 mph}**. — TCC operation — Shift solenoid A duty value **99 % or above** — Power or normal mode — Difference between engine speed and turbine speed **above 100 rpm** — Any of DTC P0500, P0705, P0706, P0710, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, or P0773 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)

<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">4</td><td rowspan="2">INSPECT LINE PRESSURE
• Start engine.
• Measure line pressure.
Specification
Idle: 334—470 kPa {3.4—4.8 kgf/cm²,
49—68 psi}
Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm²,
168—191 psi}
• Is line pressure within specification?
(See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>• All ranges: Replace oil pump or control valve body, then go to Step 6.
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)
(See ATX Workshop Manual FN4A-EL [1623-10-98E].)
• Any ranges: Replace ATX, then go to Step 6.
(See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">CHECK OPERATION OF EACH VALVE AND EACH SPRING
• Turn ignition key to OFF.
• Remove control valve body.
• Disassemble control valve body.
• Is each valve operation okay and is return spring okay?
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)
(See ATX Workshop Manual FN4A-EL [1623-10-98E].)</td><td>Yes</td><td>Replace ATX, then go to next step
(See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)</td></tr>
<tr><td>No</td><td>Repair or replace shift valve and return spring, then go to next step.
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)
(See ATX Workshop Manual FN4A-EL [1623-10-98E].)</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">VERIFY TROUBLESHOOTING OF DTC P0741 COMPLETED
• Make sure to reconnect all disconnected connectors.
• Clear DTC from memory using NGS tester.
• Start engine.
• Warm up engine and ATX.
• Access ATFT, 4GR, D SW, RPM, TURBINE, VS, THOP, SHIFT E and SHIFT A PIDs using NGS tester.
• Drive vehicle under following conditions for 15 seconds or more while monitoring PIDs.
— ATFT PID: 20 °C {68 °F} or above
— 4GR PID: ON
— D SW PID: ON
— RPM PID: 450 rpm or above
— TURBINE PID: within 225—4,988 rpm
— VS PID: within 60—100 km/h {37—62 mph}.
— SHIFT E PID: ON (TCC operation).
— SHIFT A PID: 99 %.
• Is same DTC present?</td><td>Yes</td><td>Replace PCM, then go to next step.
(See Section F1.)</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">VERIFY AFTER REPAIR PROCEDURE
• Perform "After Repair Procedure".
(See K2-61 AFTER REPAIR PROCEDURE.)
• Is there any DTC present?</td><td>Yes</td><td>Go to applicable DTC inspection.</td></tr>
<tr><td>No</td><td>Troubleshooting completed.</td></tr>
</table>

DTC P0742

DTC P0742	Torque converter clutch (TCC) stuck ON
DETECTION CONDITION	• All of following conditions satisfied under each of following throttle conditions. — ATF temperature **20 °C {68 °F} or above**. — Driving in 4GR at D range. — Engine speed **450 rpm or above**. — Turbine speed **within 225—4,988 rpm**. — Vehicle speed **below 70 km/h {43 mph}**. — Torque converter clutch (TCC) no operation — Difference between engine speed and turbine speed **below 50 rpm** — Throttle conditions — DTC P0734 not output. • Throttle conditions — Throttle opening angle **within 3.125—6.25 %** and **3 seconds or more** have passed. — Throttle opening angle **above 6.25 %** and **10 seconds or more** have passed. — Throttle opening angle closed throttle position and **10 seconds or more** have passed.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • PCM malfunction

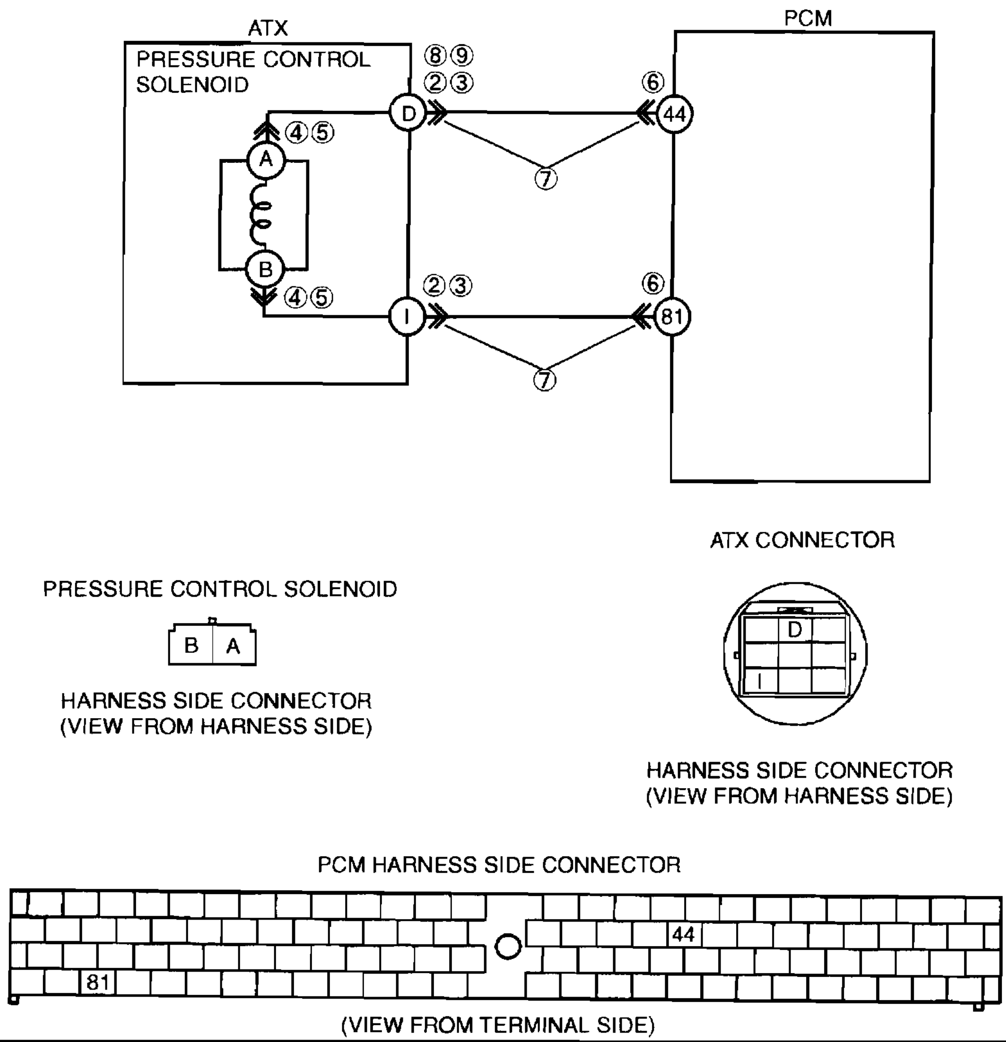
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm², 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm², 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
6	**VERIFY TROUBLESHOOTING OF DTC P0742 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up engine and ATX. • Access ATFT, 4GR, D SW, RPM, TURBINE, VS, THOP, SHIFT E PID using NGS tester. • Drive vehicle under following condition with following each throttle conditions while monitoring PIDs. — ATFT PID: **20 °C {68 °F} or above** — 4GR PID: ON — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — VS PID: **below 70 km/h {43 mph}**. — SHIFT E PID: OFF. (TCC no operation) • Throttle conditions — Throttle opening angle **within 3.125—6.25%** and 3 **seconds or more** have passed. — Throttle opening angle **above 6.25%** and **10 seconds or more** have passed. — Throttle opening angle closed throttle position and **10 seconds or more** have passed. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0745

DTC P0745	Pressure control solenoid malfunction
DETECTION CONDITION	• If PCM detects either of following conditions, PCM determines that pressure control solenoid circuit has a malfunction — Pressure control solenoid voltage stuck **0 V** after engine start — Pressure control solenoid voltage stuck **B+** after engine start
POSSIBLE CAUSE	• Pressure control solenoid malfunction • Open circuit between pressure control solenoid terminal B and ATX connector terminal I • Open circuit between ATX connector terminal I and PCM terminal 81 • Short to ground between ATX connector terminal D and PCM terminal 44 • Short to power between ATX connector terminal D and PCM terminal 44 • Open circuit between pressure control solenoid terminal A and ATX connector terminal D • Open circuit between ATX connector terminal D and PCM terminal 44 • Damaged connector between pressure control solenoid and PCM • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** ● Check for related Service Information availability. ● Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. ● If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**LINE PRESSURE TEST OF PRESSURE CONTROL SOLENOID** ● Connect **SSTs** (49 B019 901A, 49 0378 400, 49 H019 002) to the line pressure inspection part. ● Connect NGS tester to DLC. ● Start engine. ● Access LINE PID in SIMULATION TEST using NGS tester. ● Verify that the line pressure changes when solenoid duty value is changed from **0 %** to **100 %** using LINE **PID** of NGS simulation function. ● Is line pressure change according to duty value increase/decrease? (See K2-134 SIMULATION TEST.)	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
		No	Wait until ATF temperature drops, then go to next step.
3	**INSPECT POOR CONNECTION OF ATX CONNECTOR** ● Turn ignition key to OFF. ● Disconnect ATX connector. ● Check for poor connection (damaged/ pulled-out terminal, corrosion, etc.). ● Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** ● Inspect resistance between ATX connector (transaxle case side) terminals D and **I**. ● Is resistance **within 2.4—7.2** Ω? (See K2-38 SOLENOID VALVES **INSPECTION**, Inspection of Resistance (On-vehicle).)	Yes	Go to Step 7.
		No	Go to next step.
5	**INSPECT POOR CONNECTION OF PRESSURE CONTROL SOLENOID CONNECTOR** ● Disconnect pressure control solenoid connector. ● Check for poor connection (damaged/ pulled-out terminal, corrosion, etc.). ● Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** ● Inspect resistance between pressure control solenoid terminals A and B. ● Is resistance **within2.4—7.2** Ω? (See K2-38 SOLENOID VALVES INSPECTION, Inspection of **R**esistance (On-vehicle).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify pressure control solenoid installation. ● If solenoid installed correctly, replace pressure control solenoid, then go to Step 11. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)
7	**INSPECT POOR CONNECTION OF PCM CONNECTOR** ● Disconnect PCM connector. ● Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). ● Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN** ● Inspect for continuity between PCM (harness-side) and ATX connector (vehicle harness-side). — PCM terminal 44 and ATX connector terminal D — PCM terminal 81 and ATX connector terminal I ● Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, the go to Step 11.

STEP	INSPECTION		ACTION
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (engine OFF). • Inspect voltage at ATX connector terminal **D** (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Inspect for continuity between ATX connector terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0745 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Make sure to wait **more than 1 second** after turning ignition key to ON. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0751

DTC P0751	**Shift solenoid A stuck OFF**
DETECTION CONDITION	• When all conditions below satisfied with ignition key turned to ON (start engine). — ATF temperature **20 ° C {68 ° F} or above.** — Driving in 4GR at D range. — Engine speed **450 rpm or above.** — Turbine speed **within 225— 4,988 rpm.** — Differential gear case (output) revolution speed **35 rpm or above.** — Torque converter clutch (TCC) no operation — Revolution ratio of forward clutch drum revolution to differential gear case revolution **within 0.91—1.09.** — Any of DTC P0731, P0732, and P0733 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm^2, 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** ● Turn ignition key to OFF. ● Remove control valve body. ● Disassemble control valve body. ● Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
6	**VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED** ● Make sure to reconnect all disconnected connectors. ● Clear DTC from memory using NGS tester. ● Start engine. ● Warm up ATX. ● Access ATFT, D SW, RPM, and TURBINE, and SHIFT E PIDs using NGS tester. ● Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATFT PID: 20 °C {68 °F} or above — D SW PID: ON — RPM PID: 450 rpm or above — TURBINE PID: within 225—4,988 rpm — SHIFT E PID: OFF. (TCC no operation)(4GR only). ● Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** ● Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) ● Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0752

DTC P0752	Shift solenoid A stuck ON
DETECTION CONDITION	• Driving vehicle when all conditions below satisfied in 1GR and 2GR. — ATF temperature **20 °C {68 °F} or above.** — Engine speed **450 rpm or above.** — Either of P0705 or P0706 output, or D range is selected. — Brake pedal depressed. — Throttle opening angle closed throttle position. — Vehicle speed **0 km/h {0 mph}**. — Input/turbine speed sensor signal **187.5 rpm or above**. — DTC P0734 not output. — Any of DTC P0500, P0705, P0706, P0710, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, or P0773 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Control valve stuck • PCM malfunction

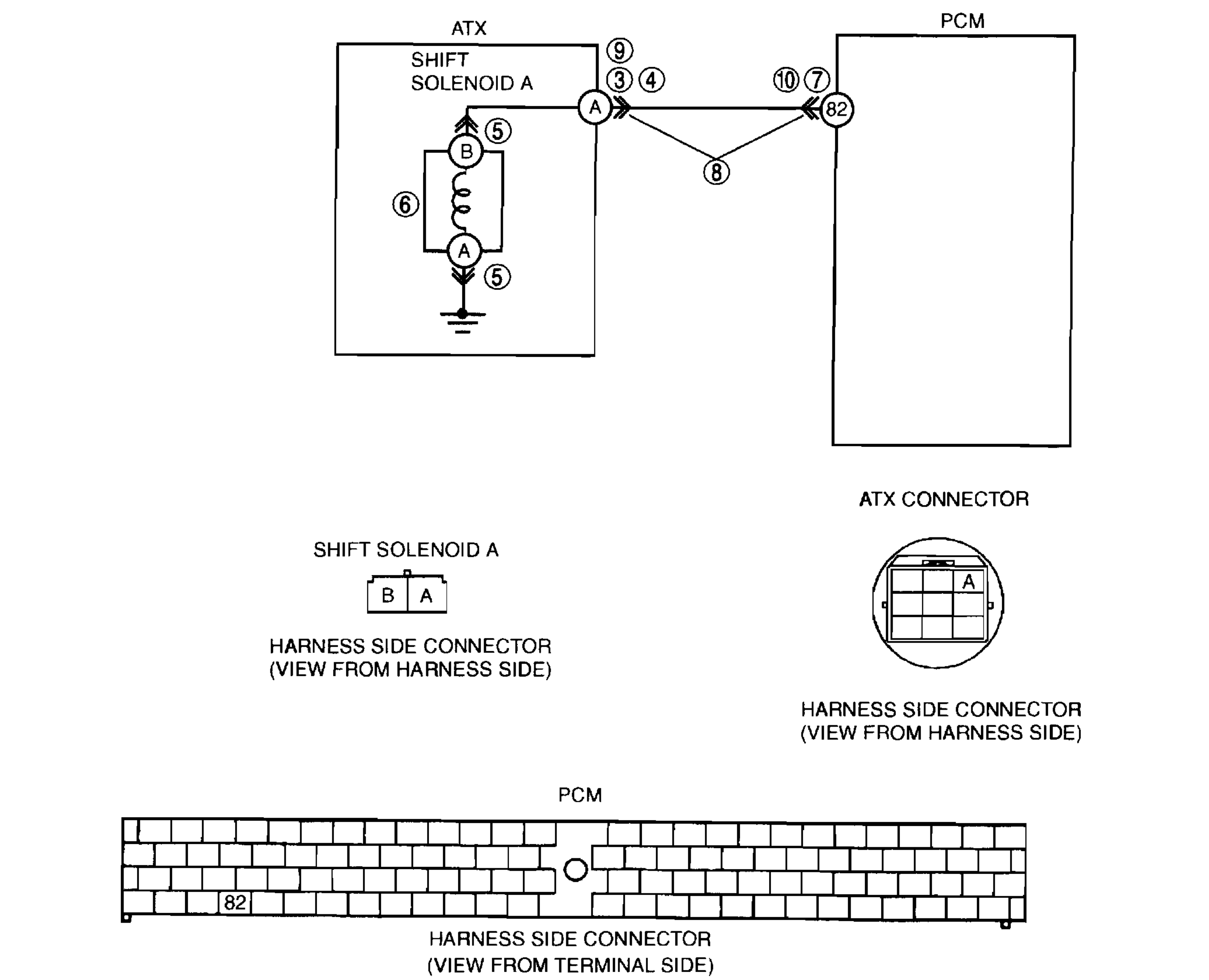
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm², 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm², 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
6	**VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up ATX. • Access ATFT, RPM, D SW and TURBINE PIDs using NGS tester. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATFT PID: **20 °C {68 °F} or above** — RPM PID: **450 rpm or above** — D SW PID: ON — TURBINE PID: **187.5 rpm or above** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0753

DTC P0753	Shift solenoid A malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of following conditions, PCM determines that shift solenoid A circuit has a malfunction: — Shift solenoid A voltage is stuck at **B+** after engine start. — Shift solenoid A voltage is stuck at **0 V** after engine start.
POSSIBLE CAUSE	• Shift solenoid A malfunction • Short to ground between ATX connector terminal A and PCM terminal 82 • Short to power between ATX connector terminal A and PCM terminal 82 • Open circuit between shift solenoid A terminal B and ATX connector terminal A • Open circuit between ATX connector terminal A and PCM terminal 82 • Open circuit between shift solenoid A terminal A and body ground point • Damaged connector between shift solenoid A and PCM • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLICK TEST OF SHIFT SOLENOID A** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access SHIFT A PID using NGS tester. • Verify the click sound of shift solenoid A using NGS simulation function. • Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF ATX CONNECTOR** • Turn ignition key to OFF. • Disconnect ATX connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Check resistance between ATX connector terminal A (transaxle case side) and body ground. • Is resistance **within 1.0—4.2 Ω**? (See K2-38 SOLENOID VALVES INSPECTION, Inspection of Resistance (On-vehicle).)	Yes	Go to Step 7.
		No	Go to next step.
5	**INSPECT POOR CONNECTION OF SHIFT SOLENOID A CONNECTOR** • Disconnect shift solenoid A connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect resistance between shift solenoid A terminals A and B (part-side). • Is resistance **within 1.0—4.2 Ω**? (See K2-38 SOLENOID VALVES INSPECTION, Inspection of Resistance (Off-vehicle).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid A installation. • If solenoid installed correctly, replace solenoid, then go to Step 11. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)
7	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN** • Inspect for continuity between PCM terminal 82 (harness-side) and ATX connector terminal A (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (engine OFF). • Inspect voltage at ATX connector terminal A (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.

STEP	INSPECTION		ACTION
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Inspect for continuity between PCM terminal 82 (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0753 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Access SHIFT A PID using NGS tester. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0756

DTC P0756	**Shift solenoid B stuck OFF**
DETECTION CONDITION	• When all conditions below satisfied with ignition key turned to ON (start engine). — ATF temperature **20 °C {68 °F} or above.** — Driving in 1GR at D range. — Engine speed **450 rpm or** above. — Turbine speed **within 225—4,988 rpm.** — Differential gear case (output) revolution speed **35 rpm or above** — Throttle opening angle **6.25 % or above.** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 2.157**. — Any of DTC P0732, P0733, and P0734 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid B stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm², 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm², 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step **6**. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)

STEP	INSPECTION		ACTION
6	**VERIFY TROUBLESHOOTING OF DTC P0756 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up ATX. • Access ATFT, D SW, RPM, TURBINE, and THOP PIDs using NGS tester. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATFT PID: **20 ° C {68 ° F} or above** — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — THOP PID: **6.25 % or above** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0757

DTC P0757	**Shift solenoid B stuck ON**
DETECTION CONDITION	• All of the following two conditions satisfied while either of DTC P0731 and P0733 not output. — When all conditions below satisfied while driving in 2GR. • ATF temperature **20 °C {68 °F} or above.** • Driving in **D** range. • Engine speed **450 rpm or above.** • Turbine speed **within 225—4,988 rpm.** • Differential gear case (output) revolution speed **35 rpm or above.** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 1.249 or more than 2.157.** — When all conditions below satisfied with driving in 4GR. • ATF temperature **20 °C {68 °F} or above.** • Driving in D range. • Engine speed **450 rpm or above.** • Turbine speed **within 225—4,988 rpm.** • Differential gear case (output) revolution speed **35 rpm or above.** • Vehicle speed **50 km/h {31 mph}.** • Throttle opening angle closed throttle position. • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.6 or 1.249 or above.**
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid B stuck • Control valve stuck • PCM malfunction

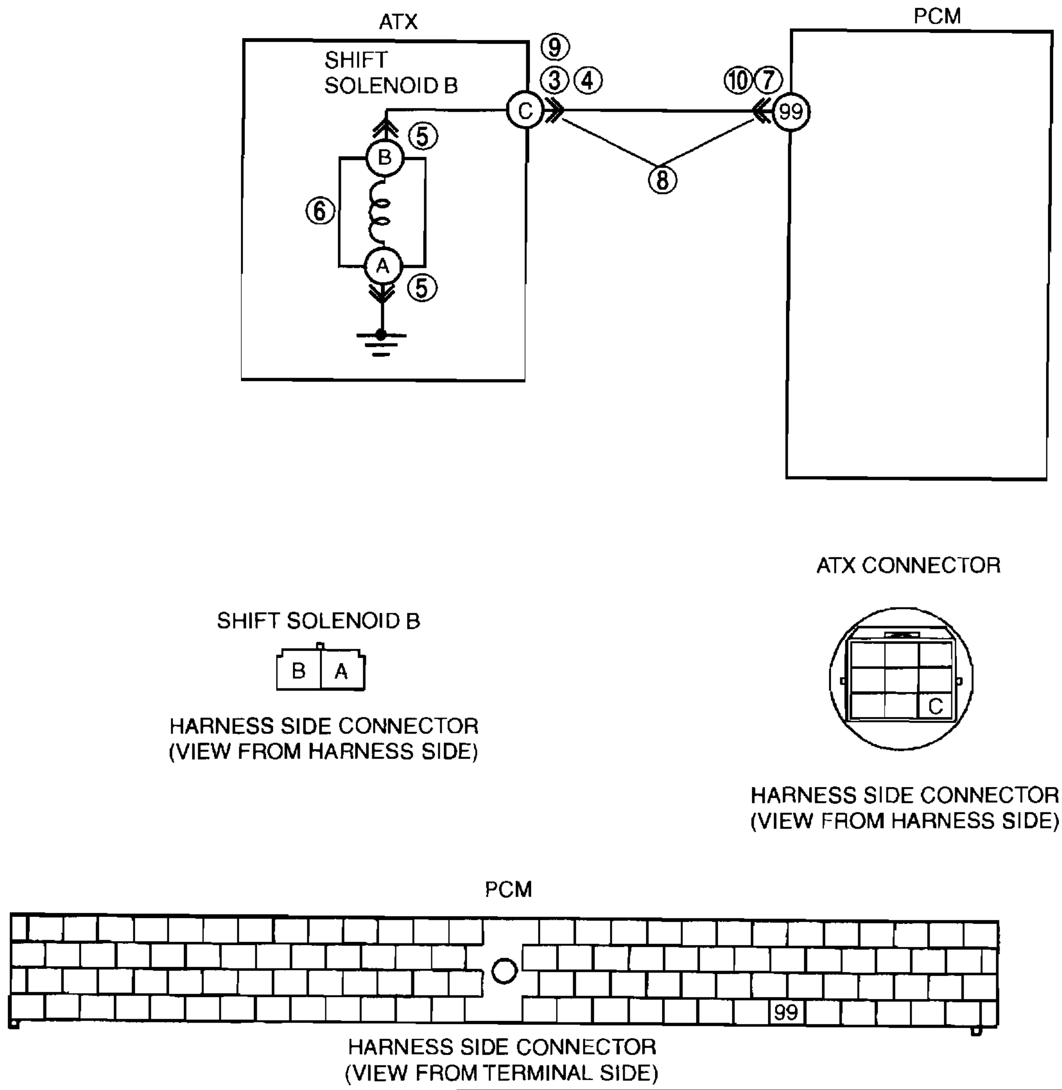
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm^2, 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-29 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

<table>
<tr><th>STEP</th><th>INSPECTION</th><th colspan="2">ACTION</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">CHECK OPERATION OF EACH VALVE AND EACH SPRING
• Turn ignition key to OFF.
• Remove control valve body.
• Disassemble control valve body.
• Is each valve operation okay and is return spring okay?
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)
(See ATX Workshop Manual FN4A-EL [1623-10-98E].)</td><td>Yes</td><td>Replace ATX, then go to next step
(See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)</td></tr>
<tr><td>No</td><td>Repair or replace shift valve and return spring, then go to next step.
(See K2-46 CONTROL VALVE BODY REMOVAL.)
(See K2-46 CONTROL VALVE BODY INSTALLATION.)
(See ATX Workshop Manual FN4A-EL [1623-10-98E].)</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">VERIFY TROUBLESHOOTING OF DTC P0757 COMPLETED
• Make sure to reconnect all disconnected connectors.
• Clear DTC from memory using NGS tester.
• Start engine.
• Warm up ATX.
• Access ATFT, D SW, RPM, TURBINE, THOP, and VS PIDs using NGS tester.
• Drive the vehicle under the following conditionds and make sure that gears shift smoothly from 1GR to 4GR.
— ATFT PID: 20 ° C {68 ° F} or above
— D SW PID: ON
— RPM PID: 450 rpm or above
— TURBINE PID: within 225—4,988 rpm
— THOP PID: 0 % (4GR only)
— VS PID: 50 km/h {31 mph} (4GR only)
• Is same DTC present?</td><td>Yes</td><td>Replace PCM, then go to next step.
(See Section F1.)</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">VERIFY AFTER REPAIR PROCEDURE
• Perform “After Repair Procedure”.
(See K2-61 AFTER REPAIR PROCEDURE.)
• Is there any DTC present?</td><td>Yes</td><td>Go to applicable DTC inspection.</td></tr>
<tr><td>No</td><td>Troubleshooting completed.</td></tr>
</table>

DTC P0758

DTC P0758	Shift solenoid B malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of following conditions, PCM determines that shift solenoid B circuit has a malfunction: — Shift solenoid B voltage is stuck at B+ after engine start. — Shift solenoid B voltage is stuck at 0 V after engine start.
POSSIBLE CAUSE	• Shift solenoid B malfunction • Short to ground between ATX connector terminal C and PCM terminal 99 • Short to power between ATX connector terminal C and PCM terminal 99 • Open circuit between shift solenoid B terminal B and ATX connector terminal C • Open circuit between ATX connector terminal C and PCM terminal 99 • Open circuit between shift solenoid B terminal A and body ground point • Damaged connector between shift solenoid B and PCM • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLICK TEST OF SHIFT SOLENOID B** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access SHIFT B PID using NGS tester. • Verify the click sound of shift solenoid B using NGS simulation function. • Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF ATX CONNECTOR** • Turn ignition key to OFF. • Disconnect ATX connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect resistance between ATX connector terminal C (transaxle case side) and body ground. • Is resistance **within 1.0—4.2 Ω**? (See K2-38 SOLENOID VALVES INSPECTION, Inspection of Resistance (On-vehicle).)	Yes	Go to Step 7.
		No	Go to next step.
5	**INSPECT POOR CONNECTION OF SHIFT SOLENOID B CONNECTOR** • Disconnect shift solenoid B connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect resistance between shift solenoid B terminals A and B (part-side). • Is resistance **within 1.0—4.2 Ω**? (See K2-38 SOLENOID VALVES INSPECTION, Inspection of Resistance (Off-vehicle).)	Yes	Replace solenoid harness, then go to Step 12.
		No	Verify shift solenoid B installation. • If solenoid installed correctly, replace solenoid, then go to Step 11. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)
7	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN** • Inspect for continuity between PCM terminal 99 (harness-side) and ATX connector terminal C (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (engine OFF). • Check for voltage at ATX connector terminal C (vehicle harness-side). • Is voltage **0** V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.

STEP	INSPECTION		ACTION
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check for continuity between PCM terminal 99 (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0758 SHIFT SOLENOID B COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Access SHIFT B PID using NGS tester. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0761

DTC P0761	Shift solenoid C stuck OFF
DETECTION CONDITION	• All of the following two conditions satisfied while either of DTC P0733 and P0734 not output. — When all conditions below satisfied while driving in 1GR. • ATF temperature **20 °C {68 °F} or above.** • Driving in D range. • Engine speed **450 rpm or above.** • Turbine speed **within 225—4,988 rpm.** • Throttle opening angle **6.25 % or above.** • Differential gear case (output) revolution speed **35 rpm or above.** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 2.157**. — When all conditions below satisfied while driving in 2GR. • ATF temperature **20 °C {68 °F} or above.** • Driving in D range. • Engine speed **450 rpm or above.** • Turbine speed **within 225—4,988 rpm.** • Differential gear case (output) revolution speed **35 rpm or above.** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 1.249 or 2.157 or above.**
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid C stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm², 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm², 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
6	**VERIFY TROUBLESHOOTING OF DTC P0761 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up ATX. • Access ATFT, D SW, RPM, TURBINE, and THOP PIDs using NGS tester. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATFT PID: **20 °C {68 °F} or above** — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — THOP PID: **6.25 % or above** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0762

DTC P0762	Shift solenoid C stuck ON
DETECTION CONDITION	• All of the following two conditions satisfied while either of DTC P0731 and P0732 output. — When all conditions below satisfied while driving in 3GR. • ATF temperature **20 °C {68 °F} or above.** • Driving in D range. • Engine speed **450 rpm or above.** • Turbine speed **within 225—4,988 rpm.** • Differential gear case (output) revolution speed **35 rpm or above.** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.863 or 1.249 or above.** — When all conditions below satisfied while driving in 4GR. • ATF temperature **20 °C {68 °F} or above.** • Driving in D range. • Engine speed **450 rpm or above.** • Turbine speed **within 225—4,988 rpm.** • Vehicle speed **50 km/h {31mph}** or above. • Differential gear case (output) revolution speed **35 rpm or above.** • Throttle opening angle closed throttle position • Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.6 or 1.249 or above.**
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid C and pressure control solenoid stuck • Control valve stuck • PCM malfunction

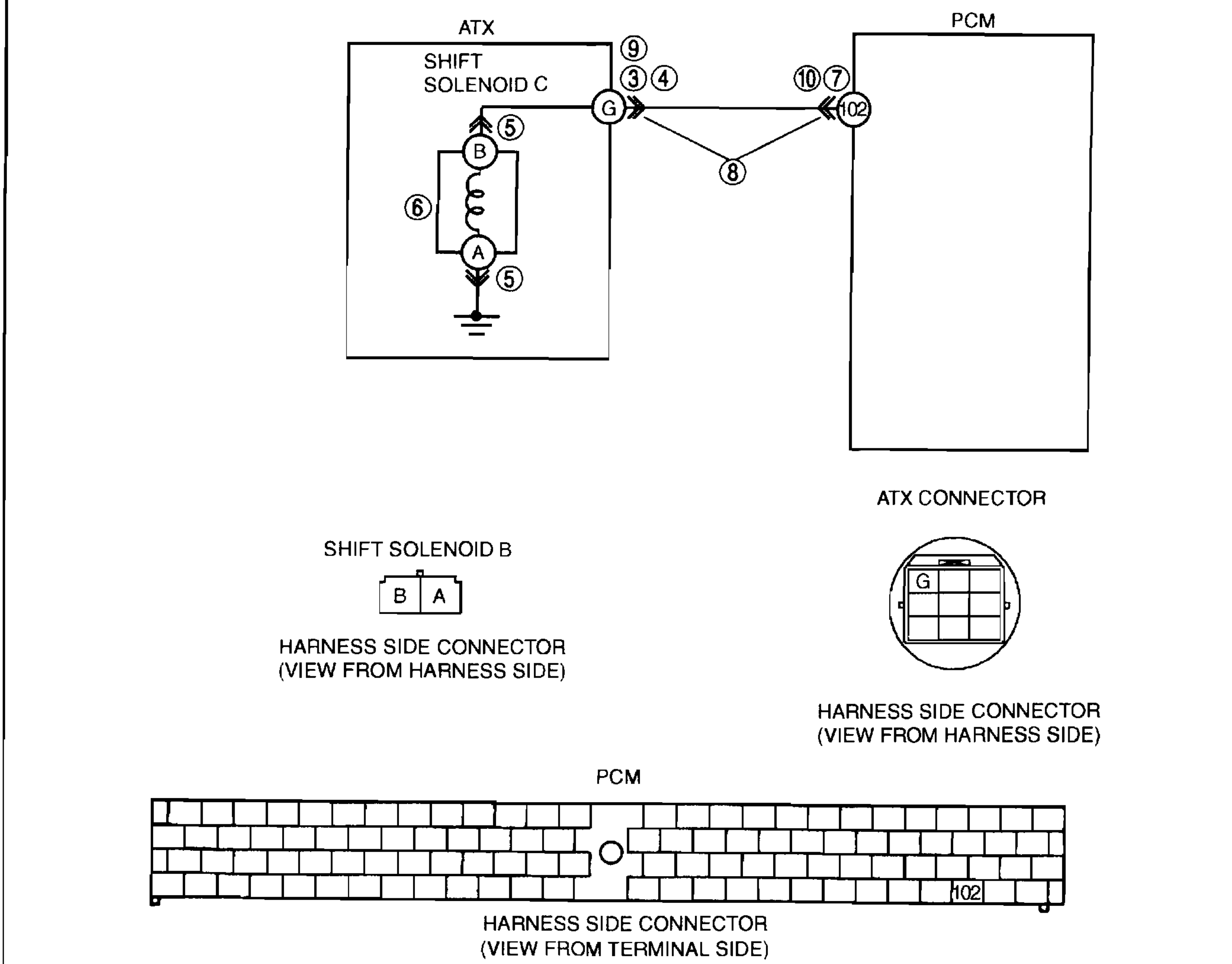
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm², 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm², 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** ● Turn ignition key to OFF. ● Remove control valve body. ● Disassemble control valve body. ● Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step. (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
6	**VERIFY TROUBLESHOOTING OF DTC P0762 COMPLETED** ● Make sure to reconnect all disconnected connectors. ● Clear DTC from memory using NGS tester. ● Start engine. ● Warm up ATX. ● Access ATFT, D SW, RPM, TURBINE, VS, and THOP PIDs using NGS tester. ● Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATFT PID: **20 °C {68 °F} or above** — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — VS PID: **50 km/h {31 mph} or above** (4GR only) — THOP PID: **0 %** (4GR only) ● Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** ● Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) ● Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0763

DTC P0763	Shift solenoid C malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of following conditions, PCM determines that shift solenoid C circuit has a malfunction: — Shift solenoid C voltage is stuck at **B+** after engine start. — Shift solenoid C voltage is stuck at **0 V** after engine start.
POSSIBLE CAUSE	• Shift solenoid C malfunction • Short to ground between ATX connector terminal G and PCM terminal 102 • Short to power between ATX connector terminal G and PCM terminal 102 • Open circuit between shift solenoid C terminal B and ATX connector terminal G • Open circuit between ATX connector terminal G and PCM terminal 102 • Open circuit between shift solenoid C terminal A and body ground point • Damaged connector between shift solenoid C and PCM. • PCM malfunction.



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLICK TEST OF SHIFT SOLENOID C** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access **SHIFT C PID** using NGS tester. • Verify the click sound of shift solenoid C using **NGS** simulation function. • Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 **INTERMITTENT CONCERN.**)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF ATX CONNECTOR** • Turn ignition key to OFF. • Disconnect ATX connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect resistance between ATX connector terminal G (transaxle case side) and body ground. • Is resistance **within 1.0—4.2** Ω? (See K2-38 SOLENOID VALVES INSPECTION, Inspection of Resistance (On-vehicle).)	Yes	Go to Step 7.
		No	Go to next step.
5	**INSPECT POOR CONNECTION OF SHIFT SOLENOID C CONNECTOR** • Disconnect shift solenoid C connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect resistance between shift solenoid C terminals A and B (part-side). • Is resistance **within 1.0—4.2** Ω? (See K2-38 SOLENOID VALVES INSPECTION, Inspection of Resistance (Off-vehicle).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid C installation. • If solenoid installed correctly, replace solenoid, then go to Step 11. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)
7	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect **PCM** connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN** • inspect for continuity between PCM terminal 102 (harness-side) and ATX connector terminal G (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (engine OFF). • Check voltage at ATX connector terminal G (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.

STEP	INSPECTION		ACTION
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Inspect for continuity between PCM terminal 102 (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0763 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Access SHIFT C PID using NGS tester. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0766

DTC P0766	Shift solenoid D stuck OFF
DETECTION CONDITION	• When all conditions below satisfied with ignition key turned to ON (engine start). — ATF temperature **20 ° C {68 ° F} or above.** — Driving in 4GR at D range. — Engine speed **450 rpm or above.** — Turbine speed **within 225—4,988 rpm.** — Differential gear case (output) revolution speed **35 rpm or above.** — Vehicle speed **50 km/h {31 mph} or above.** — Throttle opening angle closed throttle position. — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.6 or 1.249 or above.** — Any of DTC P0731, P0732, and P0733 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid D stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm², 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm², 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step **6**. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** ● Turn ignition key to OFF. ● Remove control valve body. ● Disassemble control valve body. ● Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
6	**VERIFY TROUBLESHOOTING OF DTC P0766 COMPLETED** ● Make sure to reconnect all disconnected connectors. ● Clear DTC from memory using NGS tester. ● Start engine. ● Warm up ATX. ● Access ATFT, D SW, RPM, TURBINE, VS, and THOP PIDs using NGS tester. ● Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATFT PID: **20 °C {68 °F} or above** — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — VS PID: **50 km/h {31 mph} or above.** (4GR only) — THOP PID: **0 %**. (4GR only) ● Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** ● Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) ● Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0767

DTC P0767	Shift solenoid D stuck ON
DETECTION CONDITION	• When all conditions below satisfied while Driving in 3GR. — ATF temperature **20 ° C {68 ° F} or above.** — Driving in D range. — Engine speed **450 rpm or above.** — Turbine speed **within 225—4,988 rpm.** — Differential gear case (output) revolution speed **35 rpm or above.** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **below 0.863 or 1.249 or above.** — Any of DTC P0731, P0732, P0734, and P0741 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid D stuck • Control valve stuck • PCM malfunction

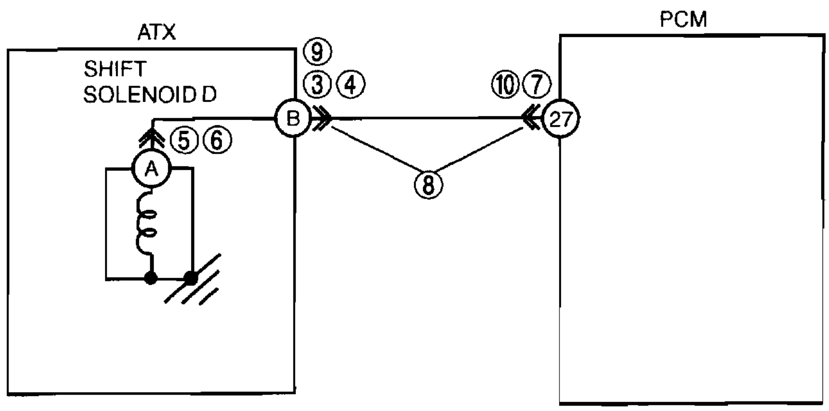
Diagnostic procedure

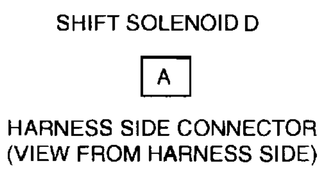
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm^2, 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)

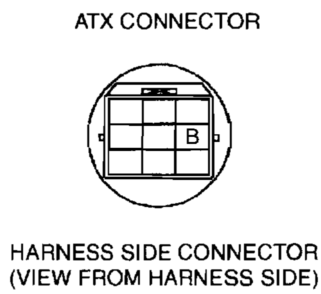
STEP	INSPECTION		ACTION
6	**VERIFY TROUBLESHOOTING OF DTC P0767 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up ATX. • Access ATFT, D SW, RPM, and TURBINE PIDs using NGS tester. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATFT PID: **20 °C {68 °F} or above** — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

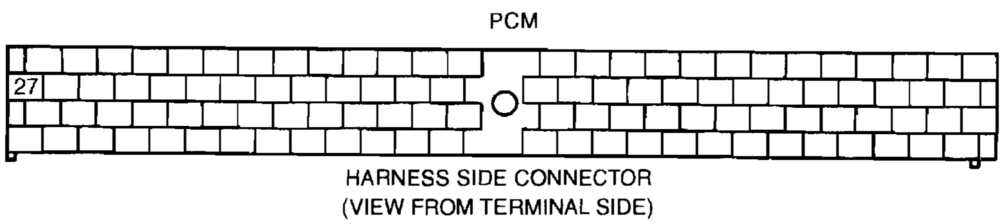
DTC P0768

DTC P0768	Shift solenoid D malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of following conditions while driving in 4GR at D range, PCM determines that shift solenoid D circuit has a malfunction: — Shift solenoid D voltage is stuck at **B+** after engine start. — Shift solenoid D voltage is stuck at **0 V** after engine start.
POSSIBLE CAUSE	• Shift solenoid D malfunction • Short to ground between ATX connector terminal B and PCM terminal 27 • Short to power between ATX connector terminal B and PCM terminal 27 • Open circuit between shift solenoid D terminal A and ATX connector terminal B • Open circuit between ATX connector terminal B and PCM terminal 27 • Damaged connector between shift solenoid D and PCM • PCM malfunction









Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLICK TEST OF SHIFT SOLENOID D** • Turn ignition key to OFF. • Connect NGS tester to DLC. • Turn ignition key to ON (engine OFF). • Access SHIFT D PID using NGS tester. • Verify the click sound of shift solenoid D using NGS simulation function. • Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF ATX CONNECTOR** • Turn ignition key to OFF. • Disconnect ATX connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect resistance between ATX connector terminal B (transaxle case side) and body ground. • Is resistance **within 10.9—26.2 Ω**? (See K2-38 SOLENOID VALVES INSPECTION, Inspection of Resistance (On-vehicle).)	Yes	Go to Step 7.
		No	Go to next step.
5	**INSPECT POOR CONNECTION OF SHIFT SOLENOID D CONNECTOR** • Disconnect shift solenoid D connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** • inspect resistance between shift solenoid D terminal A (part-side) and body ground. • Is resistance **within 10.9—26.2 Ω?** (See K2-38 SOLENOID VALVES INSPECTION, Inspection of Resistance (Off-vehicle).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid D installation. • If solenoid installed correctly, replace solenoid, then go to Step 11. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)
7	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). • Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN** • Inspect for continuity between PCM terminal 27 (harness-side) and ATX connector terminal B (vehicle harness-side). • Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (engine OFF). • Inspect voltage at ATX connector terminal B (vehicle harness-side). • Is voltage **0 V**?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.

STEP	INSPECTION		ACTION
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Inspect continuity between PCM terminal 27 (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0768 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Access SHIFT D PID using NGS tester. • Drive vehicle in **D** range and make sure that gears shift smoothly from 1GR to 4GR. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0771

DTC P0771	Shift solenoid E stuck OFF
DETECTION CONDITION	• When all conditions below satisfied with ignition key turned to ON (engine start). — ATF temperature **20 °C {68 °F} or above.** — Driving in 4GR at D range. — Engine speed **450 rpm or above.** — Turbine speed **within 225—4,988 rpm.** — Vehicle speed **within 60—100 km/h {37—62 mph}**. — TCC operation — Shift solenoid A duty value exceeds **99 %** — Power or normal mode — Difference between engine speed and turbine speed **more than 100 rpm** — Any of DTC P0731, P0732, and P0734 not output.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid E stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm^2, 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step 6. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** • Turn ignition key to OFF. • Remove control valve body. • Disassemble control valve body. • Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
6	**VERIFY TROUBLESHOOTING OF DTC P0771 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Start engine. • Warm up ATX. • Access ATFT, D SW, RPM, TURBINE, VS, THOP, SHIFT A, and SHIFT E PIDs using NGS tester. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR with TCC operation. — ATFT PID: **20 °C {68 °F} or above** — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — VS PID: **within 60—100 km/h {37—62 mph}** (4GR only). — SHIFT E PID: ON (TCC operation) (4GR only). — SHIFT A PID:**99 %** (4GR only). • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0772

DTC P0772	Shift solenoid E stuck ON
DETECTION CONDITION	• All of following conditions satisfied under each of following throttle conditions. — ATF temperature **20 °C {68 °F} or above.** — Driving in 4GR at D range. — Engine speed **450 rpm or above.** — Turbine speed **within 225—4,988 rpm.** — Vehicle speed **below 70 km/h {43 mph}.** — Torque converter clutch (TCC) no operation — Difference between engine speed and turbine speed **below 50 rpm** — P0734 not output. • Throttle conditions — Throttle opening angle **within 3.125—6.25 %** and **3 seconds or more** have passed. — Throttle opening angle **more than 6.25 %** and **10 seconds or more** have passed. — Throttle opening angle closed throttle position **10 seconds or more** have passed.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid E stuck • Control valve stuck • PCM malfunction

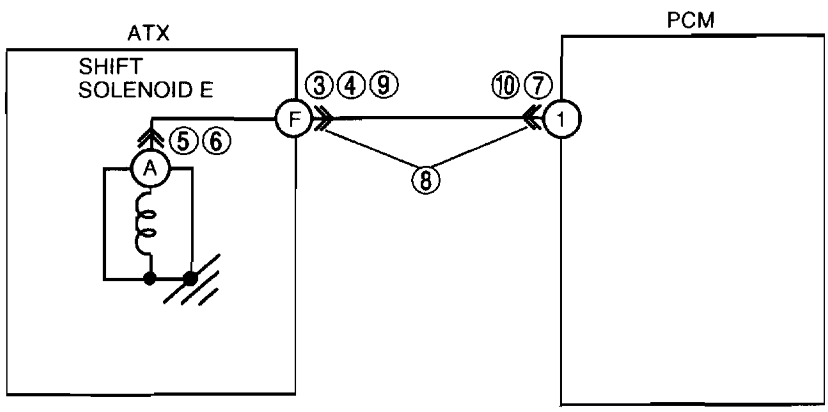
Diagnostic procedure

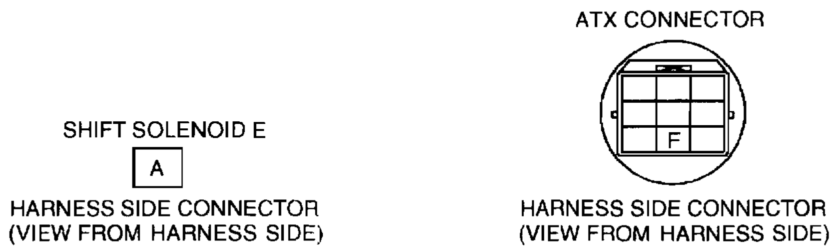
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CHECK ATF CONDITION** • Turn ignition key to OFF. • Check ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it okay? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step **4**. (See K2-29 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	**CHECK ATF LEVEL** • Start engine. • Warm up ATX. • Is ATF level within specification? (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION, Automatic Transaxle Fluid (ATF) Level Inspection.)
4	**INSPECT LINE PRESSURE** • Start engine. • Measure line pressure. **Specification** **Idle: 334—470 kPa {3.4—4.8 kgf/cm^2, 49—68 psi}** **Stall: 1,158—1,323 kPa {11.8—13.5 kgf/cm^2, 168—191 psi}** • Is line pressure within specification? (See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test.)	Yes	Go to next step.
		No	• All ranges: Replace oil pump or control valve body, then go to Step 6. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].) • Any ranges: Replace ATX, then go to Step **6**. (See K2-41 AUTOMATIC TRANSAXLE (ATX) REMOVAL/INSTALLATION.)

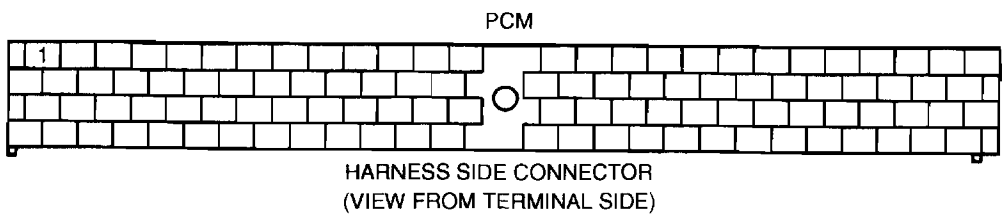
STEP	INSPECTION		ACTION
5	**CHECK OPERATION OF EACH VALVE AND EACH SPRING** ● Turn ignition key to OFF. ● Remove control valve body. ● Disassemble control valve body. ● Is each valve operation okay and is return spring okay? (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)	Yes	Replace ATX, then go to next step (See K2-41 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
		No	Repair or replace shift valve and return spring, then go to next step. (See K2-46 CONTROL VALVE BODY REMOVAL.) (See K2-46 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL [1623-10-98E].)
6	**VERIFY TROUBLESHOOTING OF DTC P0772 COMPLETED** ● Make sure to reconnect all disconnected connectors. ● Clear DTC from memory using NGS tester. ● Start engine. ● Warm up ATX. ● Access ATFT, 4GR, D SW, RPM, TURBINE, VS, THOP, and SHIFT E PIDs using NGS tester. ● Drive the vehicle under the following conditions with following each throttle conditions. — ATFT PID: **20 ° C {68 ° F} or above** — 4GR PID: ON — D SW PID: ON — RPM PID: **450 rpm or above** — TURBINE PID: **within 225—4,988 rpm** — VS PID: **below 70 km/h {43 mph}** (4GR only). — SHIFT E PID: OFF (TCC no operation). ● Throttle conditions — Throttle opening angle **within 3.125—6.25%** and **3 seconds or more** have passed — Throttle opening angle **above 6.25%** and **10 seconds or more** have passed — Throttle opening angle closed throttle position and **10 seconds or more** have passed ● Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** ● Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) ● Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0773

DTC P0773	Shift solenoid E malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of following conditions while driving in 1GR at L range or 4GR at D range with TCC operation, PCM determines that shift solenoid E circuit has a malfunction: — Shift solenoid E voltage is stuck at **B+** after engine start. — Shift solenoid E voltage is stuck at **0 V** after engine start.
POSSIBLE CAUSE	• Shift solenoid E malfunction • Short to ground between ATX connector terminal F and PCM terminal 1 • Short to power between ATX connector terminal F and PCM terminal 1 • Open circuit between shift solenoid E terminal A and ATX connector terminal F • Open circuit between ATX connector terminal F and PCM terminal 1 • Damaged connector between shift solenoid E and PCM • PCM malfunction







Diagnostic procedure

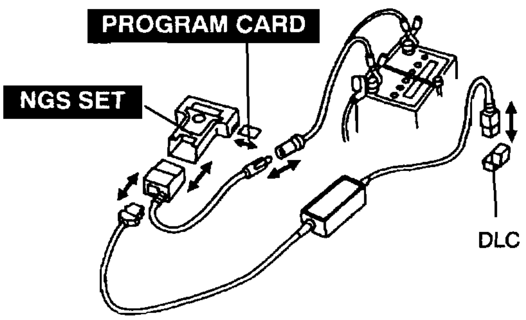
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** ● Check for related Service Information availability. ● Is any related Service Information available?	Yes	Perform repair or diagnosis according to available repair information. ● If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLICK TEST OF SHIFT SOLENOID E** ● Turn ignition key to OFF. ● Connect NGS tester to DLC. ● Turn ignition key to ON (engine OFF). ● Access SHIFT E PID using NGS tester. ● Verify the click sound of shift solenoid E using NGS simulation function. ● Is there a click sound? (See K2-134 SIMULATION TEST.)	Yes	Go to intermittent concern troubleshooting procedure. (See F1-142 INTERMITTENT CONCERN.)
		No	Go to next step.
3	**INSPECT POOR CONNECTION OF ATX CONNECTOR** ● Turn ignition key to OFF. ● Disconnect ATX connector. ● Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). ● Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** ● Inspect resistance between ATX connector terminal F (transaxle case side) and body ground. ● Is resistance **within 10.9—26.2** Ω? (See K2-38 SOLENOID VLAVES INSPECTION, Inspection of Resistance (On-vehicle).)	Yes	Go to Step 7.
		No	Go to next step.
5	**INSPECT POOR CONNECTION OF SHIFT SOLENOID E CONNECTOR** ● Disconnect shift solenoid E connector. ● Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). ● Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	**INSPECT RESISTANCE** ● Inspect resistance between shift solenoid E terminal A (part-side) and body ground. ● Is resistance **within 10.9—26.2** Ω? (See K2-38 SOLELNOID VALVES INSPECTION, Inspection of Resistance (Off-vehicle).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid E installation. ● If solenoid installed correctly, replace solenoid, then go to Step 11. (See K2-40 SOLENOID VALVES REMOVAL/INSTALLATION.)
7	**INSPECT POOR CONNECTION OF PCM CONNECTOR** ● Disconnect PCM connector. ● Check for poor connection (damaged/ pulled-out terminals, corrosion, etc.). ● Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN** ● Inspect for continuity between PCM terminal 1 (harness-side) and ATX connector terminal F (vehicle harness-side). ● Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER** ● Turn ignition key to **ON** (engine OFF). ● Inspect voltage at ATX connector terminal F (vehicle harness-side). ● Is voltage **0** V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.

STEP	INSPECTION		ACTION
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Inspect for continuity between PCM terminal 1 (harness-side) and body ground. • Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0773 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using NGS tester. • Access SHIFT E PID using NGS tester. • Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR with TCC operation. • Is same DTC present?	Yes	Replace PCM, then go to next step. (See Section F1.)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See K2-61 AFTER REPAIR PROCEDURE.) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

PCM INSPECTION

Using SSTs (NGS tester)

1. Connect the **SSTs** (NGS tester) to the DLC.



Note

- Referring to the **SST** instruction manual.

2. Turn the ignition switch to ON.
3. Select the "PID/DATA MONITOR AND RECORD" function on the NGS tester display and press TRIGGER. (See Section F1.)
4. Select the appropriate PID on the NGS tester display and press START.
5. Measure the PID value.
   - If PID value is not within the specification, follow the instruction in ACTION column.

Note

- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, if a monitored value of an output device is out of specification, it is necessary to inspect the monitored value of the input device related to the output device control. Since an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device, it is necessary to inspect the output device individually using the simulation function, etc.
- The signal which is not indicated by monitor uses **SST** (Pin Box) or voltmeter, and PCM terminal voltage is measured.

PID/DATA MONITOR TABLE (FOR EC-AT CONTROL)

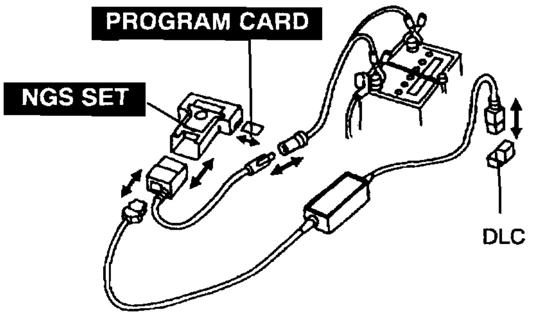
Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
1GR (First gear)	ON/OFF	First gear:ON Others:OFF	Inspect following PIDs: SHIFT A, SHIFT B, SHIFT C.	—
2GR (Second gear)	ON/OFF	Second gear: ON Others:OFF	Inspect following PIDs: SHIFT A, SHIFT B, SHIFT C.	—
3GR (Third gear)	ON/OFF	Third gear: ON Others:OFF	Inspect following PIDs: SHIFT A, SHIFT B, SHIFT C.	—
4GR. (Fourth gear)	ON/OFF	Fourth gear: ON Others:OFF	Inspect following PIDs: SHIFT A, SHIFT B, SHIFT C.	—
ATFT (Transaxle fluid temperature)	°C	°F	Transaxle fluid temperature 20 °C {68 °F}: 20 °C {68 °F} Transaxle fluid temperature 130 °C {266 °F}: 130 °C {266 °F}	Inspect TFT sensor. See K2-34 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION	37
ATFT V (Transaxle fluid temperature sensor signal voltage)	V	Transaxle fluid temperature 20 °C {68 °F}: 3.3—3.4 V Transaxle fluid temperature 130 °C {266 °F}: 1.7—1.8 V	Inspect TFT sensor. See K2-34 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION	37
B+ (B+)	V	Ignition switch ON: B+	Inspect main relay. See Section F1 Inspect battery. See Section G	55
D SW (TR switch [D range])	ON/OFF	D range: ON Others: OFF	Inspect TR switch. See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	6
HOLD LP (HOLD indicator light)	ON/OFF	HOLD mode: ON Others: OFF	Inspect HOLD indicator light. See K2-40 HOLD INDICATOR LIGHT INSPECTION	43
HOLD SW (HOLD switch)	ON/OFF	HOLD switch pressed: ON Others: OFF	Inspect HOLD switch. See K2-29 HOLD SWITCH INSPECTION	29
L SW (TR switch [L range])	ON/OFF	L range: ON Others: OFF	Inspect TR switch. See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	7

Monitor item (Definition)	Unit/ Condition		Condition/Specification	Action	PCM terminal
LINE (Pressure control solenoid)	A		ATF temperature at 60°C {140°F}—70°C {158°F} • Idle: 0.94—0.96 A • Stall (D range): 0.25—0.35 A • Stall (R range): 0—0.05 A	Inspect pressure control solenoid. See K2-38 SOLENOID VALVES INSPECTION	44, 81
R SW (TR switch [R range])	ON/OFF		R range: ON Others: OFF	Inspect TR switch. See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	32
S SW (Transaxle range switch [S range])	ON/OFF		S range: ON Others: OFF	Inspect TR switch. See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	9
SHIFT A (Shift solenoid A)	%		Fourth gear: 99% Others: 0%	Inspect shift solenoid A. See K2-38 SOLENOID VALVES INSPECTION	82
SHIFT B (Shift solenoid B)	%		First gear: 99% Others: 0%	Inspect shift solenoid B. See K2-38 SOLENOID VALVES INSPECTION	99
SHIFT C (Shift solenoid C)	%		First gear: 99% Second gear: 99% Others: 0%	Inspect shift solenoid C. See K2-38 SOLENOID VALVES INSPECTION	102
SHIFT D (Shift solenoid D)	ON/OFF		N or P position: ON Others: OFF	Inspect shift solenoid D. See K2-38 SOLENOID VALVES INSPECTION	27
SHIFT E (Shift solenoid E)	ON/OFF		Fourth gear at D range: ON Others: OFF	Inspect shift solenoid E. See K2-38 SOLENOID VALVES INSPECTION	1
TEN (TEN terminal (in DLC))	ON/OFF		Terminal TEN (DLC) shorted to GND: ON Terminal TEN (DLC) open: OFF	Inspect wiring from DLC terminal TEN to PCM terminal 1L.	5
THOP (TP)	%		CTP: 0 % WOT: 100 %	Inspect TP sensor. See Section F1	89
TR SW (Load/no load condition signal)	ON/OFF		N or P position: ON Others: OFF	Inspect TR switch. See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION	64
TURBINE (Input/turbine speed signal)	RPM		Ignition switch ON: 0 rpm Idle: 675—825 rpm	Inspect input/turbine speed sensor. See K2-35 INPUT/TURBINE SPEED SENSOR INSPECTION	23, 84
VS (Vehicle speed)	KPH	MPH	Vehicle speed 20 km/h {12 mph}: 20 km/h {12 mph} Vehicle speed 40 km/h {25 mph}: 40 km/h {25 mph}	ATX: Inspect VSS. See K2-36 VEHICLE SPEED SENSOR (VSS) INSPECTION	58

SIMULATION TEST

Shift Solenoid Valve A, B, and C

1. Connect the NGS to the DLC.



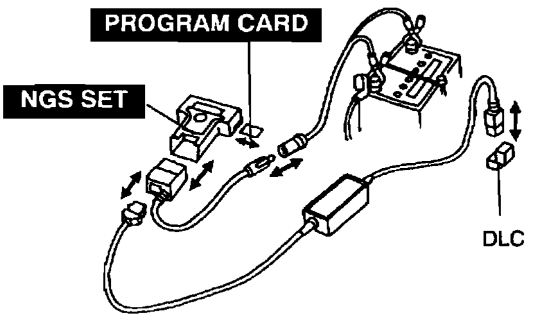
2. Turn the ignition switch to ON.

Note
- For information on how to operate the NGS, refer to the instruction manual that comes with the NGS.

3. Select the "SIMULATION TEST" on the NGS. (See F1-35 ON-BOARD DIAGNOSTIC TEST, Simulation Test Procedure.)
4. Perform the simulation test.
   - If no operation sound is heard from solenoid valve, inspect solenoid valve.

Pressure Control Solenoid Valve

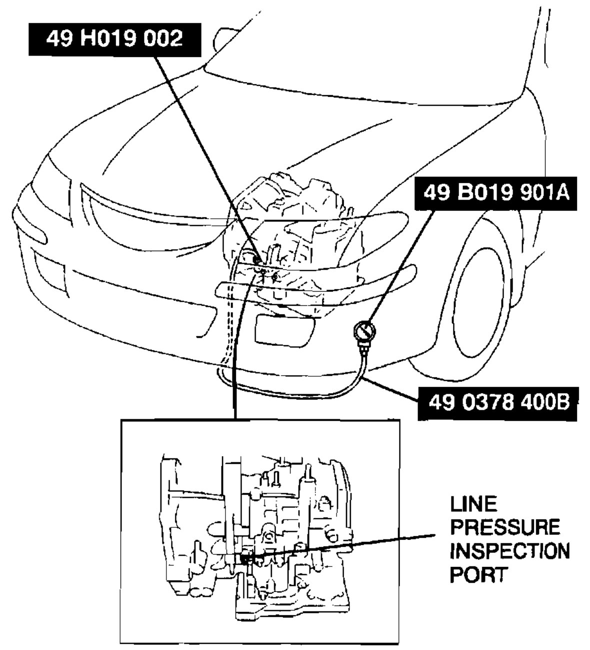
1. Connect the NGS to the DLC.



2. Perform mechanical system test preparation. (See K2-21 MECHANICAL SYSTEM TEST, Mechanical System Test Preparation.)

Warning
- **Removing the square-head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square-head plug, allow the ATF to cool.**

3. Connect the **SSTs** (49 H019 002,49 0378 400B) to the line pressure inspection port. Then replace the gauge of the **SST** (49 0378 400B) with (49 B019 901A).

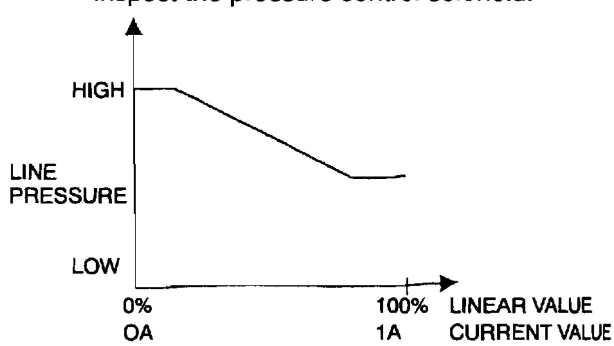


4. Start the engine.
5. Select the "SIMULATION TEST" on the NGS. (See F1-35 ON-BOARD DIAGNOSTIC TEST, Simulation Test Procedure.)

Caution
- **After the simulation test, be sure to idle for one minute or more in N position. Otherwise the transaxle could be damaged.**

Note
- For information on how to operate the NGS, refer to the instruction manual that comes with the NGS.

6. Perform the simulation test and verify that the line pressure changes as shown in the chart below.
   - If the line pressure does not increase or decrease corresponding to the linear value, inspect the pressure control solenoid.



×: Applied
–: Not applied

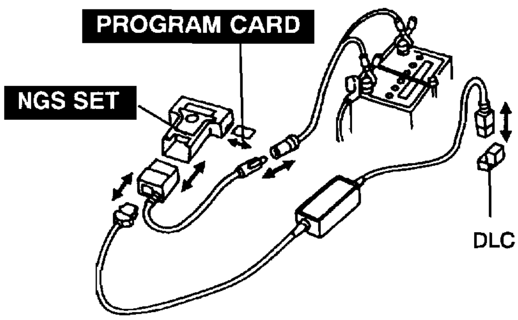
Simulation Test Table

Simulation item	Full name	Practicable operation	Test condition		PCM terminal
			IG ON	Idle	
LINE*1	Pressure control solenoid	Actuates at any current up to 1A (0—100%)	×	×	44, 81
SHIFT A	Shift solenoid A	Actuates at any duty value (0—100%)	×	–	82
SHIFT B	Shift solenoid B	Actuates at any duty value (0—100%)	×	–	99
SHIFT C	Shift solenoid C	Actuates at any duty value (0—100%)	×	–	102
SHIFT D*2	Shift solenoid D	ON or OFF	×	–	27
SHIFT E*2	Shift solenoid E	ON or OFF	×	–	1

*1: When the ignition switch is on, line pressure is not generated because the oil pump does not operate.
*2: A simulation test can be performed but inspection is not possible, as the line pressure does not change and solenoid valve is barely audible.

DIAGNOSTIC SUPPORT PROCEDURE

1. Connect the NGS to the DLC.



2. Select the "DIAGNOSTIC SUPPORT PROCEDURE" on the NGS.
   (See F1-34 ON-BOARD DIAGNOSTIC TEST, Diagnostic Support Procedure.)

Diagnostic Support Procedure Table

Diagnostic table	Remark
READ/CLEAR DIAGNOSTIC TEST RESULTS	Diagnose according to the procedures displayed on the NGS tester.
TPS, CTP SW TEST	
TR, SHIFT SW TEST	
MAF/VAF TEST	
BASIC SW TEST	

TROUBLESHOOTING

FOREWORD

- Refer to Section GI and thoroughly read and understand the basic flow of troubleshooting in order to properly perform the procedures.

BASIC INSPECTION

STEP	INSPECTION	RESULTS	ACTION
1	Perform the mechanical system test. See K2-21 MECHANICAL SYSTEM TEST Is mechanical system okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result.
2	Turn IG SW to ON. When selector lever is moved, does the selector illumination indicate synchronized position to lever location? Also, when other ranges are selected from N or P during idling, does vehicle creep within 1 or 2 seconds?	Yes	Go to next step.
		No	Inspect selector lever and TR switch. Repair or replace defected areas. See K2-55 SELECTOR LEVER INSPECTION See K2-30 TRANSAXLE RANGE (TR) SWITCH INSPECTION If selector lever and TR switch are okay, go to next step.
3	Inspect the ATF color and condition. See K2-28 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION Are ATF color and odor normal?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	Perform the line pressure test. See K2-21 MECHANICAL SYSTEM TEST, Line Pressure Test Is line pressure okay?	Yes	Go to next step.
		No	Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	Perform the stall test. See K2-21 MECHANICAL SYSTEM TEST, Stall Test Is stall speed okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result.
6	Inspect the value at the following PIDs using the NGS tester. See F1-25 PCM INSPECTION • ATFT • ATFT V • TP V • TR • TR V • VS • TCS Is PID value okay?	Yes	Perform symptom troubleshooting and follow procedures.
		No	Repair or replace any defective parts according to inspection result.

SYMPTOM TROUBLESHOOTING ITEM TABLE

- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	TROUBLESHOOTING ITEM	DESCRIPTION
1	Vehicle does not move in D, S, L ranges, or in R position	Vehicle does not move when AP depressed.
2	Vehicle moves in N position	Vehicle creeps in N position. Vehicle creeps if brake pedal is not depressed in N position.
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged	Vehicle rolls when on a downward slope and tires do not lock in P position. Tires are locked when P is disengaged, vehicle does not move in D, S, L ranges, and R position when AP is depressed, and engine remains in stall condition.

No.	TROUBLESHOOTING ITEM	DESCRIPTION
4	Excessive creep	Vehicle accelerates in D, S, L ranges, and R position without depressing accelerator pedal.
5	No creep at all	Vehicle does not move in D, S, L ranges, or R position when idling on flat paved road.
6	Low maximum speed and poor acceleration	Vehicle acceleration is poor at start. Delayed acceleration when accelerator pedal is depressed while driving.
7	No shifting	Single shift range only. Sometimes it shifts correctly.
8	Does not shift to fourth gear (4GR)	Vehicle does not upshift from 3GR to 4GR even though vehicle speed increases. Vehicle does not shift to 4GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.
9	Abnormal shifting	Shifts incorrectly (incorrect shift pattern).
10	Frequent shifting	Downshifting occurs immediately even when accelerator pedal is depressed slightly in D, S, L ranges non-HOLD mode.
11	Shift point is high or low	Shift point is considerably different from automatic shift diagram. Shift delayed when accelerating. Shift occurs quickly when accelerating and engine speed does not increase.
12	Torque converter clutch (TCC) non-operation	TCC does not operate when vehicle reaches TCC operation range.
13	No kickdown	Does not downshift when accelerator pedal is fully depressed within kickdown range.
14	Engine flares up or slips when upshifting or downshifting	When accelerator pedal is depressed for driveway, engine speed increases but vehicle speed increase slowly. When accelerator is depressed while driving, engine speed increases but vehicle does not.
15	Engine flares up or slips when accelerating vehicle	Engine flares up when accelerator pedal is depressed for upshifting. Engine flares up suddenly when accelerator pedal is depressed for downshifting.
16	Judder upon torque converter clutch (TCC) operation	Vehicle jolts when TCC is engaged.
17	Excessive shift shock from N to D or N to R position/range	Strong shock is felt when shifting from N to D or N to R position/range at idle.
18	Excessive shift shock is given when upshifting and downshifting	Excessive shift shock is felt when depressing accelerator pedal to accelerate at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.
19	Excessive shift shock on torque converter clutch (TCC)	Strong shock is felt when TCC is engaged.
20	Noise occurs at idle when vehicle is stopped in all positions/ranges	Transaxle is noisy in all positions and ranges when vehicle is idling.
21	Noise occurs at idle when vehicle is stopped in D, S, L ranges, or in R position	Transaxle is noisy in driving ranges when vehicle is idling.
22	No engine braking in HOLD mode	Engine speed drops to idle but vehicle coasts when accelerator pedal is released during cruising at medium to high speeds. Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in L range at low vehicle speed.
23	Transaxle overheats	Burnt smell is emitted from transaxle. Smoke is emitted from transaxle.
24	Engine stalls when shifted to D, S, L ranges, or in R position	Engine stalls when shifting from N or P position to D, S, L ranges or R position at idle.
25	Engine stalls when driving at slow speeds or stopping	Engine stalls when brake pedal is depressed while driving at low speed or stopping.
26	HOLD indicator light does not illuminate when HOLD switch is turned to ON	HOLD indicator light in dashboard does not illuminate when HOLD switch is turned on and IG SW at ON.
27	HOLD indicator light illuminates when HOLD switch is not turned to ON	HOLD indicator light in dashboard illuminates even though HOLD switch is turned off and IG SW at ON.

QUICK DIAGNOSIS CHART

No.	Item	Selector lever misadjusted	Not within line pressure specification	Idle speed is misadjusted	IG timing is misadjusted	TR switch is misadjusted	Electrical system components / ATX outer parts / TP sensor: Signal is not inputed	TP sensor: Malfunction signal is inputed	Input/turbine speed sensor: Signal is not inputed	Input/turbine speed sensor: Malfunction signal is inputed	Vehicle speed sensor: Signal is not inputed	Vehicle speed sensor: Malfunction signal is inputed	HOLD switch: Signal is not inputed	HOLD switch: Malfunction signal is inputed	ECT sensor: Signal is not inputed	ECT sensor: Malfunction signal is inputed	Poor GND
1	Vehicle does not move in D, S, L ranges, or in R position	O	O														
2	Vehicle moves in N position	O															
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged	O															
4	Excessive creep			O	O												
5	No creep at all		O				O	O	O	O	O	O					O
6	Low maximum speed and poor acceleration		O		O		O	O	O	O	O	O	O	O			O
7	No shifting						O	O	O	O	O	O	O	O			O
8	Does not shift to fourth gear (4GR)						O	O	O	O	O	O	O	O			O
9	Abnormal shifting	O	O			O	O	O	O	O	O	O					O
10	Frequent shifting						O	O	O	O	O	O					O
11	Shift point is high or low						O	O	O	O	O	O					O
12	Torque converter clutch (TCC) non-operation					O	O	O	O	O	O	O	O	O	O	O	O
13	No kickdown						O	O									O
14	Engine flares up or slips when upshifting or downshifting		O				O	O	O	O	O	O					O
15	Engine flares up or slips when accelerating vehicle		O				O	O	O	O	O	O					O
16	Judder upon torque converter clutch (TCC) operation		O				O	O	O	O	O	O					O
17	Excessive shift shock from N to D or N to R position/range		O	O			O	O	O	O	O	O					O
18	Excessive shift shock is felt when upshifting and downshifting		O				O	O	O	O	O	O					O
19	Excessive shift shock on torque converter clutch (TCC)		O				O	O	O	O	O	O					O
20	Noise occurs at idle when vehicle is stopped in all positions/ranges																
21	Noise occurs at idle when vehicle is stopped in D, S, L ranges, or in R position																
22	No engine braking in HOLD mode						O	O	O	O	O	O	O	O			O
23	Transaxle overheats		O														O
24	Engine stalls when shifted to D, S, L ranges, or in R position			O													
25	Engine stalls when driving at slow speeds or stopping			O													
26	HOLD indicator light does not illuminate when HOLD switch is turned to ON												O	O			
27	HOLD indicator light illuminates when HOLD switch is not turned to ON													O			

Symptom / Cause of trouble / Inspection method

Item	Selector lever misadjusted	Not within line pressure specification	Idle speed is misadjusted	IG timing is misadjusted	TR switch is misadjusted	TP sensor: Signal is not inputed	TP sensor: Malfunction signal is inputed	Input/turbine speed sensor: Signal is not inputed	Input/turbine speed sensor: Malfunction signal is inputed	Vehicle speed sensor: Signal is not inputed	Vehicle speed sensor: Malfunction signal is inputed	HOLD switch: Signal is not inputed	HOLD switch: Malfunction signal is inputed	ECT sensor: Signal is not inputed	ECT sensor: Malfunction signal is inputed	Poor GND
Line pressure test		O														
Stall test																
Time lag test																
DTC						O		O		O				O		

No.	Item (Symptom / Inspection method)	Electrical system components — ATX outer parts: Transaxle fluid temperature sensor — Signal is not inputed	Electrical system components — ATX outer parts: Transaxle fluid temperature sensor — Malfunction signal is inputed	Shift solenoid D malfunction	Shift solenoid E malfunction	Shift solenoid A malfunction	Shift solenoid B malfunction	Shift solenoid C malfunction	Pressure control solenoid malfunction	Hydraulic system components: Control valve is not operating properly	Forward accumulator is not operating properly	Servo apply accumulator is not operating properly	Oil cooler is not operating properly	Powertrain system: Slipping (Brake, clutch)	Burnt (Brake, clutch)	Torque converter is not operating properly	TCC burnt Inspection method
1	Vehicle does not move in D, S, L ranges, or in R position			○		○	○		○	○				○	○	○	
2	Vehicle moves in N position									○							
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged																
4	Excessive creep																
5	No creep at all		○	○	○	○	○	○	○	○				○	○	○	
6	Low maximum speed and poor acceleration	○	○	○	○	○	○	○	○	○				○	○	○	○
7	No shifting			○	○	○	○	○	○	○				○	○		
8	Does not shift to fourth gear (4GR)	○	○	○	○	○	○	○		○				○	○		
9	Abnormal shifting			○	○	○	○	○		○	○	○		○	○		
10	Frequent shifting																
11	Shift point is high or low																
12	Torque converter clutch (TCC) non-operation	○	○	○	○	○	○	○		○						○	○
13	No kickdown			○	○	○	○	○		○				○	○		
14	Engine flares up or slips when upshifting or downshifting		○	○	○	○	○	○	○	○				○	○		
15	Engine flares up or slips when accelerating vehicle		○						○	○				○	○		
16	Judder upon torque converter clutch (TCC) operation									○						○	○
17	Excessive shift shock from N to D or N to R position/range						○		○	○	○	○		○	○		
18	Excessive shift shock is felt when upshifting and downshifting	○	○	○	○	○	○	○	○	○	○	○		○	○		
19	Excessive shift shock on torque converter clutch (TCC)		○			○				○						○	○
20	Noise occurs at idle when vehicle is stopped in all positions/ranges																
21	Noise occurs at idle when vehicle is stopped in D, S, L ranges, or in R position																
22	No engine braking in HOLD mode									○				○	○		
23	Transaxle overheats	○	○							○			○				○
24	Engine stalls when shifted to D, S, L ranges, or in R position									○						○	○
25	Engine stalls when driving at slow speeds or stopping									○						○	○
26	HOLD indicator light does not illuminate when HOLD switch is turned to ON																
27	HOLD indicator light illuminates when HOLD switch is not turned to ON																
	Line pressure test									○				○	○		
	Stall test									○				○	○	○	
	Time lag test										○	○		○	○		
	DTC	○		○	○	○	○	○	○								

Cause of trouble

NO.1 VEHICLE DOES NOT MOVE IN D, S, L RANGES, OR IN R POSITION

1	**Vehicle does not move in D, S, L ranges, or in R position**
DESCRIPTION	• Vehicle does not move when AP depressed.
POSSIBLE CAUSE	• If the vehicle does not move in D, S, L ranges or R position, basically, the malfunction is in the ATX. (Vehicle will move even with a malfunction in the PCM.) Since a malfunction is in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related harnesses. 1. Clutch slippage, worn (D, S, L ranges — Forward clutch, R position — Reverse clutch, Low and reverse brake) • Line pressure low • Sensor GND malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Selector lever malfunction 3. Parking mechanism not properly operation 4. Torque converter malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	When vehicle is stopped on a flat, paused road and engine is off, does vehicle move when pushed? (in D, S ranges or N, R positions and brake is released)	Yes	Go to next step.
		No	Check for parking mechanism. (See ATX workshop manual (FN4A-EL) [1623-19-98E].)
2	Check the value at the following PID using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 Ω?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
4	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.2 VEHICLE MOVES IN N POSITION

2	Vehicle moves in N position
DESCRIPTION	• Vehicle creeps in N position. • Vehicle creeps if brake pedal is not depressed in N position.
POSSIBLE CAUSE	• If the vehicle moves in N position, basically, the malfunction is in the ATX. Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related harnesses. 1. Clutch burned (Forward clutch) • Control valve body malfunction 2. Selector lever position disparity (Although the selector indicator light shows N position, the hydraulic circuit shows D range, R position)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does vehicle creep when selector lever is moved slightly in N position?	Yes	Go to next step.
		No	Adjust selector lever. (See K2-56 SELECTOR LEVER REMOVAL/INSTALLATION.)
2	Check the value at the following PID using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
4	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED

3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged
DESCRIPTION	• Vehicle rolls when on a downward slope and tires do not lock in P position. • Tires are locked when P is disengaged, vehicle does not move in D, S, L ranges, and R position when AP is depressed, and engine remains in stall condition.
POSSIBLE CAUSE	1. Parking mechanism malfunction (May have effect on noise or shock from transaxle) 2. Improper adjustment of selector lever 3. If vehicle moves in N position, perform No.2 "Vehicle moves in N position"

NO.4 EXCESSIVE CREEP

4	Excessive creep
DESCRIPTION	• Vehicle accelerates in D, S, L ranges, and R position without depressing accelerator pedal.
POSSIBLE CAUSE	1. Engine idle speed high (transaxle system is not cause of problem) 2. Go to No.8 "Fast idle/runs on" (See F1-120 No.8 FAST IDLE/RUNS ON.)

NO.5 NO CREEP AT ALL

5	No creep at all
DESCRIPTION	• Vehicle does not move in D, S, L ranges, or R position when idling on flat paved road.
POSSIBLE CAUSE	• Either the transaxle is stuck in 3GR position, or there is clutch circuit slippage because the 3—4 clutch is stuck. 1. Clutch burned • Line pressure low • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring • Poor connection of connector • The electronic parts of output and input system is malfunction 3. The engine torque is not start • The torque converter is malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does vehicle creep in any range/position?	Yes	Go to next step.
		No	Inspect or adjust selector lever. (See K2-56 SELECTOR LEVER REMOVAL/INSTALLATION.)
2	Check the value at the following PID using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0 Ω**?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
4	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION

6	Low maximum speed and poor acceleration
DESCRIPTION	• Vehicle acceleration is poor at start. • Delayed acceleration when accelerator pedal is depressed while driving.
POSSIBLE CAUSE	• If the clutch is stuck or does not stay in 3GR, the malfunction is in the engine circuit. 1. Clutch slippage, burned • Line pressure low • TP sensor malfunction • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Sensor GND malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring • Poor connection of connector • The electronic parts of output and input system is malfunction 3. Insufficient starting torque (Suspected when in-gear condition, shift control and engine circuit are normal) • The torque converter is malfunction (Poor operation, stuck) 4. Engagement of TCC operation range (Operation of fail-safe function) • Transaxle fluid temperature sensor malfunction (Short or open circuit)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With ignition switch at ON, does HOLD indicator light indication correspond to HOLD switch operation?	Yes	Go to next step.
		No	Go to No.26 "HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED ON.". No.27 "HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED ON."
2	Go to No.11 "Lack/loss of power". (See F1-125 No.11 LACK/LOSS OF POWER-ACCELERATION/CRUISE.) Does CIS system okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect solenoid connector. Does vehicle operate as follows? **D, S ranges: 3GR (fixed)** **L range: 1 GR (fixed)** **R position: Reverse**	Yes	Go to next step.
		No	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
4	Drive vehicle in D, S, and L ranges except HOLD mode. Does vehicle start from stop in first gear?	Yes	Go to next step.
		No	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V • VSS • TURBINE • TR Repair or replace any defective parts.
5	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • SHIFT A • SHIFT B • SHIFT C Are PID values okay?	Yes	Go to next step.
		No	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V • VSS • TSS/ISS Repair or replace any defective parts.
6	Perform the stall test. (See K2-22 MECHANICAL SYSTEM TEST, Stall Test.) Is stall speed okay?	Yes	Reverify symptoms of malfunction.
		No	Overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)

NO.7 NO SHIFTING

7	No shifting
DESCRIPTION	• Single shift range only. • Sometimes it shifts correctly.
POSSIBLE CAUSE	• When the gear position is fixed in 3GR due to the fail-safe operation, the malfunction is in the ATX. • Perform malfunction diagnosis according to No.6 "Low maximum speed and poor acceleration". 1. Clutch burned • Line pressure low • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Sensor GND malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. 3GR is fixed (Operation in fail-safe function) • Short or open circuit in wiring • Poor connection of connector • Disconnected shift solenoid connector • Poor ground of shift solenoid

NO.8 DOES NOT SHIFT TO FOURTH GEAR (4GR)

8	Does not shift to fourth gear (4GR)
DESCRIPTION	• Vehicle does not upshift from 3GR to 4GR even though vehicle speed increases. • Vehicle does not shift to 4GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.
POSSIBLE CAUSE	• Basically, the TCC does not operate when the fail-safe is operating. Verify the DTC first. If the TCC operates when driving at high speeds only, the malfunction (improper adjustment) is in the HOLD switch circuit or TR switch circuit. **Caution** • **If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC slippage, burned • Line pressure low • TP sensor malfunction • Engine coolant temperature sensor malfunction • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Sensor GND malfunction 2. Transaxle fluid temperature sensor malfunction • Short or open circuit in wiring • Poor connection of connector • Sensor malfunction 3. TR switch malfunction • Short or open circuit in wiring • Poor connection of connector • Sensor malfunction • Selector lever adjustment incorrect • TR switch adjustment incorrect 4. Shift solenoid A, shift solenoid E valve malfunction • Short or open circuit in wiring • Poor connection of connector • Solenoid valve stuck 5. HOLD switch malfunction 6. Torque converter malfunction 7. Control valve body malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With indicator switch at ON, does HOLD indicator light indication correspond to HOLD switch operation?	Yes	Go to next step.
		No	Go to No.26 "HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED ON.", No.27 "HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED ON."
2	Check the value at the following PID using the NGS tester. (See F1-25 PCM INSPECTION.) • TFT Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • SHIFT A • SHIFT B • SHIFT C Are PID values okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Go to next step.
4	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TR • TURBINE • VS Repair or replace any defective parts.
		No	Repair open ground circuit. Reconnect PCM.

NO.9 ABNORMAL SHIFTING

9	**Abnormal shifting**
DESCRIPTION	• Shifts incorrectly (incorrect shift pattern)
POSSIBLE CAUSE	• There is a malfunction in the signal circuit which controls shifting (TP sensor, input/turbine speed sensor, vehicle speed sensor), the control valve is stuck, the accumulator (forward or servo apply) is stuck, or the clutch circuit is stuck. 1. Clutch slippage, burned • Line pressure low • TP sensor malfunction or misadjustment • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Sensor GND malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Body GND malfunction • Accelerator cable misadjustment • Control valve body malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Disconnect PCM Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
2	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V • TURBINE • VS Is PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.10 FREQUENT SHIFTING

10	**Frequent shifting**
DESCRIPTION	• Downshifting occurs immediately even when accelerator pedal is depressed slightly in D, S, L ranges non-HOLD mode.
POSSIBLE CAUSE	• The circuit which is the cause is basically the same as for No.9 "Abnormal shift". However, a malfunction of the input signal to the TP sensor, input/turbine speed sensor, vehicle speed sensor (including the sensor GND, sensor harness and connector), or clutch slippage (clutch stuck, low pressure in line) may also be the cause.

NO.11 SHIFT POINT IS HIGH OR LOW

11	**Shift point is high or low**
DESCRIPTION	• Shift point is considerably different from automatic shift diagram. Shift delayed when accelerating. • Shift occurs quickly when accelerating and engine speed does not increase.
POSSIBLE CAUSE	• If the transaxle does not shift abnormally, there is a malfunction of the input signal to the TP sensor, input/turbine speed sensor, or vehicle speed sensor. • If the engine speed is high or low, regardless normal shifting, inspect the tachometer. • Verify that the output signal of the TP sensor changes linearly.

NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION

12	**Torque converter clutch (TCC) non-operation**
DESCRIPTION	• TCC does not operate when vehicle reaches TCC operation range.
POSSIBLE CAUSE	• Basically, the TCC does not operate when the fail-safe is operating. Verify the DTC first. **Caution** • **If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC burned ① Input sensor system malfunction • Transaxle fluid temperature sensor • Input/turbine speed sensor • Vehicle speed sensor • Sensor GND ② Output solenoid valve system malfunction (Stuck) • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid E malfunction ③ Control valve body malfunction system (Poor operation, stuck) • TCC hydraulic pressure system 2. TP sensor malfunction (Not operating linear) 3. Input/turbine speed sensor or vehicle speed sensor malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With indicator switch at ON, does HOLD indicator light indication correspond to HOLD switch operation?	Yes	Go to next step.
		No	Go to No.26 "HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED ON.", No.27 "HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED ON."
2	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V • VS • TSS/ISS Are PID values okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit.
4	Check resistance between TCC control circuit at PCM connector and control valve body connector. Check resistance between TCC circuit at PCM connector and control valve body connector. Are the resistances less than **5.0** Ω?	Yes	Go to next step.
		No	Repair TCC control or TCC circuit. Reconnect PCM.
5	Inspect TCC control solenoid valve and TCC solenoid valve. (See K2-38 SOLENOID VALVE INSPECTION.) Are the solenoid valves operating properly?	Yes	Replace PCM.
		No	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)

NO.13 NO KICKDOWN

13	No kickdown
DESCRIPTION	• Does not downshift when accelerator pedal is fully depressed within kickdown range.
POSSIBLE CAUSE	• If the transaxle does not downshift though shifting is normal, the malfunction is in the TP sensor circuit (including the sensor GND, sensor harness and connector).

NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING

14	Engine flares up or slips when upshifting or downshifting
DESCRIPTION	• When accelerator pedal is depressed for driveway, engine speed increases but vehicle speed increases slowly. • When accelerator pedal is depressed while driving, engine speed increases but vehicle does not.
POSSIBLE CAUSE	• There is clutch slip because the clutch is stuck or the line pressure and clutch pressure is low. 1. Clutch stuck, slippage (forward clutch, 3--4 clutch, 2--4 brake band, one-way clutch) • Line pressure low • TP sensor malfunction or misadjustment • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Sensor GND malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Accelerator cable misadjustment • Control valve body malfunction 2. Poor operation of mechanical pressure • Selector lever position disparity • TR switch position disparity

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Is shift point okay?	Yes	Go to next step.
		No	Go to No.9 "ABNORMAL SHIFT"
2	Check the value at the following PID using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
4	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE

15	**Engine flares up or slips when accelerating vehicle**
DESCRIPTION	• Engine flares up when accelerator pedal is depressed for upshifting. • Engine flares up suddenly when accelerator pedal is depressed for downshifting.
POSSIBLE CAUSE	• The malfunction is basically the same as for No.14 "Engine flares up or slips when upshifting or downshifting". If conditions for No.14 worsen, the malfunction will develop to No.15.

NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION

16	**Judder upon torque converter clutch (TCC) operation**
DESCRIPTION	• Vehicle jolts when TCC is engaged.
POSSIBLE CAUSE	• Poor TCC engagement due to either slippage because the TCC is stuck or the line pressure is low **Caution** **• If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC piston slippage, burned • Line pressure low • TP sensor malfunction or misadjustment • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Shift solenoid A malfunction • Control valve body malfunction 2. Torque converter malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V • VS • TURBINE Are PID values okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
2	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit.

STEP	INSPECTION		ACTION
3	Check resistance between TCC control circuit at PCM connector and control valve body connector. Check resistance between TCC circuit at PCM connector and control valve body connector. Are the resistance less than **5.0** Ω?	Yes	Go to next step.
		No	Repair TCC control or TCC circuit.
4	Inspect TCC control solenoid valve and TCC solenoid valve. (See K2-38 SOLENOID VALVE INSPECTION.) Are the solenoid valves operating properly?	Yes	Go to next step.
		No	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
5	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Replace PCM.

NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE

17	**Excessive shift shock from N to D or N to R position/range**
DESCRIPTION	• Strong shock is felt when shifting from N to D or N to R position/range at idle.
POSSIBLE CAUSE	• Shift shock may worsen when the fail-safe is operating. If no DTC is output, the shift shock may worsen due to poor operation of the control valve body or sticking of the clutch. 1. Clutch burned (N→D: Forward clutch, N→R: Reverse clutch or low and reverse brake) • Line pressure low • TP sensor malfunction • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Accelerator cable misadjustment • Control valve body malfunction 2. Poor hydraulic operation (Malfunction in range change) • Servo apply accumulator malfunction 3. Idle speed high 4. Poor tightening torque of engine mount, exhaust mount

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does shift shock occur only when engine cold?	Yes	Go to next step.
		No	Go to Step 3.
2	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V • ATFT Repair or replace any defective parts.
		No	Repair open ground circuit. Reconnect PCM.
3	Perform the stall test. (See K2-22 MECHANICAL SYSTEM TEST, Stall Test.) Is stall speed okay?	Yes	Go to next step.
		No	Go to Step 5.
4	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TR • TR V Are PID values okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

STEP	INSPECTION		ACTION
5	Check the value at the following PID using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
6	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
7	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING

18	**Excessive shift shock is felt when upshifting and downshifting**
DESCRIPTION	• Excessive shift shock is felt when depressing accelerator pedal to accelerate at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.
POSSIBLE CAUSE	• Shift shock may worsen when the fail-safe is operating. The shift shock has worsened if the TP sensor, input/turbine speed sensor, or vehicle speed sensor signal malfunctions. 1. Clutch slippage, burned (2-4 brake band, 3-4 clutch) • Line pressure low, high • TP sensor malfunction • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Transaxle fluid temperature sensor malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Accelerator cable misadjustment • Control valve body malfunction 2. Poor hydraulic operation (Malfunction in range change) • Forward accumulator malfunction • Servo apply accumulator malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Perform the stall test. (See K2-22 MECHANICAL SYSTEM TEST, Stall Test.) Is stall speed okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
2	Check the value at the following PID using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
4	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC)

19	**Excessive shift shock on torque converter clutch (TCC)**
DESCRIPTION	• Strong shock is felt when TCC is engaged.
POSSIBLE CAUSE	• The troubleshooting flow is the same as for No.16 “Judder upon TCC operation”.

NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES

20	**Noise occurs at idle when vehicle is stopped in all positions/ranges**
DESCRIPTION	• Transaxle is noisy in all positions and ranges when vehicle is idling.
POSSIBLE CAUSE	• The malfunction is in the oil pump which causes a high-pitched noise to be emitted from the transaxle at idle. **Note** • If a noise is emitted during shifting only, the malfunction is in shift solenoid D, E or shift solenoid A, B, C. If a noise is emitted during shifting at certain gears only or during deceleration only, it is gear noise.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does noise stop when solenoid connector is disconnected?	Yes	Go to next step.
		No	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
2	Check the value at the following PIDs using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V • VS • TURBINE Are PID values okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
4	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D, S, L RANGES, OR IN R POSITION

21	Noise occurs at idle when vehicle is stopped in D, S, L ranges, or in R position
DESCRIPTION	• Transaxle is noisy in driving ranges when vehicle is idling.
POSSIBLE CAUSE	• Although the malfunction is basically the same as No.20 "Noise occurs at idle when vehicle is stopped in all positions/ranges", other causes may be selector lever position disparity or TR switch position disparity.

NO.22 NO ENGINE BRAKING IN HOLD MODE

22	No engine braking in hold mode
DESCRIPTION	• Engine speed drops to idle but vehicle coasts when accelerator pedal is released during cruising at medium to high speeds. • Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in L range at low vehicle speed.
POSSIBLE CAUSE	1. Clutch slippage, burned (low and reverse brake) • Line pressure low • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • TP sensor malfunction • Control valve body malfunction 2. HOLD switch ON not judged by PCM (short, or open circuit, poor operation) • HOLD switch signal malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Do following symptoms concurrently occur? Engine flares up or slips during acceleration. Engine flares up or slips when shifting.	Yes	Go to symptom troubleshooting NO.14 "Engine flares up or slips when upshifting or downshifting" or No.15 "Engine flares up or slips when accelerating vehicle".
		No	Repeat basic inspection and repair or replace any defective parts according to inspection result. (See K2-136 BASIC INSPECTION)

NO.23 TRANSAXLE OVERHEATS

23	Transaxle overheats
DESCRIPTION	• Burnt smell is emitted from transaxle. • Smoke is emitted from transaxle.
POSSIBLE CAUSE	• The malfunction is restricted to hindrance of coolant at the oil cooler. In addition, overheating of the transaxle may be caused by a malfunction of the transaxle fluid temperature sensor. 1. Burned (TCC) • Control valve body malfunction • Accelerator cable misadjustment 2. Oil cooler malfunction (Foreign material mixed with ATF) 3. Transaxle fluid temperature sensor malfunction 4. Excessive amount of ATF 5. Torque converter malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect for bent, damage, corrosion or kinks of oil cooler pipes. Are oil cooler pipes okay?	Yes	Go to next step.
		No	Replace any defective parts.
2	Perform the stall test. (See K2-22 MECHANICAL SYSTEM TEST, Stall Test.) Is stall speed okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Check the value at the following PID using the NGS tester. (See F1-25 PCM INSPECTION.) • TP V Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.

STEP	INSPECTION		ACTION
4	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than **5.0** Ω?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
5	Check LINE PID value. Is LINE PID value okay?	Yes	Overhaul control valve body and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].)
		No	Repair or replace any defective parts.

NO.24 ENGINE STALLS WHEN SHIFTED TO D, S, L RANGES, OR IN R POSITION

24	**Engine stalls when shifted to D, S, L ranges, or in R position**
DESCRIPTION	• Engine stalls when shifting from N or P position to D, S, L ranges or R position at idle.
POSSIBLE CAUSE	• The malfunction is on the engine control side (I.e. IAC system). Otherwise, the malfunction is in the input/turbine speed sensor (engine sometimes starts) or TCC circuit (engine always stalls).

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Go to symptom troubleshooting No.4 “Engine stalls”. (See F1-109 NO.4 ENGINE STALLS - AFTER START/AT IDLE.) Is engine control system okay?	Yes	Repeat basic inspection and repair or replace any defective parts according to inspection result. (See K2-136 BASIC INSPECTION.)
		No	Repair or replace any defective parts according to inspection results.

NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING

25	**Engine stalls when driving at slow speeds or stopping**
DESCRIPTION	• Engine stalls when brake pedal is depressed while driving at low speed or stopping.
POSSIBLE CAUSE	• The malfunction is on the engine control side (Fuel injection control, IAC system).

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Go to symptom troubleshooting No.9 “Low idle/stalls during deceleration”. (See F1-129 NO.9 LOW IDLE/STALLS DURING DECELERATION.) Does engine control system okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection results.
2	Go to symptom troubleshooting No.4 “Engine Stalls.” (See F1-109 NO.4 ENGINE STALLS - AFTER START/AT IDLE.) Is engine control system okay?	Yes	Repeat basic inspection and repair or replace any defective parts according to inspection result. (See K2-136 BASIC INSPECTION.)
		No	Repair or replace any defective parts according to inspection results.

NO.26 HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED TO ON

26	**HOLD indicator light does not illuminate when HOLD switch is turned to ON**
DESCRIPTION	• HOLD indicator light in dashboard does not illuminate when HOLD switch is turned on and IG SW at ON.
POSSIBLE CAUSE	• HOLD switch, HOLD indicator light or related wiring harness malfunction.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Are other indicator lights illuminated with ignition switch is at ON?	Yes	Inspect meter fuse.
		No	Go to next step.
2	Check the HOLD switch. (See K2-29 HOLD SWITCH INSPECTION.) Is HOLD switch okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Turn ignition switch on. Is voltage between 43 terminal at the PCM connector and body ground greater than **10.5 V**?	Yes	Replace PCM.
		No	Reconnect PCM. Go to next step.
4	Check the HOLD indicator light. Is HOLD indicator light okay?	Yes	Inspect for open circuit or disconnected connector in harness between the following: • Ignition switch and HOLD indicator light • HOLD indicator light and PCM
		No	Repair or replace any defective parts.

NO.27 HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED TO ON

27	**HOLD indicator light illuminates when HOLD switch is not turned to ON**
DESCRIPTION	• HOLD indicator light in dashboard illuminates even though HOLD switch is turned off and IG SW at ON.
POSSIBLE CAUSE	• HOLD switch or related wiring harness malfunction.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Check the HOLD switch. (See K2-29 HOLD SWITCH INSPECTION.) Is HOLD switch okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
2	Disconnect PCM. Turn ignition switch off. Is resistance between 43 terminal at the PCM connector and body ground greater than **10 kΩ**?	Yes	Replace PCM.
		No	Repair short circuit between HOLD indicator light and PCM. Reconnect PCM.

FRONT AND REAR AXLES

FEATURES

SERVICE

M

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the front and rear axles of the face-lifted 626 (GF), 626 Station Wagon (GW) is essentially carried over from that of the current 626 (GF), 626 Station Wagon (GW) (Refer to Mazda 626 Training Manual 3303-10-97D, Mazda 626 Station Wagon 1603-10-97J, and Mazda 626 626 Station Wagon Workshop Manual Supplement 1614-10-98D.), however, the drive shaft has been changed according to the adoption of the FN4A-EL automatic transaxle in the FS engine model (Sedan, 5HB).

SPECIFICATIONS

Item		Engine					
		FP	FS (Sedan, 5HB)		FS (Wagon)		RF Turbo
Transaxle		MTX	MTX	ATX (FN4A-EL)	MTX	ATX (GF4A-EL)	MTX
Front axle							
Bearing type		Angular ball bearing					
Rear axle							
Bearing type		Angular ball bearing					
Drive shaft							
Joint type	Wheel side	Bell joint					
	Differential side	Double offset joint	Double offset joint	Tripod joint	Double offset joint	Tripod joint	Double offset joint
Shaft diameter (mm{in})		26.0{1.02}	26.0{1.02}	22.7{0.89}	22.5{0.89}	24.0{0.94}	22.5{0.89}
Length (mm{in})	Left side	651.1 {25.63}		638.8 {25.15}	647.2 {25.48}	649.5 {25.57}	647.2 {25.48}
	Right side	601.1 {23.67}		587.9 {23.15}	598.2 {23.55}	592.2 {23.31}	598.2 {23.55}

▭ indicates new specification.

SUPPLEMENTAL SERVICE INFORMATION

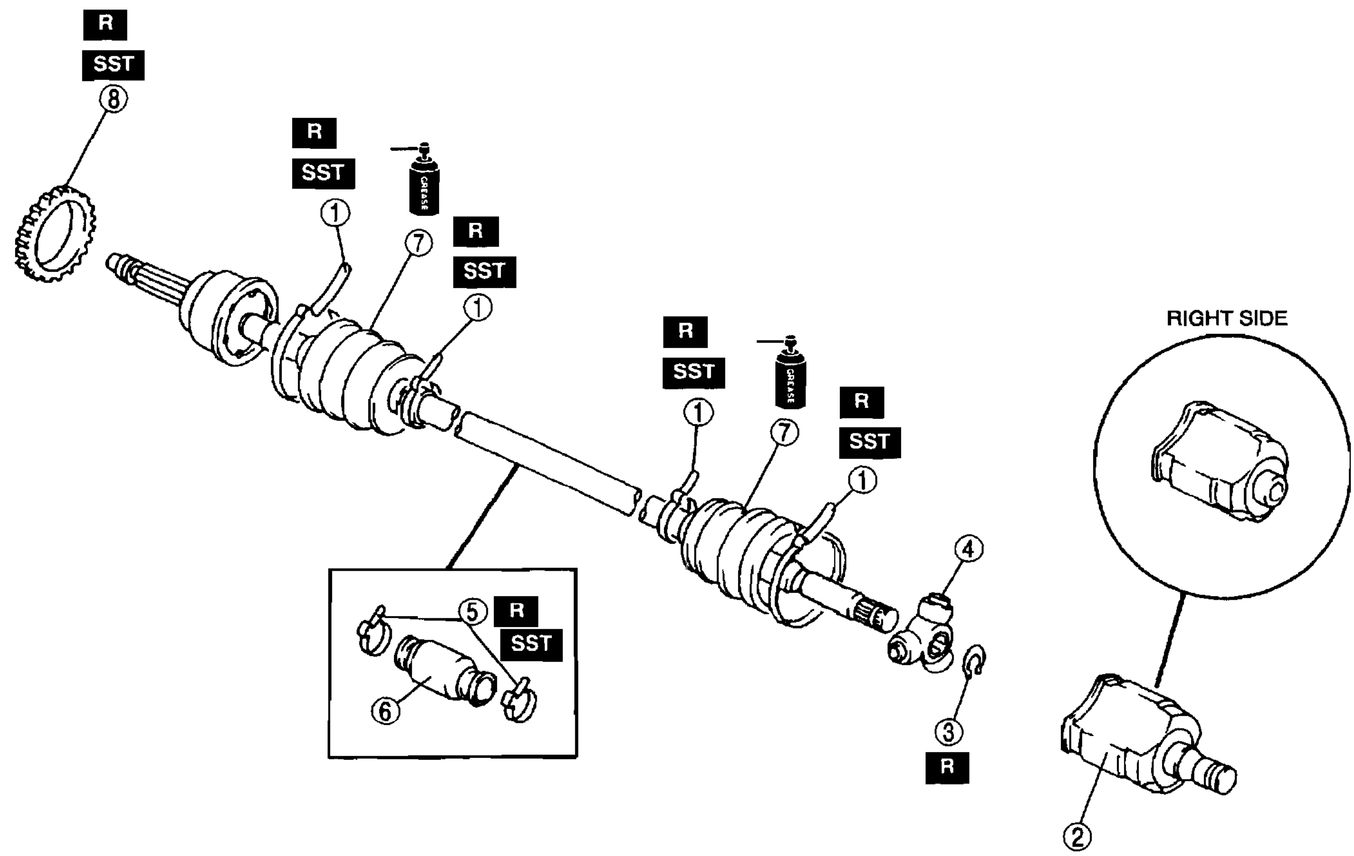
The following changes and/or additions have been made since publication of the Mazda 626 Workshop Manual (1577-10-97D).

Drive shaft
- Disassembly/Assembly procedures modified.

DRIVE SHAFT

DRIVE SHAFT (SEDAN, 5HB ATX) DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



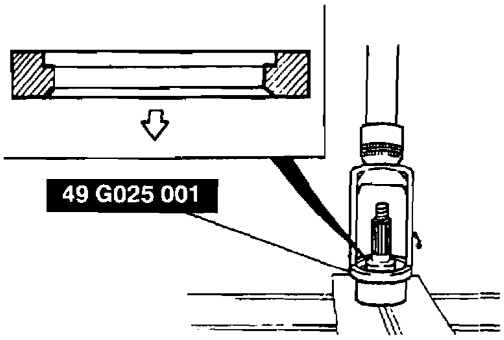
1	Boot band See M-6 Boot Band Assembly Note
2	Outer ring See M-5 Outer Ring Assembly Note
3	Snap ring
4	Tripod joint
5	Dynamic damper band See M-5 Dynamic Damper Band Assembly Note

6	Dynamic damper See M-5 Dynamic Damper Assembly Note
7	Boot See M-5 Boot Assembly Note
8	ABS sensor rotor See M-5 ABS Sensor Rotor Assembly Note

ABS Sensor Rotor Assembly Note

Caution
- **Verify the direction of the sensor rotor.**

1. Set a new ABS sensor rotor on the drive shaft and press it on using the **SST**.



Boot Assembly Note

Note
- The wheel side and transaxle side boots are different.
- Use the specified grease supplied in the boot kit.

1. Fill the boot (wheel side) with the specified grease.

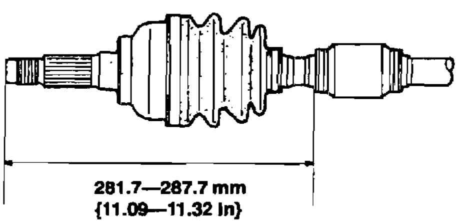
Grease amount
85—105 g {3.0—3.7 oz}

2. With the splines of the shaft still wrapped in tape from disassembly, install the boot.
3. Remove the tape.

Dynamic Damper Assembly Note

1. Install the dynamic damper as shown in the figure.

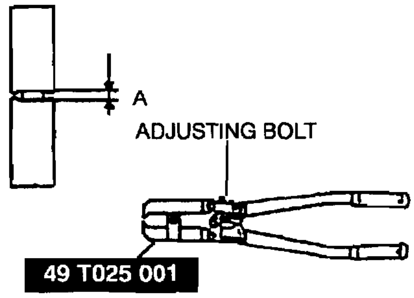
Standard length
281.7—287.7 mm {11.09—11.32 in}



Dynamic Damper Band Assembly Note

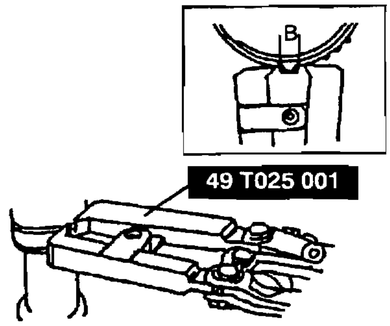
1. Adjust clearance A by turning the adjusting bolt of the **SST**.

Clearance A
2.9 mm {0.11 in}



2. Crimp the band using the **SST**. Verify that clearance B is within the specification.

Clearance B
2.4—2.8 mm {0.095—0.110 in}



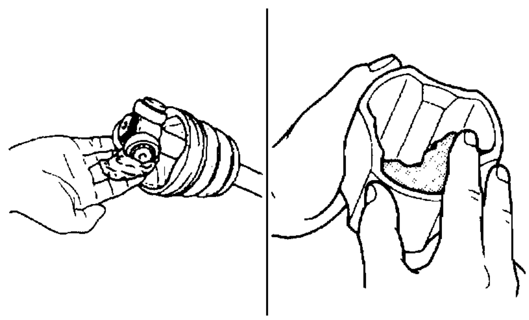
3. If clearance B is more than the specification, reduce clearance A of the **SST** and crimp the band again.
   If clearance B is less than the specification, replace the band, increase clearance A of the **SST**, and crimp the new dynamic damper.
4. Verify that the band does not protrude from the band installation area. If it does, replace the band and repeat steps **2** and 3.

Outer Ring Assembly Note

Note
- Use the specified grease supplied in the boot kit.

1. Fill the outer ring and boot (transaxle side) with the specified grease.

Grease amount
115—135 g {4.1—4.7 oz}

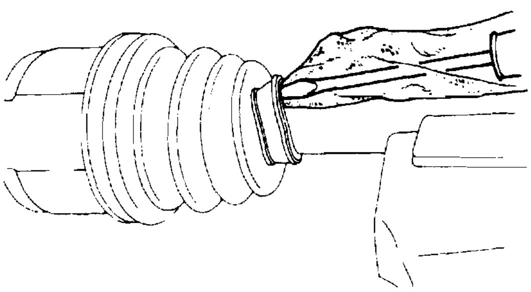


M

2. Install the outer ring.
3. Set the drive shaft to the standard length.

Standard length
Left side: 633.8—643.8 mm {25.00—25.34 in}
Right side: 582.9—592.9 mm {22.95—23.34 in}

4. Release any trapped air from the boots by carefully lifting up the small end of each boot with a clothwrapped screwdriver.

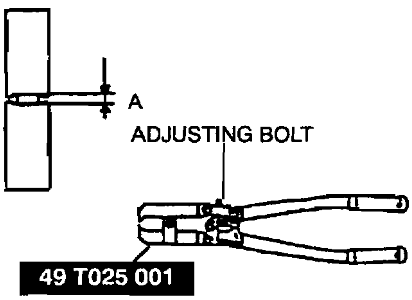


5. Verify that the drive shaft length is within the standard

Boot Band Assembly Note

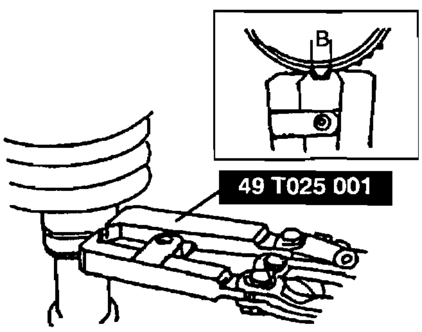
1. Adjust clearance A by turning the adjusting bolt of the **SST**.

Clearance A
2.9 mm {0.11 in}



2. Crimp the wheel side small boot band using the **SST**. Verify that clearance B is within the specification.

Clearance B
2.4—2.8 mm {0.095—0.110 in}



3. If clearance B is more than the specification, reduce clearance A of the **SST** and crimp the boot again.
   If clearance B is less than the specification, replace the boot band, increase clearance A of the **SST**, and crimp the new boot.
4. Verify that the boot band does not protrude from the boot band installation area. If it does, replace the boot band and repeat steps 2 and 3.
5. Fill the boot with the repair kit grease.
6. Adjust clearance A by turning the adjusting bolt of the **SST**.

Clearance A
3.2 mm {0.13 in}

7. Crimp the wheel side big boot band using the **SST**.
8. Verify that clearance B is within the specification.

Clearance B
2.4—2.8 mm {0.095—0.110 in}

If clearance B is more than the specification, reduce clearance A of the **SST** and crimp the boot again.
If clearance B is less than the specification, replace the boot band, increase clearance A of the **SST** and crimp the new boot.

9. Verify that the boot band does not protrude from the boot band installation area. If it does, replace the boot band and repeat steps 7 and 8.

STEERING SYSTEM

FEATURES

SERVICE

N

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the face-lifted 626 (GF), 626 Station Wagon (GW) models is essentially carried over from that of the current 626 (GF), 626 Station Wagon (GW) models except for the following features. (See 626 Training Manual 3303-10-97D, 626 Station Wagon Workshop Manual Supplement 1603-10-97K, 626, 626 Station Wagon RF Turbo Workshop Manual Supplement 1614-10-98D respectively.)

FEATURES

Improved handling

- Steering gear mount bolt has been changed (10 mm {0.39 in}→12 mm {0.47 in}) for improved rigidity.

Simplified power steering system

- The power steering oil pump is a vane type equipped with a fluid reservoir, and is driven by a gear. The operation of the power steering oil pump for RF Turbo engine models is the same as the current PREMACY (CP).

SPECIFICATIONS

<table>
<tr><th colspan="3">Item</th><th>Specification</th></tr>
<tr><td rowspan="2">Steering wheel</td><td colspan="2">Outer diameter (mm {in})</td><td>380 {15.0}</td></tr>
<tr><td colspan="2">Lock-to-lock (turns)</td><td>3.1</td></tr>
<tr><td rowspan="2">Steering gear</td><td colspan="2">Type</td><td>Rack-and-pinion</td></tr>
<tr><td colspan="2">Rack stroke (mm {in})</td><td>130—132 {5.12—5.19}</td></tr>
<tr><td rowspan="2">Steering column and shaft</td><td colspan="2">Shaft type</td><td>Collapsible</td></tr>
<tr><td colspan="2">Joint type</td><td>2-cross joint</td></tr>
<tr><td rowspan="3">Power steering</td><td colspan="2">Power assist type</td><td>Engine speed sensing</td></tr>
<tr><td rowspan="2">Fluid</td><td>Type</td><td>ATF M-III or equivalent (e.g. Dexron® II)</td></tr>
<tr><td>Capacity (L {US qt, Imp qt})</td><td>0.84 {0.89, 0.74} [Without cooling pipe]
0.98 {1.04, 0.86} [With cooling pipe]</td></tr>
</table>

SUPPLEMENTAL SERVICE INFORMATION

The following points in this section are additional to the 626 Workshop Manual (1577-10-97D), 626 Station Wagon Workshop Manual Supplement (1603-10-97K), and 626, 626 Station Wagon RF Torbo Workshop Manual Supplement (1614-10-98D).

Engine speed sensing power steering

- Steering gear and linkage Removal/Installation
- Power steering oil pump (RF Turbo) Removal/Installation

ENGINE SPEED SENSING POWER STEERING

STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION

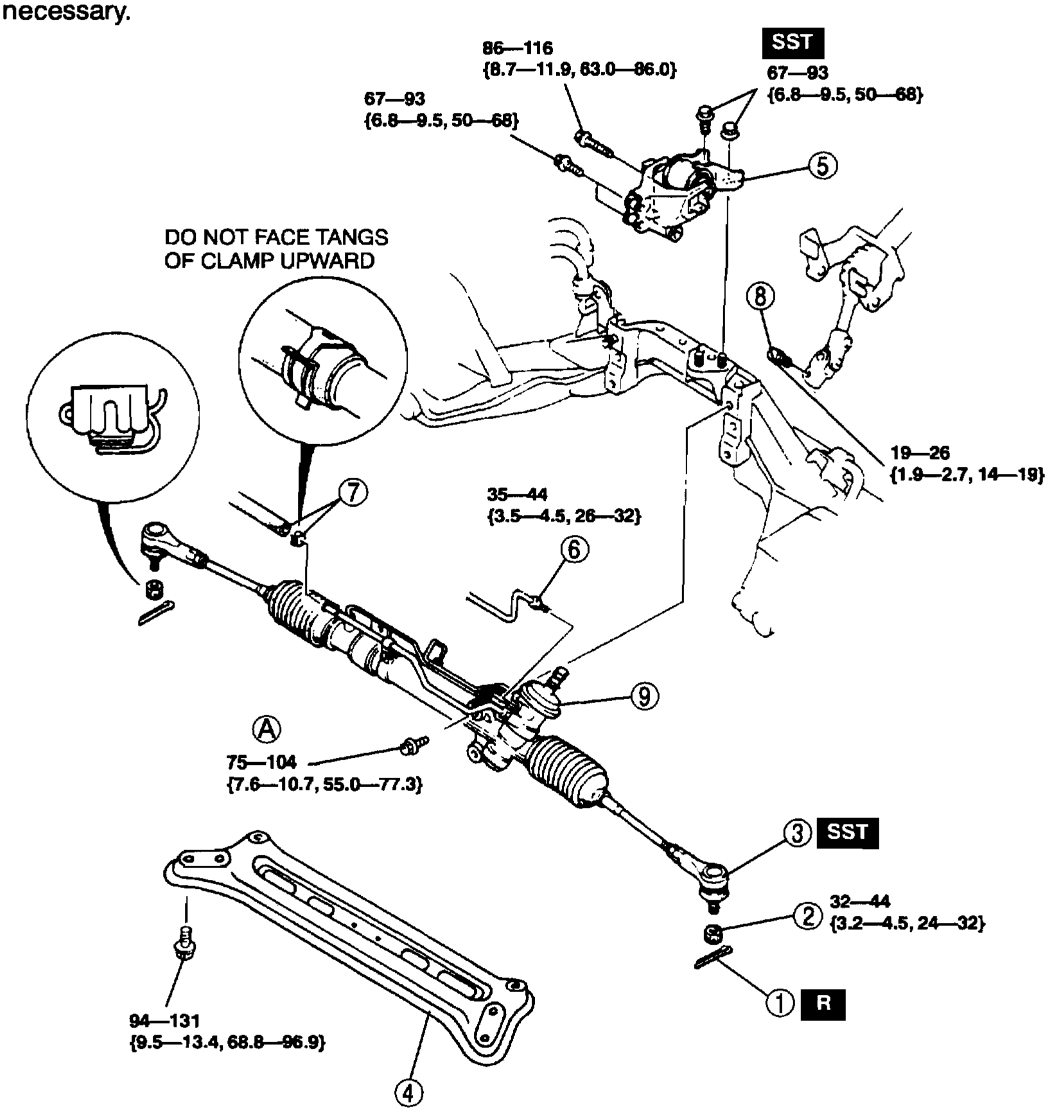
Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be mistaken while servicing the vehicle.**

Note

- On this procedure, tightening torque of the steering gear installation bolts and nuts (Ⓐ in the figure) for the front cross member has only been changed from the current models.
  No change has been made for the **SSTs** and the notes from the current models.

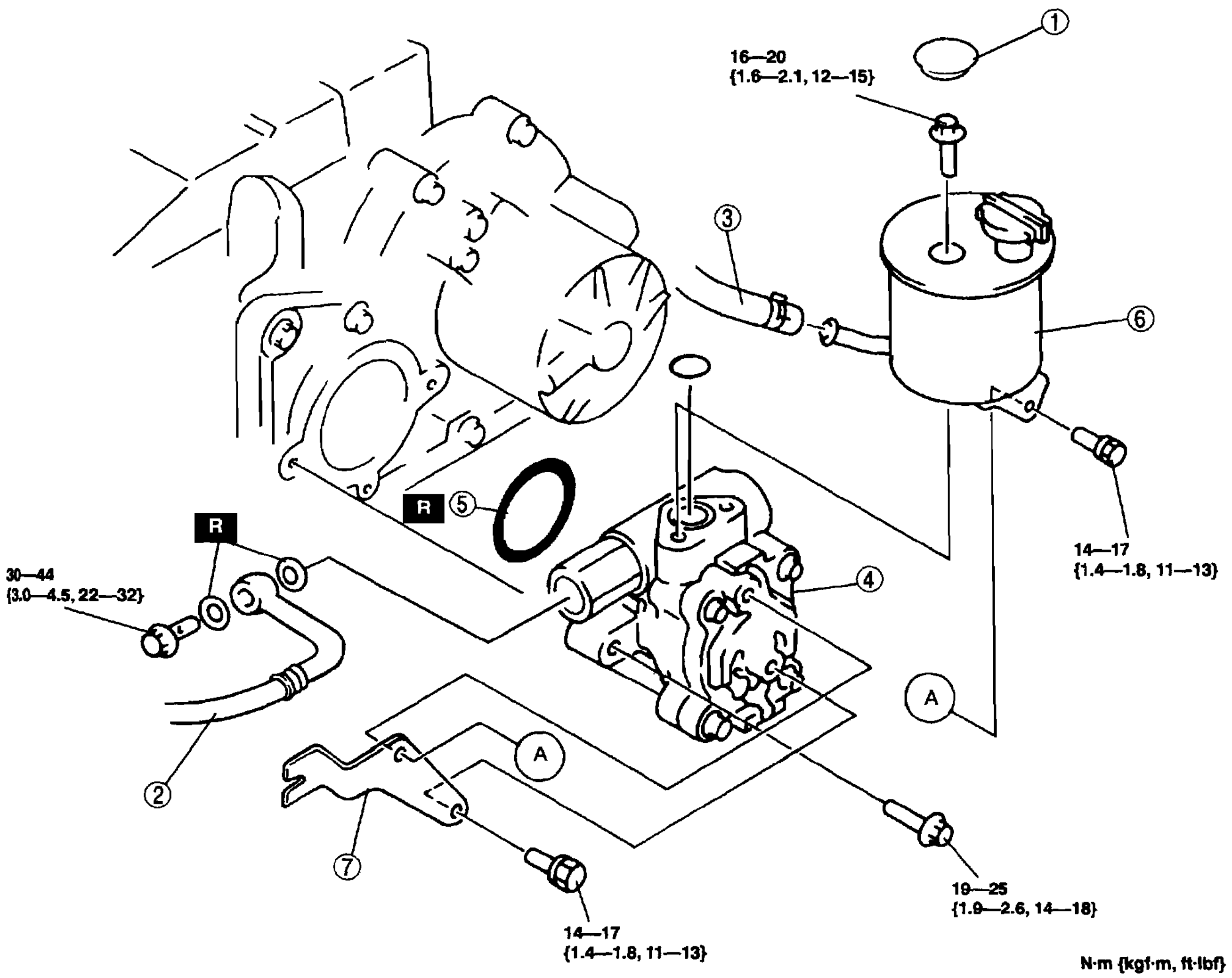
1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the front wheel alignment.
   - Adjust as necessary.



1	Cotter pin		6	Pressure pipe
2	Nut		7	Return hose and clamp
3	Tie-rod end ball joint		8	Bolt (Intermediate shaft)
4	Transverse member		9	Steering gear and linkage
5	Engine mount component			

POWER STEERING OIL PUMP (RF Turbo) REMOVAL/INSTALLATION

1. Remove the battery.
2. Remove the air pipe.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



1	Cap
2	Pressure pipe
3	Return hose
4	Power steering oil pump
5	O-ring
6	Fluid reservoir
7	Bracket

BRAKING SYSTEM

FEATURES

SERVICE

P

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the conventional braking system and ABS of the face-lifted 626 (GF) and 626 Station Wagon (GW) is essentially carried over from that of the current 626 (GF) and 626 Station Wagon (GW). (See 626 Training Manual 3303–10–97D, 626 Workshop Manual 1577–10–97D, 626 Station Wagon Workshop Manual Supplement 1603–10–97J, 626, 626 Station Wagon Workshop Manual Supplement 1614–10–98D, and 626, 626 Station Wagon Workshop Manual Supplement 1668–10–99C.) However, the following have been changed.
  — Rear brake (drum) has been changed.
  — Disc plate and Pad have been changed.
  — For R.H.D. ABS and TCS models, New ABS HU/CM (ABS/TCS HU/CM) has been adapted (same as L.H.D. models)

SPECIFICATIONS

Item		Specification		
		SEDAN, 5HB	WAGON: FP, FS, FS (Hi-power) engine model	WAGON: RF Turbo engine model
Brake pedal	Type	Suspended		
	Pedal lever ratio	3.7		
	Max. stroke (mm {in})	116 {4.57}		
Master cylinder	Type	Tandem (with level sensor)		
		ABS model: Port-less, Non ABS model: Conventional		
	Cylinder inner diameter (mm {in})	23.8 {0.937}		
Front disc brake	Type	Ventilated disc		
	Cylinder bore (mm {in})	57.15 {2.250}		
	Pad dimensions (area × thickness) (mm² {in²} × mm {in})	4800 {7.44} × 10 {0.39}		5300 {8.21} × 10 {0.39}
	Disc plate dimensions (outer diameter × thickness) (mm {in})	258 × 24 {10.16 × 0.94}		274 × 24 {10.79 × 0.94}
Rear disc brake	Type	Solid disc		
	Cylinder bore (mm {in})	34.93 {1.375}		
	Pad dimensions (area × thickness) (mm² {in²} × mm {in})	3210 {4.97} × 8.0 {0.31}		
	Disc plate dimensions (outer diameter × thickness) (mm {in})	261 × 10 {9.88 × 0.39}		280 × 10 {11.02 × 0.39}
Power brake unit	Type	Vacuum multiplier		
		Single diaphragm		
	Diameter (mm {in})	239 {9.41}		
Braking force control device	Type	ABS model: EBD Non ABS model: Dual proportioning valve		
Brake fluid		SAE J1703, FMVSS116 DOT-3 or DOT-4		
Parking brake	Type	Mechanical two-rear-wheel control		
	Operation system	Center lever		

Indicates new specification.

SUPPLEMENTAL SERVICE INFORMATION

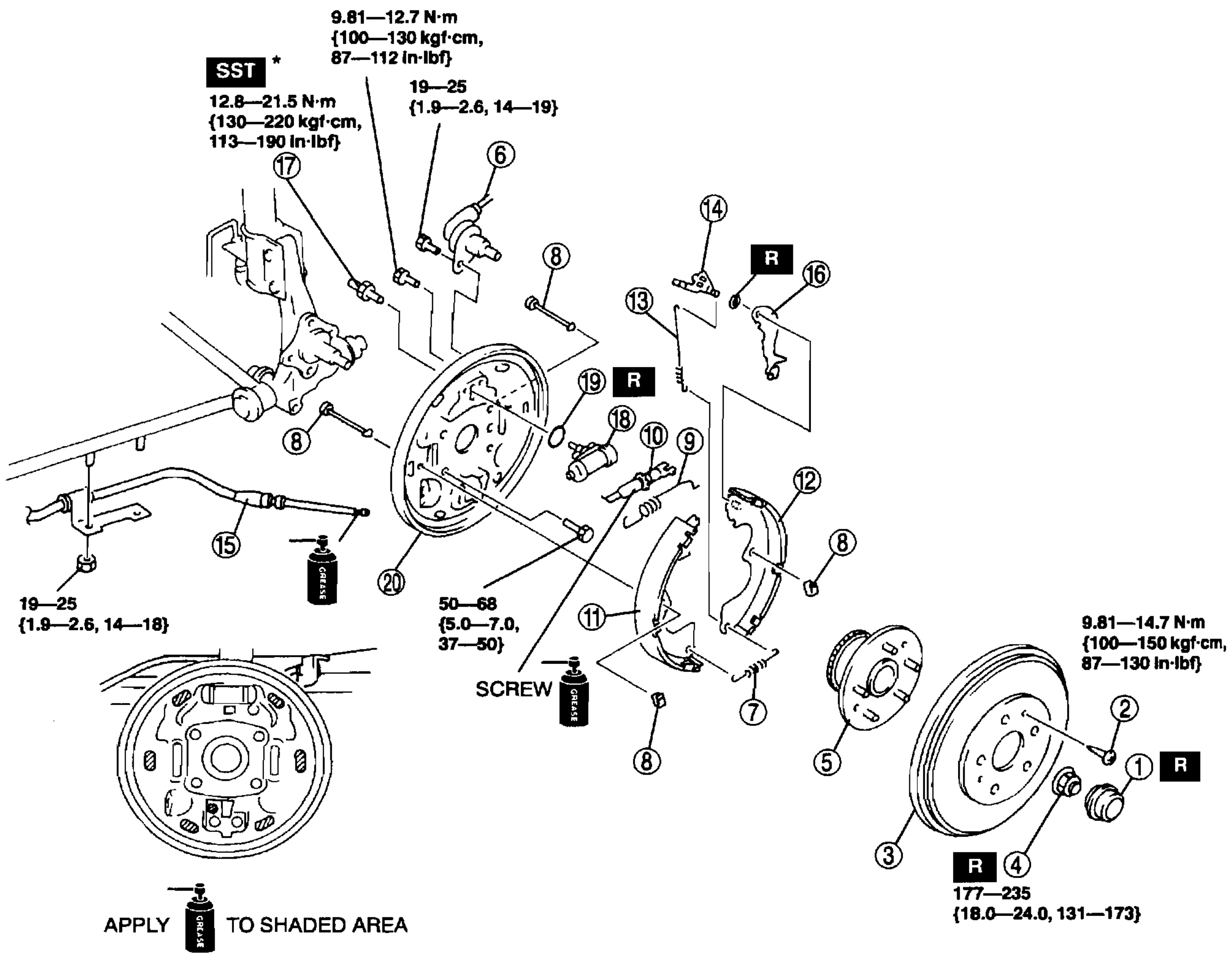
The following changes have been made since publication of the 626 Workshop Manual (1577-10-97D), 626 Station Wagon Workshop Manual Supplement (1603-10-97J), 626, 626 Station Wagon Workshop Manual Supplement (1614-10-98D), and 626, 626 Station Wagon Workshop Manual Supplement (1168-10-99C).

Rear brake (Drum)
- Removal/Installation procedure has been added.

CONVENTIONAL BRAKE SYSTEM

REAR BRAKE (DRUM) REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Perform the following.
   (1) Depress the brake pedal a few times. Then verify that the brakes do not drag.
   (2) Inspect the pedal-to-floor clearance.
   (3) Inspect the parking brake lever stroke.



* 49 0259 770B

N·m {kgf·m, ft·lbf}

1	Hub cap
2	Screw
3	Brake drum
4	Locknut
5	Wheel hub
6	ABS wheel-speed sensor
7	Lower return spring
8	Hold pin and hold spring
9	Upper return spring
10	Adjust strut

11	Leading shoe
12	Trailing shoe
13	Adjust spring
14	Adjust lever
15	Parking brake cable
16	Operating lever
17	Brake pipe
18	Wheel cylinder
19	O-ring
20	Backing plate

SUSPENSION

FEATURES

SERVICE

R

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the suspension system of the face-lifted 626 (GF), 626 Station Wagon (GW) is essentially the same as that of the current 626 (GF), 626 Station Wagon (GW) models. (See 626 Training Manual 3303–10–97D, 626 Station Wagon Workshop Manual Supplement 1603–10–97K.)

FEATURES

Improved handling

- Revised steering gear mount bolt (10 mm {0.39 in}→12 mm {0.47 in}) for improved rigidity
- Revised box-type transverse member
- Adopted stiffener in the installation part to the body of the shock absorber mount
- Adopted 16-inch wheels and 205/50R16 87V tires for FS (Hi-power) model

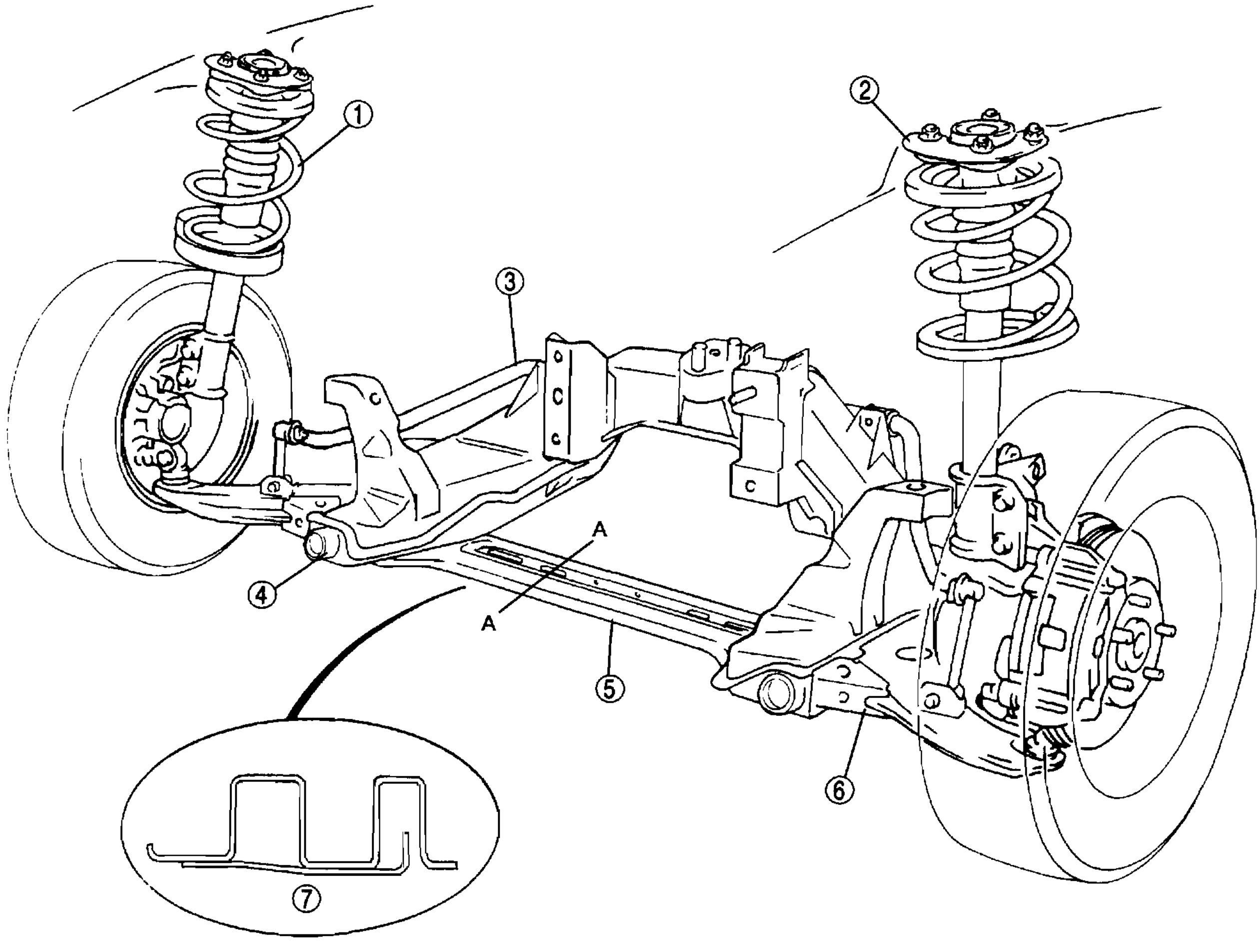
SPECIFICATIONS

Item				Specification			
				SEDAN, 5HB	WAGON		
					Without suspension control system		With suspension control system
					Without rear third seat	With rear third seat	
Front suspension	Type			Strut			
	Spring type			Coil spring			
	Shock absorber type			Cylindrical, double-acting (Low-pressure gas charged)			
	Stabilizer	Type		Torsion bar			
		Diameter	(mm {in})	27 {1.06}			
	Wheel alignment (Unloaded[*1])	Total toe-in	(mm {in})	Tire: 3 ± 4 {0.12 ± 0.16}, Rim inner: 2 ± 4 {0.08 ± 0.16}			
			(degree)	0°17' ± 0°23'			
		Maximum steering angle	Inner	38° ± 3°			
			Outer	32°30' ± 3°			
		Caster angle		1°52' ± 1°	1°44' ± 1°	1°42' ± 1°	1°39' ± 1°
		Camber angle[*2]		−0°20' ± 1°	−0°19' ± 1°	−0°07' ± 1°	−0°19' ± 1°
		Steering axis inclination		12°43'	12°41'	12°20'	12°41'
Rear suspension	Type			Strut			
	Spring type			Coil spring			
	Shock absorber type			Cylindrical, double-acting (low-pressure gas charged)			
	Stabilizer	Type		Torsion bar			
		Diameter	(mm {in})	17 {0.67}			
	Wheel alignment (Unloaded[*1])	Total toe-in	(mm {in})	Tire: 1 ± 4 {0.04 ± 0.16}, Rim inner: 0.5 ± 4 {0.02 ± 0.16}			
			(degree)	0°06' ± 0°23'			
		Camber angle[*2]		−0°47' ± 1°	−0°41' ± 1°	−0°36' ± 1°	−0°39' ± 1°

*1: Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position of the vehicle.
*2: Difference between left and right must not exceed 1°30'.

FRONT SUSPENSION

STRUCTURAL VIEW



1	Front shock absorber and coil spring
2	Stiffener
3	Front stabilizer
4	Front cross member

5	Transverse member
6	Front lower arm
7	Section A–A

SUPPLEMENTAL SERVICE INFORMATION

The following point in this section is additional to the 626 Workshop Manual (1577-10-97D) and 626 Station Wagon Workshop Manual Supplement (1603-10-97J).

Front suspension
- Transverse member and front cross member Removal/Installation

FRONT SUSPENSION

TRANSVERSE MEMBER AND FRONT CROSS MEMBER REMOVAL/INSTALLATION

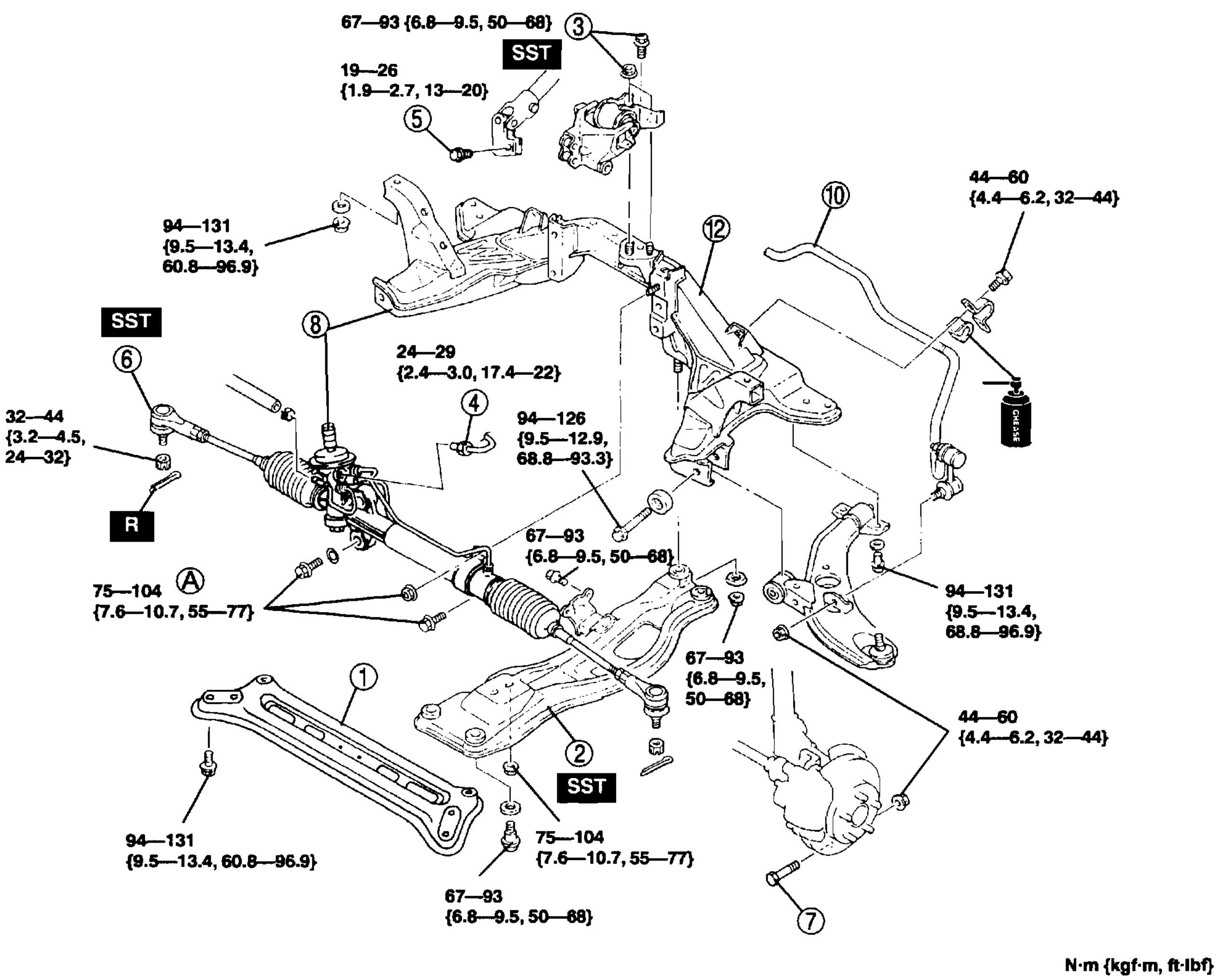
Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be mistaken while servicing the vehicle.**

Note

- On this procedure, tightening torque of the steering gear installation bolts and nuts (Ⓐ in the figure) for the front cross member has only been changed from the current models.
  No change has been made for the **SSTs** and the notes from the current models.

1. Remove the front exhaust pipe.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the front wheel alignment.
   - Adjust as necessary.



1	Transverse member		7	Lower arm joint bolt
2	Engine mount member		8	Cross member and steering gear component
3	No.1 engine mounting nut and bolt		9	Steering gear and linkage
4	Pressure pipe and return hose		10	Front stabilizer
5	Intermediate shaft bolt		11	Front lower arm
6	Outer ball joint		12	Front cross member

BODY

FEATURES

SERVICE

S

OUTLINE

OUTLINE OF CONSTRUCTION

- The body system is essentially carried over from that of the current 626 (GF) and 626 Station Wagon (GW) models, except for the following features. (See 626 Training Manual 3303-10-97D, 626 Station Wagon 1603-10-97J.)

FEATURES

Improved safety

- Automatic window return function has been added for the driver-side power window system.

Improved security

- Auto lock function and unlock cancel function have been added for the door lock system.

Improved comfort

- Armrest box has been adopted for the driver's seat.

POWER WINDOW SYSTEM

OUTLINE

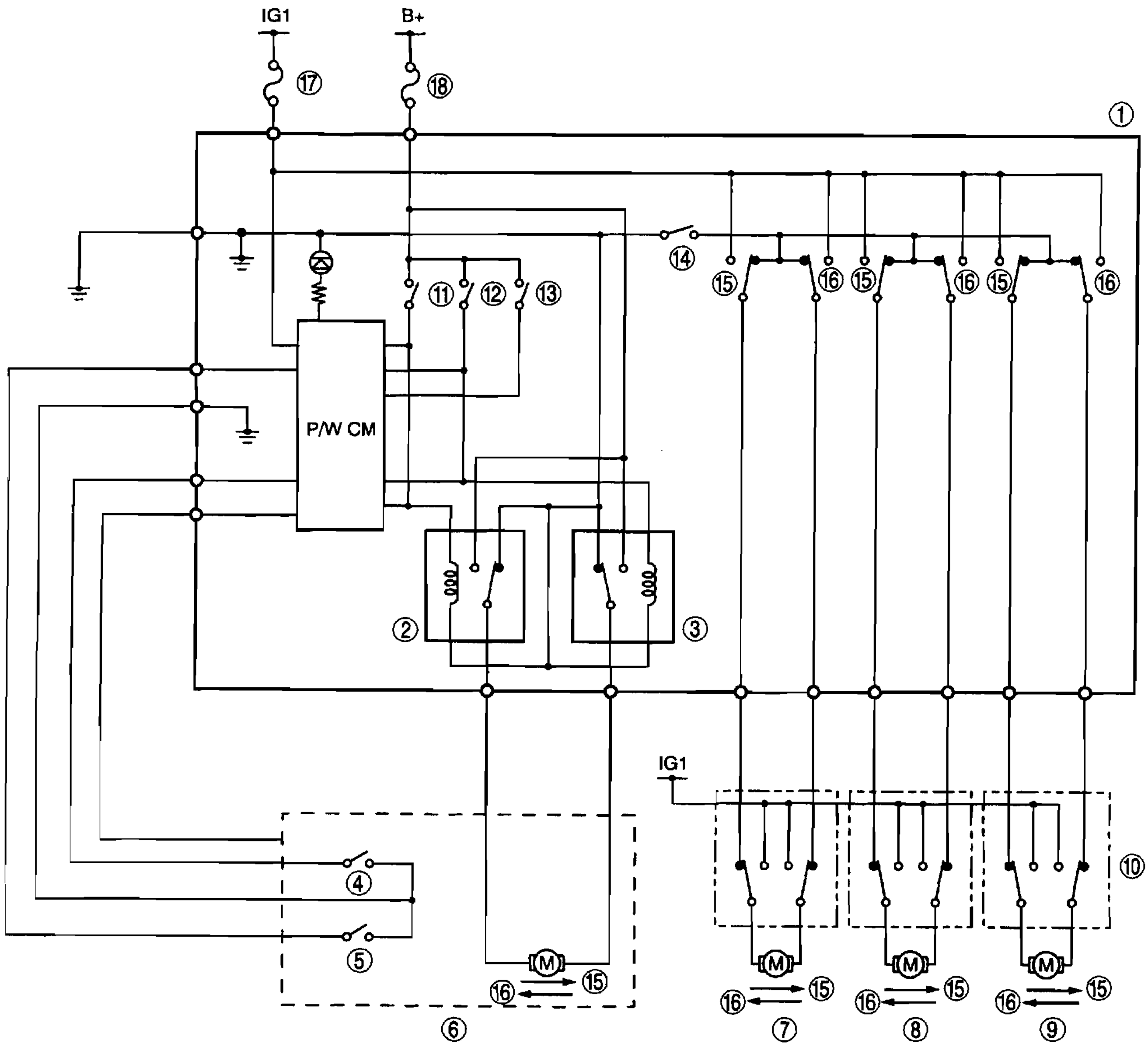
- The automatic window return function is essentially carried over from that of the current PREMACY (CP) model, except for the structure and resetting in the power window motor.

×: Applied

Function	New 626	PREMACY (CP)	Current 626 (GF, GW)
Auto open/close	×	×	×
Power-cut	×	×	×
Automatic window return	×	×	N/A

POWER WINDOW SYSTEM

SYSTEM WIRING DIAGRAM



1	Power window main switch		10	Power window subswitch
2	Close relay		11	Manual close
3	Open relay		12	Manual open
4	Pulse generator		13	Auto
5	Limit switch		14	Power-cut switch
6	Front power window regulator (Driver's side)		15	Close
7	Front power window regulator (Passenger's side)		16	Open
8	Rear power window regulator (Right side)		17	P/WIND 30 A fuse
9	Rear power window regulator (Left side)		18	P/WIND 20 A fuse

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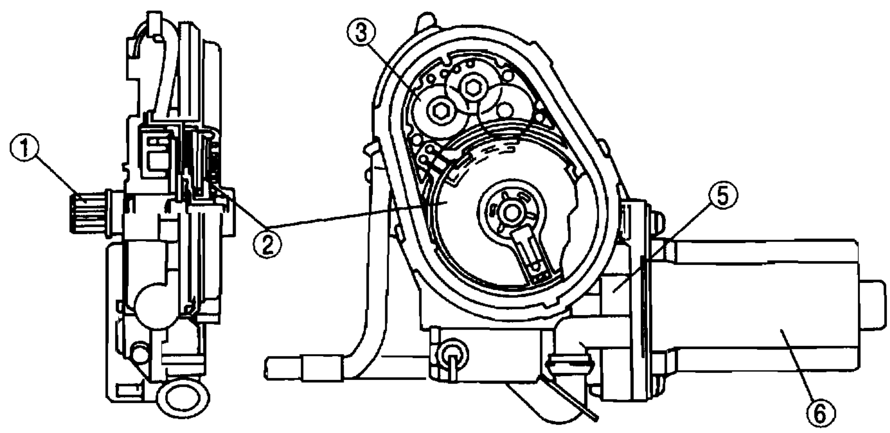
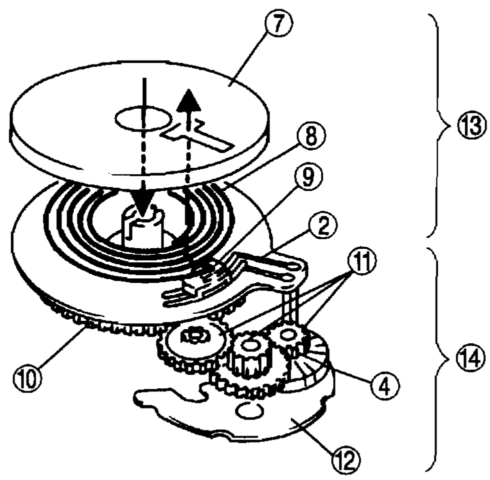
AUTOMATIC WINDOW RETURN FUNCTION
Power Window Motor
Structure

- The power window motor contains the magnet-type pulse generator and limit switch.





1	Output axis		8	Scroll
2	Print base A		9	Slider
3	Magnet and hole IC		10	Gear A
4	Magnet		11	Gear B, C, D (Speed increasing gear)
5	Gear case		12	Print base B (With hole IC)
6	Motor		13	Limit switch
7	Plate		14	Pulse generator

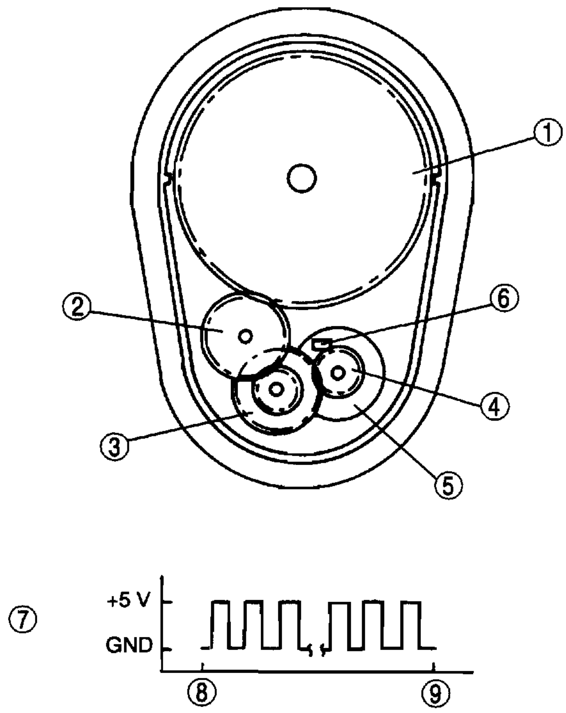
Pulse Generator

Function

- The pulse generator converts the rotation of the motor into a pulse, and sends a voltage pulse to the power window control module.

Structure

- The pulse generator consists of gear A, which rotates with the motor shaft, gears B, C, and D to increase rotation speed, the magnet, which generates pulse, and the hole IC.



1	Gear A
2	Gear B
3	Gear C
4	Gear D
5	Magnet

6	Hole IC
7	Motor rotation signal
8	Bottom of door glass
9	Top of door glass

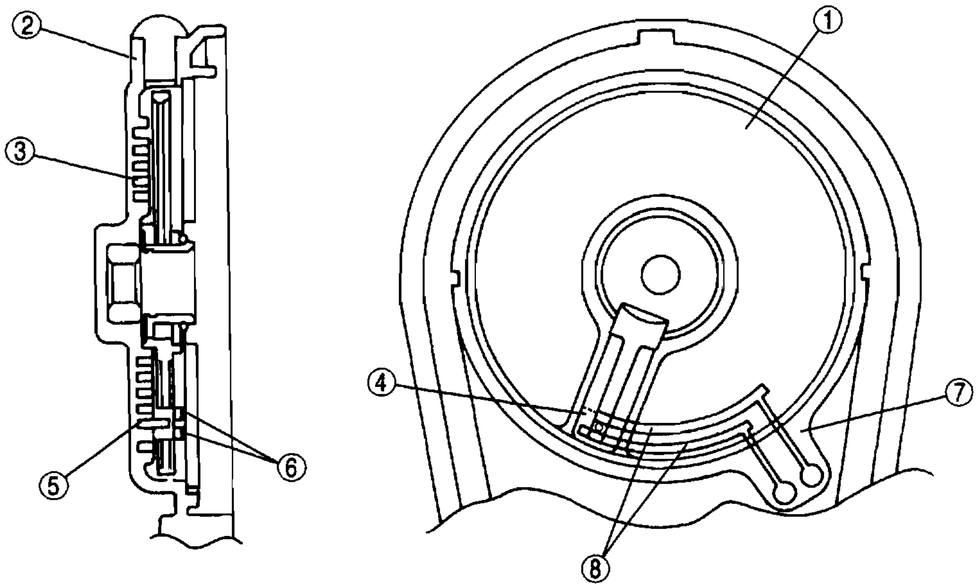
Operation

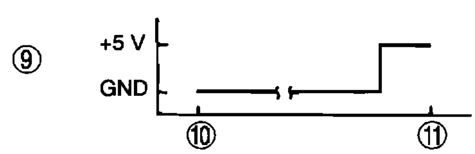
- When the magnet rotates, the hole IC detects the N/S magnetic field and outputs it as a voltage pulse.
- For each rotation (movement of the door glass: approximately 144 mm {5.67 in}) of the motor, 96 pulses are generated.

* The output waveform in the figure above describes the signal waveform when the motor is connected to the P/W CM. If the motor is not connected to the P/W CM, electric power is not supplied to the hole IC and the waveform is not output.

Limit Switch
Function
- The limit switch detects the rotation position (window glass position) of the shaft in the motor and outputs it to the P/W CM.

Structure
- The limit switch consists of a plate, which rotates with the motor shaft, a scroll groove inside the housing, a slider (with a brush) that moves along the groove, and print base A, on which contact patterns are printed.





1	Plate
2	Housing
3	Scroll groove
4	Slider
5	Pin
6	Brush

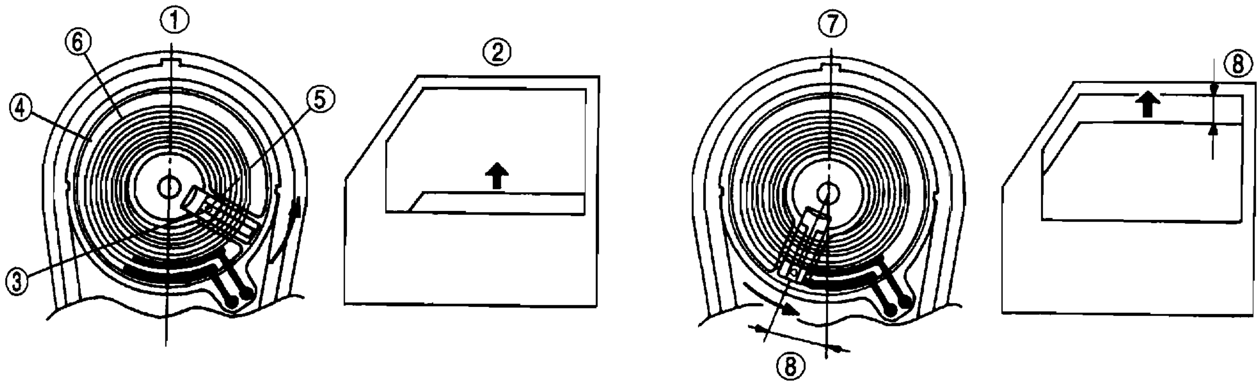
7	Print base A
8	Contact pattern
9	Door glass position detection signal
10	Bottom of door glass
11	Top of door glass

- For output, the limit switch has a built-in signal inverting circuit that inverts ON/OFF signals at the contact points.

* The output waveform in the figure above describes the signal waveform when the motor is connected to the P/W CM. If the motor is not connected to the P/W CM, electric power is not supplied to the signal inverting circuit and the waveform is not output.

Normal operation

- When the door glass is lowered, the brush is separated from the two contact patterns and the two patterns are OFF. (The output is GND.)
- When the motor rotates (door glass is raised), the plate and the slider installed to the output axis on the rotale and, in order that the scroll pin moves in the scroll groove, the slider moves around the periphering.
- When the door glass enters the non-return range, the brush shorts the two contact patterns and the circuit turns ON. (The output is +5 V.)

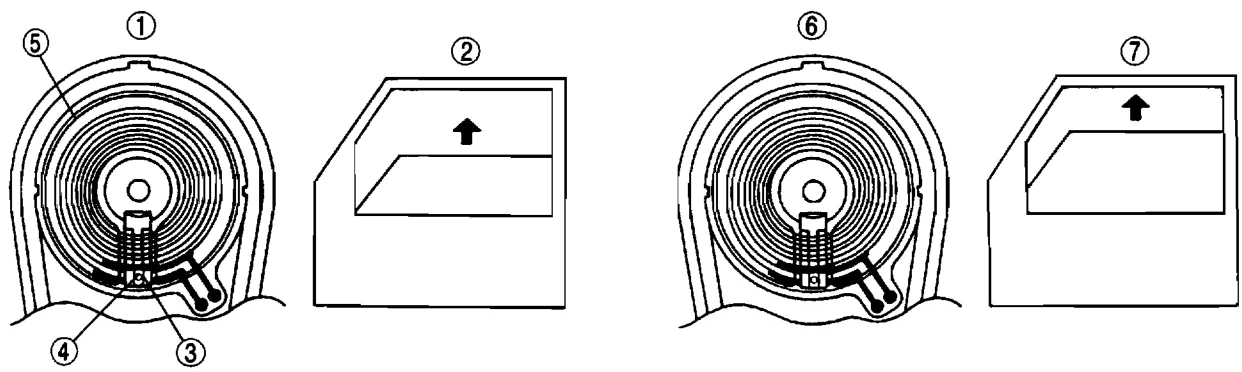


1	Contact points: OFF (Switch output: GND)
2	Door glass position: open
3	Slider (With a brush)
4	Plate

5	Slider pin
6	Scroll groove
7	Contact points: ON (Switch output: 5 V)
8	Non-return range

Reset operation

- When the power window regulator is removed or automatic window return function is not operated properly, the initial position of the power window motor can be reset by performing the following procedure. (For details, See S-12 DRIVER-SIDE POWER WINDOW MOTOR RESETTING.)
- When the door glass is raised, the slider pin stops at the end of the scroll groove, thus activating the clutch to rotate gear A only and the plate remains stopped.
- As a result, the position of the limit switch to the output axis is displaced and the switch mechanically memorizes the fully closed position.



1	Contact points: ON (Switch output: 5 V)
2	Door glass position: open
3	Slider pin
4	Scroll groove end

5	Plate
6	Contact points: ON→ON (Switch output: 5 V)
7	Door glass position: open→close

Power Window Main Switch
Outline
- The function, structure and operation is essentially carried over from that of the current PREMACY (CP) model, except for the adoption of the power supply for the pulse generator (2A terminal).

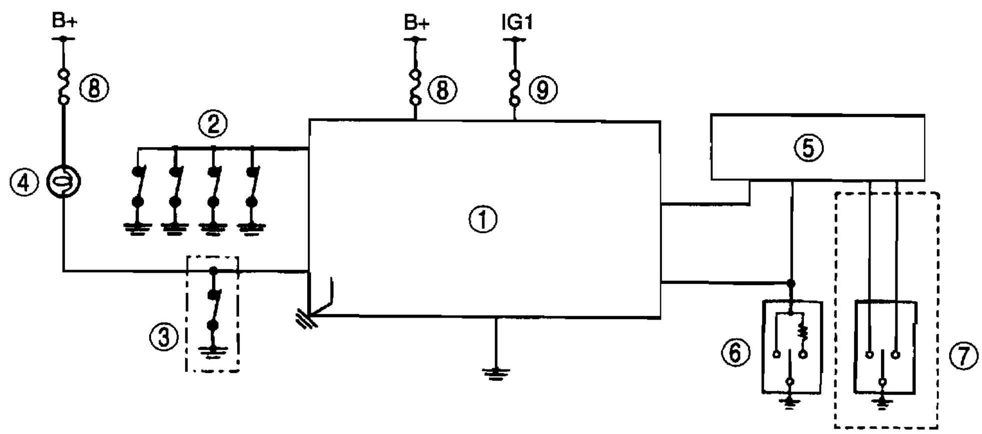
×: Applied

Function		New 626	PREMACY (CP)	Current 626 (GF, GW)	Remark
Power supply of pulse generator (2A terminal)		×	N/A	N/A	—
Fail-safe	Limit switch	×	×	N/A	The new 626 has power supply of the pulse generator and therefore has fail-safe function of the sensor power supply.
	Pulse generator	×	×	N/A	
	Sensor power supply	×	N/A	N/A	

POWER DOOR LOCK SYSTEM

OUTLINE
- The function, structure and operation is essentially carried over from that of the current 626 (GF) and 626 Station Wagon (GW) models, except for the following:
  — A cargo (trunk) compartment light switch signal has been incorporated in the keyless unit in accordance with the addition of an auto lock function.
  — The unlock cancel function is used with the trunk lid or liftgate.
  — The liftgate or trunk lid has been locked/unlocked by the interlock function, as well as all doors, except during cancellation. (5HB, sedan)

SYSTEM WIRING DIAGRAM



1	Keyless unit
2	Door switch
3	Trunk compartment light switch (sedan), cargo compartment light switch (5HB, station wagon)
4	Trunk compartment light (sedan), cargo compartment light (5HB, station wagon)
5	Door lock timer unit

6	Ligftgate key cylinder switch (station wagon)
7	Trunk lid lock-link switch (sedan), liftgate lock-link switch (5HB)
8	ROOM 10 A fuse
9	METER 7.5 A fuse

AUTO LOCK FUNCTION
Function
- This function prevents the doors and liftgate (trunk lid) from being left in an unlocked state caused by misoperation of the transmitter.

Operation
- When any door and the liftgate (trunk lid) are not opened within 30 seconds after the transmitter UNLOCK button is pressed, the UNLOCK signal is cancelled and the doors are locked.

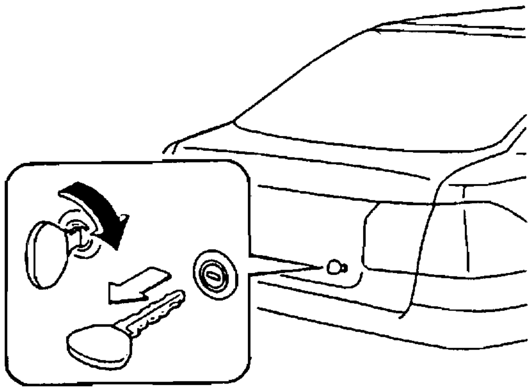
UNLOCK CANCEL FUNCTION

Function

- Operating the door lock knob disables unlocking of the trunk lid or liftgate.

Operation

- Insert the key, turn it clockwise until the lock is in the horizontal position and remove the key. The trunk lid or liftgate will not unlock even when the door lock knob, transmitter or door key cylinder is operated.



SEAT

OUTLINE

- The function, structure and operation is essentially carried over from that of the current 626 (GF) and 626 Station Wagon (GW) models, except for the adoption of the box-type armrest (driver's seat only).

STRUCTURAL VIEW

1	Armrest box

SUPPLEMENTAL SERVICE INFORMATION

The following changes and/or additions have been made since publication of the Mazda 626 Workshop Manual (1577-10-97D), Mazda 626 Station Wagon Workshop Manual Supplement (1603-10-97J).

Front door
- Disassembly/Assembly procedure has been modified

Front power window regulator
- Disassembly/Assembly procedure has been added

Power window motor
- Inspection procedure has been added
- Resetting procedure has been added (driver-side)
- Automatic window return function procedure has been added

Power window main switch
- Inspection procedure has been modified

Trunk lid lock-link switch
- Inspection procedure has been added

Liftgate lock-link switch
- Inspection procedure has been added

Door lock timer unit
- Inspection procedure has been modified

Keyless unit
- Removal/Installation procedure has been modified
- Inspection procedure has been modified

Transmitter battery
- Replacement procedure has been modified
- Inspection procedure has been modified

Trunk lid
- Removal/Installation procedure has been modified
- Adjustment procedure has been modified

liftgate
- Removal/Installation procedure has been modified
- Adjustment procedure has been modified

Bumper
- Removal/Installation procedure has been modified

Radiator grille
- Removal/Installation procedure has been modified

Console
- Removal/Installation procedure has been added
- Disassembly/Assembly procedure has been modified
- Adjustment procedure has been added

Front seat
- Disassembly/Assembly procedure has been modified

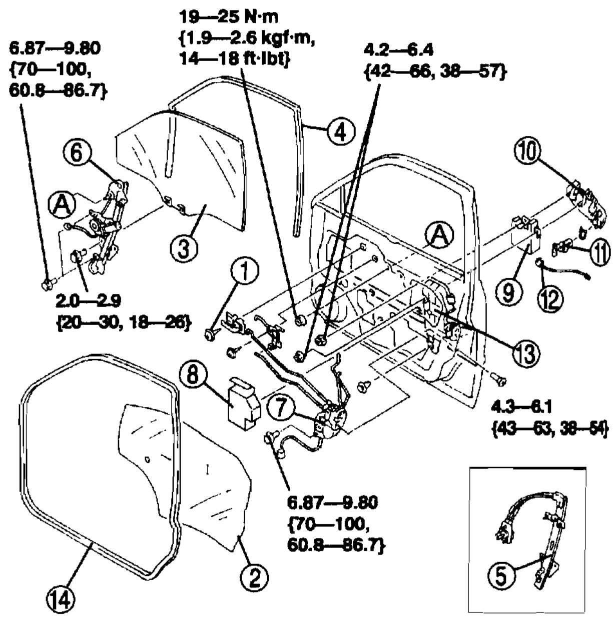
Troubleshooting
- Power window system has been added

DOOR

FRONT DOOR DISASSEMBLY/ASSEMBLY

Caution
- **The automatic window return may not operate properly if the following is performed on the driver-side front door. (See S-12 DRIVER-SIDE POWER WINDOW MOTOR RESETTING.)**
  - **— The power window motor is operated without the door glass properly installed.**
  - **— The door glass is replaced.**
  - **— The glass run channel is replaced.**
  - **— The power window regulator is removed or installed. If a new power window regulator is installed, however, the power window motor does not require resetting.**

1. Operate the front door glass so that the distance from the top of the front door glass at the rear end to the upper part of the front beltline molding is **60 mm {2.4 in}**
2. Disconnect the negative battery cable.
3. Remove the front door trim.
4. Disassemble in the order indicated in the table.
5. Assemble in the reverse order of disassembly.



N·m {kgf·cm, in·lbf}

1	Inner handle
2	Door screen
3	Front door glass
4	Glass run channel
5	Manual window regulator
6	Power window regulator
7	Front door lock
8	Pad A
9	Pad B

10	Outer handle
11	Door key cylinder
12	Door key cylinder switch
13	Rod protector
14	Door weatherstrip

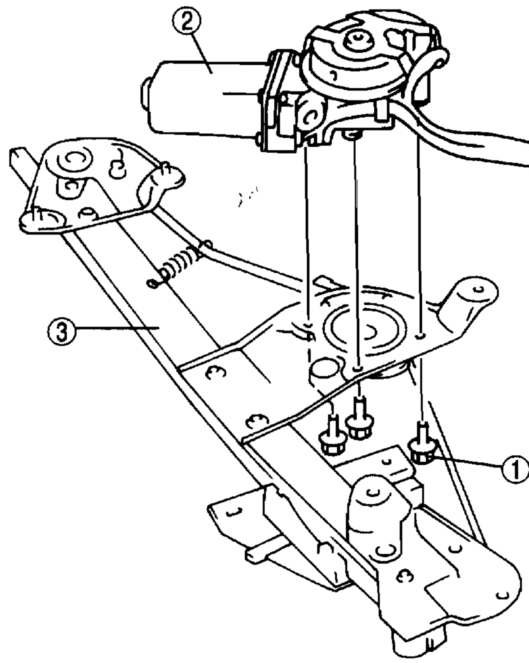
POWER WINDOW SYSTEM

FRONT POWER WINDOW REGULATOR DISASSEMBLY/ASSEMBLY

Caution

- **The automatic window return may not operate properly if the frame of the driver-side front power window regulator is removed from the power window motor. After performing any work, be sure to reset the power window motor. (See S-12 DRIVER-SIDE POWER WINDOW MOTOR RESETTING.)**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



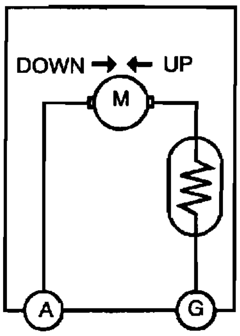
1	Bolt
2	Power window motor
3	Frame

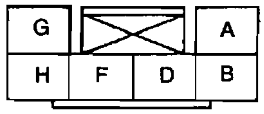
POWER WINDOW MOTOR INSPECTION

Driver's Side

1. Remove the power window motor. (See S-11 FRONT POWER WINDOW REGULATOR DISASSEMBLY/ASSEMBLY.)
2. Apply battery positive voltage to the power window motor terminals A and G and inspect the operation of the power window motor.
   - If not as specified, replace the power window motor.

Terminal		Motor operation
A	G	
GND	B+	UP
B+	GND	DOWN





COMPONENT SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

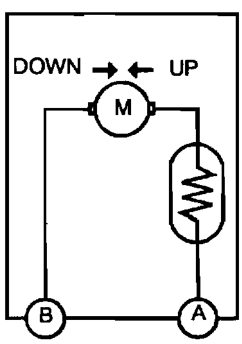
3. Apply **5 V** to the power window motor terminal B and connect terminal F to ground.
4. Measure the voltage at terminal D while operating the power window motor.
   - If not as specified, replace the power window motor.

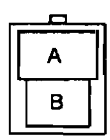
Voltage
Pulse wave: MAX. 5 V, MIN. 0 V

Passenger's Side

1. Remove the power window motor.
2. Apply battery positive voltage to the power window motor terminals and inspect the operation of the power window motor.
   - If not as specified, replace the power window motor.

Terminal		**Motor operation**
A	**B**	
B+	GND	UP
GND	B+	DOWN





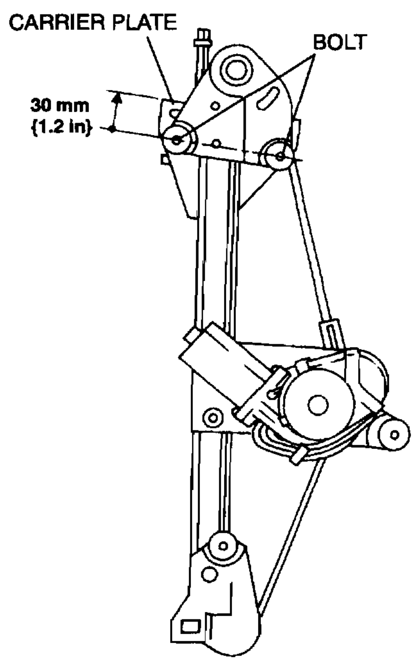
COMPONENT SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

DRIVER-SIDE POWER WINDOW MOTOR RESETTING

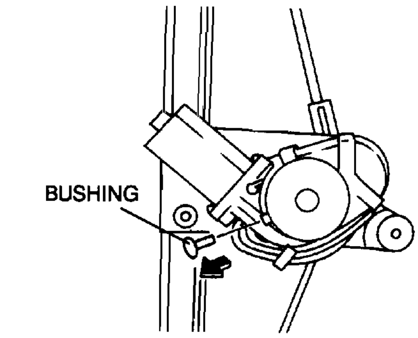
Caution

- **The initial position of a new power window regulators has been preset. It is not necessary to reset the power window motor.**
- **The initial position of a new power window motor which is separately delivered has been reset. Begin again at Step 10.**
- **The automatic window return may not operate properly if the following is performed on the front door.**
  - **— The power window motor is operated without the door glass properly installed.**
  - **— The door glass is replaced.**
  - **— The glass run channel is replaced.**
  - **— The power window regulator is removed.**

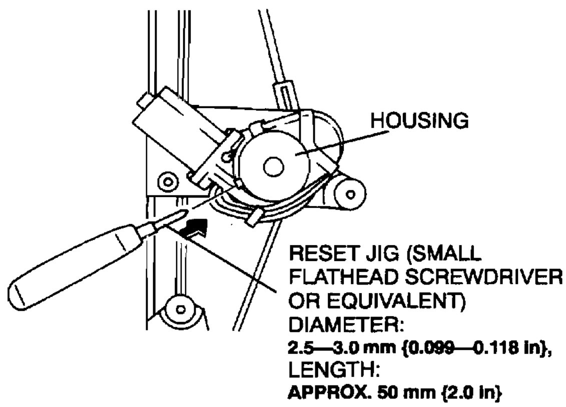
1. Remove the power window regulator from the front door.
2. Connect the power window main switch connector.
3. Connect the power window motor connector.
4. Connect the negative battery cable.
5. Operate the power window switch to the close position so that the carrier plate moves to the upper end of the frame (above the two bracket bolts).
   - Do not raise the carrier plate excessively, or it will come off. Set the carrier plate no further than **30 mm {0.12 in}** above the bolts.

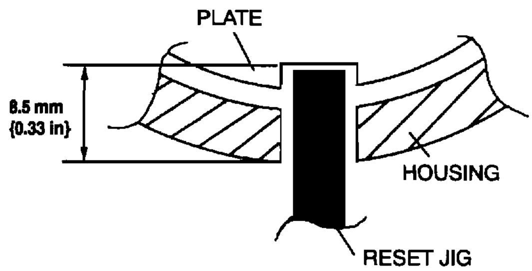


6. Remove the bushing inserted into the power window motor sensor

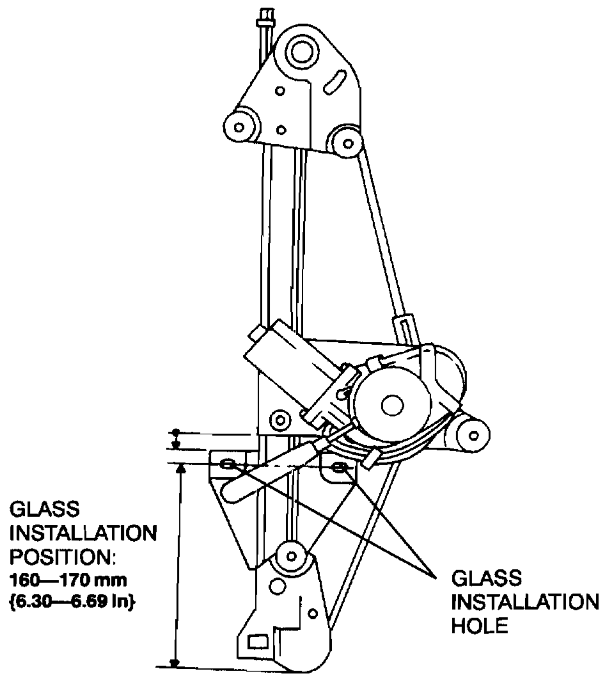


7. Slowly insert the reset jig into the hole where the bushing was installed until it stops.

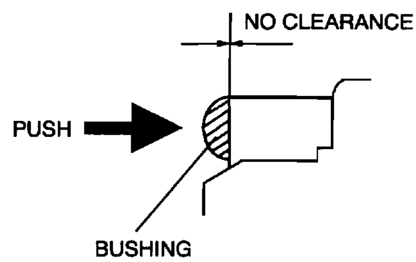




8. While inserting the reset jig to the end point, operate the power window switch to the open position so that the carrier plate moves to the lower end (below the motor).
   - If the carrier plate is inadvertently raised above the bracket bolts, return to Step 7.



9. Verify that there is no foreign matter on the bushing and insert the bushing free of any gaps.
   - If the carrier plate is inadvertently raised above the bracket bolts, return to Step 6.



10. Install the power window regulator to the front door.
11. Install the front door glass to the power window regulator.
12. Close the power window by operating the power window switch.
    - In the event that the automatic window return operates after the window fully closes by auto close, repeat Step 1.

Caution
- **Automatic window return may not operate immediately after the power window motor is reset. In the event that auto window return is operated, be sure to perform Step 12.**

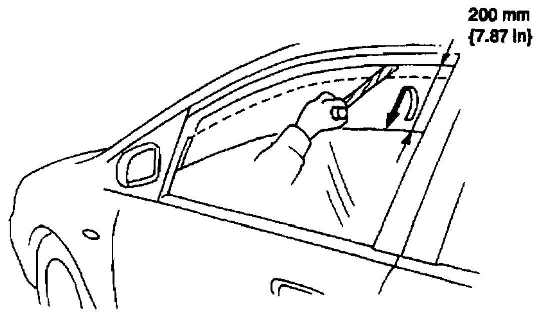
13. Inspect the automatic window return function. (See S-14 AUTOMATIC WINDOW RETURN FUNCTION INSPECTION.)

AUTOMATIC WINDOW RETURN FUNCTION INSPECTION

Warning
- **Do not put your hand, arm, or any part of your body in the window while inspecting. A malfunction in the automatic window return function could cause injury. Be careful not to allow your body to get caught in the window.**

Note
- The automatic window return function is used only for the driver-side front door.
- The automatic window return function operates during auto close operation or when the window is closed manually with the IG OFF timer.

1. Fully lower the door glass.
2. Position the handle of the hammer as shown in the figure.
3. Operate the power window switch to the auto close position and close the window.
4. Verify that the window reverses operation when it contacts the handle of the hammer and that it opens **approximately 200 mm {7.87 in}**.
   - If not as specified, inspect the system following the TROUBLESHOOTING.

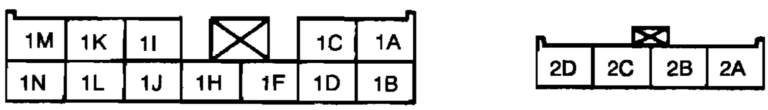


POWER WINDOW MAIN SWITCH INSPECTION

Driver's side

1. Remove the power window main switch.
2. Connect the power window main switch connector.
3. Measure the voltage at the power window main switch terminals as indicated below.
4. Disconnect the power window main switch connector before inspecting for continuity at terminals 1H, 2B, and 2C.
   - If not as specified, inspect the parts listed under "Action."
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the power window main switch.

Terminal voltage list (Reference)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
1A (1M)	Close output	Power window motor	Door glass is open	Below 1.0	• Inspect power window motor • Inspect related harness
			Door glass is closed	B+	
1C (1K)	Open output	Power window motor	Door glass is open	B+	• Inspect power window motor • Inspect related harness
			Door glass is closed	Below 1.0	
1F	IG1	P/WIND 30 A FUSE	Ignition switch is at ON position	B+	• Inspect P/WIND 30 A fuse • Inspect related harness
			Ignition switch is at LOCK position	Below 1.0	
1H	Ground	GND	Under any condition: inspect for continuity to ground	Yes	• Inspect GND
1I	Power supply	P/WIND 20 A fuse	Under any condition	B+	• Inspect P/WIND 20 A fuse • Inspect related harness
1N	—	—	—	—	—

( ): R.H.D.

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
2A	Power supply (pulse)	Power window motor	Ignition switch is at ON position	5	• Power window motor
			Ignition switch is at LOCK position	Below 1.0	
2B	Limit switch on/off	Power window motor	Door glass is opened fully (limit switch is on): inspect for continuity to terminal 2C	Yes	• Inspect power window motor • Inspect related harness
			Door glass is closed fully (limit switch is off): inspect for continuity to terminal 2C	No	
2C	Ground	Power window motor	Under any condition: inspect for continuity to ground	Yes	• Inspect GND
2D	Pulse	Power window motor	Door glass is in motion	0⇔5	• Inspection power window motor • Inspection related harness
			Door glass is not in motion	0 or 5	

Except driver's side

1. Remove the power window main switch.
2. Turn the power-cut switch to UNLOCK.
3. Inspect for continuity between the power window main switch terminals using an ohmmeter.
   - If not as specified, replace the power window main switch.

Passenger's side

○—○ : Continuity

Switch position	Terminal 1F	1H	1M (1A)	1K (1C)
CLOSE	○—		—○	
		○—		—○
OFF		○—	—○—	—○
OPEN	○—			—○
		○—	—○	

( ): R.H.D.

Rear right

○—○ : Continuity

Switch position	Terminal 1F	1H	1J	1L
CLOSE	○—		—○	
		○—		—○
OFF		○—	—○—	—○
OPEN	○—			—○
		○—	—○	

Rear left

○—○ : Continuity

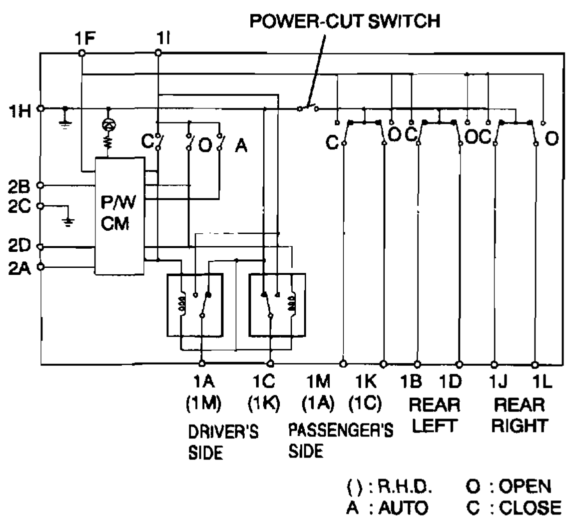
Switch position	Terminal 1F	1H	1B	1D
CLOSE	○—		—○	
		○—		—○
OFF		○—	—○—	—○
OPEN	○—			—○
		○—	—○	

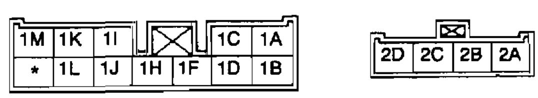
Power-cut switch

○—○ : Continuity

Switch position	Terminal 1H	1A (1M)	1C (1K)	1M (1A)	1K (1C)	1J	1L	1B	1D
UNLOCK	○—	—○—	—○—	—○—	—○—	—○—	—○—	—○—	—○
LOCK	○—	—○—	—○	○—	—○—	—○—	—○—	—○—	—○

( ): R.H.D.





COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

POWER DOOR LOCK SYSTEM

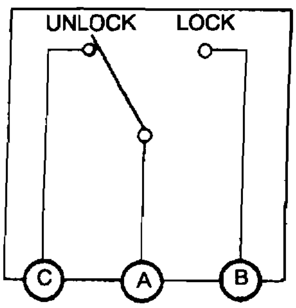
TRUNK LID LOCK-LINK SWITCH INSPECTION

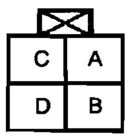
Note
- The trunk lid lock-link switch is built into the trunk lid key cylinder.

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim.
3. Disconnect the trunk lid lock-link switch connector.
4. Inspect for continuity between the trunk lid lock-link switch terminals using an ohmmeter.
   - If not as specified, replace the trunk lid key cylinder.

○—○ : Continuity

Lock knob position	Terminal		
	A	B	C
Lock	○—	—○	
Unlock	○—	——	—○





COMPONENT SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

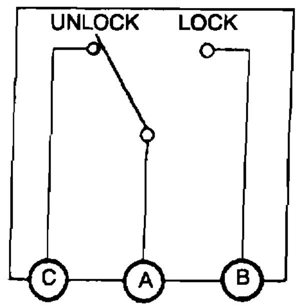
LIFTGATE LOCK-LINK SWITCH INSPECTION

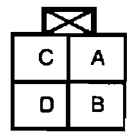
Note
- The liftgate lock-link switch is built into the liftgate key cylinder.

1. Disconnect the negative battery cable.
2. Remove the liftgate trim.
3. Disconnect the liftgate lock-link switch connector.
4. Inspect for continuity between the liftgate lock-link switch terminals using an ohmmeter.
   - If not as specified, replace the liftgate key cylinder.

○—○ : Continuity

Lock knob position	Terminal		
	A	B	C
Lock	○—	—○	
Unlock	○—	——	—○



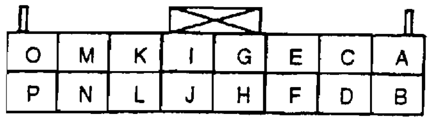


COMPONENT SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

DOOR LOCK TIMER UNIT INSPECTION

1. Remove the lower panel.
2. Measure the voltage at the door lock timer unit terminals as indicated below.
3. Disconnect the door lock timer unit connector before inspecting for continuity at terminals K, L, M, and N.
   - If not as specified, inspect the parts listed under "Action."
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the door lock timer unit.

Terminal voltage list (Reference)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
A	Power supply	DOOR LOCK 30 A fuse	Under any condition	B+	• Inspect DOOR LOCK 30 A fuse • Inspect related harness
B	Double lock output (with double locking system)	• Door lock actuator • Liftgate lock actuator	Door lock actuator is double locked	0→B+→0	• Inspect door lock actuator • Inspect liftgate lock actuator • Inspect related harness
			Other	0	
C	Unlock output	• Door lock actuator • Liftgate lock actuator	Door lock actuator is unlocked	0→B+→0	• Inspect door lock actuator • Inspect liftgate lock actuator • Inspect related harness
			Other	0	
D	Lock output	• Door lock actuator • Liftgate lock actuator	Door lock actuator is locked	0→B+→0	• Inspect door lock actuator • Inspect liftgate lock actuator • Inspect related harness
			Other	0	
E	–	–	–	–	–
F	Lock/Unlock input	• Door key cylinder switch • Keyless unit	Key cylinder had been locked	*2.5 5	• Inspect key cylinder switch • Inspect related harness
			Key cylinder had been unlocked	0	
			Key cylinder at neutral position	*5 B+	
			Transmitter lock button is pressed	*5→2.5→5 B+→5→B+	• Inspect keyless unit • Inspect transmitter • Inspect related harness
			Transmitter unlock button is pressed	*5→0→5 B+→0→B+	
G	–	–	–	–	–
H	Security light output (with double locking system)	Instrument cluster	Double locking system operated	1.4	• Inspect instrument cluster • Inspect related harness
			Other	B+	
I	IG1 (with double locking system)	METER 7.5 A fuse	Ignition switch at ON position	B+	• Inspect METER 7.5 A fuse • Inspect ignition switch • Inspect related harness
			Ignition switch at LOCK or ACC position	0	
J	Key reminder switch (with double locking system)	Key reminder switch	Key reminder switch at on	B+	• Inspect key reminder switch • Inspect related harness
			Other	0	

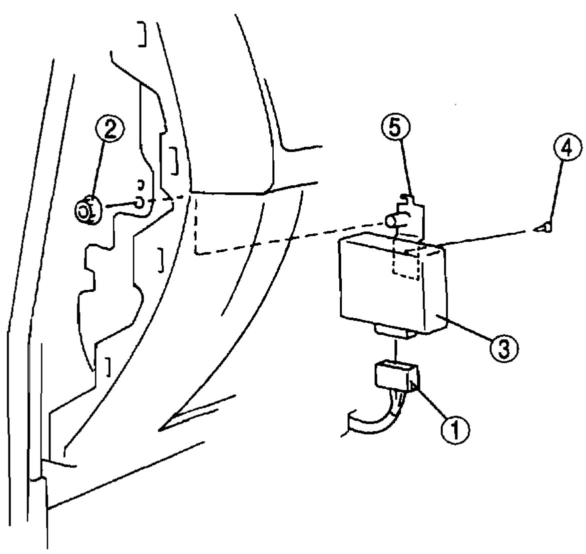
*: With double locking system or theft-deterrent system

Terminal	Signal	Connected to	Test condition	Continuity	Action
K	Lock input	Door lock-link switch	Driver's side door is locked: inspect for continuity to ground	Yes	• Inspect door lock-link switch • Inspect related harness
			Driver's side door is unlocked: inspect for continuity to ground	No	
L	Unlock input	Door lock-link switch	Driver's side door is locked: inspect for continuity to ground	No	• Inspect door lock-link switch • Inspect related harness
			Driver's side door is unlocked: inspect for continuity to ground	Yes	
M	Signal ground	GND	Under any condition: inspect for continuity to ground	Yes	• Inspect GND
N	Power ground	GND	Under any condition: inspect for continuity to ground	Yes	• Inspect GND
O	Lock input	• Trunk lid lock-link switch • Liftgate lock-link switch	Trunk lid or liftgate is locked: inspect for continuity to ground	Yes	• Inspect trunk lid lock-link switch • Inspect liftgate lock-link switch • Inspect related harness
			Trunk lid or liftgate is unlocked: inspect for continuity to ground	No	
P	Unlock input	• Trunk lid lock-link switch • Liftgate lock-link switch	Trunk lid or liftgate is locked: inspect for continuity to ground	No	• Inspect trunk lid lock-link switch • Inspect liftgate lock-link switch • Inspect related harness
			Trunk lid or liftgate is unlocked: inspect for continuity to ground	Yes	

KEYLESS UNIT REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the left side side panel.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

1	Connector
2	Nut
3	Keyless unit
4	Screw
5	Bracket



KEYLESS UNIT INSPECTION

1. Remove the left side side panel.
2. Measure the voltage at the keyless unit terminals as indicated below.
3. Disconnect the keyless unit connector before inspecting continuity between terminal L and the ground.
   - If not specified, inspect the screw mountings on the keyless unit and bracket, and the bracket and body.
4. Disconnect the keyless unit connector before inspecting for continuity at terminals C and L.
   - If not as specified, inspect the parts listed under “Action.”
   - If the parts and wiring harnesses are okay but the system still does not work properly, perform the troubleshooting.

Terminal Voltage Table (Reference)

O	M	K	I	G	E	C	A
P	N	L	J	H	F	D	B

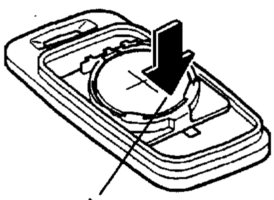
HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
A	IG1	METER 7.5 A fuse	Ignition switch is at ON position	B+	• Inspect METER 7.5 A fuse • Inspect related harness
			Ignition switch is at LOCK or ACC position	0	
B	Power supply	ROOM 10 A fuse	Under any condition	B+	• Inspect ROOM 10 A fuse • Inspect related harness
C	Door open/ closed	Door switch	Any door is open (door switch is on): inspect for continuity to ground	Yes	• Inspect door switch • Inspect related harness
			All doors are closed (door switch is off): inspect for continuity to ground	No	
D	Liftgate open/closed	Cargo compartment light switch	Liftgate is open (cargo compartment light switc is on): inspecting for continuity to ground	Yes	• Inspect cargo compartment light switch • Inspect related harness
			Liftgate is closed (cargo compartment light switch is off): inspecting for continuity to ground	No	
E	–	–	–	–	–
F	–	–	–	–	–
G	–	–	–	–	–
H	–	–	–	–	–
I	–	–	–	–	–
J	–	–	–	–	–
K	–	–	–	–	–
L	Ground	GND	Under any condition: inspect for continuity to ground	Yes	–
M	–	–	–	–	–
N	–	–	–	–	–
O	Lock/unlock output	Door lock timer unit	Transmitter LOCK button is pressed	B+→6→B+	• Inspect door lock timer unit • Inspect transmitter • Inspect related harness
			Transmitter UNLOCK button is pressed once	B+→0→B+	
			No transmitter buttons are pressed	5	
P	–	–	–	–	–

TRANSMITTER BATTERY REPLACEMENT

1. Insert a small flathead screwdriver into the slot and gently pry open the transmitter.

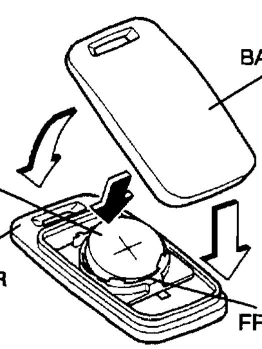
2. Press the portion of the battery indicated by A and remove the battery.



3. Install a new battery (CR2025 or the equivalent) into the front portion of the holder with the positive pole (+) facing up. Press on the B portion of the battery to set the battery.
4. Align the front and back covers and snap the transmitter shut.

Battery specification
Lithium CR2025 × 1

Note
- The batteries will last about **2 years** when used **10 times** a day.

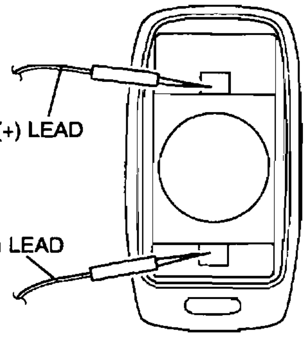


TRANSMITTER BATTERY INSPECTION

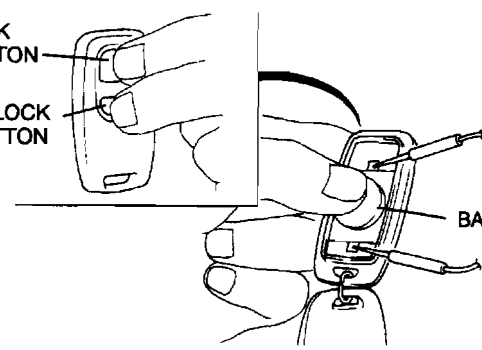
Note
- Since a correct measurement can not be obtained if the battery temperature is low, make sure the battery has been at **18 °C {64 °F} or more** for **at least 30 minutes** before reinspecting when a measurement value is under the standard voltage.

Caution
- **Since the battery voltage does not drop fully if the button is pushed for only 4 seconds or less, it can not be properly examined to see whether it is good or bad. Always push the button for 5 seconds.**

1. Remove the transmitter cover.
2. Apply the circuit tester leads to the positions as indicated in the figure.



3. While pressing the battery as shown in the figure, press the LOCK and UNLOCK buttons on the transmitter at the same time for **5 seconds.**



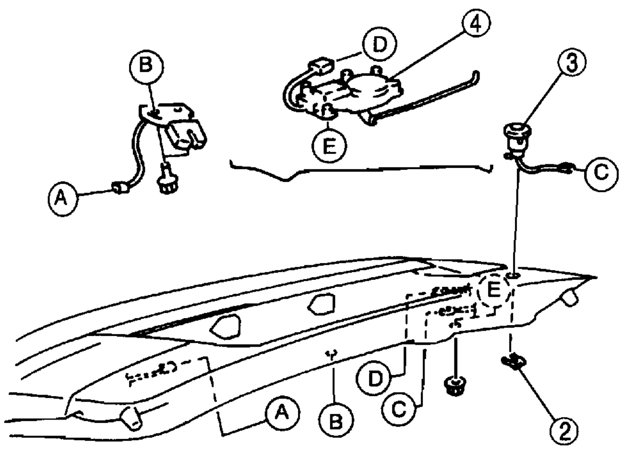
4. Measure the minimum voltage for a period of **10 seconds** from the time the transmitter buttons are pressed.
   - If the voltage is under the standard voltage, replace the battery.

Standard voltage
2.7 V

TRUNK LID

TRUNK LID LOCK REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

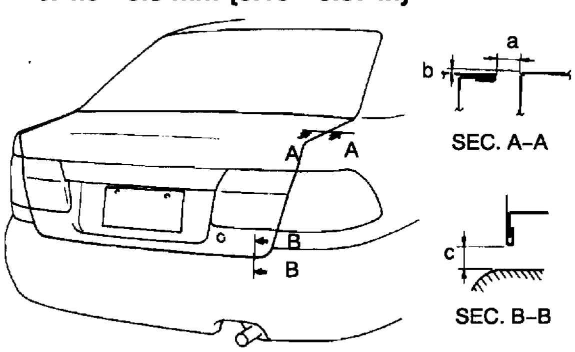


1	Trunk lid lock
2	Trunk lid key cylinder retainer
3	Trunk lid key cylinder
4	Trunk lid lock actuator

TRUNK LID ADJUSTMENT

1. Loosen the trunk lid installation nuts.
2. Reposition the trunk lid as specified.

Clearance
a: 3.0—5.0 mm {0.12—0.19 in}
b: -0.5—1.5 mm {0.019—0.059 in}
c: 4.5—9.5 mm {0.18—0.37 In}

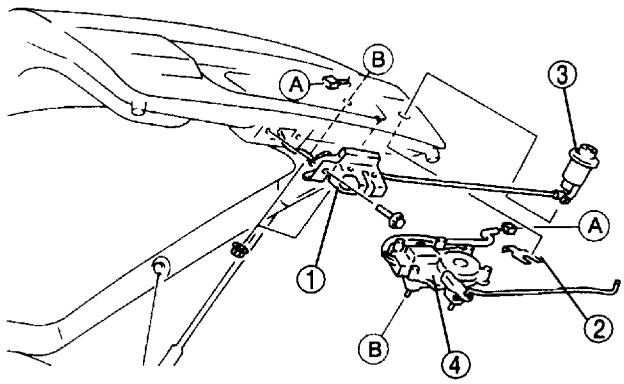


3. Tighten the nuts.

LIFTGATE

LIFTGATE LOCK REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

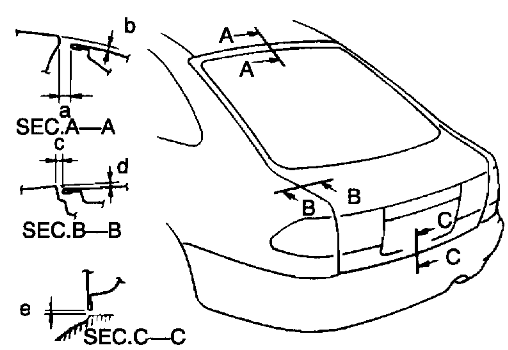


1	Liftgate lock
2	Liftgate key cylinder retainer
3	Liftgate key cylinder
4	Liftgate lock actuator

LIFTGATE ADJUSTMENT

1. Loosen the liftgate installation nuts.
2. Reposion the liftgate as specified.

Clearance
a: 7.7—9.7 mm {0.31—0.38 in}
b: 0.1—2.1 mm {0.004—0.08 in}
c: 3.5—6.5 mm {0.14—0.25 In}
d: -0.5—1.5 mm {-0.01—0.05 In}
e: 6.0—9.0 mm {0.24—0.35 In}

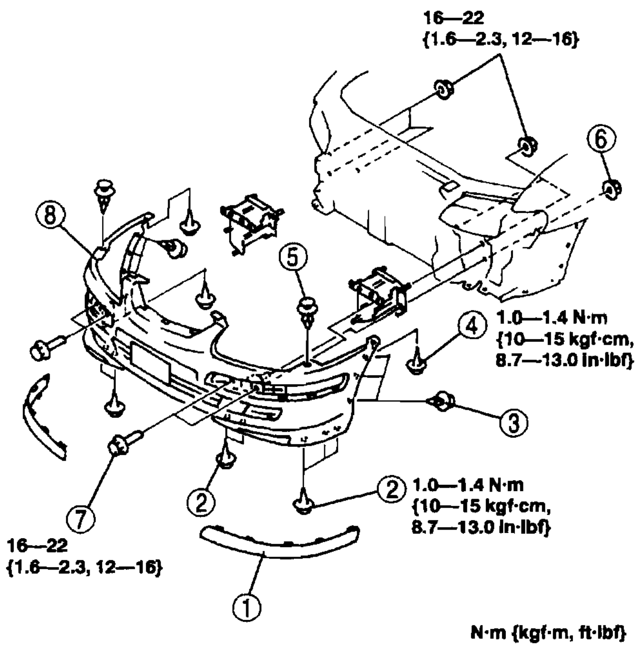


3. Tighten the bolts and nuts.

BUMPER

FRONT BUMPER REMOVAL/INSTALLATION

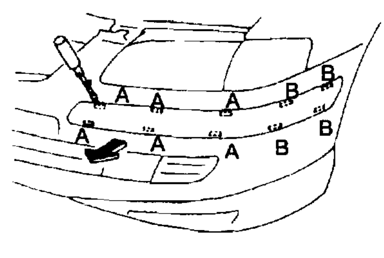
1. Disconnect the negative battery cable.
2. Remove the radiator grille.
3. Remove the front turn light.
4. Disconnect the front fog light connector. (if equipped with front fog lights)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Adjust the front fog light aiming. (if equipped with front fog lights) (See T-17 FRONT FOG LIGHT AIMING.)

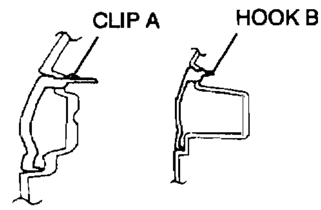


1	Protector (See S-22 Protector Removal Note)
2	Screw A
3	Fastener A
4	Screw B
5	Fastener B
6	Nut
7	Bolt
8	Front bumper

Protector Removal Note

1. Apply protective tape to the front bumper to protect it from damage.
2. Disengage clips A using a tape-wrapped flathead screwdriver.
3. Pull the protector indicated by the arrow and disengage hooks B from the front bumper.

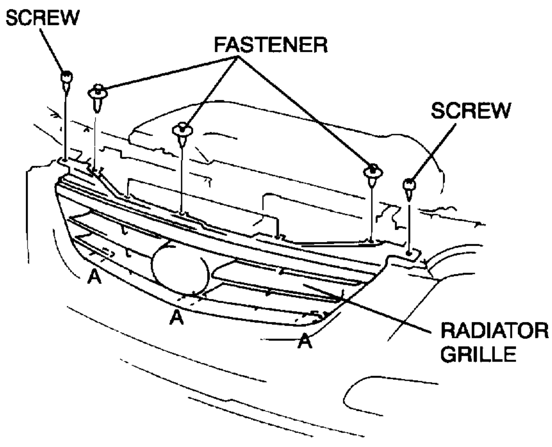


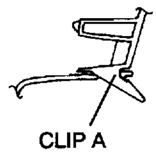


EXTERIOR ATTACHMENT

RADIATOR GRILLE REMOVAL/INSTALLATION

1. Remove the upper seal board.
2. Remove the fasteners and screws.
3. Pull the radiator grille forward, then disengage clips A from the front bumper.





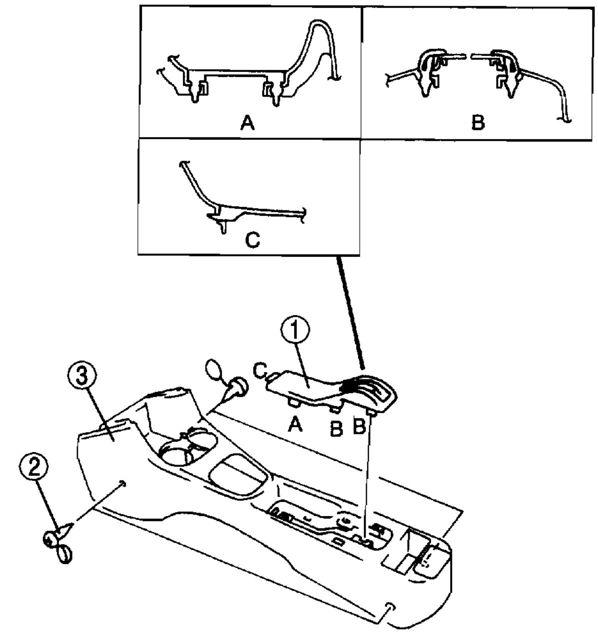
4. Install in the reverse order of removal.

DASHBOARD AND CONSOLE

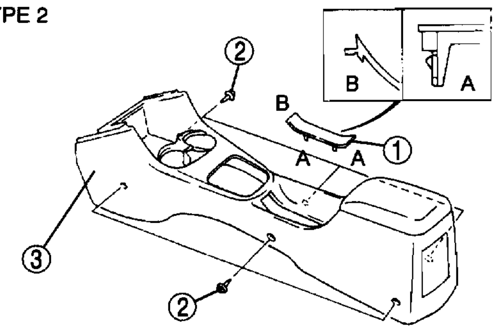
CONSOLE REMOVAL/INSTALLATION

1. Shift the selector lever to L range.(ATX)
2. Remove the selector lever knob.(ATX)
3. Remove the shift knob.(MTX)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Adjust the console. (See S-24 CONSOLE ADJUSTMENT.)

TYPE 1



TYPE 2

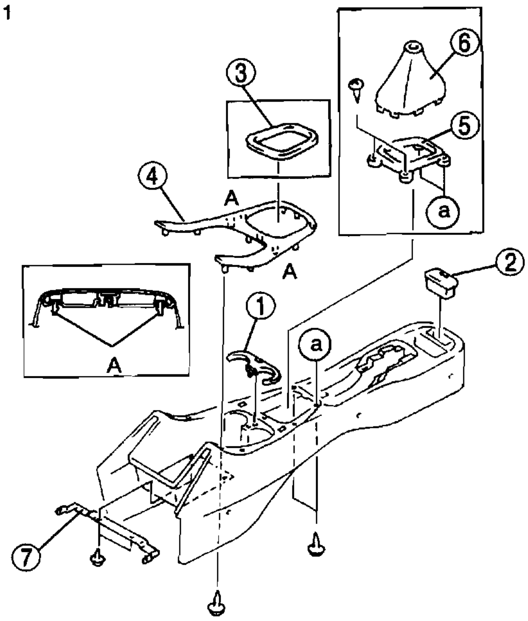


1	Console cover
2	Screw
3	Console

CONSOLE DISASSEMBLY/ASSEMBLY

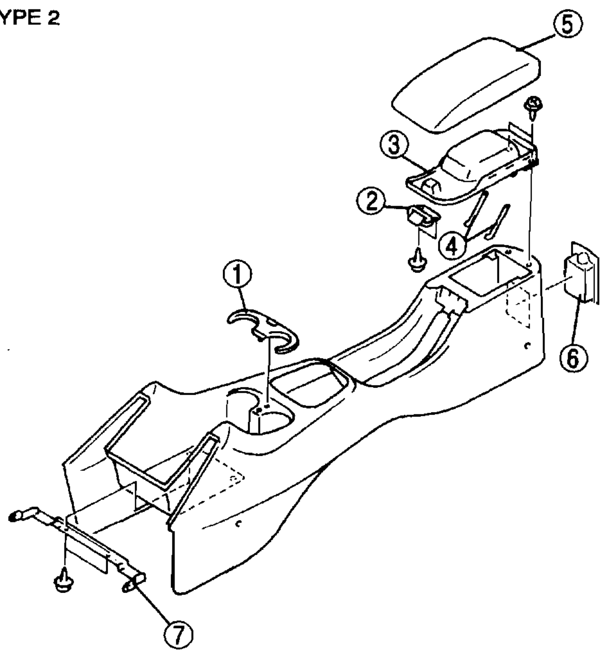
1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

TYPE 1



1	Cup holder
2	Ashtray
3	Ring
4	Upper panel
5	Set panel
6	Boot
7	Bracket

TYPE 2



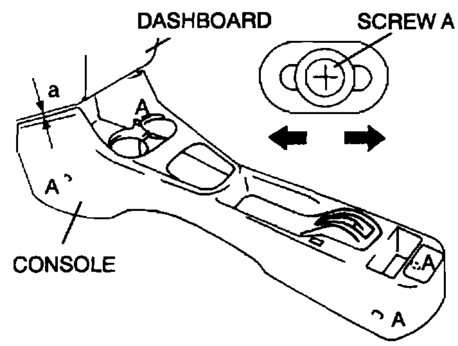
1	Cup holder
2	Console lid lock
3	Console inner lid
4	Console lid stopper
5	Console lid
6	Ashtray
7	Bracket

CONSOLE ADJUSTMENT

Caution
- **Take care to install the console and the center panel so that there is not any interference which may cause noise.**

1. Loosen screws A.
2. Slide the console indicated shown by the arrow and measure the gap between the console and the dashboard.

Clearance
a: 2.0—8.0 mm {0.08—0.31 in}



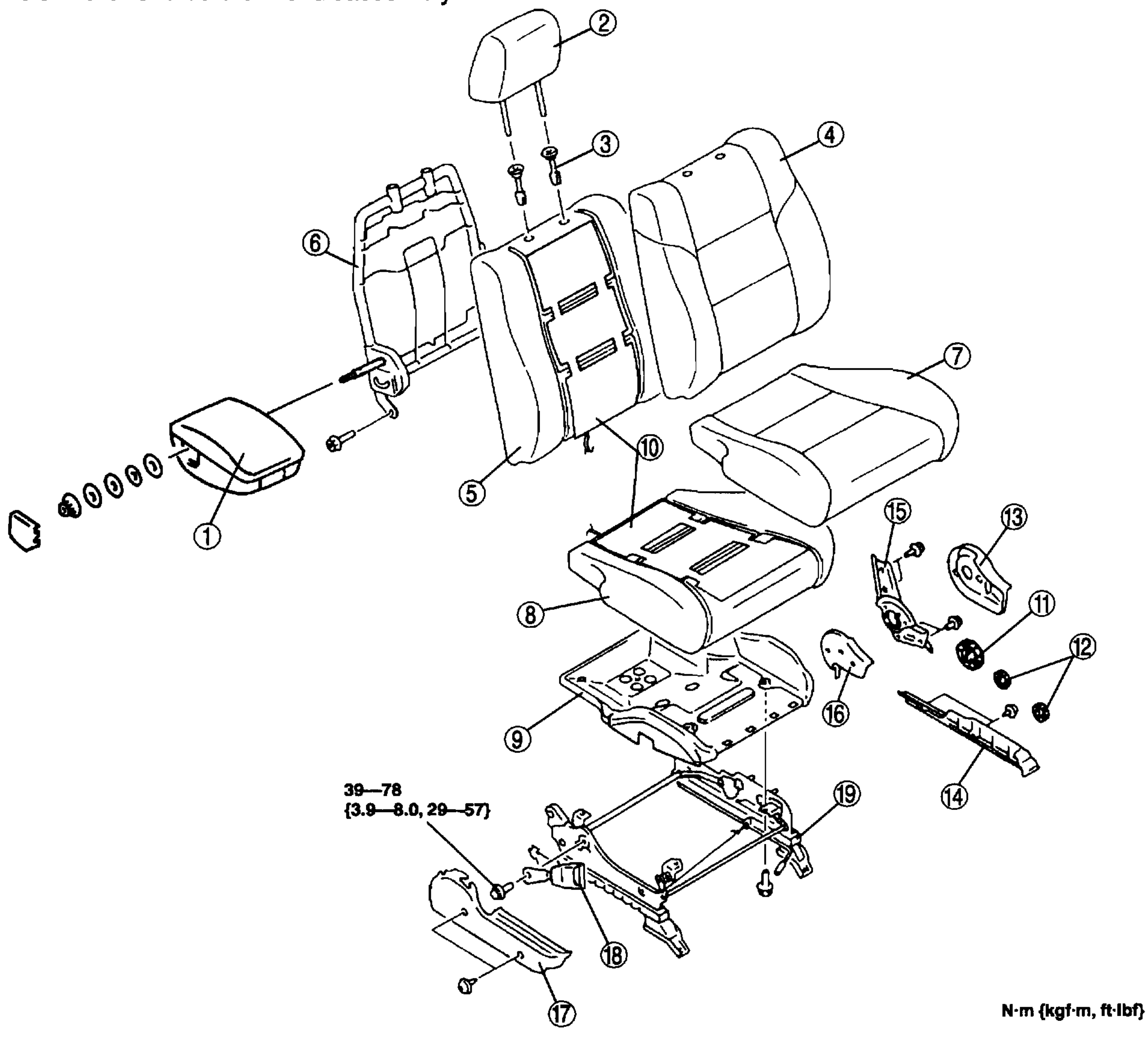
3. Tighten screws A.

SEAT

FRONT SEAT DISASSEMBLY/ASSEMBLY
Driver's Seat

Warning
- **Handling the front seat (side air bag) improperly can accidentally deploy the side air bag, which may seriously injure you. Read SERVICE WARNINGS before handling the front seat. (See T–56 SERVICE WARNINGS.)**

Armrest box type
1. Remove the driver-side side air bag module. (See Section T)
2. Disassemble in the order indicated in the table.
3. Assemble in the reverse order of disassembly.



1	Armrest
2	Headrest
3	Pole guide
4	Seat back trim
5	Seat back pad
6	Seat back frame
7	Seat cushion trim
8	Seat cushion pad
9	Seat cushion frame
10	Seat warmer unit

11	Recliner dial
12	Tilt dial
13	Side cover No.1
14	Lower cover
15	Recliner knuckle
16	Reverse cover
17	Side cover No.2
18	Front buckle
19	Slide adjuster

TROUBLESHOOTING [POWER WINDOW SYSTEM]

AUTOMATIC WINDOW RETURN FUNCTION

Foreword

- Always perform basic power window system inspection before troubleshooting.
- The possible cause section lists inspection areas (steps) for the malfunctioning system. Use it when you want to confirm an inspection procedure quickly.
- Troubleshooting gives content unique to trouble caused by problems in the automatic window return function.

Caution

- **The automatic window return may not operate properly if the following is performed on the front door. (See S-12, DRIVER-SIDE POWER WINDOW MOTOR RESETTING.)**
  - **— The power window motor is operated without the door glass properly installed.**
  - **— The door glass is replaced.**
  - **— The glass run channel is replaced.**
  - **— The power window regulator is removed or installed. If a new power window regulator is installed, however, the power window motor does not require resetting.**

Basic Power Window System Inspection

Manual mode function inspection

STEP	INSPECTION		ACTION
1	• Turn ignition switch to ON position. • Do all windows go up and down in manual mode using power window main switch?	Yes	Go to next step.
		No	Inspect the following items: • Power window main switch power supply fuses • Power window main switch ground wiring harness • Power window main switch power supply wiring harnesses • Wiring harness between power window main switch and power window motor • Power window main switch • Power window motor • Each power window motor wire installation point • Each window's installation point on its carrier plate • Each power window regulator installation point on each door Repair or replace the problem area, then go to Step 4.
2	• Does each window go up and down in manual mode using power window sub-switch?	Yes	Go to next step.
		No	Inspect the following items: • Power window main switch (power-cut switch system malfunction) • Power window subswitch • Subswitch power supply wiring harnesses Repair or replace the problem area, then go to automatic mode function inspection.
3	• Turn power-cut switch to LOCK. • Operate power window main switch for all doors in manual mode. • Does only driver-side front window go up and down?	Yes	Manual mode function is normal. Go to automatic mode function inspection.
		No	Replace power window main switch, then go to automatic mode function inspection (power-cut switch system malfunction).
4	• Were any of the following parts replaced or reinstalled? — Driver-side front power window motor — Driver-side front door glass — Driver-side front power window regulator — Driver-side front power window wire — Driver-side front glass run channel	Yes	Reset the driver-side front power window motor, then go to automatic mode function inspection. (See S-12 DRIVER-SIDE POWER WINDOW MOTOR RESETTING)
		No	Go to automatic mode function inspection.

Automatic mode function inspection

STEP	INSPECTION		ACTION
1	• Turn ignition switch to ON position. • Operate power window main switch for driver-side front door in automatic mode. • Does driver-side front window go up and down?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index No. 1.
2	• Gently nudge the driver-side front power window switch up while driver-side front window is going down in automatic mode. • Does the glass stop?	Yes	Go to next step.
		No	Replace power window main switch, then go to automatic window return function inspection.
3	• Gently nudge the driver-side front power window switch down while driver-side front window is going up in automatic mode. • Does the glass stop?	Yes	Automatic mode function is normal. Go to automatic window return function inspection.
		No	Replace power window main switch, then go to automatic window return function inspection.

Automatic window return function inspection

STEP	INSPECTION		ACTION
1	• Turn ignition switch to ON position. • Open driver-side front window completely. • Use power window main switch to close driver's window in automatic mode. • Does window automatically reverse even though the glass does not encounter a foreign object while it is going up in automatic mode ?	Yes	Go to Step 1 of troubleshooting index No. 3.
		No	Go to next step.
2	• Open driver-side front window completely. • Take a hammer and hold it against the inside of the top of the window frame so that the window will hit its handle when it is closed. • Close the window using automatic mode. • When the window hits the hammer handle, does it immediately reverse and go down to about **200 mm {7.87 in}** from the completely closed position?	Yes	Automatic window return function inspection is normal. Recheck malfunction symptoms.
		No	Go to Step 1 of troubleshooting index No. 2.

TROUBLESHOOTING INDEX

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Front driver-side window does not go up and down in automatic mode.	Power window main switch may enter fail-safe mode.	(See S–28 NO. 1 FRONT DRIVER-SIDE WINDOW DOES NOT GO UP AND DOWN IN AUTOMATIC MODE.)
2	Automatic window return function does not work.	Front driver-side window does not reverse even when encountering a foreign object in its path.	(See S–31 NO. 2 AUTOMATIC WINDOW RETURN FUNCTION DOES NOT WORK.)
3	Automatic window return function activates even though the glass does not encounter a foreign object.	Front driver-side window reverses even though the glass does not encounter a foreign object while it is going up in automatic mode.	(See S–32 NO. 3 AUTOMATIC WINDOW RETURN FUNCTION ACTIVATES EVEN THOUGH THE GLASS DOES NOT ENCOUNTER A FOREIGN OBJECT.)

NO. 1 FRONT DRIVER-SIDE WINDOW DOES NOT GO UP AND DOWN IN AUTOMATIC MODE.

1	Front driver-side window does not go up and down in automatic mode.
DESCRIPTION	Power window main switch may enter fail-safe mode.
POSSIBLE CAUSE	• Open or short to B+ circuit in limit switch signal, ground signal from wiring harness (between power window main switch and driver-side front power window motor), inner control panel or inner motor: Steps 3—5 • Open or short to B+/ground circuit in pulse generator signal from wiring harness (between power window main switch and driver-side front power window motor), inner control panel or inner motor: Steps 6—10 • Open or short to B+/ground circuit in +5 V signal from wiring harness (between power window main switch and driver-side front power window motor), inner control panel or inner motor.

Diagnostic procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**CHECK TO SEE WHETHER POWER WINDOW MAIN SWITCH ENTER FAIL-SAFE MODE OR NOT** • Did driver-side front window go up or down in automatic mode?	Yes	Recheck malfunction symptoms.
		No	Go to next step. (Power window main switch may enter fail-safe mode.)
*2	**CHECK TO SEE WHETHER PROBLEM IS WITH LIMIT SWITCH SIGNAL OR GROUND SIGNAL BETWEEN POWER WINDOW MAIN SWITCH, IN DRIVER-SIDE FRONT POWER WINDOW MOTOR, OR ELSEWHERE** • Test voltage at power window main switch connector terminal 2B (limit switch signal). • Is voltage **approximately 5 V** when driver-side front window is closed completely and **0 V** when it is opened halfway?	Yes	Go to Step 6.
		No	Go to next step.
*3	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY OR SHORT TO B+) IS IN DRIVER-SIDE FRONT POWER WINDOW MOTOR OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect driver-side front power window motor. • Turn ignition switch to **ON** position. • Connect circuit tester negative probe to driver-side front power window motor connector terminal B, because it will be possible to inspect the power window main switch connector terminal 2C (ground signal) line as well. • Measure voltage at driver-side front power window motor connector terminal F (limit switch signal). • Is voltage **approximately 5 V**?	Yes	Replace driver-side front power window motor (open or short to B+ in motor), then go to Step 15.
		No	Go to next step.

STEP	INSPECTION		ACTION
*4	**INSPECT WIRING HARNESS BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR FOR CONTINUITY** • Turn ignition switch to LOCK position. • Disconnect power window main switch connector. • Is there continuity between the following power window main switch connector terminals and driver-side front power window motor connector terminals? — 2B–F (limit switch signal) — 2C–B (ground signal)	Yes	Go to next step.
		No	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 15.
*5	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR), OR ELSE IS A LACK OF CONTINUITY OR SHORT TO B+ IN POWER WINDOW MAIN SWITCH** • Turn ignition switch to ON position. • Measure voltage at the following power window main switch connector terminals: — 2B (limit switch signal) — 2C (ground signal) • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 15.
		No	Replace power window main switch (open or short to B+ in power window main switch).
*6	**CHECK TO SEE WHETHER PROBLEM IS WITH PULSE GENERATOR SIGNAL OR +5 V SIGNAL BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOE MOTOR** • Test voltage at power window main switch connector terminal 2D (pulse generator signal). • Is voltage **approximately 2.5 V** while driver-side front window is being closed from the completely open position?	Yes	Go to Step 11.
		No	Go to next step.
*7	**CHECK TO SEE WHETHER MALFUNCTION IS IN DRIVER-SIDE FRONT POWER WINDOW MOTOR (LACK OF CONTINUITY OR SHORT TO B+/GROUND) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect driver-side front power window motor. • Turn ignition switch to ON position. • Measure voltage at driver-side front power window motor connector terminal D (pulse generator signal). • Is voltage **approximately 5 V**?	Yes	Replace driver-side front power window motor (open or short to B+/ground in motor), then go to Step 15.
		No	Go to next step.

STEP	INSPECTION		ACTION
*8	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect power window main switch connector and driver-side front power window motor connector. • Is there continuity between power window main switch connector terminal 2D (pulse generator signal) and driver-side front power window motor connector terminal D (pulse generator signal)?	Yes	Go to next step.
		No	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 15.
*9	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO GROUND BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR ELSEWHERE** • Is there continuity between power window main switch connector terminal 2D (pulse generator signal) and ground?	Yes	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 15.
		No	Go to next step.
*10	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR POWER WINDOW MAIN SWITCH** • Turn ignition switch to ON position. • Measure voltage at power window main switch connector terminal 2D (pulse generator signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between power window main switch and front driver-side power window motor, then go to Step 15. Replace power window main switch (open or short to B+/ground in power window main switch), then go to Step 15.
		No	Go to next step.
*11	**CHECK TO SEE WHETHER MALFUNCTION IS IN DRIVER-SIDE FRONT POWER WINDOW MOTOR (LACK OF CONTINUITY OR SHORT TO B+/GROUND) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect driver-side front power window motor. • Turn ignition switch to ON position. • Measure voltage at driver-side front power window motor connector terminal H (+5 V signal). • Is voltage **approximately 5 V**?	Yes	Replace driver-side front power window motor (open or short to B+/ground in motor), then go to Step 15.
		No	Go to next step.
*12	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect power window main switch and driver-side front power window motor. • Is there continuity between power window main switch connector terminal 2A (+5 V signal) and driver-side front power window motor connector terminal H (+5 V signal)?	Yes	Go to next step.
		No	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 15.

STEP	INSPECTION		ACTION
*13	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO GROUND BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR ELSEWHERE** • Is there continuity between power window main switch connector terminal 2A (+5 V signal) and ground?	Yes	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 15.
		No	Go to next step.
*14	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR POWER WINDOW MAIN SWITCH** • Turn ignition switch to ON position. • Measure voltage at power window main switch connector terminal 2A (+5 V signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between power window main switch and driver-side front power window motor, then go to next step.
		No	Replace power window main switch (open or short to B+/ground in power window main switch), then go to next step.
15	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Reset the driver-side front window motor. (See S–12 DRIVER-SIDE POWER WINDOW MOTOR RESETTING) • Did malfunction disappear?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 2 AUTOMATIC WINDOW RETURN FUNCTION DOES NOT WORK.

2	Automatic window return function does not work.
DESCRIPTION	Front driver-side window does not reverse even when encountering a foreign object in its path.
POSSIBLE CAUSE	• Mis-adjustment of auto-reverse range: Step 2

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK FOR CUSTOMER COMPLAINT** • Did customer complain that driver-side front window did not reverse within **4.0 mm {0.16 in}** of complete close?	Yes	System normal. Explain to customer that automatic window return power window system does not operate in within **4.0 mm {0.16 in}** of complete close.
		No	Go to next step.
2	**RESET REVERSE AREA THAT DRIVER-SIDE FRONT WINDOW MOTOR IS MEMORY** • Reset the driver-side front window motor. (See S–12 DRIVER-SIDE POWER WINDOW MOTOR RESETTING) • Did malfunction disappear?	Yes	Troubleshooting completed. Explain to customer that mis-adjustment of auto-reverse range was the problem.
		No	Inspect power window main switch.

NO. 3 AUTOMATIC WINDOW RETURN FUNCTION ACTIVATES EVEN THOUGH THE GLASS DOES NOT ENCOUNTER A FOREIGN OBJECT.

3	Automatic window return function activates even though the glass does not encounter a foreign object.
DESCRIPTION	Front driver-side window reverses even though the glass does not encounter a foreign object while it is going up in automatic mode.
POSSIBLE CAUSE	• Mis-adjustment of auto-reverse range: Step 1 • Too much driver-side front window friction resistance: Steps 2—6 • Short to ground in limit switch signal from wiring harness (between power window main switch and driver-side front power window motor), inner driver-side front power window motor or inner power window main switch: Steps 7, 8

Diagnostic procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**RESET REVERSE AREA THAT DRIVER-SIDE FRONT WINDOW MOTOR IS MEMORY** • Reset the driver-side window motor. (See S-12 DRIVER-SIDE POWER WINDOW MOTOR RESETTING) • Did malfunction disappear?	Yes	Troubleshooting completed. Explain to customer that adjustment of auto-reverse range was bad.
		No	Go to next step.
2	**INSPECT FOR FOREIGN OBJECT IN DRIVER-SIDE FRONT WINDOW** • Is there a foreign object in driver-side front window?	Yes	Remove the object.
		No	Go to next step.
3	**INSPECT ACRYLIC VISOR BRACKET INSTALLATION** • Is acrylic visor bracket properly installed?	Yes	Go to next step.
		No	Reinstall acrylic visor bracket properly.
4	**INSPECT TO SEE IF GLASS RUN CHANNEL INTERFERES WITH DRIVER-SIDE FRONT WINDOW** • Remove driver-side front door trim. • Does glass run channel interfere with driver-side front window?	Yes	Repair or replace glass run channel, then go to Step 9.
		No	Go to next step.
5	**INSPECT LUBRICANT ON DRIVER-SIDE CARRIER PLATE** • Is there lubricant on driver-side carrier plate?	Yes	Go to next step.
		No	Apply lubricant (mineral oil).
6	**INSPECT INSTALLATION OF DRIVER-SIDE FRONT POWER WINDOW SYSTEM COMPONENTS** • Are the following parts properly installed? — Driver-side front door glass — Driver-side power window motor wire — Driver-side power window motor — Driver-side power window regulator frame — Driver-side carrier plate — Driver-side glass run channel	Yes	Go to next step.
		No	Reinstall part(s) properly, then go to Step 9.

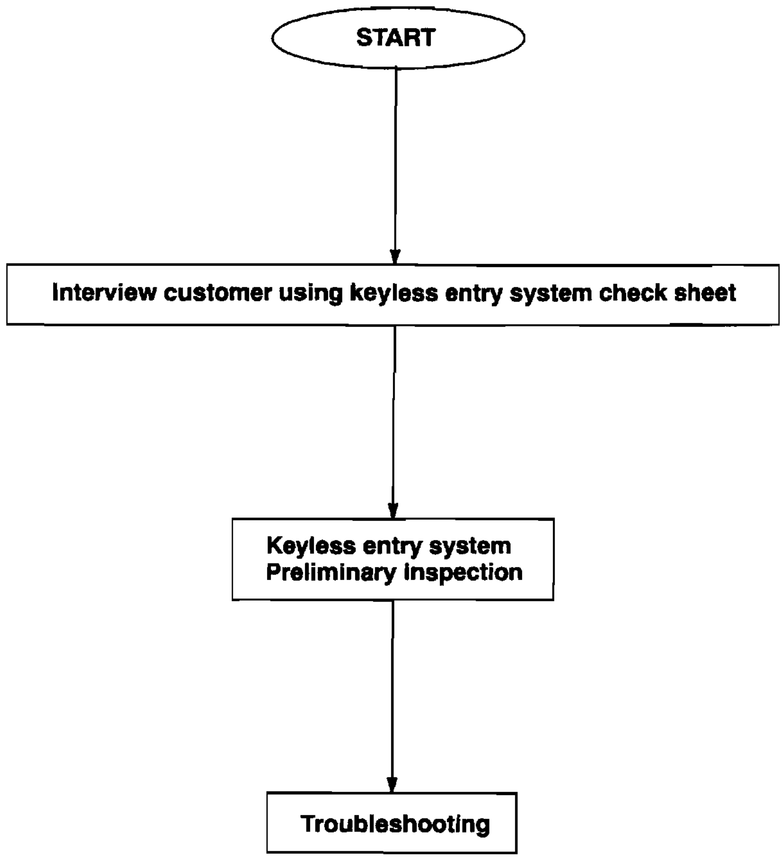
STEP	INSPECTION		ACTION
*7	**CHECK TO SEE WHETHER MALFUNCTION IS A SHORT TO GROUND IN DRIVER-SIDE FRONT POWER WINDOW MOTOR OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect driver-side front power window motor. • Turn ignition switch to **ON** position. • Measure voltage at driver-side front power window motor connector terminal **F** (limit switch signal). • Is voltage **approximately** 5 V?	Yes	Replace driver-side front power window motor (short to ground in motor), then go to Step 9.
		No	Go to next step.
8	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN WIRING HARNESS (BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR POWER WINDOW MAIN SWITCH** • Turn ignition switch to LOCK position. • Disconnect power window main switch. • Is there continuity between power window main switch connector terminal 2B (limit switch signal) and ground?	Yes	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 9.
		No	Replace power window main switch (short to ground in power window main switch), then go to Step 9.
9	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Reset the driver-side front window motor. (See S–12 DRIVER-SIDE POWER WINDOW MOTOR RESETTING) • Did malfunction disappear?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

FOREWORD

- Go to troubleshooting after identifying the specific malfunction by doing a keyless entry system preliminary inspection.

Flowchart



KEYLESS ENTRY SYSTEM CHECK SHEET

Note
- Use the below sheet as a customer interview sheet when accepting a vehicle for service.
- If the symptom is "Power door lock system does not operate with transmitter at all ", find out how the customer uses the keyless entry system by following the check sheet below.

Perform the following inspection with customer:

Q1. What's the customer's complaint?
- ☐ Power door lock system does not operate with transmitter (door does not lock/unlock)
- ☐ Other ______

Q2. Is system factory-installed or after-market?
- ☐ Factory-installed system
  → Go to Q3.
- ☐ After-market system
  → Perform troubleshooting according to after-market keyless entry system manual.

Q3. Operate transmitter with customer from 2.5 m {8.2 ft} away from center of vehicle. (Make sure the ignition key is either in the LOCK position or removed.)
Does keyless entry system work?
- ☐ Yes
  → Explain the following to the customer:
  - Keyless entry system does not work when ignition switch is in ON position.
  - Keyless entry system does not work from excessive distances (more than 2.5 m {8.2 ft} away from center of vehicle).
- ☐ No
  → Go to Q4.

Q4. Check location where customer uses keyless entry system.
Does a particular area, such as being near TV towers, power plants, power lines or factories, have an effect on malfunction?
- ☐ Yes Place ______
  →Area of operation is bad. Explain effect of outside interference on transmitter to customer.
- ☐ No
  → Go to Q5.

Q5. Make sure there are no after-market electrical parts installed on vehicle.
Are there any of the following present?
- Cellular phone
- Radio-wave equipment
- Remote engine starter
- TV, etc.

- ☐ Yes Parts ______
- ☐ No

Perform the keyless entry system preliminary inspection.

KEYLESS ENTRY SYSTEM PRELIMINARY INSPECTION

- Perform the following preliminary inspection before troubleshooting.

STEP	INSPECTION		ACTION
1	• Is the system an after-market one?	Yes	Perform troubleshooting according to after-market keyless entry system manual.
		No	Go to next step.
2	• Did customer activate keyless entry system when ignition switch was in LOCK position?	Yes	Go to next step.
		No	Explain to customer that system does not work when ignition switch is in ON position. Turn ignition switch to LOCK position, then go to next step.
3	• Did customer use keyless entry system in particular area, such as being near TV towers, power plants, power lines or factories?	Yes	Attempt to lock/ unlock doors with transmitter in non-interference area. **If system operates:** Area of operation is bad. Explain effect of outside interference on transmitter to customer. **If system does not operate:** Go to next step.
		No	Go to next step.
4	• Are any of the following after-market electrical parts on the vehicle? — Cellular phone — Radio-wave equipment — Remote engine starter — TV, etc.	Yes	Disconnect after-market electrical part connectors and attempt to lock/ unlock doors with transmitter. **If system operates:** After-market electrical parts are interfering with keyless entry system. **If system does not operate:** Go to next step.
		No	Go to next step.
5	• Perform on-board diagnostic function. (See S-37 ON-BOARD DIAGNOSTIC FUNCTION) • Does on-board diagnostic function work?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting NO. 1.
6	• Attempt to reprogram transmitter ID code. • Can transmitter ID code be reprogrammed?	Yes	System is normal now.
		No	Go to Step 1 of troubleshooting NO. 2.

ON-BOARD DIAGNOSTIC FUNCTION

START

1. Remove ignition key from steering lock.
2. Close all doors.

Open driver-side door.

NOTE
- Perform the following procedures **within 30 seconds.**

Repeat the following four steps **4 times**:
1. Insert ignition key into steering lock.
2. Turn ignition switch to ON position.
3. Turn ignition switch to LOCK position.
4. Remove ignition key from steering lock.

Push driver-side door switch **3 times**.

Confirm the following operations in order **every 1 second:**
- All doors to lock.
- All doors to unlock.

Are above operations okay?

Yes → On-board diagnostic function is operated properly. On-board diagnosis is completed.

No ↓

Did you conduct on-board diagnosis properly?

Yes → On-board diagnostic function inoperative. On-board diagnosis is completed.

No ↓

Wait for **40 seconds**.

Return

TROUBLESHOOTING INDEX

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	On-board diagnostic function inoperative	CPU's on-board diagnostic function does not operate.	(See S-38 NO.1 ON-BOARD DIAGNOSTIC FUNCTION INOPERATIVE.)
2	Transmitter ID code cannot be reprogramed.	CPU's transmitter ID code reprogram function does not work.	(See S-40 NO.2 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED.)

NO.1 ON-BOARD DIAGNOSTIC FUNCTION INOPERATIVE.

1	On-board diagnostic function inoperative
DESCRIPTION	CPU's on-board diagnostic function does not operate.
POSSIBLE CAUSE	• Malfunction in door lock timer unit system • Malfunction in door lock linkage • Malfunction in power door lock system • Malfunction in IG1, +B signal circuit of keyless unit — Keyless unit power supply fuse malfunction — Malfunction in wiring harness between keyless unit power supply fuse(s) and keyless unit itself • Malfunction in keyless unit's door open/closed signal circuit — Door switch, keyless unit or instrument cluster print plate malfunction — Malfunction in wiring harness between instrument cluster and door switch(es) or keyless unit — Malfunction in wiring harness between keyless unit and door switch(es) • Malfunction in keyless units liftgate open/close signal circuit — Cargo compartment light switch malfunction — Malfunction in wiring harness between keyless unit and cargo compartment light switch • Malfunction in keyless unit GND signal circuit — Malfunction in wiring harness between keyless unit and ground • Malfunction in keyless unit door lock/unlock signal circuit — Keyless unit malfunction — Malfunction in wiring harness between keyless unit and door lock timer unit

Diagnostic procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**CHECK TO SEE WHETHER MALFUNCTION IS IN DOOR LOCK TIMER UNIT SYSTEM OR ELSEWHERE** • Did any of the following items work during on-board diagnostic function operation? — All doors locked — All doors unlocked	Yes	Go to next step.
		No	Go to Step 3.
2	**CHECK TO SEE WHETHER MALFUNCTION IS IN KEYLESS UNIT OR DOOR LOCK TIMER UNIT SYSTEM** • Inspect following electrical parts. — Door lock timer unit, door lock actuators, related wiring harnesses • Are they okay?	Yes	Replace keyless unit and reprogram transmitter ID code, then go to Step 16.
		No	Repair or replace malfunctioning part(s), then go to Step 16.
3	**INSPECT DOOR LOCK LINKAGE SYSTEM** • Operate inner door lock knob and make sure door locks and unlocks manually. • Do all door's lock systems work?	Yes	Go to next step.
		No	Troubleshoot the door lock linkage.

STEP	INSPECTION		ACTION
4	**CHECK TO SEE WHETHER MALFUNCTION IS IN DOOR LOCK TIMER UNIT, DOOR LOCK ACTUATOR, A KEY CYLINDER SWITCH AND RELATED WIRING HARNESS, OR ELSEWHERE** • Do all of the following items work when inserting ignition key into driver's door key cylinder and operating ignition key? — All doors locked — All doors unlocked	Yes	Go to Step 6.
		No	Go to next step.
5*	**INSPECT POWER DOOR LOCK SYSTEM** • Turn ignition switch to LOCK position. • Disconnect keyless unit connector. • Measure voltage at keyless unit connector terminal O. • Is voltage **approximately 5 V**?	Yes	Inspect power door lock system except for driver's door key cylinder switch and wiring harness (door lock timer unit and keyless unit, driver's door key cylinder switch).
		No	Inspect power door lock system, then go to Step 16.
6	**INSPECT KEYLESS UNIT POWER SUPPLY FUSES** • Are keyless unit power supply fuses okay?	Yes	Go to next step.
		No	Check for a short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse.
7	**INSPECT DOOR SWITCHES** • Are door switches installed securely?	Yes	Go to next step.
		No	Install door switch(es) securely, then go back to Step 5 of keyless entry system preliminary inspection.
8	**INSPECT CARGO COMPARTMENT LIGHT SWITCH** • Is cargo compartment light switch installed securely?	Yes	Go to next step.
		No	Install cargo compartment light switch securely, then go back to Step 5 of keyless entry system preliminary inspection.
9	**INSPECT FOR DTC 04 IN INSTRUMENT CLUSTER** • Inspect door switch using instrument cluster input/output check mode. (See T-26 INSTRUMENT CLUSTER INSPECTION) • Does DTC 04 function properly?	Yes	Go to next step.
		No	Repair door switch system using DTC 04 inspection procedure, then go to Step 16.
10*	**INSPECT WIRING HARNESS BETWEEN KEYLESS UNIT POWER SUPPLIES AND KEYLESS UNIT FOR CONTINUITY** • Turn ignition switch to ON position. • Measure voltage at following keyless unit terminals: — IG1 signal (Terminal A) — B+ signal (Terminal B) • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and keyless unit, then go to Step 16.
11*	**INSPECT WIRING HARNESS FOR CONTINUITY BETWEEN KEYLESS UNIT AND DOOR LOCK TIMER UNIT** • Turn ignition switch to LOCK. • Disconnect keyless unit connector. • Measure voltage at keyless unit connector terminal O. • Is voltage **approximately 5V**?	Yes	Go to next step.
		No	Repair wiring harness between keyless unit and door lock timer unit, then go to Step 16.
12*	**INSPECT WIRING HARNESS BETWEEN KEYLESS UNIT POWER SUPPLY, KEYLESS UNIT AND GROUND FOR SHORT TO B+** • Disconnect keyless unit connector. • Measure voltage at following keyless unit connector terminals: — IG1 signal (Terminal A) — Ground signal (Terminal L) • Is voltage **approximately 12 V**?	Yes	Repair malfunctioning wiring harness, then go to Step 16.
		No	Go to next step.

STEP	INSPECTION		ACTION
13*	**INSPECT WIRING HARNESS BETWEEN KEYLESS UNIT AND GROUND FOR CONTINUITY** • Is there continuity between keyless unit connector terminal L and ground?	Yes	Go to next step.
		No	Repair wiring harness between keyless unit and ground, then go to Step 16.
14*	**INSPECT WIRING HARNESS BETWEEN KEYLESS UNIT AND DOOR SWITCHES FOR CONTINUITY** • Open the driver's door. • Is there continuity between keyless unit connector terminal C and ground?	Yes	Go to next step.
		No	Repair wiring harness between keyless unit and door switch(es), then go to Step 16.
15*	**INSPECT WIRING HARNESS FOR CONTINUITY BETWEEN KEYLESS UNIT AND CARGO COMPARTMENT LIGHT SWITCH** • Open the liftgate. • Is there continuity between keyless unit connector terminal D and ground?	Yes	Replace keyless unit and reprogram transmitter ID code, then go to next step.
		No	Repair wiring harness between keyless unit and cargo compartment light switch, then go to next step.
16	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT REOCCUR AFTER REPAIR** • Does keyless entry system operate properly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.

NO. 2 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED.

2	Transmitter ID code cannot be reprogrammed.
DESCRIPTION	CPU's transmitter ID code reprogram function does not work.
POSSIBLE CAUSE	• Malfunction in transmission circuit — Transmitter battery, transmitter, keyless unit bracket, keyless unit bracket ground screw or keyless unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT TRANSMITTER BATTERY INSTALLATION AND TYPE** • Visually inspect transmitter battery. • Are below items okay? — Transmitter battery installation (correct polarity) — Battery type (CR2025)	Yes	Go to next step.
		No	Set transmitter battery properly or replace with specified transmitter battery (CR2025), then go to Step 8.
2	**INSPECT TRANSMITTER BATTERY TERMINALS FOR RUST AND POOR CONNECTION** • Visually inspect transmitter. — Is there rust on transmitter battery terminals (positive or negative pole)? — Is there poor connection between terminals and battery ?	Yes	Replace transmitter battery or repair transmitter battery terminal, then go to Step 8.
		No	Go to next step.
3	**INSPECT TRANSMITTER BATTERY** • Inspect transmitter battery. • Is battery voltage normal?	Yes	Go to next step.
		No	Replace transmitter battery, then go to Step 8.
4	**INSPECT KEYLESS UNIT BRACKET INSTALLATION** • Is keyless unit bracket installed securely?	Yes	Go to next step.
		No	Install bracket securely, then go back to Step 6 of keyless entry system preliminary inspection.

STEP	INSPECTION		ACTION
5	**INSPECT GROUND SCREW INSTALLATION BETWEEN KEYLESS UNIT AND KEYLESS UNIT BRACKET** • Are keyless unit and keyless unit bracket connected securely to ground screw?	Yes	Go to next step.
		No	Install screw securely, then go back to Step 6 of keyless entry system preliminary inspection.
6	**CHECK TO SEE WHETHER MALFUNCTION IS IN TRANSMITTER BATTERY OR ELSEWHERE** • Replace with a known good transmitter battery. • Does keyless entry system operate properly?	Yes	Replace transmitter battery, then go to Step 8.
		No	Go to next step.
7	**CHECK TO SEE WHETHER MALFUNCTION IS IN TRANSMITTER OR KEYLESS UNIT** • Reprogram transmitter ID codes by using another known good transmitter. • Does keyless entry system operate okay ?	Yes	Replace transmitter and reprogram transmitter ID code, then go to next step.
		No	Replace keyless unit and reprogram transmitter ID code, then go to next step.
8	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT REOCCUR AFTER REPAIR** • Does keyless entry system operate properly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

BODY ELECTRICAL SYSTEM

T

OUTLINE

OUTLINE OF CONSTRUCTION

- The body electrical system is essentially carried over from the current 626 (GF), 626 Station Wagon (GW) model, except for the following features. (See 626 Training manual 3303-10-97D) (See 626 Station Wagon Workshop Manual Supplement 1603-10-97J)

FEATURES

Improved serviceability

- DTCs 06, 22, 23, 24, and 25 of input/output check mode in the instrument cluster have been added.
- The side air bag system and passenger-side air bag cut-off function have been changed.
- The circuit of running light system has been changed.

Improved marketability

- The glove compartment light has been added.
- The antenna type of sedan and 5HB have been changed to the power antenna from the roof antenna.

EXTERIOR LIGHTING SYSTEM

RUNNING LIGHT SYSTEM

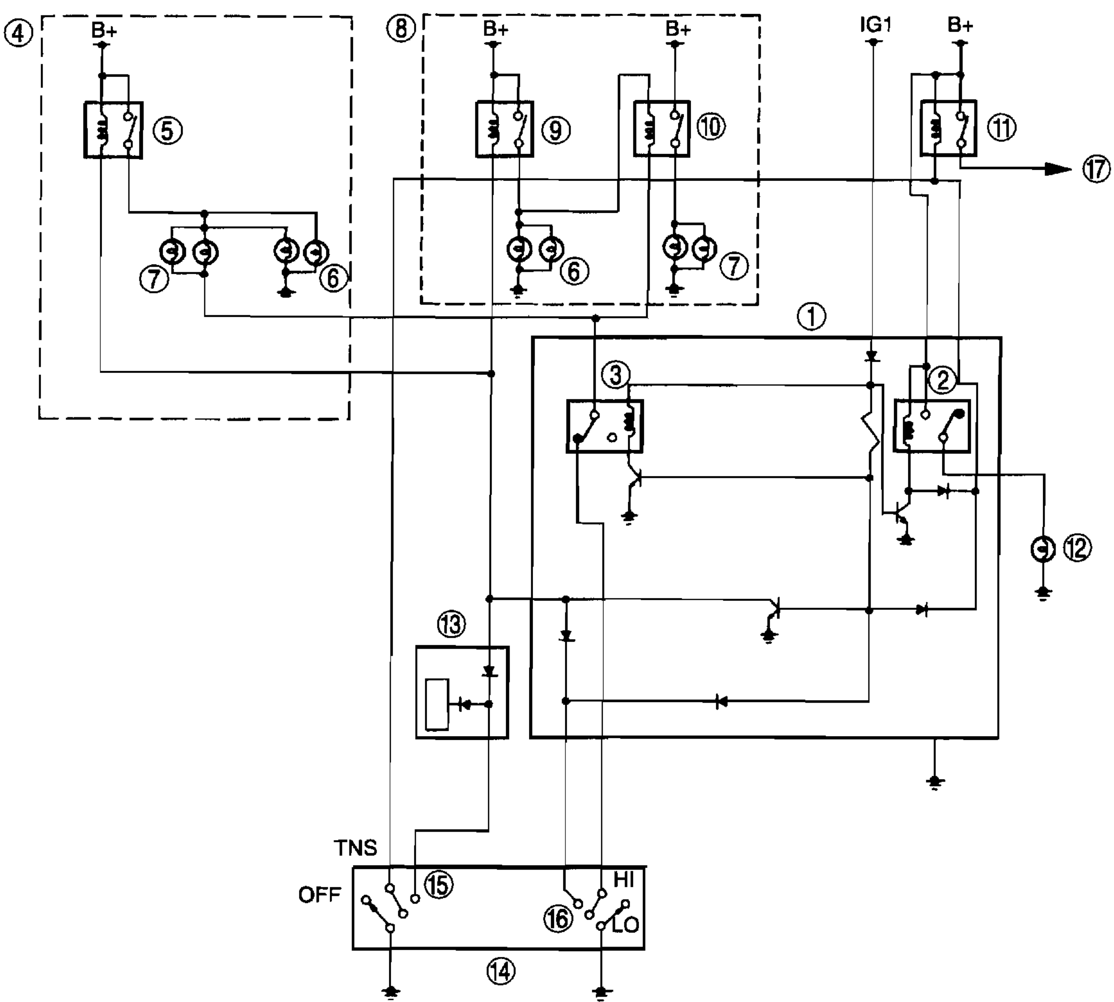
Outline

- The construction and operation are essentially carried over from the current 323 (BJ) model, except for the following.

Comparison with current 323 (BJ) model

Condition	New 626	323 (BJ)
Headlight high beam on	Low beam on	Low beam off

System Wiring Diagram



1	Running light unit
2	Relay A
3	Relay B
4	FP, FS, FS (Hi-power)
5	Headlight relay
6	Headlight (low beam)
7	Headlight (high beam)
8	RF Turbo
9	Headlight low relay

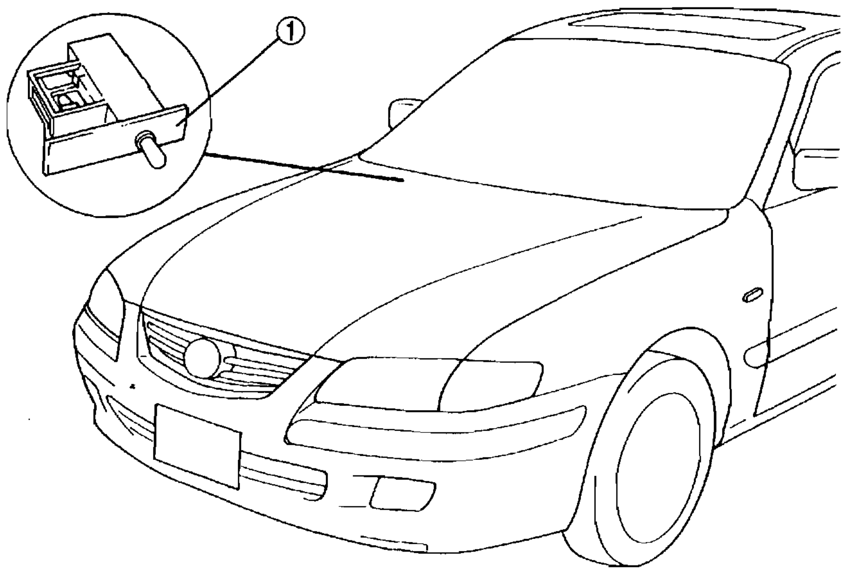
10	Headlight high relay
11	TNS relay
12	Parking light/taillight/license plate light
13	Instrument cluster
14	Headlight switch
15	Headlight
16	Flash-to-pass
17	To front fog light relay

INTERIOR LIGHTNG SYSTEM

OUTLINE

- The glove compartment light has been added.

STRUCTURAL VIEW



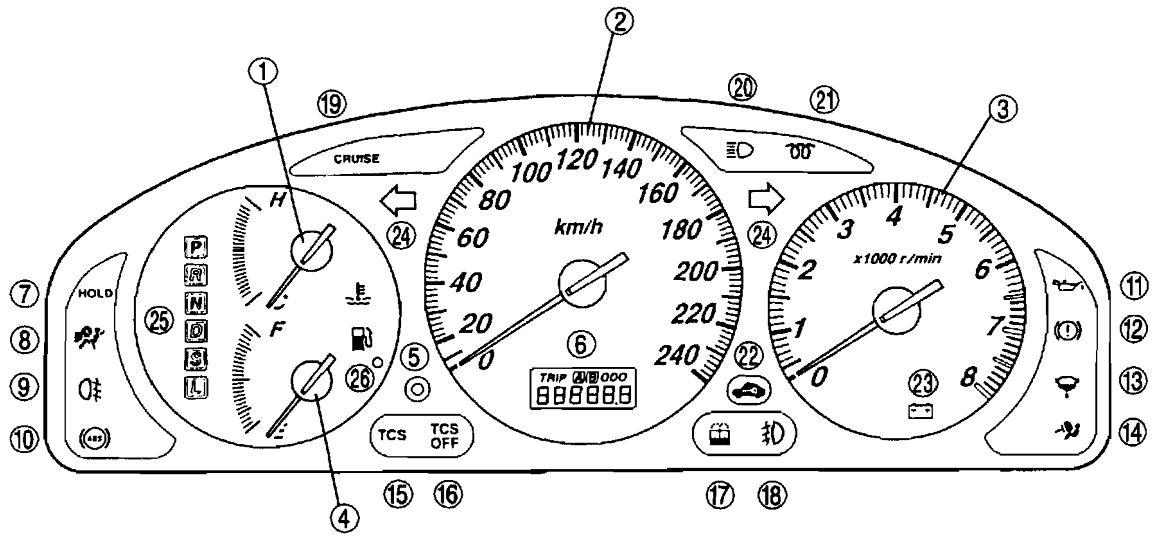
1	Glove compartment light

WARINIG AND INDICATOR SYSTEM

OUTLINE

- The brake system warning light circuit in the instrument cluster has been changed by adding electronic brakeforce distribution (EBD) control to the ABS (ABS/TCS). (See Section P.)
- DTCs 06, 22, 23, 24, and 25 of input/output check mode have been added.

INSTRUMENT CLUSTER
Structural View



1	Water temperature gauge
2	Speedometer
3	Tachometer

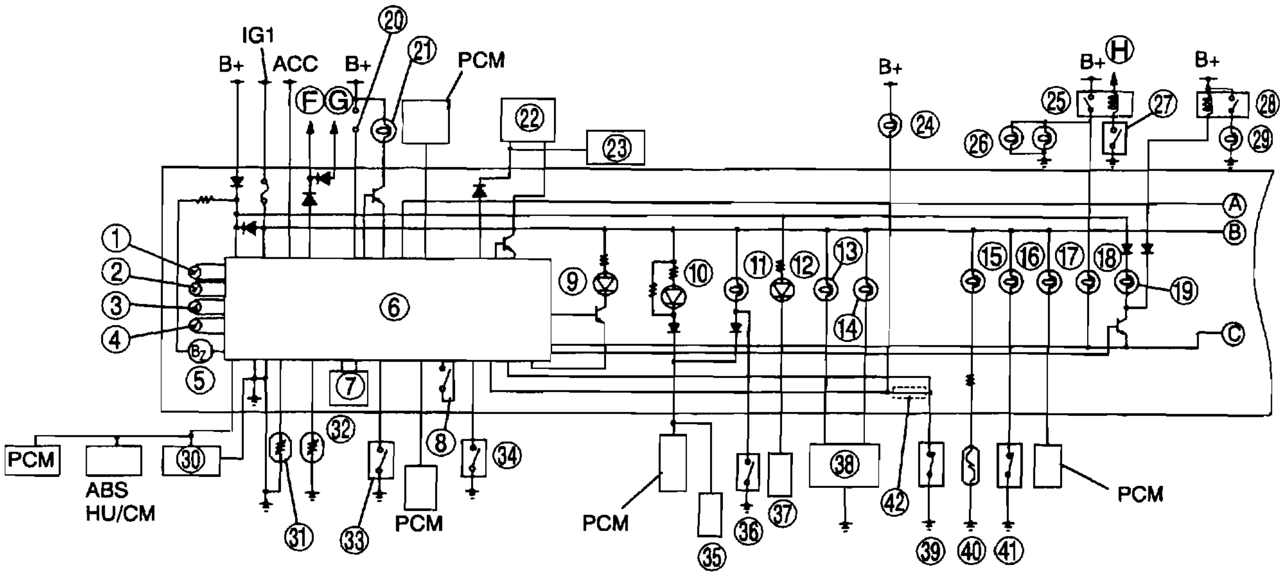
4	Fuel gauge
5	Odometer/tripmeter switch
6	Odometer/tripmeter

No.	Warning and indicator light	Note
7	HOLD indicator light	ATX only
8	Passenger-side air bag cut-off indicator light	—
9	Rear fog light indicator light	—
10	ABS warning light	—
11	Oil pressure warning light	—
12	Brake system warning light	—
13	Sedimentor warning light	RF Turbo
14	Air bag system warning light	—
15	TSC indicator light	—
16	TSC-OFF light	—
17	Washer fluid-level warning light	—
18	Front fog indicator light	—
19	Cruise set indicator light	—
20	High beam indicator light	—
21	Glow indicator light	RF Turbo
22	Security light	—
23	Generator warning light	—
24	Turn indicator light	—
25	Selector indicator light	ATX only
26	Fuel-level warning light	—

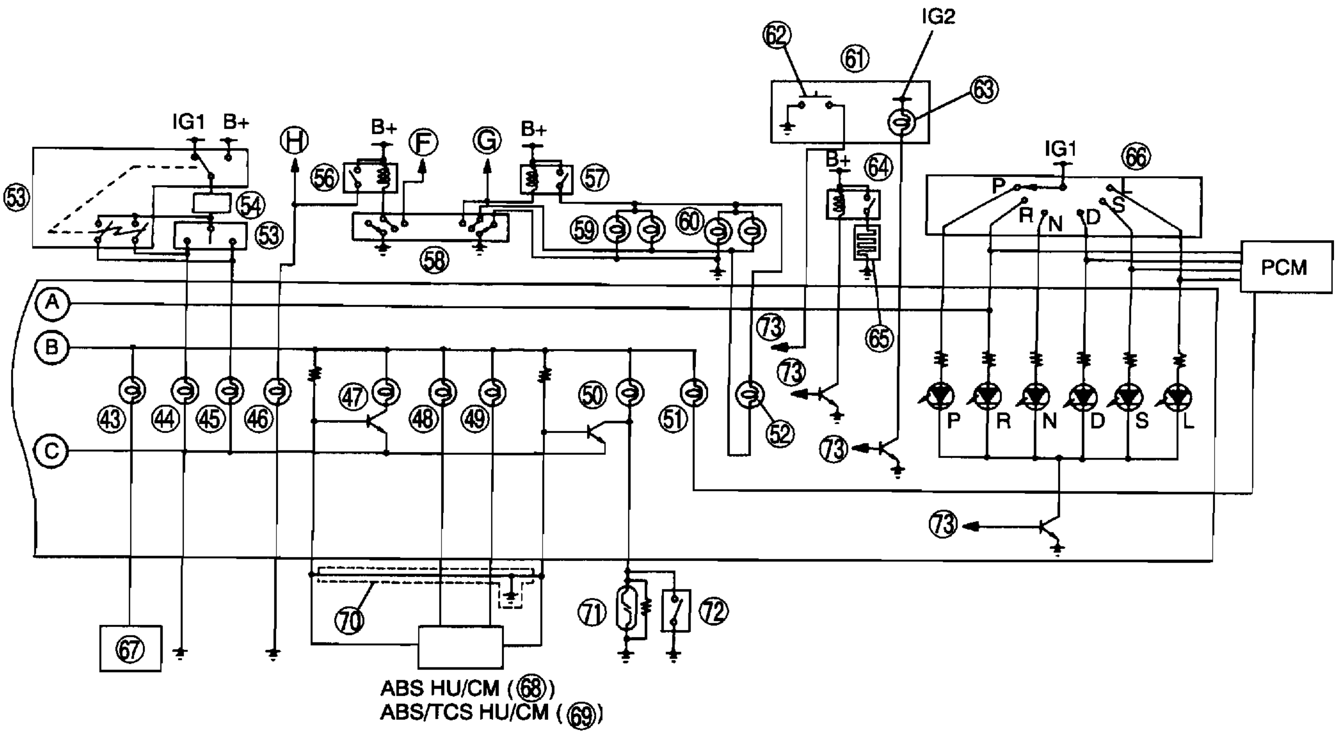
Specifications

Item			Specification
Speedometer	Meter type		Cross coil type
	Indication range	L.H.D. (km/h)	0—240
	Indication range	R.H.D. (MPH {km/h})	0—150 {0—240}
	Input signal source	Sedan, 5HB	MTX, without ABS: Vehicle speedometer sensor MTX, with ABS: ABS HU/CM ATX: PCM
		Station wagon	Without ABS: Vehicle speedometer sensor With ABS: ABS HU/CM
	Input signal		8 pulses/one rotation of speedometer driven gear
	Output signal		4 pulses/one rotation of speedometer driven gear
	Rated voltage (V)		DC 12
Tachometer	Meter type		Cross coil type
	Indication range (rpm)		RF Turbo: 0—6000 FP, FS, FS (Hi-power): 0—8000
	Red zone (rpm)		RF Turbo: 5000—6000 FP, FS, FS (Hi-power): 6500—8000
	Input signal source		PCM
	Input signal		4 pulses/two engine rotations
	Rated voltage (V)		DC 12
Fuel gauge	Meter type		Cross coil type (Reset-to-zero type)
	Rated voltage (V)		DC 12
Water temperature gauge	Meter type		Cross coil type (Medium range stabilized type)
	Rated voltage (V)		DC 12
Odometer	Display		LCD
	Indication digits		6 digits
	Characteristics		1 km is added for 5096 pulses of vehicle speed input signal 1 mile is added for 8202 pulses of vehicle speed input signal
	Rated voltage (V)		DC 12
Tripmeter	Display		LCD
	Indication digits		4 digits
	Cancellation		Push method
	Characteristics		1 km is added for 5096 pulses of vehicle speed input signal 1 mile is added for 8202 pulses of vehicle speed input signal
	Rated voltage (V)		DC 12

SYSTEM WIRING DIAGRAM



1	Speedometer		22	Door lock timer unit
2	Tachometer		23	Door lock-link switch
3	Fuel gauge		24	Interior light
4	Water temperature gauge		25	Front fog light relay
5	Buzzer		26	Front fog light
6	Microcomputer		27	Front fog light switch
7	Odometer/tripmeter		28	Rear fog light relay
8	Odometer/tripmeter switch		29	Rear fog light
9	Fuel-level warning light		30	Vehicle speedometer sensor
10	Generator warning light		31	Fuel gauge sender unit
11	Sedimentor warning light		32	Water temperature sender unit
12	Security light		33	Rear fog light switch
13	Air bag system warning light		34	Outer handle switch
14	Passenger-side air bag cut-off indicator light		35	Generator (RF Turbo only)
15	Washer fluid-level warning light		36	Sedimentor switch
16	Oil pressure warning light		37	Immobilizer unit
17	HOLD indicator light		38	SAS unit
18	Front fog light indicator light		39	Door switch
19	Rear fog light indicator light		40	Washer fluid-level sensor
20	Key reminder switch		41	Oil pressure switch
21	Ignition key illumination		42	Vehicles without interior light control system



43	Cruise set indicator light
44	Turn indicator light (left)
45	Turn indicator light (right)
46	Instrument cluster illumination
47	ABS warning light
48	TCS indicator light
49	TCS OFF light
50	Brake system warning light
51	Glow indicator light
52	High beam indicator light
53	Hazard warning switch
54	Flasher unit
55	Turn switch
56	TNS relay
57	Headlight relay
58	Headlight switch
59	Headlight (left)
60	Headlight (right)
61	Climate control unit
62	Rear window defroster switch
63	Rear window defroster switch illumination
64	Rear window defroster relay
65	Filament
66	Transaxle range switch
67	Cruise control module
68	Without TCS
69	With TCS
70	Without ABS
71	Brake fluid-level sensor
72	Parking brake switch
73	To microcomputer

Input/output Check Mode

- The operation order of the input/output check mode is the same as that of the current 626 (GF) model.
- A comparison of available DTCs for the new 626 and the current 626 (GF) model is shown below.

Input circuit check

×: Applied
–: Not applied

DTC	New 626	Current 626 (GF)	Parts sending input signal	
			New 626	Current 626 (GF)
04	×	×	Door switch	←
05	×	×	Door lock-link switch	←
06	×	–	Outer handle switch	–
07	×	×	Rear window defroster switch (Climate control unit)	←
08	×	×	TNS relay	←
09	×	×	Headlight switch	←
10	×	×	**Sedan, 5HB** • Vehicle speedometer sensor (MTX, without ABS) • ABS HU/CM (MTX, with ABS) • PCM (ATX) **Station wagon** • Vehicle speedometer sensor (Without ABS) • ABS HU/CM (With ABS)	Vehicle speedometer sensor
11	×	×	PCM	←
22	×	–	Fuel gauge sender unit	–
24	×	–	Water temperature sender unit	–
29	×	×	Rear fog light switch	←
31	×	×	Key reminder switch	←
40	×	×	Front fog light relay	←

Individual part check

×: Applied
–: Not applied

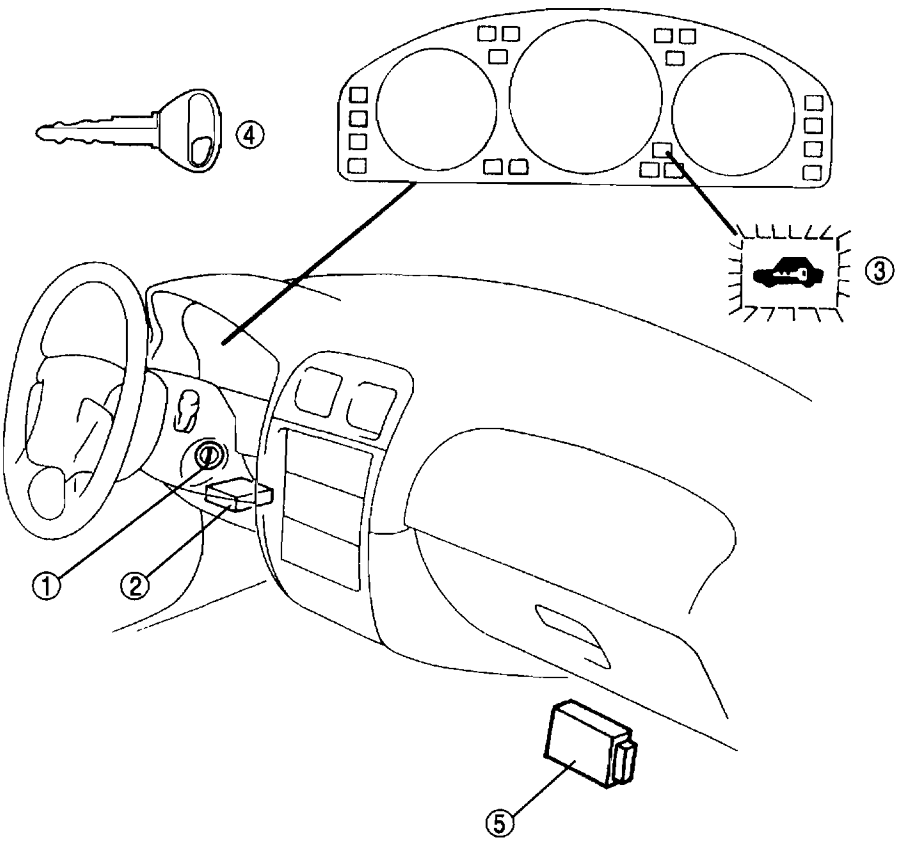
DTC	New 626	Current 626 (GF)	Parts sending input signal	
			New 626	Current 626 (GF)
12	×	×	Speedometer	←
13	×	×	Tachometer	←
14	×	×	Buzzer	←
15	×	×	Rear fog light relay	←
16	×	×	Fuel-level warning light	←
17	×	×	Rear window defroster indicator light	←
18	×	×	Ignition key cylinder illumination	←
20	×	×	Rear window defroster indicator relay	←
21	×	×	Door lock timer unit	←
23	×	×	Fuel gauge	–
25	×	×	Water temperature gauge	–
26	×	×	LCD	←
27	×	×	Interior light	←
28	–	×	–	Door lock-link switch
32	–	×	–	Key reminder switch

IMMOBILIZER SYSTEM

OUTLINE

- The construction and operation is the same as that of the current DEMIO, 121 DEMIO (DW) model.

STRUCTURAL VIEW



1	Coil
2	Immobilizer unit
3	Security light

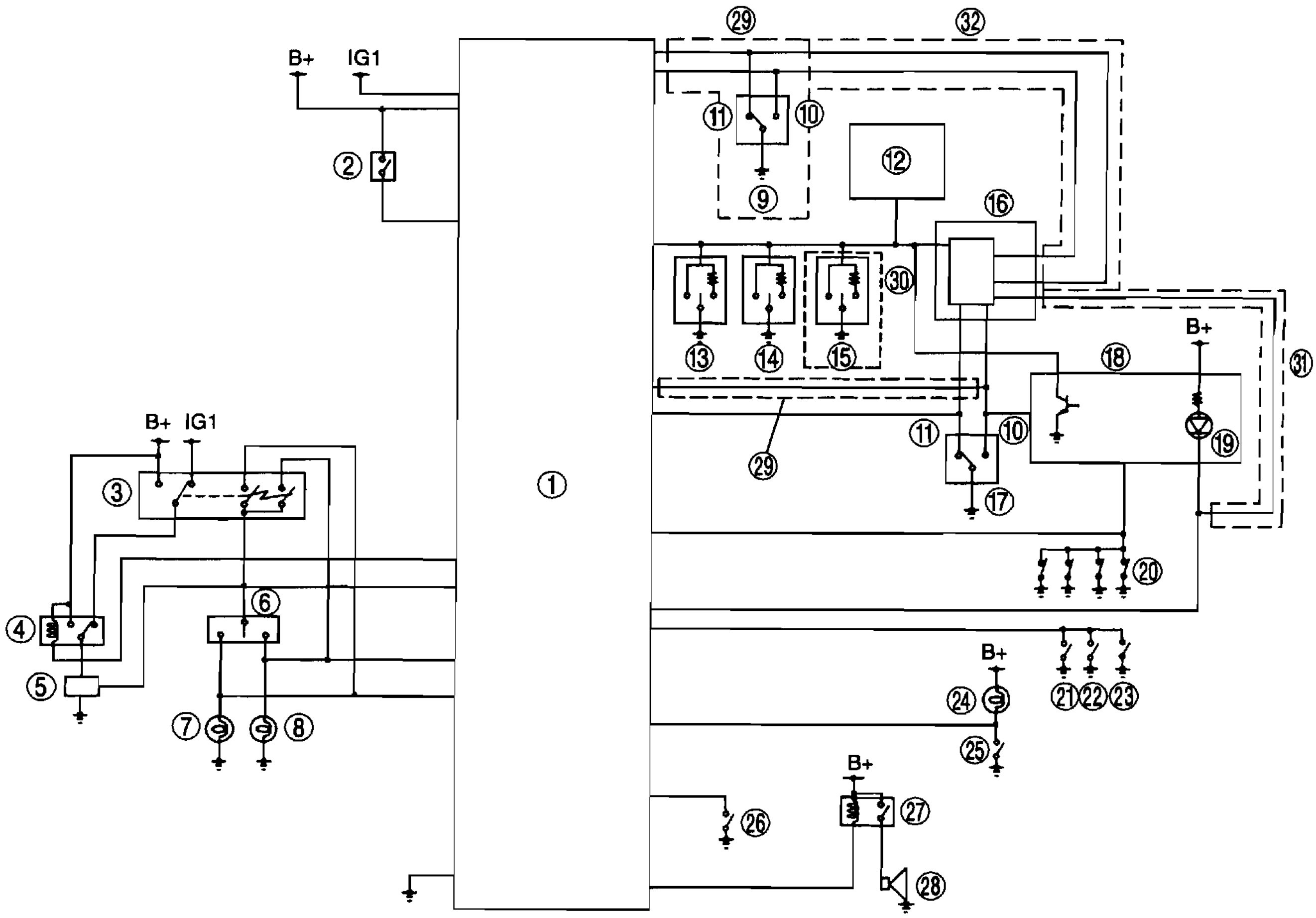
4	Key (transponder)
5	PCM

THEFT-DETERRENT SYSTEM

OUTLINE

- The construction and operation is essentially carried over from the current 626 (GF) model, except for the following.
  - — The trunk lid LOCK/UNLOCK signal is output by the trunk lid lock-link switch/liftgate lock-link switch, instead of the trunk lid key cylinder. (4SD, 5HB)

SYSTEM WIRING DIAGRAM



1	Theft-deterrent control module
2	Key reminder switch
3	Hazard warning switch
4	Theft-deterrent relay
5	Flasher unit
6	Turn switch
7	Turn light (left)
8	Turn light (right)
9	Trunk lid lock-link switch/liftgate lock-link switch
10	Lock
11	Unlock
12	Keyless unit
13	Driver's door key cylinder switch
14	Passenger's door key cylinder switch
15	Liftgate key cylinder switch
16	Door lock timer unit
17	Driver's door lock-link switch

18	Instrument cluster
19	Security light
20	Door switch
21	Passenger's door lock-link switch
22	Left side rear door lock-link switch
23	Right side rear door lock-link switch
24	Trunk compartment light/liftgate compartment light
25	Trunk compartment light switch/liftgate compartment light switch
26	Bonnet switch
27	Theft-deterrent horn relay
28	Theft-deterrent horn
29	Sedan, 5HB
30	Station wagon
31	With double locking system
32	Without double locking system

AIR BAG SYSTEM

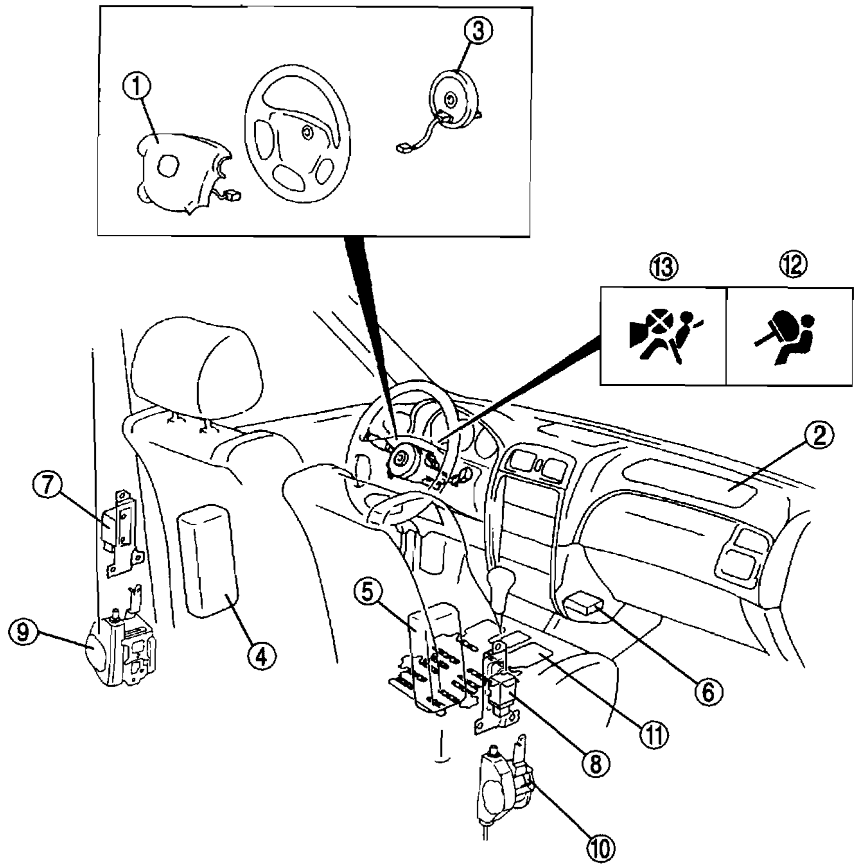
OUTLINE

- The construction and operation is essentially carried over from the current 323 (BJ) model and 626 (GF) model. Refer to the following table.

COMPARISON WITH CURRENT 323 (BJ) MODEL AND 626 (GF) MODEL

Item	Comparison
SAS unit	Same as the current 323 (BJ) model
Side air bag sensor	
Driver-side air bag module	Same as the current 626 (GF) model
Passenger-side air bag module	
Side air bag module	Same as the current 323 (BJ) model
Clock spring	Same as the current 626 (GF) model
Air bag system warning light	
Pre-tensioner seat belt	
Passenger-side air bag cut-off function	Same as the current 323 (BJ) model
Deployment authorization procedure	Same as the current 626 (GF) model

STRUCTURAL VIEW



1	Driver-side air bag module	8	Passenger-side side air bag sensor
2	Passenger-side air bag module	9	Driver-side pre-tensioner seat belt
3	Clock spring	10	Passenger-side pre-tensioner seat belt
4	Driver-side side air bag module	11	Occupancy sensor
5	Passenger-side side air bag module	12	Air bag system warning light
6	SAS unit	13	Passenger-side air bag cut-off indicator light
7	Driver-side side air bag sensor		

SYSTEM COMPONENT

- Available combinations of the air bag system components are shown below.

×: Applied
–: Not applied

Component	A	B	C	D	E
Pre-tensioner seat belt	×	×	×	×	×
Driver-side air bag module	×	×	×	×	×
Passenger-side air bag module	–	×	×	×	×
Side air bag module	–	–	×	–	×
Passenger-side air bag cut-off function	–	–	–	×	×

SUPPLEMENTAL SERVICE INFORMATION

The following changes and/or additions have been made since publication of the Mazda 626 Workshop Manual (1577-10-97D), Mazda 626 Station Wagon Workshop Manual Supplement (1603-10-97J), and Mazda 626 626 Station Wagon RF Turbo Workshop Manual Supplement (1614-10-98D)

Ignition switch
- Removal/Installation procedure modified
- Inspection procedure modified

Accessory socket
- Removal/Installation procedure added
- Inspection procedure added

Front fog light
- Removal/Installation procedure modified
- Aiming procedure modified
- Bulb removal/installation procedure modified

Inboard combination light
- Removal/Installation procedure modified

Flasher unit
- Inspection procedure modified

Running light
- Inspection procedure modified

TNS relay
- Removal/Installation procedure modified
- Inspection procedure modified

Headlight relay
- Removal/Installation procedure modified
- Inspection procedure modified

Front fog light relay
- Removal/Installation procedure modified
- Inspection procedure modified

Rear fog light relay
- Inspection procedure modified

Door switch
- Removal/Installation procedure modified

Glove compartment light switch
- Removal/Installation procedure added
- Inspection procedure added

Headlight cleaner nozzle
- Adjustment procedure modified

Headlight cleaner switch
- Inspection procedure modified

Headlight cleaner relay
- Removal/Installation procedure added
- Inspection procedure added

Instrument cluster
- Disassembly/assembly procedure modified
- Inspection procedure modified
- Input/output check mode procedure modified

Fuel gauge sender unit
- Inspection procedure modified

Horn
- Removal/Installation procedure modified

Horn relay
- Removal/Installation procedure modified
- Inspection procedure modified

Information display
- Inspection procedure modified

Theft-deterrent control module
- Inspection procedure modified

Power antenna
- Removal/Installation procedure modified
- Disassembly/assembly procedure modified
- Inspection procedure modified
- Antenna mast removal/installation procedure added

Noise filter
- Removal/Installation procedure added
- Inspection procedure added

Front antenna feeder
- Removal/Installation procedure modified
- Inspection procedure modified

Rear antenna feeder
- Removal/Installation procedure modified
- Inspection procedure modified

Side air bag sensor
- Removal/Installation procedure modified

SAS unit
- Removal/Installation procedure modified

SAS unit bracket
- Removal/Installation procedure added

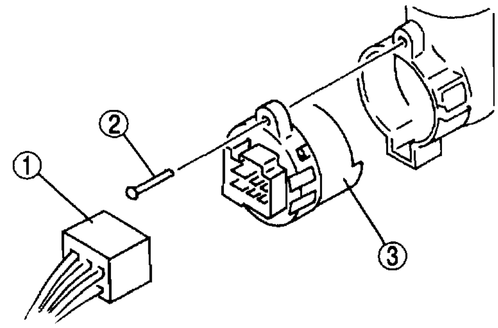
On-board diagnostic
- Air bag system modified

Troubleshooting
- Air bag system modified

POWER SYSTEM

IGNITION SWITCH REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



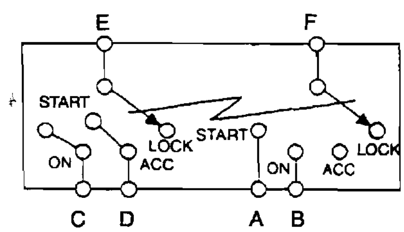
1	Connector
2	Screw
3	Ignition switch

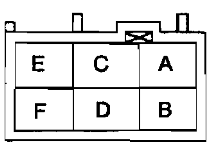
IGNITION SWITCH INSPECTION

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Disconnect the ignition switch connectors.
4. Inspect for continuity between the ignition switch terminals using an ohmmeter.
   - If not as specified, replace the ignition switch.

O—O : Continuity

Ignition key position	Terminal					
	E	F	D	C	B	A
LOCK						
ACC	O		O			
ON	O	O	O	O	O	
START	O	O		O		O

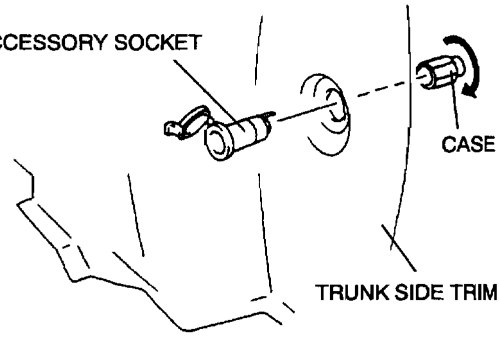




COMPONENT SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

ACCESSORY SOCKET REMOVAL/INSTALLATION

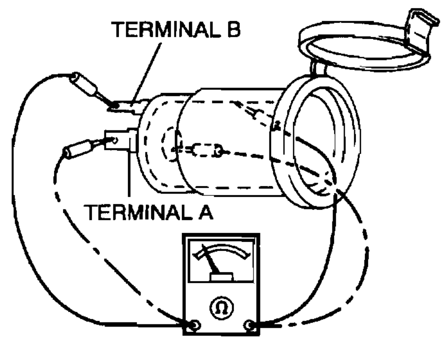
1. Disconnect the negative battery cable.
2. Remove the trunk side trim.
3. Remove the case by turning it counterclockwise.
4. Remove the accessory socket.

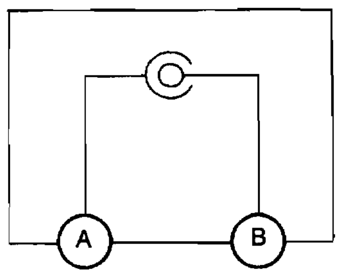


5. Install in the reverse order of removal.

ACCESSORY SOCKET INSPECTION

1. Remove the accessory socket.
2. Inspect for continuity between the accessory socket terminals A and B using an ohmmeter as shown in the figure.
   - If not as specified, replace the accessory socket.

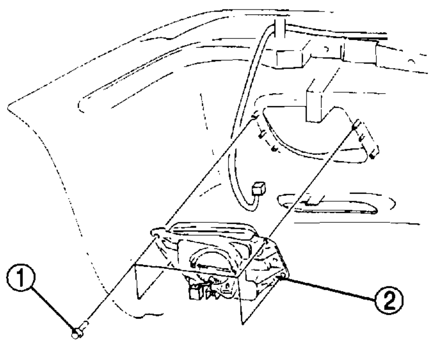




EXTERIOR LIGHTING SYSTEM

FRONT FOG LIGHT REMOVAL/INSTALLATION

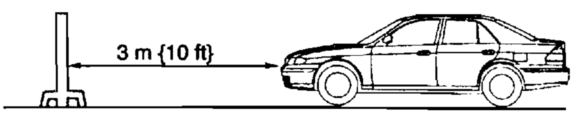
1. Disconnect the negative battery cable.
2. Remove the front bumper.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Adjust the front fog light aiming.



1	Screw
2	Front fog light

FRONT FOG LIGHT AIMING

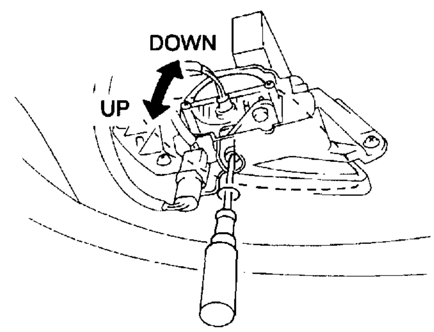
1. Adjust the tire air pressure to the specification.
2. Position the unloaded vehicle on a flat, level surface.
3. Seat one person in the driver's seat.
4. Position the vehicle **3 m {10 ft}** in front of a white screen.

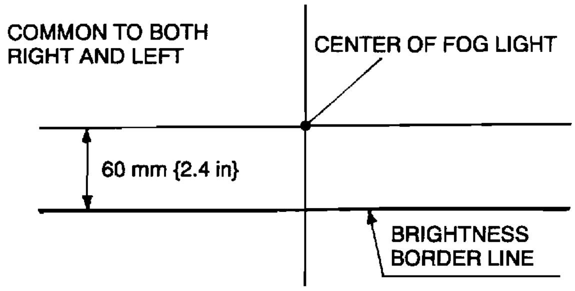


5. While adjusting one fog light, mask the other.
6. Start the engine to charge the battery.
7. Turn the front fog light on.
8. Adjust the brightness border line by turning the adjusting screw as shown in the figure. Loosen the screws first, then tighten them.

Note

- If the adjusting screws are tightened first, then loosened, they will continue to loosen when the vehicle is in motion and may cause the front fog lights to become misaligned.





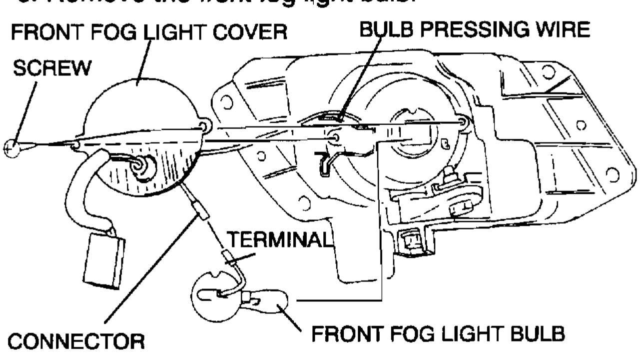
FRONT FOG LIGHT BULB REMOVAL/INSTALLATION

1. Remove the front fog light.
2. Remove the screw.
3. Remove the front fog light cover.
4. Disconnect the front fog light bulb terminal from connector.
5. Release the bulb pressing wire.

Caution

- **A halogen bulb generates extremely high heat when it is used. If the surface of the bulb is soiled, excessive heat will build up and the light's life will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

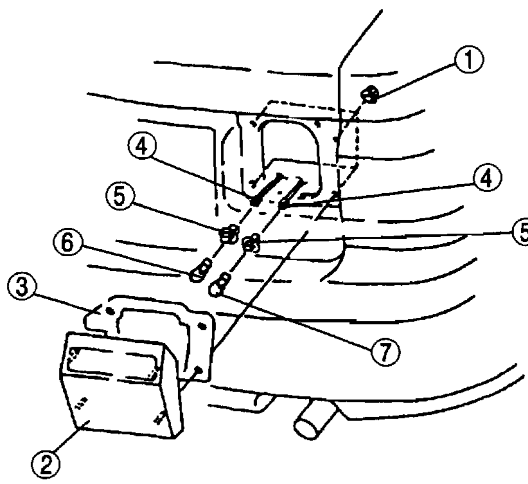
6. Remove the front fog light bulb.



7. Install in the reverse order of removal.

INBOARD COMBINATION LIGHT
REMOVAL/INSTALLATION
Sedan

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim.
3. Remove the rear finisher.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.

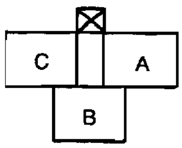


1	Nut
2	Inboard combination light
3	Gasket
4	Connector
5	Socket
6	Back-up light bulb
7	Rear fog light bulb

FLASHER UNIT INSPECTION

1. Remove the bracket and pull it toward you.
2. Measure the voltage at the flasher unit terminals as indicated below.
3. Disconnect the negative battery cable before inspecting for continuity at terminal C.
4. If not as specified, inspect the parts listed under "Action."
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the flasher unit.

Terminal Voltage List (Reference)



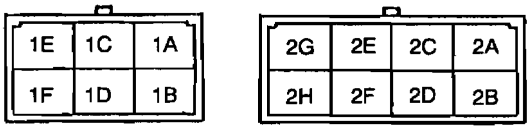
COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

<table>
<tr><th>Terminal</th><th>Signal</th><th>Connected to</th><th colspan="2">Test condition</th><th>Voltage (V) /Continuity</th><th>Action</th></tr>
<tr><td rowspan="3">A</td><td rowspan="3">Power supply</td><td rowspan="3">Hazard warning switch</td><td colspan="2">Hazard warning switch on</td><td>Alternates B+ and 0</td><td rowspan="3">• Inspect HAZARD 15 A fuse
• Inspect METER 7.5 A fuse
• Inspect hazard warning switch
• Inspect related harness</td></tr>
<tr><td rowspan="2">Hazard warning switch off</td><td>Ignition switch at ON position</td><td>B+</td></tr>
<tr><td>Ignition switch at LOCK or ACC position</td><td>Below 1.0</td></tr>
<tr><td rowspan="3">B</td><td rowspan="3">Flasher unit output</td><td rowspan="3">• Hazard warning switch
• Turn switch</td><td colspan="2">Hazard warning switch on</td><td>Alternates B+ and 0</td><td rowspan="3">• Inspect hazard warning switch
• Inspect light switch
• Inspect related harness</td></tr>
<tr><td rowspan="2">• Hazard warning switch off
• Turn switch off</td><td>Ignition switch at ON position</td><td>B+</td></tr>
<tr><td>Ignition switch at LOCK or ACC position</td><td>Below 1.0</td></tr>
<tr><td>C</td><td>Flasher unit ground</td><td>GND</td><td colspan="2">Under any condition: inspect for continuity to ground</td><td>Yes</td><td>• Inspect GND</td></tr>
</table>

RUNNING LIGHT UNIT INSPECTION

1. Remove the bracket and pull it toward you.
2. Measure the voltage at the running light unit terminals as indicated below.
3. Disconnect the running light unit connector before inspecting for continuity at terminals 1C and 1D.
4. If not as specified, inspect the parts listed under “Action.”
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the running light unit.

Terminal Voltage List (Reference)



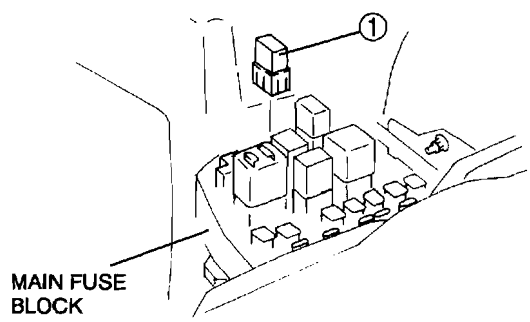
COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Terminal	Signal	Connected to	Test condition		Voltage (V) /Continuity	Action
1A	Headlight high operation	Headlight switch (dimmer switch: HI position)	Headlight switch (light) at OFF or TNS position		Below 1.0	• Inspect headlight relay • Inspect related harness
			Headlight switch (dimmer) at LO position		B+	
			Headlight switch (dimmer) at HI position		Below 1.0	
			Flash-to-pass on		Below 1.0	
1B	TNS operation	• Parking light • Taillight • License plate light	Ignition switch at ON position		B+	—
			Ignition switch at LOCK or ACC position	Headlight switch (light) at TNS or headlight position	B+	
				Headlight switch (light) at OFF position	Below 1.0	
1C	Headlight (high beam) on/off	Headlight switch	Headlight switch (dimmer) at LO position: inspect for continuity to ground		No	• Inspect headlight switch • Inspect related harness
			Headlight switch (dimmer) at HI position: inspect for continuity to ground		Yes	
1D	Running light unit ground	GND	Under any condition: inspect for continuity to ground		Yes	• Inspect GND
1E	—	—	—		—	—
1F	—	—	—		—	—
2A	Power supply	HEAD C/U 10 A fuse	Under any condition		B+	• Inspect HEAD C/U 10 A fuse • Inspect related harness
2B	IG1	METER 7.5 A fuse	Ignition switch at ON position		B+	• Inspect METER 7.5 A fuse • Inspect related harness
			Ignition switch at LOCK or ACC position		Below 1.0	
2C	Headlight relay on/off	Headlight relay	Headlight switch (light) at OFF or TNS position		B+	• Inspect headlight relay • Inspect related harness
			Headlight switch (light) at headlight position		Below 1.0	
			Flash-to-pass on		Below 1.0	
2D	—	—	—		—	—
2E	—	—	—		—	—

Terminal	Signal	Connected to	Test condition	Voltage (V) /Continuity	Action
2F	Flash-to-pass on/off	Headlight switch (dimmer switch)	Headlight switch (light) at OFF or TNS position	B+	• Headlight switch • Inspect related harness
			Headlight switch (light) at headlight position	Below 1.0	
			Flash-to-pass on	Below 1.0	
2G	TNS relay on/off	TNS relay	Headlight switch (light) at TNS or headlight position	Below 1.0	• Headlight switch • Inspect TNS relay • Inspect related harness
			Headlight switch (light) at OFF position	B+	
2H	—	—	—	—	—

TNS RELAY REMOVAL/INSTALLATION
FP, FS, FS (Hi-power)

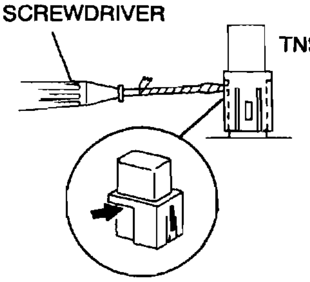
1. Remove the negative battery cable.
2. Remove the main fuse block cover.
3. Remove the cooling fan relay.
4. Remove as indicated in the table.
5. Install in the reverse order of removal.



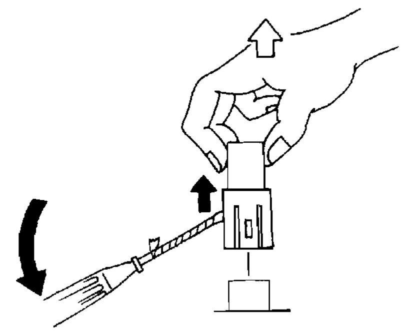
1	TNS relay See T-21 TNS relay removal note

TNS relay removal note

1. Insert a tape-wrapped flathead screwdriver into the dented portion of the TNS relay.



2. Pull out the TNS relay while pressing the flathead screwdriver downward.

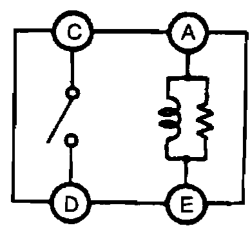


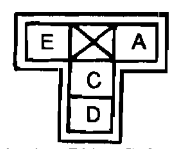
TNS RELAY INSPECTION

1. Remove the TNS relay.
2. Inspect for continuity between the TNS relay terminals using an ohmmeter
   - If not as specified, replace the TNS relay.

O—O : Continuity

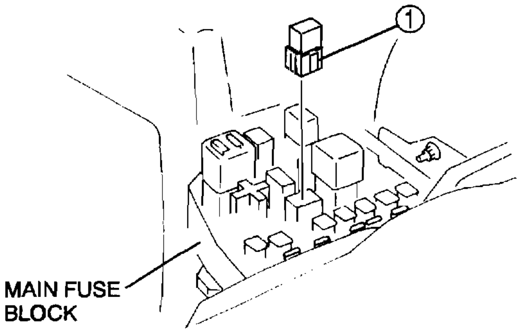
Step	Terminal A	Terminal E	Terminal C	Terminal D
1	O—	—O		
2	B+	GND	O—	—O





HEADLIGHT RELAY REMOVAL/INSTALLATION
FP, FS, FS (Hi-power)

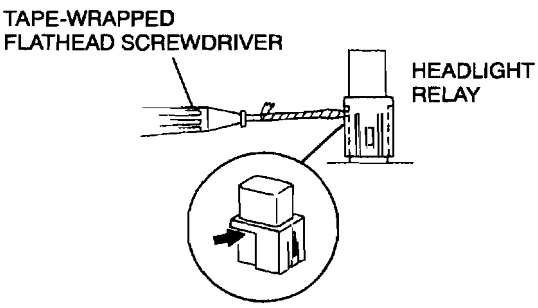
1. Remove the negative battery cable.
2. Remove the main fuse block cover.
3. Remove the condenser fan relay.
4. Remove the horn relay.
5. Remove as indicated in the table.
6. Install in the reverse order of removal.



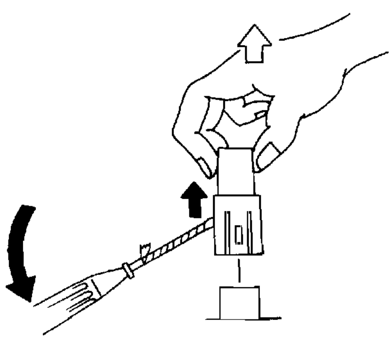
1	Headlight relay See T-22 Headlight relay removal note

Headlight relay removal note

1. Insert a tape-wrapped flathead screwdriver into the dented portion of the headlight relay.



2. Pull out the headlight relay while pressing the flathead screwdriver downward.

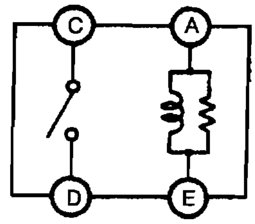


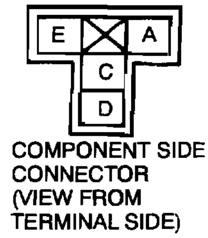
HEADLIGHT RELAY INSPECTION
FP, FS, FS (Hi-power)

1. Remove the headlight relay.
2. Inspect for continuity between the headlight relay terminals using an ohmmeter.
   - If not as specified, replace the headlight relay.

O—O : Continuity

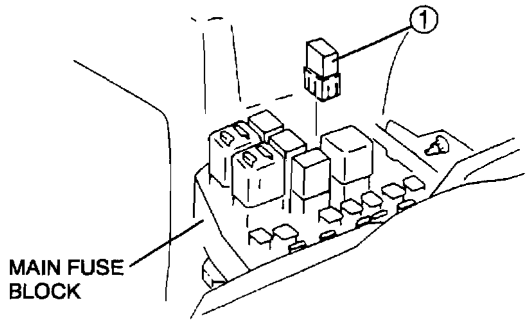
Step	Terminal			
	A	E	C	D
1	O—	—O		
2	B+	GND	O—	—O





FRONT FOG LIGHT RELAY REMOVAL/INSTALLATION
FP, FS, FS (Hi-power)

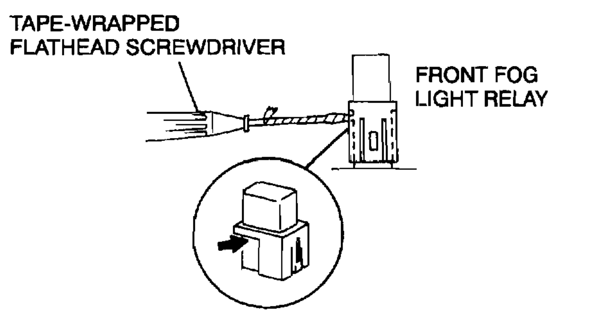
1. Remove the negative battery cable.
2. Remove the main fuse block cover.
3. Remove as indicated in the table.
4. Install in the reverse order of removal.



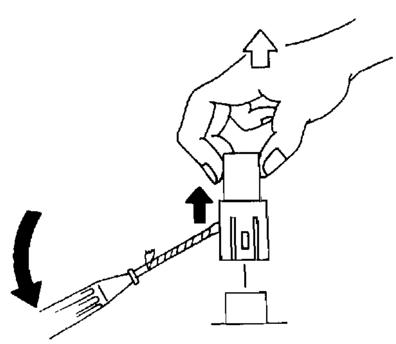
1	Front fog light relay See T-22 Front fog light relay removal note

Front fog light relay removal note

1. Insert a tape-wrapped flathead screwdriver into the dented portion of the front fog light relay.



2. Pull out the front fog light relay while pressing the flathead screwdriver downward.

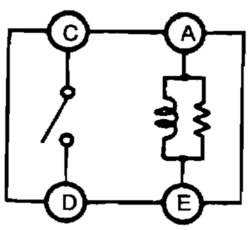


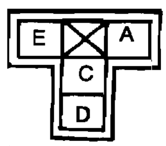
FRONT FOG LIGHT RELAY INSPECTION
FP, FS, FS (Hi-power)

1. Remove the front fog light relay.
2. Inspect for continuity between the front fog light relay terminals using an ohmmeter.
   - If not as specified, replace the front fog light relay.

O—O : Continuity

Step	Terminal			
	A	E	C	D
1	O—	—O		
2	B+	GND	O—	—O





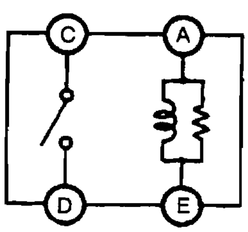
COMPONENT SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

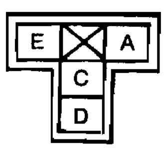
REAR FOG LIGHT RELAY INSPECTION

1. Remove the bracket and pull it toward you.
2. Inspect for continuity between the rear fog light relay terminals using an ohmmeter.
   - If not as specified, replace the rear fog light relay.

O—O : Continuity

Step	Terminal			
	A	E	C	D
1	O—	—O		
2	B+	GND	O—	—O





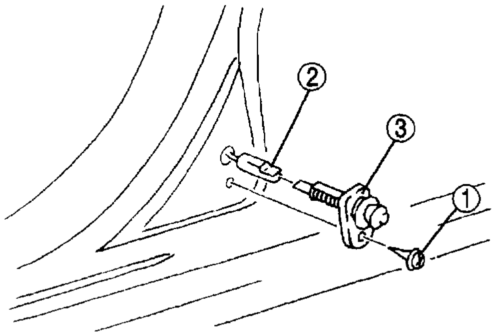
COMPONENT SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

INTERIOR LIGHTING SYSTEM

DOOR SWITCH REMOVAL/INSTALLATION

Front

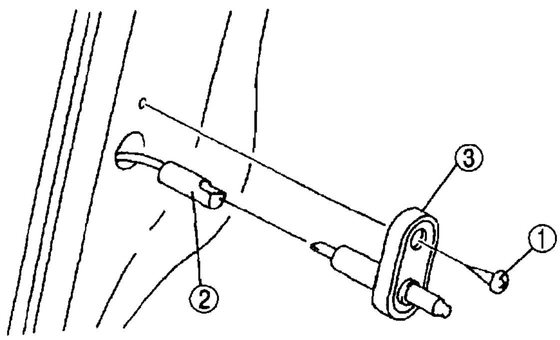
1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



1	Screw
2	Connector
3	Door switch

Rear

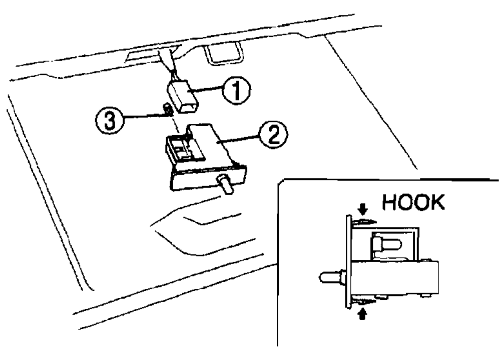
1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



1	Screw
2	Connector
3	Door switch

GLOVE COMPARTMENT LIGHT SWITCH REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



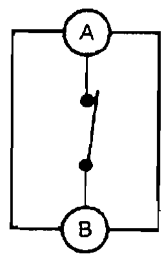
1	Connector
2	Glove compartment light switch
3	Glove compartment light bulb

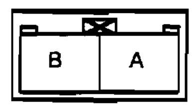
GLOVE COMPARTMENT LIGHT SWITCH INSPECTION

1. Remove the glove compartment light switch.
2. Inspect for continuity between the glove compartment light switch terminals using an ohmmeter.
   - If not as specified, replace the glove compartment light switch.

O—O : Continuity

Switch position	Terminal	
	A	B
Pressed		
Released	O—	—O



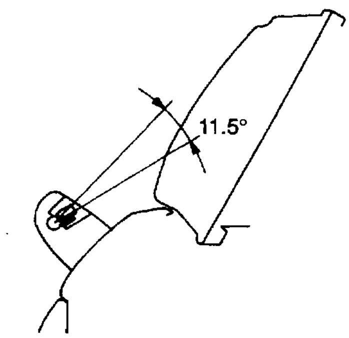


COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

WIPER AND WASHER

HEADLIGHT CLEANER NOZZLE ADJUSTMENT

1. Use a flathead screwdriver to adjust the headlight cleaner nozzle so that the fluid properly sprays on the headlight.

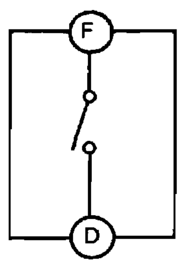


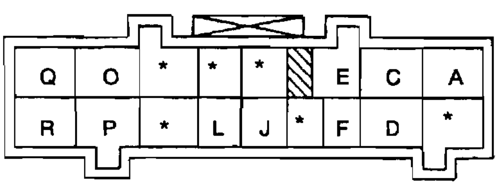
HEADLIGHT CLEANER SWITCH INSPECTION

1. Disconnect the negative battery cable.
2. Remove the light switch.
3. Inspect for continuity between the headlight cleaner switch terminals using an ohmmeter.
   - If not as specified, replace the light switch.

O—O : Continuity

Switch position	Terminal	
	D	F
ON	O—	—O
OFF		



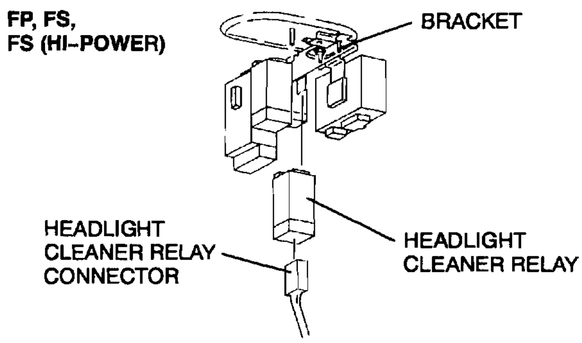


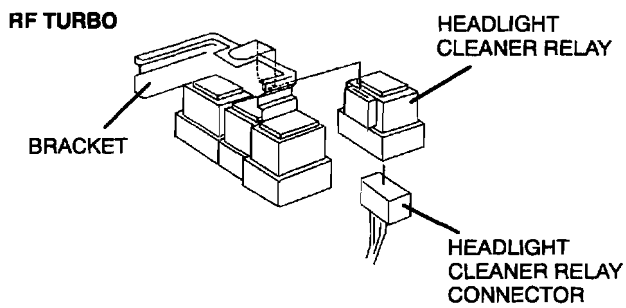
COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

HEADLIGHT CLEANER RELAY REMOVAL/INSTALLATION

Note
- Because the lock section of the relay is damaged easily, do not remove the relay from the bracket unless replacement is necessary. Always perform an inspection of the headlight cleaner relay before removal.

1. Disconnect the negative battery cable.
2. Remove the bracket.
3. Disconnect the headlight cleaner relay connector.
4. Remove the headlight cleaner relay.





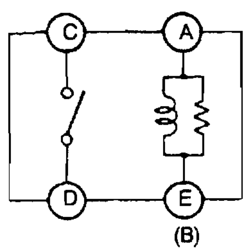
5. Install in the reverse order of removal.

HEADLIGHT CLEANER RELAY INSPECTION

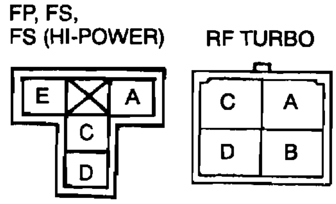
1. Remove the headlight cleaner relay.
2. Inspect for continuity between the headlight cleaner relay terminals using an ohmmeter.
   - If not as specified, replace the headlight cleaner relay.

O—O : Continuity

Step	Terminal			
	A	C	D	E (B)
1	O—	—	—	—O
2	B+	O—	—O	GND



( ): RF TURBO



COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

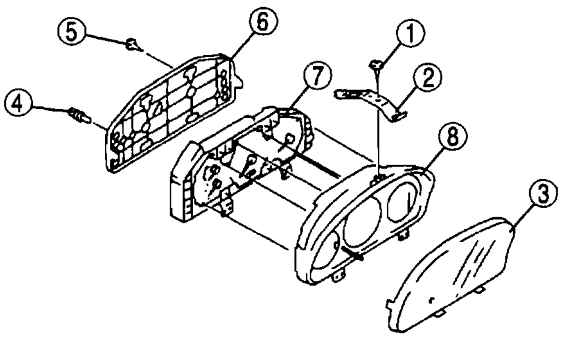
WARNING AND INDICATOR SYSTEM

INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY

Caution

- **If the instrument cluster is dropped or the print plate is damaged, the system will not work properly and it may be the cause of trouble or malfunctions.**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



1	Screw A
2	Bracket
3	Lens
4	Bulb
5	Screw B
6	Cover
7	Instrument cluster
8	Case

INSTRUMENT CLUSTER INSPECTION

Speedometer

Using the input/output check mode

1. Inspect the speedometer by setting it in the input/output check mode DTC 12.

Using a speedometer tester

1. Adjust the tire air pressure to the specification.
2. Using a speedometer tester, verify that the speedometer indication is within the allowable ranges shown below.

L.H.D.

Speedometer tester indication (km/h)	Allowable range (km/h)
20	20—24
40	40—44
60	60—64
80	80—84
100	100—105
120	120—126
140	140—146

R.H.D.

Speedometer tester indication (km/h)	Allowable range (km/h)
20	18—22
40	38—42
60	58—62
80	78—82
100	97—103
120	117—123
140	137—143

Speedometer tester indication (mph)	Allowable range (mph)
20	20—22
40	40—43
60	60—63
80	80—84

3. Verify that fluctuation of the speedometer needle is within the allowable range.
   - If the speedometer needle does not move or the indication is outside of the allowable range, refer to the following table and inspect the appropriate part and related wiring harness.

×: Applicable
–: Not applicable

Item	Sedan				5HB				Station wagon			
	MTX		ATX		MTX		ATX		MTX		ATX	
	ABS				ABS				ABS			
	–	×	–	×	–	×	–	×	–	×	–	×
Vehicle speedometer sensor	×	–	–	–	×	–	–	–	×	–	×	–
ABS HU/CM	–	×	–	–	–	×	–	–	–	×	–	×
PCM	–	–	×	×	–	–	×	×	–	–	–	–

— If the vehicle speedometer sensor, ABS HU/CM, PCM and related wiring harness are normal, replace the instrument cluster.

Needle fluctuation allowable range
Within 3.0 km/h

Tachometer

Using the input/output check mode

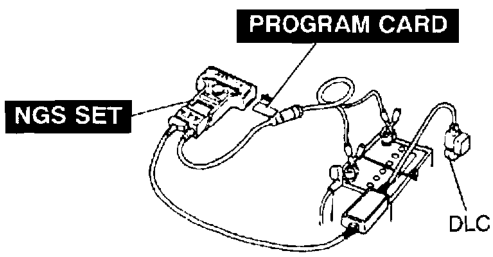
1. Inspect the tachometer by setting it in the input/output check mode DTC 13.

Using the SSTs (NGS tester set) or a dwell tacho tester

Caution
- **If the engine speed exceeds the allowable range, the engine could be damaged. Therefore, when inspecting the tachometer, do not allow the engine speed to exceed the allowable range indication on the tachometer.**

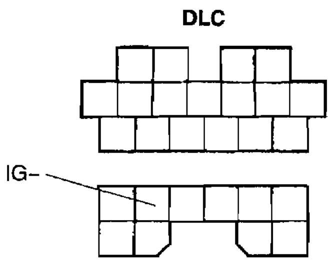
1. Follow the appropriate procedure for using the **SSTs** (NGS tester set) or a dwell tacho tester.

Using the SSTs (NGS tester set)
1. Connect the **SSTs** (NGS tester set) to the DLC and battery.



2. Select "VEHICLE & ENGINE SELECTION" and press TRIGGER. (Select the model and specifications of the vehicle you are testing.)
3. Select "PCM-POWERTRAIN CTRL MODULE" and press TRIGGER.
4. Select "PID/DATA MONITOR AND RECORD" and press TRIGGER.
5. Select "RPM" and press TRIGGER.
6. Press START.

Using a dwell tacho tester
1. Connect a dwell tacho tester to the DLC terminal IG–.



2. Verify that the tachometer indication is within the allowable range as shown below.
   - If the tachometer needle does not move or the indication is outside of the allowable range, inspect the engine speed signal transmitter PCM and related wiring harness.
     — If the engine speed signal transmitter PCM and related wiring harness are normal, replace the instrument cluster.

FP, FS, FS (HI-power)

Tacho tester indication (rpm)	Allowable range (rpm)
1,000	951—1,077
2,000	1,976—2,134
3,000	3,000—3,190
4,000	4,024—4,248
5,000	5,049—5,305
6,000	6,073—6,361

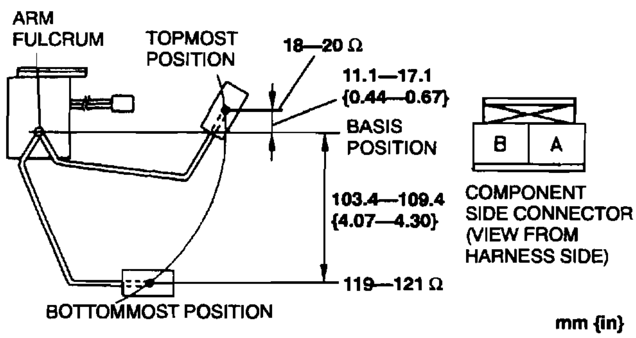
RF Turbo

Tester indication (rpm)	Allowable range (rpm)
1,000	964—1,060
2,000	1,982—2,112
3,000	3,000—3,162
4,000	4,017—4,213
5,000	5,036—5,264
6,000	6,054—6,314

Fuel Gauge
1. Inspect the fuel gauge by setting it in the input/output check mode DTC 23.

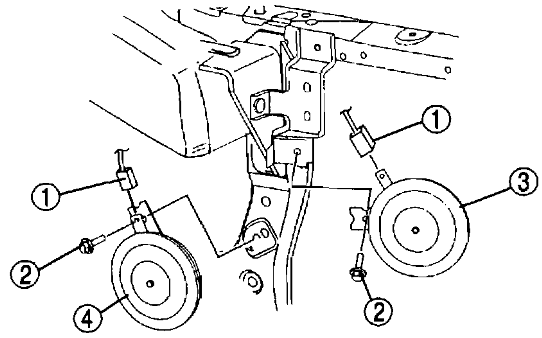
Water Temperature Gauge
1. Inspect the water temperature gauge by setting it in the input/output check mode DTC 24.

FUEL GAUGE SENDER UNIT INSPECTION
1. Remove the fuel gauge sender unit. (See Section F1, F2.)
2. Move the float to the topmost and bottommost positions, and verify that the resistance between terminals A and B of the unit and the position of the float are as indicated in the figure.
   - If they are not as indicated, replace the fuel gauge sender unit.



HORN REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the radiator grille.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

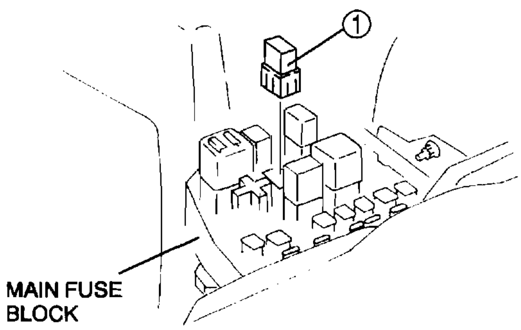


1	Connector
2	Bolt
3	Horn (low)
4	Horn (high)

HORN RELAY REMOVAL/INSTALLATION

FP, FS, FS (Hi-power)

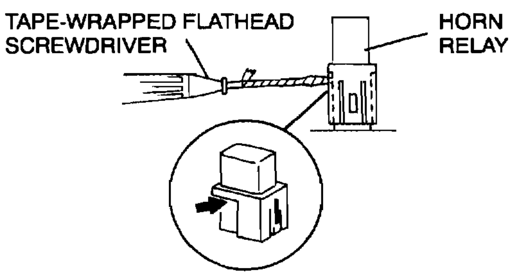
1. Disconnect the negative battery cable.
2. Remove the main fuse block cover.
3. Remove the condenser fan relay.
4. Remove as indicated in the table.
5. Install in the reverse order of removal.



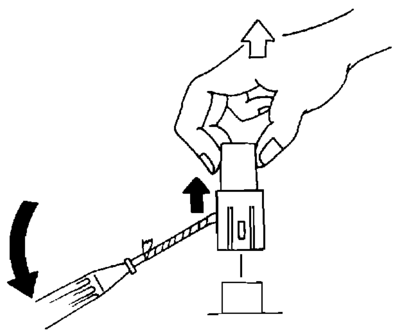
1	Horn relay See T-28 Horn relay removal note

Horn relay removal note

1. Insert a tape-wrapped flathead screwdriver into the dented portion of horn relay.



2. Pull out the horn relay while pressing the flathead screwdriver downward.

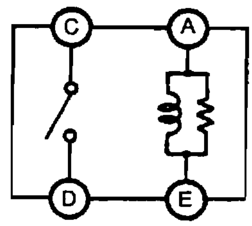


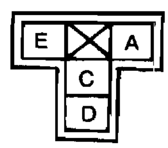
HORN RELAY INSPECTION

1. Remove the horn relay.
2. Inspect for continuity between the horn relay terminals using an ohmmeter.
   - If not as specified, replace the horn relay.

O—O : Continuity

Step	Terminal			
	A	E	D	C
1	O—	—O		
2	B+	GND	O—	—O



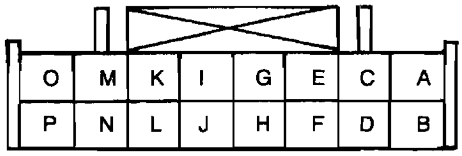


COMPONENT SIDE
CONNECTOR
(VIEW FROM
TERMINAL SIDE)

INFORMATION DISPLAY INSPECTION

1. With the connector still connected, remove the information display.
2. Measure the voltage at the information display terminals as indicated below.
3. Disconnect the information display connector before checking for continuity at terminals E.
4. If not as specified, inspect the parts listed under "Action".
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the information display.

Terminal Voltage List (Reference)



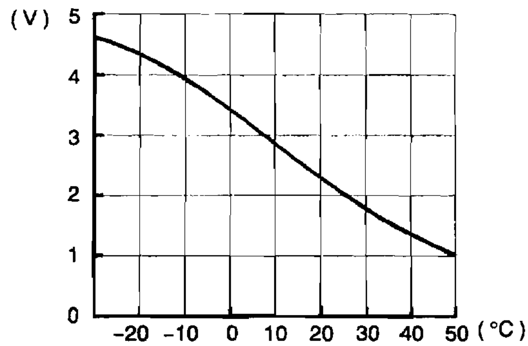
Terminal	Signal	Connection to	Test condition	Voltage (V)/ Continuity	Action
A	Power supply	ROOM 10 A fuse	Under any condition	B+	• Inspect ROOM 10 A fuse • Inspect related harness
B	ACC	A/C 15 A fuse	Ignition switch at ACC	B+	• Inspect A/C 15 A fuse • Inspect ignition switch • Inspect related harness
			Ignition switch at LOCK	Below 1.0	
C	IG1	METER 7.5 A fuse	Ignition switch at ON	B+	• Inspect METER 7.5 A fuse • Inspect ignition switch • Inspect related harness
			Ignition switch at LOCK or ACC	Below 1.0	
D	Illumination (+)	Headlight switch	Headlight switch at TNS	B+	• Inspect TAIL 10 A fuse • Inspect headlight switch • Inspect related harness
			Headlight switch at OFF	Below 1.0	
E	Information display ground	GND	Under any condition: inspect for continuity to ground	Yes	• Inspect GND
F	Fuel (–)	Fuel gauge sender unit	(See T–30 F terminal inspection)	—	• Inspect fuel gauge sender unit • Inspect related harness
G	Ambient temperature (–)	Ambient temperature sensor	(See T–30 G terminal inspection)	—	• Inpect ambient temperature sensor • Inspect related harness
H	Ambient temperature (+)	Ambient temperature sensor	Ignition switch at ACC	B+	• Inspect ambient temperature sensor • Inspect related harness
			Ignition switch at LOCK	Below 1.0	
I	Fuel (+)	Fuel gauge sender unit	Ignition switch at ON	B+	• Inspect fuel gauge sender unit • Inspect related harness
			Ignition switch at LOCK or ACC	Below 1.0	
J	—	Not used	—	—	—
K	Injection	PCM	Ignition switch at ON	B+	• Inspect PCM • Inspect related harness
			Ignition switch at LOCK or ACC	Below 1.0	
L	Vehicle speed	Instrument cluster	(See T–30 L terminal inspection)	—	• Inspect instrument cluster
M	—	Not used	—	—	—
N	—	Not used	—	—	—
O	Illumination (–)	Panel light control switch	(See T–30 O terminal inspection)	—	• Inspect panel light control switch • Inspect related harness
P	—	Not used	—	—	—

F terminal inspection

1. Inspect the voltage at the information display terminal I.
2. Disconnect the information display connector.
3. Inspect for continuity between the information display terminal F and ground.

G terminal inspection

1. Ignition switch at ACC.
2. Measure the temperature around the ambient temperature sensor.
3. Measure the voltage of the G terminal on the information display by using an ohmmeter.
4. Verify that the voltage is as shown in the graph.



L terminal inspection

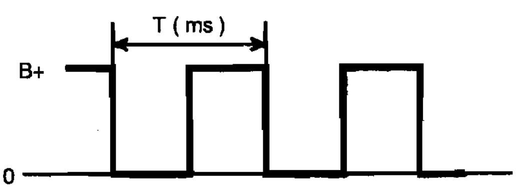
1. At a constant speed, rotate the drive wheels by using a chassis roller.
2. Measure the wave pattern of L terminal on the information display.
3. Apply the speed of the vehicle to the following calculation in order to calculate the cycle (T) and verify that the cycle (T) does not vary largely from the cycle on the screen of oscilloscope.

Calculation

$$T\ (ms) = \frac{1413}{V\ (km/h)}$$

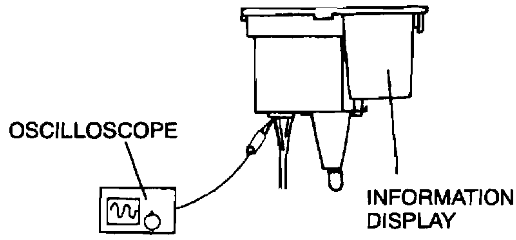
T: 1 cycle
V: speed

4. Verify that the wave pattern is continuous and output voltage is constant.

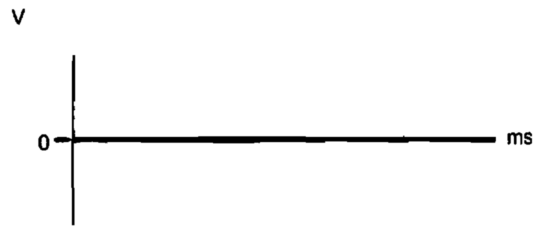


O terminal inspection

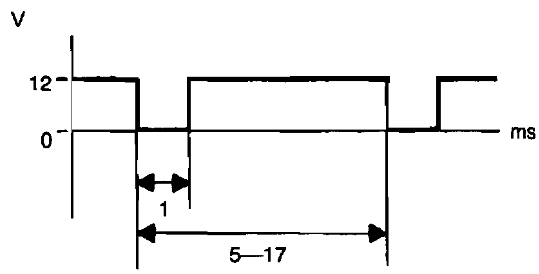
1. Measurer the wave pattern of the O terminal on the information display by using an oscilloscope.



2. Set the headlight switch to either the first or second position.
3. Set the panel light control switch to the brightest position.
4. Verify that the pattern on the screen is as shown in the figure.



5. Verify that the pattern on the screen matches the pattern shown in the figure as the panel light control switch is gradually turned to the darkest position.



INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE

Note
- In this mode, it is possible to check the items in the following chart.

Diagnostic Trouble Code Chart

DTC	Checked item	Related item
04	Door switch	• Ignition key illumination • Interior light control • Power door lock system • Lights-on reminder warning buzzer
05	Door lock-link switch	• Interior light control • Power door lock system
06	Outer handle switch	Ignition key/door key cylinder illumination timer function
07	Rear window defroster switch	Rear window defroster switch
08	TNS relay	• Lights-on reminder warning buzzer • Each illumination
09	Headlight switch	• Headlight • Rear fog light control system
10	**Sedan, 5HB** • Vehicle speedometer sensor (MXT, without ABS) • ABS HU/CM (MXT, with ABS) • PCM (ATX) **Station wagon** • Vehicle speedometer sensor (Without ABS) • ABS HU/CM (With ABS)	Speedometer
11	PCM	Tachometer
12	Speedometer	Speedometer
13	Tachometer	Tachometer
14	Buzzer	Lights-on reminder warning buzzer
15	Rear fog light relay	Rear fog light indicator light
16	Fuel-level warning light	Fuel-level warning light
17	Rear window defroster indicator light	Rear window defroster
18	Ignition key cylinder illumination	Ignition key cylinder illumination
20	Rear window defroster relay	Rear window defroster
21	Door lock timer unit	• Theft-deterrent system • Power door lock system
22	Fuel gauge sender unit	Fuel gauge
23	Fuel gauge	Fuel gauge
24	Water temperature sender unit	Water temperature gauge
25	Water temperature gauge	Water temperature gauge
26	LCD	LCD
27	Interior light	Interior light control
29	Rear fog light switch	Rear fog light control system
31	Key reminder switch	Key reminder warning buzzer
40	Front fog light relay	Front fog light relay

Note
- Diagnostic trouble codes which are not listed may be indicated, but they cannot be inspected.
- The diagnostic trouble codes are displayed in numerical order. (While performing the inspection, if you want to inspect a diagnostic trouble code of which the number is smaller than the code number you are currently inspecting, terminate the check mode then repeat the inspection from the beginning.)
- If the speed signal is put into the instrument cluster (the front wheels are rotated) while a code other than DTC 10 is displayed, the input/output check mode will be cancelled.
- The diagnostic trouble codes can be fast-forwarded by pushing and holding the odometer/tripmeter switch for **1 second or more.**

Operating Order

Preparation

START

Disconnect negative battery cable.

Except DTC 22 and 24 → Open driver-side door.

DTC 22 and 24 →

Disconnect connectors of following parts and verify continuity of harnesses.
- DTC 22 : Between instrument cluster and fuel gauge sender unit
- DTC 24 : Between instrument cluster and water temperature sensor

Is there continuity?

Yes → Connect instrument cluster connector. → Connect **SST** (Fuel And Thermometer checker) to instrument cluster.

No → Repair harness. If a malfunction of system is found after repairing harness, connect instrument cluster connector. → Connect **SST** (Fuel And Thermometer checker) to instrument cluster.

Connect **SST** (Fuel And Thermometer checker) to instrument cluster. → Open driver-side door.

Disconnect negative battery cable. → Open driver-side door.

Open driver-side door.

Wait **30 seconds or more** after disconnecting negative battery cable, and connect negative battery cable.

Operate following procedure **within 30 seconds** after connecting negative battery cable.
1.Turn ignition switch to ON position.
2.Push driver-side door switch **three times**.
3.Push odometer/tripmeter switch **three times**.

Inspection Procedure

Does odometer/tripmeter indicate DTC 00?

No → Disconnect negative battery cable.

Yes →

Push odometer/tripmeter switch to select DTC.

Inspect part following "Inspection of Diagnostic Trouble Codes." Is systems okay?

Yes → Are there any DTCs to inspect?

No → Repair or replace part. → Are there any DTCs to inspect?

Are there any DTCs to inspect?

Yes → Push odometer/tripmeter switch to select DTC.

No →

Ending Procedure of Instrument cluster input/output check mode

Turn ignition switch to LOCK position.

Disconnect negative battery cable.

Disconnect **SST** (Fuel And Thermometer checker) and connect fuel gauge sender unit connector and water temperature sensor connector, if necessary.

Connect negative battery cable.

END

Checking Order

Note
- When inspecting more than two DTCs, perform the inspection by following the priority order of inspection indicated in the chart below.

Priority order of inspection	IG switch position	Check code
1	ON	22, 24
2		04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 23, 25, 26, 27, 29, 40
3	LOCK	31

Inspection of Diagnostic Trouble Codes

DTC 04	Door switch on/off signal

INSTRUMENT CLUSTER CONNECTOR

1Q	1O	1M	1K	1I	1G	1E	1C	1A
1R	1P	1N	1L	1J	1H	1F	1D	1B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Open driver-side door. (Door switch on.)	on	Close driver-side door, then go to next step.
		oFF	Measure voltage at instrument cluster terminal 1I. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, Inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
2	Open passenger-side door. (Door switch on.)	on	Close passenger-side door, then go to next step.
		oFF	Measure voltage at instrument cluster terminal 1I. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
3	Open rear door on driver's side. (Door switch on.)	on	Close rear door on driver's side, then go to next step.
		oFF	Measure voltage at instrument cluster terminal 1I. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)

STEP	INSPECTION	INDICATION	ACTION
4	Open rear door on passenger's side. (Door switch on.)	on	Close rear door on passenger's side, then go to next step.
		oFF	Measure voltage at instrument cluster terminal 1I. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
5	Close all doors. (Door switch off.)	on	Measure voltage at instrument cluster terminal 1I. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
		oFF	Input signals to instrument cluster are okay.

DTC 05	Door lock-link switch on/off signal

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Turn driver-side door lock knob to lock position. (Door lock-link switch to lock position.)	on	Go to next step.
		oFF	Measure voltage at instrument cluster terminal 3F. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door lock-link switch — Wiring harness (Instrument cluster—door lock-link switch)
2	Turn driver-side door lock knob to unlock position. (Door lock-link switch to unlock position.)	on	Measure voltage at instrument cluster terminal 3F. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door lock-link switch — Wiring harness (Instrument cluster—lock-link switch)
		oFF	Input signal to instrument cluster is okay.

DTC 06	Outer handle switch on/off signal

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	1. Verify that indication is off. 2. Pull up and release driver-side outer handle. (Outer handle switch on.)	on	Go to next step.
		oFF	Measure voltage at terminal 3M of outer handle switch. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Outer handle switch — Wiring harness (Instrument cluster—outer hadle switch)
2	Pull up and release driver-side outer handle again. (Outer handle switch off.)	on	Measure voltage at terminal 3M of outer handle switch. Is voltage **5 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Outer handle switch — Wiring harness (Instrument cluster—outer handle switch)
		oFF	Input signal to instrument cluster is okay.

DTC 07	Rear window defroster switch on/off signal

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Turn rear window defroster switch on.	on	Go to next step.
		oFF	Measure voltage at instrument cluster terminal 3R. Is voltage **5 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Rear window defroster switch — Wiring harness (Instrument cluster—climate control unit)

STEP	INSPECTION	INDICATION	ACTION
2	Turn rear window defroster switch on.	oFF	Input signal to instrument cluster is okay.
		on	Measure voltage at instrument cluster terminal 3R. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Rear window defroster switch — Wiring harness (Instrument cluster—climate control unit)

DTC 08	TNS relay on/off signal

INSTRUMENT CLUSTER CONNECTOR

1Q	1O	1M	1K	1I	1G	1E	1C	1A
1R	1P	1N	1L	1J	1H	1F	1D	1B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Turn headlight switch to TNS position. (TNS relay on.)	on	Go to next step.
		oFF	Measure voltage at instrument cluster terminal 1E. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — TNS relay — Wiring harness (Battery—TNS relay—instrument cluster)
2	Turn headlight switch off. (TNS relay off.)	on	Measure voltage at instrument cluster terminal 1E. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — TNS relay — Wiring harness (TNS relay—instrument cluster)
		oFF	Input signal to instrument cluster is okay.

DTC 09	Headlight switch on/off signal

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Turn headlight switch to headlight position.	on	Go to next step.
		oFF	Measure voltage at instrument cluster terminal 3Q. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Headlight switch — Wiring harness (Instrument cluster—headlight switch—GND)
2	Turn headlight switch off.	on	Measure voltage at instrument cluster terminal 3Q. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Headlight switch — Wiring harness (Instrument cluster—headlight switch—GND)
		oFF	Input signal to instrument cluster is okay.

DTC 10	Vehicle speed input signal	
INSPECTION	**INDICATION**	**ACTION**
Rotate drive wheels using chassis roller.	on	Input signal to instrument cluster is okay.
	oFF	Inspect following parts **Sedan, 5HB** • Vehicle speadometer sensor (MTX, without ABS) • ABS HU/CM (MTX, with ABS) • PCM (ATX) • Wiring harness (Instrument cluster—vehicle speedometer sensor) • Wiring harness (Instrument cluster—ABS HU/CM) • Wiring harness (Instrument cluster—PCM) **Station wagon** • Vehicle speedometer sensor (WIithout ABS) • ABS HU/CM (With ABS) • Wiring harness (Instrument cluster—vehicle speedometer sensor) • Wiring harness (Instrument cluster—ABS HU/CM)

DTC 11	Engine speed input signal	
INSPECTION	**INDICATION**	**ACTION**
Start engine.	on	Input signal to instrument cluster is okay.
	oFF	Inspect following parts. • PCM • Wiring harness (PCM—instrument cluster)

DTC 12	Operation signal to speedometer		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 12.	00	Speedometer needle moves full scale then returns to **60 km/h or 60 MPH**.	Speedometer is okay.
		Other than stated above.	Replace instrument cluster.
	Err	—	

DTC 13	Operation signal to tachometer		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 13.	00	Tachometer needle moves full scale then returns to **3000 rpm**.	Tachometer is okay.
		Other than stated above.	Replace instrument cluster.
	Err	—	

DTC 14	Operation signal to buzzer		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 14.	on (Fixed)	Buzzer continuously sounds.	Buzzer is okay.
		Buzzer does not continuously sound.	Replace instrument cluster.

DTC 15	Operation signal to rear fog light relay		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 15.	on (Turns on and off)	Rear fog light indicator light turns on and off **three times.**	Rear fog light relay is okay.
		Other than stated above.	Inspect rear fog light indicator light bulb for burn out or looseness. • If there is malfunction, replace or reinstall bulb as necessary. • If bulb is okay, inspect rear fog light relay. Inspect rear fog light relay. • If as specified, replace instrument cluster. • If not as specified, replace rear fog light relay.

DTC 16	Operation signal to fuel-level warning light		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 16.	on (Turns on and off)	Fuel-level warning light turns on and off **three times**.	Fuel-level warning light is okay.
		Other than stated above.	Inspect bulb for burn out or looseness. • If there is malfunction, replace or reinstall bulb as necessary. • If bulb is okay, replace instrument cluster.

DTC 17	Operation signal to rear window defroster indicator light		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 17.	on (Turns on and off)	Rear window defroster indicator light turns on and off **three times.**	Rear window defroster indicator light is okay.
		Other than stated above.	Inspect LED for burn out or looseness. • If there is malfunction, replace or reinstall LED as necessary. • If bulb is okay, replace instrument cluster.

DTC 18 **Ignition key illumination on/off signal**

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

INSPECTION	INDICATION	SITUATION	ACTION
Wait for **2 seconds** after selecting DTC 18.	On (Turns on and off)	Ignition key illumination turns on and off **three times.**	Ignition key illumination is okay.
		Other than stated above.	Measure voltage at instrument cluster terminal 3A. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Ignition key illumination — Wiring harness (Battery—ignition key illumination—instrument cluster)

DTC 20	Operation signal to rear window defrostor relay on/off signal

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

INSPECTION	INDICATION	SITUATION	ACTION
Wait for **2 seconds** after selecting DTC 20.	On (Turns on and off)	Rear window defroster relay turns on and off **three times.**	Rear window defroster relay is okay.
		Other than stated above.	Measure voltage at instrument cluster terminal 3P. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Wiring harness (Instrument cluster—rear window defroster relay)

DTC 21	Operation signal to door lock timer unit

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

INSPECTION	INDICATION	SITUATION	ACTION
Wait for **2 seconds** after selecting DTC 21.	017 (Turns on and off)	All door lock knobs lock and unlock **three times**.	Door lock timer unit is okay.
		Other than stated above.	Measure voltage at instrument cluster terminal 3D. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door lock timer unit — Wiring harness (Battery—door lock timer unit—instrument cluster)

DTC 22	Fuel level signal

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Select DTC 22 with fuel gauge sender unit connector disconnected.	162 ~ 255	Go to next step.
		Other than stated above.	Replace instrument cluster.
2	Connect instrument cluster terminal 3C to ground.	000 ~ 003	Go to next step.
		Other than stated above.	Replace instrument cluster.
3	Using **SST** (Fuel And Thermometer checker) or resistor, input **20** Ω to instrument cluster terminal 3C.	017 ~ 023	Go to next step.
		Other than stated above.	Replace instrument cluster.

STEP	INSPECTION	INDICATION	ACTION
4	Using **SST** (Fuel And Thermometer checker) or resistor, input **60** Ω to instrument cluster terminal 3C.	057 ~ 063	Go to next step.
		Other than stated above.	Replace instrument cluster.
5	Using **SST** (Fuel And Thermometer checker) or resistor, input **100** Ω to instrument cluster terminal 3C.	097 ~ 103	Inspect fuel gauge sender unit.
		Other than stated above.	Replace instrument cluster.

DTC 23	Operation signal to fuel gauge		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting DTC 23.	00	Fuel gauge indicates in following order for every **2 seconds**. • F→1/2→E→F (fixed)	Fuel gauge is okay.
		Other than stated **above**.	Replace instrument cluster.
	99	Replace instrument cluster.	

DTC 24 **Water temperature signal**

INSTRUMENT CLUSTER CONNECTOR

3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Select DTC 24 with water temperature sender unit connector disconnected.	252 ~ 255	Go to next step.
		Other than stated above.	Replace instrument cluster.

STEP	INSPECTION	INDICATION	ACTION
2	Connect instrument cluster terminal 3E to ground.	000 ~ 003	Go to next step.
		Other than stated above.	Replace instrument cluster.
3	Using **SST** (Fuel And Thermometer checker) or resistor, input **20** Ω to instrument cluster terminal 3E.	017 ~ 023	Go to next step.
		Other than stated above.	Replace instrument cluster.
4	Using **SST** (Fuel And Thermometer checker) or resistor, input **60** Ω to instrument cluster terminal 3E.	057 ~ 063	Go to next step.
		Other than stated above.	Replace instrument cluster.
5	Using **SST** (Fuel And Thermometer checker) or resistor, input **100** Ω to instrument cluster terminal 3E.	097 ~ 103	Inspect water temperature sender unit.
		Other than stated above.	Replace instrument cluster.

DTC 25	Operation signal to water temperature gauge		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Wait for **2 seconds** after selecting **D**TC 25.	00	Water temperature gauge indicates in following order for every **2 seconds**. • H→Center→C→ H (fixed)	Water temperature gauge is okay.
		Other than stated above.	Replace instrument cluster.
	99	Replace instrument cluster.	

DTC 26	LCD indication		
INSPECTION	**INDICATION**	**SITUATION**	**ACTION**
Select **D**TC 26.	TRIP Ⓐ Ⓑ ODO 88888.8	Indication is normal.	LCD is okay.
		Other than stated above.	Replace instrument cluster.

DTC 27	Operation signal to interior light

INSTRUMENT CLUSTER CONNECTOR

1Q	1O	1M	1K	1I	1G	1E	1C	1A
1R	1P	1N	1L	1J	1H	1F	1D	1B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

INSPECTION	INDICATION	SITUATION	ACTION
1. Turn interior light switch to DOOR position. 2. Wait for **2 seconds** after selecting DTC 27.	on (Turns on and off)	Interior light turns on and off **three times.**	Interior light is okay.
		Other than stated above.	Measure voltage at instrument cluster terminal 1H. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Interior light — Wiring harness (Battery—interior light—instrument cluster)

DTC 29	Rear fog light switch on/off signal

INSTRUMENT CLUSTER CONNECTOR

1Q	1O	1M	1K	1I	1G	1E	1C	1A
1R	1P	1N	1L	1J	1H	1F	1D	1B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	1. Verify that indication is off. 2. Push and hold rear fog light switch. (Rear fog light switch is on.)	on	Go to next step.
		oFF	Measure voltage at instrument cluster terminal 3T. Is voltage **5 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Rear fog light switch — Wiring harness (Instrument cluster—rear fog light switch)
2	1. Verify that indication is on. 2. Push and hold rear fog light switch. (Rear fog light switch is off.)	oFF	Input signals to instrument cluster are okay.
		on	Measure voltage at instrument cluster terminal 3T. Is voltage **0 V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Rear fog light switch — Wiring harness (Instrument cluster—rear fog light switch)

DTC 31	Key reminder on/off signal

INSTRUMENT CLUSTER CONNECTOR

2O	2M	2K	2I	2G	2E	2C	2A
2P	2N	2L	2J	2H	2F	2D	2B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Remove key from steering lock and then insert key into steering lock after selecting DTC 31. (Key reminder switch on.)	on	Go to next step.
		oFF	Measure voltage at instrument cluster terminal 2J. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, replace following parts. — Key reminder switch — Wiring harness (Battery—key reminder switch—instrument cluster)
2	Remove key from steering lock (Key reminder switch off.)	on	Measure voltage at instrument cluster terminal 2J. Is voltage **0V**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Key reminder switch — Wiring harness (Key reminder switch—instrument cluster)
		oFF	Input signal to instrument cluster is okay.

DTC 40	Front fog light relay on/off signal

INSTRUMENT CLUSTER CONNECTOR

2O	2M	2K	2I	2G	2E	2C	2A
2P	2N	2L	2J	2H	2F	2D	2B

HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Turn front fog light switch on. (Front fog light relay on.)	on	Go to next step.
		oFF	Measure voltage at instrument cluster terminal 2N. Is voltage **B+**? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Rear fog light switch — Wiring harness (Instrument cluster—front fog light relay)

<table>
<tr><th>STEP</th><th>INSPECTION</th><th>INDICATION</th><th>ACTION</th></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Turn front fog light switch off.
(Front fog light relay off.)</td><td>oFF</td><td>Input signals to instrument cluster are okay.</td></tr>
<tr><td>on</td><td>Measure voltage at instrument cluster terminal 2N.
Is voltage 0 V?
• If as specified, replace instrument cluster.
• If not as specified, inspect following parts.
— Front fog light switch
— Wiring harness (Instrument cluster—front fog light relay)</td></tr>
</table>

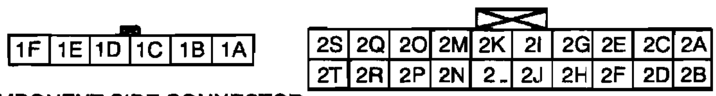
THEFT-DETERRENT SYSTEM

THEFT-DETERRENT CONTROL MODULE INSPECTION

Sedan, 5HB

1. Remove the theft-deterrent control module without disconnecting the connectors.
2. Measure the voltage at the theft-deterrent control module terminals as indicated below.
3. Disconnect the theft-deterrent control module connector before inspecting for continuity at terminals 1F, 2B, 2F, 2K, 2L, 2M, 2N, and 2R.
4. If not as specified, inspect the parts listed under "Action."
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the theft-deterrent control module.

Terminal voltage list (Reference)



COMPONENT SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

COMPONENT SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

Terminal	Signal	Connection to	Test condition		Voltage (V)	Action
1A	IG1	ENGINE 10 A fuse	Ignition switch at ON position		B+	• Inspect ignition switch • ENGINE 10 A fuse • Inspect related harness
			Ignition switch at LOCK or ACC position		Below 1.0	
1B	Power supply	ROOM 10 A fuse	Under any condition		B+	• ROOM 10 A fuse
1C	Flasher input	• Turn switch • Hazard warning switch • Flasher unit	Ignition switch ON position	Turn switch on	Alternates 0 and B+	• Inspect turn switch • Inspect hazard warning switch • Inspect flasher unit • Inspect related harness
				Turn switch off	Below 1.0	
			Hazard warning switch on		Alternates 0 and B+	
			Hazard warning switch off		Below 1.0	
			Theft-deterrent system alarm 1: Active		Alternates 0 and B+	
			Theft-deterrent system alarm 1: Other		Below 1.0	
1D	Turn (left)	Turn light (left)	Ignition switch at ON position	Turn switch on	Alternates 0 and B+	• Inspect turn light (left) • Inspect related harness
				Turn switch off	Below 1.0	
			Hazard warning switch on		Alternates 0 and B+	
			Hazard warning switch off		Below 1.0	
			Theft-deterrent system alarm 1: Active		Alternates 0 and B+	
			Theft-deterrent system alarm 1: Other		Below 1.0	

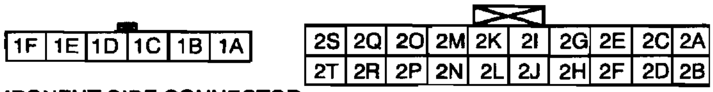
Terminal	Signal	Connection to	Test condition	Voltage (V) /Continuity	Action
1E	Turn (right)	Turn light (right)	Ignition switch at ON position: Turn switch on	Alternates 0 and B+	• Inspect turn light (right) • Inspect related harness
			Ignition switch at ON position: Turn switch off	Below 1.0	
			Hazard warning switch on	Alternates 0 and B+	
			Hazard warning switch off	Below 1.0	
			Theft-deterrent system alarm 1: Active	Alternates 0 and B+	
			Theft-deterrent system alarm 1: Other	Below 1.0	
1F	Theft-deterrent control module ground	GND	Under any condition: inspect for continuity to ground	Yes	–
2A	–	–	–	–	–
2B	Lock/unlock	• Trunk lid lock-link switch (Liftgate lock-link switch) • Door lock timer unit	Trunk lid lock-link switch (liftgate lock-link switch) locked: inspect for continuity to gound.	No	• Inspect trunk lid lock-link switch (liftgate lock-link switch) • Inspect related harness
			Trunk lid lock-link switch (liftgate lock-link switch) unlocked: inspect for continuity to gound.	Yes	
2C	Theft-deterrent horn on/off	Theft-deterrent horn relay	Theft-deterrent system alarm 1: Other	B+	• Inspect theft-deterrent horn relay • Inspect related harness
			Theft-deterrent system alarm 1: Active	Alternates 0 and B+	
2D	Key reminder switch on/off	Key reminder switch	Key reminder switch on	B+	• Inspect key reminder switch • Inspect related harness
			Key reminder switch off	0 Below 1.0	
2E	–	–	–	–	–
2F	Lock/unlock	• Door lock timer unit • Driver's door lock-link switch	Driver's door lock-link switch locked: inspect for continuity to ground.	No	• Inspect driver's door lock-link switch • Inspect related harness
			Driver's door lock-link switch unlocked: inspect for continuity to gound.	Yes	
2G	–	–	–	–	–
2H	–	–	–	–	–
2I	–	–	–	–	–
2J	–	–	–	–	–
2K	Lock/unlock	• Door lock timer unit • Driver's door lock-link switch	Driver's door lock-link switch locked: inspect for continuity to ground	No	• Inspect driver's door lock-link switch • Inspect related harness
			Driver's door lock-link switch unlocked: inspect for continuity to ground	Yes	
2L	Lock/unlock	• Trunk lid lock-link switch (Liftgate lock-link switch) • Door lock timer unit	Trunk lid lock-link switch (liftgate lock-link switch) locked: inspect for continuity to gound.	Yes	• Inspect trunk lid lock-link switch (liftgate lock-link switch) • Inspect related harness
			Trunk lid lock-link switch (liftgate lock-link switch) unlocked: inspect for continuity to gound.	No	

Terminal	Signal	Connection to	Test condition	Voltage (V) /Continuity	Action
2M	Lock/unlock	• Passenger's door lock-link switch • Rear door lock-link switch	Passenger's and rear door lock-link switch locked: inspect for continuity to ground	No	• Inspect passenger's or rear door lock-link switch • Inspect related harness
			Passenger's or rear door lock-link switch unlocked: inspect for continuity to ground	Yes	
2N	Bonnet open/closed	Bonnet switch	Bonnet switch on: inspect for continuity to ground	Yes	• Inspect bonnet switch • Inspect related harness
			Bonnet switch off: inspect for continuity to ground	No	
2O	Door key cylinder switch	• Driver's door key cylinder switch • Passenger's door key cylinder switch • Liftgate lock cylinder switch • Keyless unit • Instrument cluster • Door lock timer unit	Driver's or passenger's door or liftgate locked with key or transmitter	2.5	• Inspect driver's or passenger's door key cylinder switch • Inspect keyless unit • Inspect related harness
			Driver's or passenger's door or liftgate unlocked with key or transmitter	Below 1.0	
			Other	5	
2P	Trank compartment light switch (Cargo compartment light switch) on/off	Trank compartment light switch (Cargo compartment light switch)	Trank compartment light switch (Cargo compartment light switch) on	Below 1.0	• Inspect trunk compartment light switch (cargo compartment light switch) • Inspect related harness
			Trank compartment light switch (Cargo compartment light switch) off	B+	
2Q	Security light on/off	Security light	Security light on	Below 1.0	• Inspect security light • Inspect related harness
			Security light off	B+	
2R	Door open/closed	Door switch	Any door open: inspect for continuity to ground	Yes	• Inspect door switch • Inspect related harness
			All doors closed: inspect for continuity to ground	No	
2S	Theft-deterrent relay on/off	Theft-deterrent relay	Theft-deterrent system alarm 1: Active	Below 1.0	• Inspect theft-deterrent relay • Inspect related harnass
			Theft-deterrent system alarm 1: Other	B+	
2T	–	–	–	–	–

Station Wagon

1. Remove the theft-deterrent control module without disconnecting the connectors.
2. Measure the voltage at the theft-deterrent control module terminals as indicated below.
3. Disconnect the theft-deterrent control module connector before inspecting for continuity at terminals 1F, 2K, 2M, 2N, and 2R.
4. If not as specified, inspect the parts listed under "Action."
   - If the parts and wiring harnesses are okay but the system still does not work properly, replace the theft-deterrent control module.

Terminal voltage list (Reference)



COMPONENT SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

COMPONENT SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

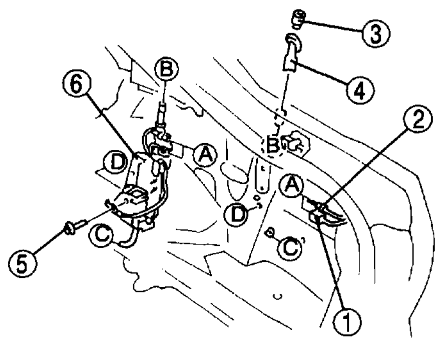
Terminal	Signal	Connection to	Test condition		Voltage (V)	Action
1A	IG1	ENGINE 10 A fuse	Ignition switch at ON position		B+	• Inspect ignition switch • ENGINE 10 A fuse • Inspect related harness
			Ignition switch at LOCK or ACC position		Below 1.0	
1B	Power supply	ROOM 10 A fuse	Under any condition		B+	• ROOM 10 A fuse
1C	Flasher input	• Turn switch • Hazard warning switch • Flasher unit	Ignition switch ON position	Turn switch on	Alternates 0 and B+	• Inspect turn switch • Inspect hazard warning switch • Inspect flasher unit • Inspect related harness
				Turn switch off	Below 1.0	
			Hazard warning switch on		Alternates 0 and B+	
			Hazard warning switch off		Below 1.0	
			Theft-deterrent system alarm 1: Active		Alternates 0 and B+	
			Theft-deterrent system alarm 1: Other		Below 1.0	
1D	Turn (left)	Turn light (left)	Ignition switch at ON position	Turn switch on	Alternates 0 and B+	• Inspect turn light (left) • Inspect related harness
				Turn switch off	Below 1.0	
			Hazard warning switch on		Alternates 0 and B+	
			Hazard warning switch off		Below 1.0	
			Theft-deterrent system alarm 1: Active		Alternates 0 and B+	
			Theft-deterrent system alarm 1: Other		Below 1.0	
1E	Turn (right)	Turn light (right)	Ignition switch at ON position	Turn switch on	Alternates 0 and B+	• Inspect turn light (right) • Inspect related harness
				Turn switch off	Below 1.0	
			Hazard warning switch on		Alternates 0 and B+	
			Hazard warning switch off		Below 1.0	
			Theft-deterrent system alarm 1: Active		Alternates 0 and B+	
			Theft-deterrent system alarm 1: Other		Below 1.0	

Terminal	Signal	Connection to	Test condition	Voltage (V) /Continuity	Action
1F	Theft-deterrent control module ground	GND	Under any condition: inspect for continuity to ground	Yes	–
2A	–	–	–	–	–
2B	–	–	–	–	–
2C	Theft-deterrent horn on/off	Theft-deterrent horn relay	Theft-deterrent system alarm 1: Other	B+	• Inspect theft-deterrent horn relay • Inspect related harness
			Theft-deterrent system alarm 1: Active	Alternates 0 and B+	
2D	Key reminder switch on/off	Key reminder switch	Key reminder switch on	B+	• Inspect key reminder switch • Inspect related harness
			Key reminder switch off	0 Below 1.0	
2E	–	–	–	–	–
2F	–	–	–	–	–
2G	–	–	–	–	–
2H	–	–	–	–	–
2I	–	–	–	–	–
2J	–	–	–	–	–
2K	Lock/unlock	• Door lock timer unit • Driver's door lock-link switch	Driver's door lock-link switch locked: inspect for continuity to ground	No	• Inspect driver's door lock-link switch • Inspect related harness
			Driver's door lock-link switch unlocked: inspect for continuity to ground	Yes	
2L	–	–	–	–	–
2M	Lock/unlock	• Passenger's door lock-link switch • Rear door lock-link switch	Passenger's and rear door lock-link switch locked: inspect for continuity to ground	No	• Inspect passenger's or rear door lock-link switch • Inspect related harness
			Passenger's or rear door lock-link switch unlocked: inspect for continuity to ground	Yes	
2N	Bonnet open/closed	Bonnet switch	Bonnet switch on: inspect for continuity to ground	Yes	• Inspect bonnet switch • Inspect related harness
			Bonnet switch off: inspect for continuity to ground	No	
2O	Door key cylinder switch	• Driver's door key cylinder switch • Passenger's door key cylinder switch • Liftgate key cylinder switch • Keyless unit • Instrument cluster • Door lock timer unit	Driver's or passenger's door or liftgate locked with key or transmitter	2.5	• Inspect driver's or passenger's door key cylinder switch • Inspect liftgate key cylinder switch • Inspect keyless unit • Inspect related harness
			Driver's or passenger's door or liftgate unlocked with key or transmitter	Below 1.0	
			Other	5	
2P	Cargo compartment light switch on/off	Cargo compartment light switch	Cargo compartment light switch on	Below 1.0	• Inspect cargo compartment light switch • Inspect related harness
			Cargo compartment light switch off	B+	

Terminal	Signal	Connection to	Test condition	Voltage (V) /Continuity	Action
2Q	Security light on/off	Security light	Security light on	Below 1.0	• Inspect security light • Inspect related harness
			Security light off	B+	
2R	Door open/closed	Door switch	Any door open: inspect for continuity to ground	Yes	• Inspect door switch • Inspect related harness
			All doors closed: inspect for continuity to ground	No	
2S	Theft-deterrent relay on/off	Theft-deterrent relay	Theft-deterrent system alarm 1: Active	Below 1.0	• Inspect theft-deterrent relay • Inspect related harnass
			Theft-deterrent system alarm 1: Other	B+	
2T	–	–	–	–	–

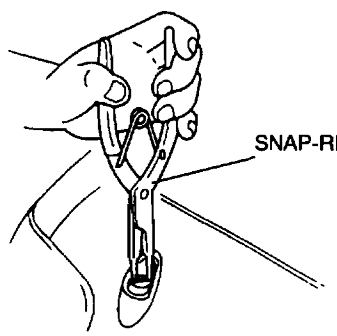
AUDIO

POWER ANTENNA REMOVAL/INSTALLATION
Sedan, 5HB
1. Disconnect the negative battery cable.
2. Remove the trunk side trim.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

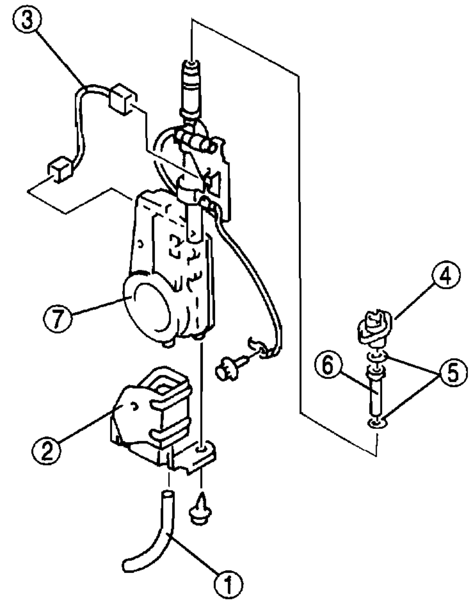


1	Power antenna connector
2	Antenna jack
3	Mounting nut See T-53 Mounting nut removal note
4	Spacer
5	Bolt
6	Power antenna

Mounting nut removal note
- Use snap-ring pliers to remove the mounting nut.



POWER ANTENNA DISASSEMBLY/ASSEMBLY
Sedan, 5HB
1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

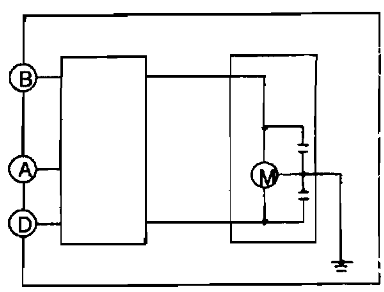


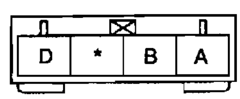
1	Drain hose
2	Bracket
3	Harness
4	Ground plate
5	O-ring
6	Rod insulator
7	Motor

POWER ANTENNA INSPECTION
Sedan, 5HB
1. Remove the trunk side trim.
2. Disconnect the power antenna connector.
3. Connect ground to a bare metal part of vehicle and terminal D of the power antenna.
4. Connect battery positive voltage to the following terminal of the power antenna.
5. Verify that the power antenna operation is as indicated below.
   - If not as specified, replace the power antenna.

B+: Battery positive voltage

Terminal		Power antenna operation
A	B	
-	B+	Down
B+	B+	Up



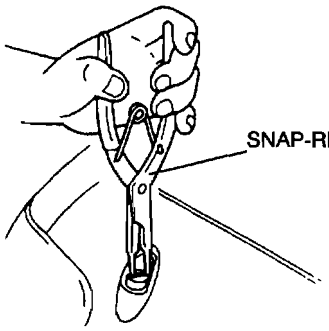


COMPONENT SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

ANTENNA MAST REMOVAL
Sedan, 5HB

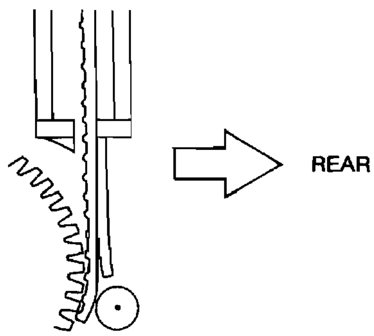
Caution
- **Always remove the antenna mast with the power antenna installed in the vehicle. Removing the antenna mast from the removed power antenna may damage the power antenna or the antenna mast.**

1. Use snap-ring pliers to remove the mounting nut.



2. Turn the ignition switch to ACC.
3. Audio power switch is on.
4. To turn on the radio, press AM/FM button.
5. Pull out the antenna mast after it fully extends.

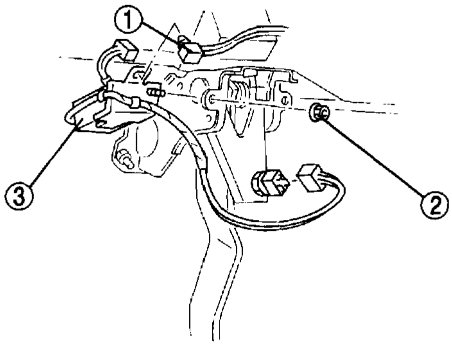
ANTENNA MAST INSTALLATION
Sedan, 5HB
1. Turn the ignition switch to ACC.
2. Straighten the warp of rack end.
3. Audio power switch is on.
4. To turn on the radio, press AM/FM button.
5. To turn off the radio, turn the audio power switch off, then immediately insert the rack into the power antenna.



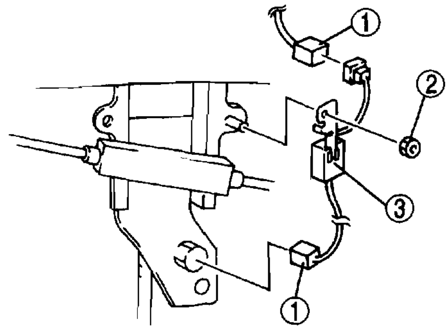
6. After the antenna mast is fully retracted, tighten the mounting nut.
7. Verify that the power antenna operates smoothly when the audio unit radio on.

NOISE FILTER REMOVAL/INSTALLATION
1. Disconnect the negative battery cable.
2. Remove the lower panel.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

L.H.D.



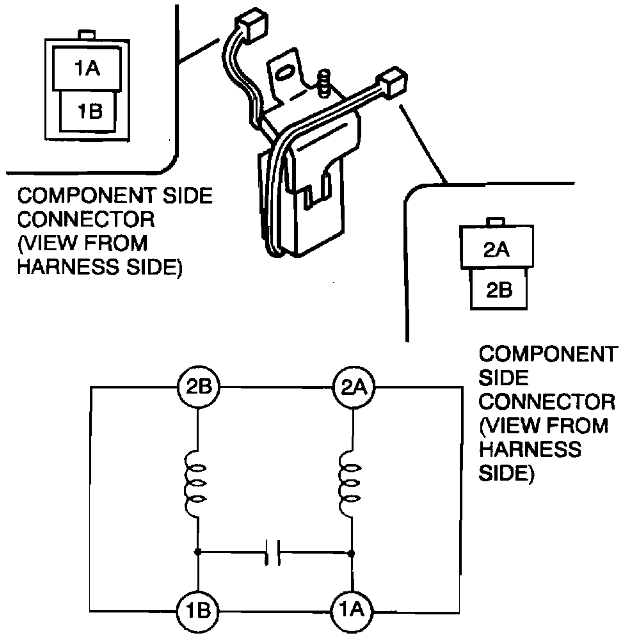
R.H.D.



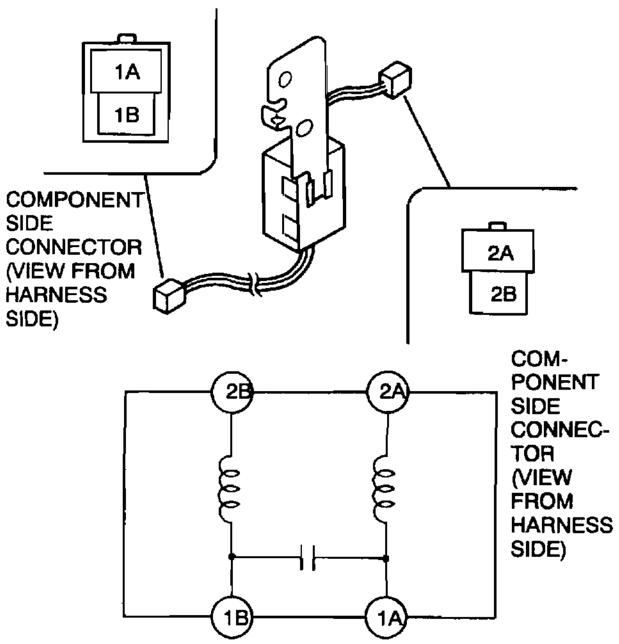
1	Connector
2	Nut
3	Noise filter

NOISE FILTER INSPECTION
1. Remove the noise filter.
2. Verify that resistance between noise filter terminals 1A and 2A, 1B and 2B is **0.1** Ω using an ohmmeter.
   - If not as specified, replace the noise filter.

L.H.D.



R.H.D.



FRONT ANTENNA FEEDER REMOVAL/INSTALLATION

Note
- The front antenna feeder is fixed to the instrument panel harness.

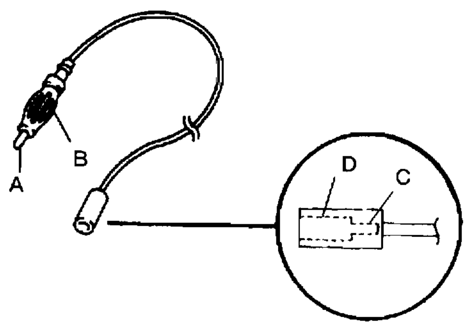
1. Disconnect the negative battery cable.
2. Remove the dashboard.
3. Remove the instrument panel harness.
4. Install in the reverse order of removal.

FRONT ANTENNA FEEDER INSPECTION

1. Remove the audio unit.
2. Remove the glove compartment.
3. Disconnect the connection between the front antenna and the rear antenna feeder.
4. Verify that there is no continuity between the front antenna feeder terminals A and B using an ohmmeter.
5. Inspect for continuity between the front antenna feeder terminals using an ohmmeter.
   - If not as specified, replace the instrument panel harness.

O—O : Continuity

Step	Terminal			
	A	B	C	D
1	O—	—	—O	
2		O—	—	—O



REAR ANTENNA FEEDER REMOVAL/INSTALLATION

Note
- The rear antenna feeder is fixed to the room harness.

1. Disconnect the negative battery cable.
2. Remove the room harness.
3. Install in the reverse order of removal.

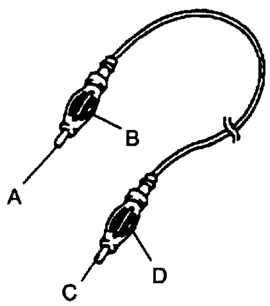
REAR ANTENNA FEEDER INSPECTION

1. Remove the glove compartment.
2. Disconnect the connection between the front antenna and the rear antenna feeder.
3. Remove the trunk side trim. (Sedan, 5HB)
4. Remove the trunk side lower trim. (Station Wagon)

5. Verify that there is no continuity between the rear antenna feeder terminals A and B using an ohmmeter.
6. Inspect for continuity between the rear antenna feeder terminals using an ohmmeter.
   - If not as specified, replace the room harness.

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○—	—	—○	
2		○—	—	—○

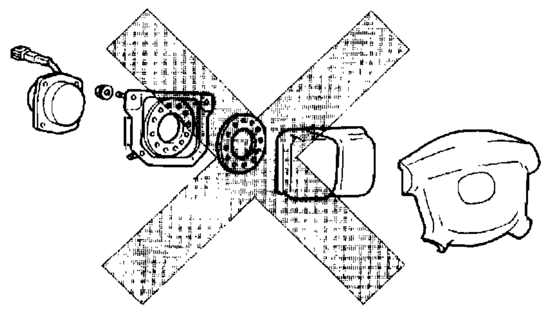


AIR BAG SYSTEM

SERVICE WARNINGS

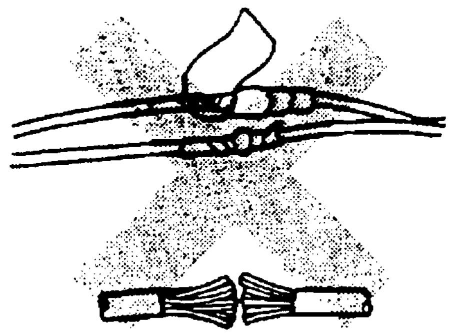
Component Disassembly

- **Disassembling and reassembling the components of the air bag system can render the system inoperative, which may result in serious injury or death in the event of an accident. Do not disassemble any air bag system components.**



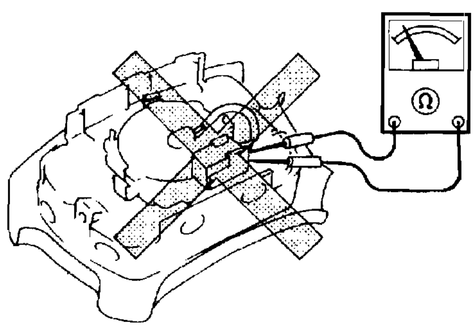
Wiring Harness Repair

- **Incorrectly repairing an air bag system wiring harness can accidentally deploy the air bag module or pre-tensioner seat belt, which can cause serious injury. If a problem is found in the system wiring, replace the wiring harness. Do not try to repair it.**



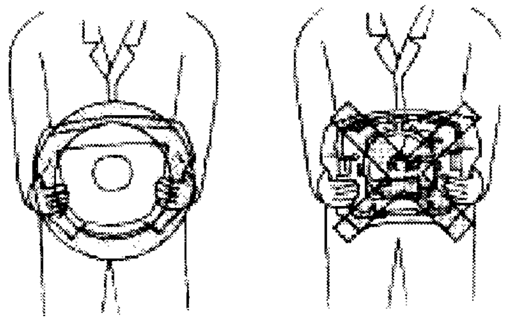
Air Bag Module Inspection

- **Inspecting an air bag module using an ohmmeter can deploy the air bag module, which may cause serious injury. Do not use an ohmmeter to inspect an air bag module. Always use the on-board diagnostic to diagnose the air bag module for malfunctions.**

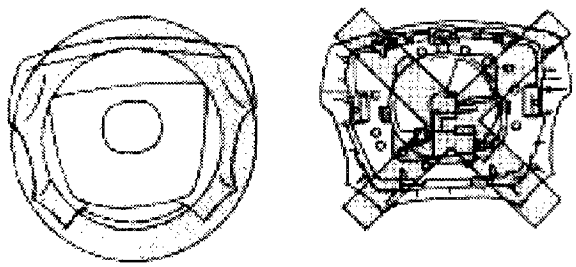


Air Bag Module Handling

- **A live (undeployed) air bag module may accidentally deploy when it is handled and cause serious injury. When carrying a live (undeployed) air bag module, point the front surface away from your body to lessen the chance of injury in case it deploys.**



- **A live (undeployed) air bag module placed face down on a surface is dangerous. If the air bag module deploys, the motion of the module can cause serious injury. Always face the front surface up to reduce the motion of the module in case it accidentally deploys.**



Side Air Bag Module Handling

- **When the side air bag module deploys due to a collision, the interior of the seat back (pad, frame, etc.) may become damaged. If the seat back is reused and the side air bag module does not deploy properly, a serious accident may result. When the side air bag module deploys, always replace both the side air bag module and the seat back (pad, frame, trim) with new parts. After service, confirm that the seat operates normally and that the harness is positioned properly.**

SAS Unit Handling

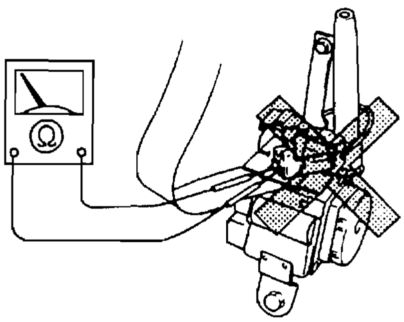
- **Disconnecting the SAS unit connector or removing the SAS unit with the ignition switch at ON position can cause the air bag modules to deploy, which may seriously injure you. Before disconnecting the SAS unit connector or removing the SAS unit, turn the ignition switch to LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS unit to deplete its stored power.**
- **Connecting the SAS unit connector without firmly installing the SAS unit to the vehicle is dangerous. The crash sensor inside the control module may send an electrical signal to the air bag modules. This will deploy the air bag modules, which may result in serious injury. Therefore, before connecting the connector, firmly mount the control module to the vehicle.**
- **For vehicles with a single point sensor, once an air bag module is deployed due to an accident or other causes, the SAS unit must be replaced with a new one even if the used one does not have any external signs of damage. The used SAS unit may have been damaged internally which may cause improper operation, resulting in major injuries or even death. The used single point SAS unit cannot be bench-checked or self-checked.**

Side Air Bag Sensor Handling

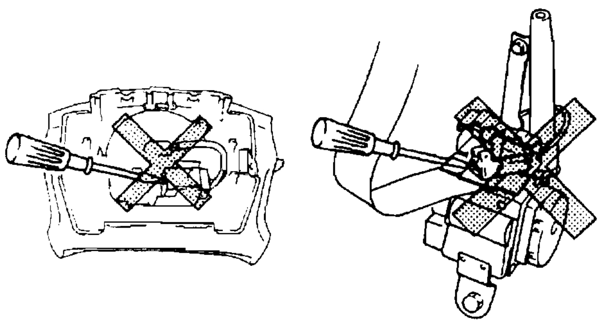
- **Disconnecting the side air bag sensor connector or removing the side air bag sensor with the ignition switch at ON position can cause the side air bag sensor to operate and the side air bag module to deploy, which may seriously injure you. Before disconnecting the side air bag sensor connector or removing the side air bag sensor, always turn the ignition switch to LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS control module to deplete its stored power.**
- **If the side air bag sensor is subjected to shock or the sensor is disassembled, the side air bag module may operate (deploy) suddenly and cause injury, or it may fail to operate normally and cause a serious accident. Do not subject the side air bag sensor to shock or disassemble the sensor.**
- **Because a sensor is built into the side air bag sensor, when the side air bag module operates (deploys), there may be a problem, such as an internal malfunction, even if there is not any external damage or deformation. If the side air bag sensor is reused, the side air bag module may fail to operate normally and cause a serious injury. Always replace the side air bag sensor with a new part. The side air bag sensor cannot be bench-checked or self-checked.**

Pre-tensioner Seat Belt Inspection

- **Inspecting a pre-tensioner seat belt using an ohmmeter can deploy the pre-tensioner seat belt, which can cause serious injury. Do not use an ohmmeter to inspect the pre-tensioner seat belt. Always use the on-board diagnostic to diagnose the pre-tensioner seat belt for malfunctions.**



Component Handling
- **Oil, grease, water, etc on components may cause the air bag modules and pre-tensioner seat belts to fail to deploy in an accident, which may cause serious injury. Do not allow oil, grease, water, etc., on components.**
- **Inserting a screwdriver, etc., into the connector of an air bag module or a pre-tensioner seat belt may damage the connector and cause the air bag module or the pre-tensioner seat belt to deploy improperly, which may cause serious injury. Do not insert any foreign objects into the connector.**



Component reusing
- **Even if an air bag module or a pre-tensioner seat belt does not deploy in a collision and does not have any external signs of damage, it may have been damaged internally, which may cause improper operation. Improper operation may cause serious injury. Always self-check the undamaged air bag module or pre-tensioner seat belt to determine whether it can be reused.**

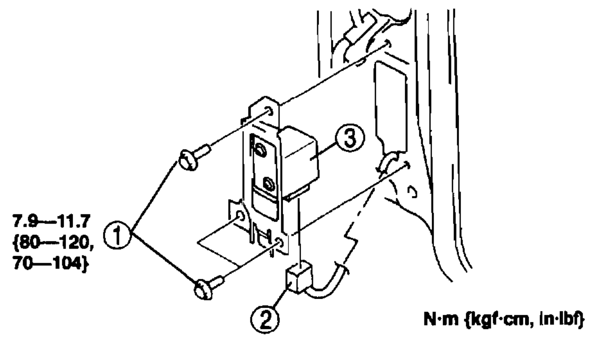
SIDE AIR BAG SENSOR REMOVAL/INSTALLATION

Warning
- **Handling the side air bag sensor improperly can accidentally deploy the side air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the side air bag sensor. (See T-58 SERVICE WARNINGS.)**

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute.**
3. Remove the B-pillar lower trim.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.

Note
- When a new side air bag sensor has been installed, perform the air bag module deployment authorization procedure. (See Section T.)

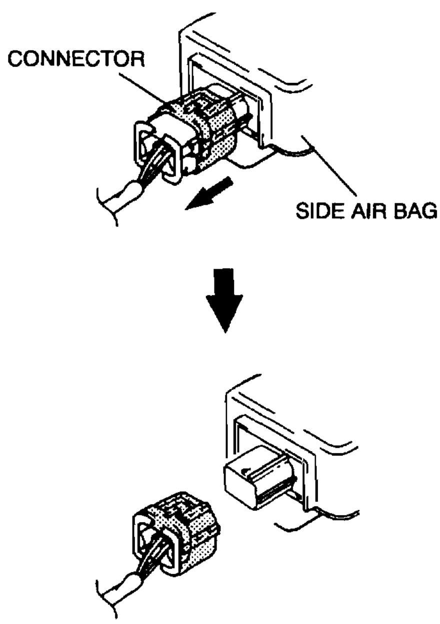
6. Turn the ignition switch to ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic function.



1	Bolt
2	Connector (See T-59 Connector Removal Note) (See T-59 Connector Installation Note)
3	Side air bag sensor

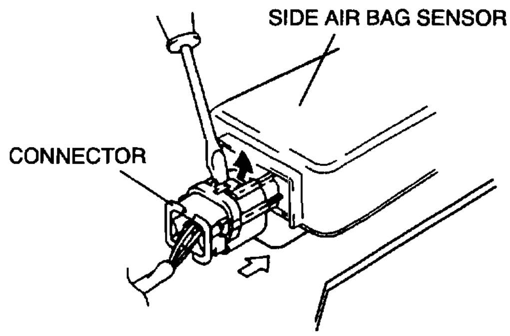
Connector Removal Note

- Slide the connector cover toward the harness and then disconnect the connector from the side air bag sensor.



Connector Installation Note

1. Attach the connector to the side air bag sensor.
2. Connect the connector by attaching it to the side air bag sensor while lifting up the lock on the connector with a flathead screwdriver.



SAS UNIT REMOVAL/INSTALLATION

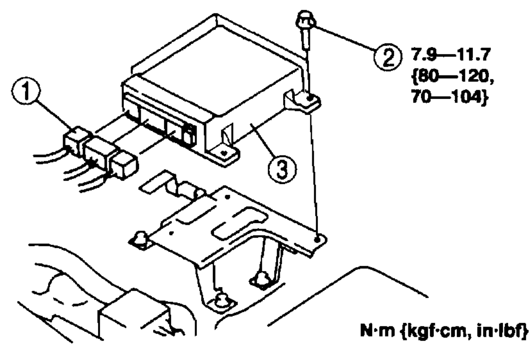
Warning

- **Handling the SAS unit improperly can accidentally deploy the air bag modules, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the SAS unit. (See T-56 SERVICE WARNINGS.)**

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute.**
3. Remove the side walls.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Turn the ignition switch to ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
   - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.

Note

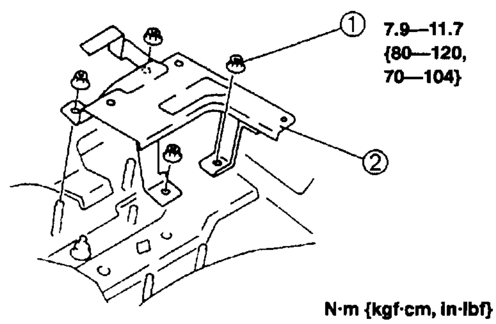
- When a new SAS unit has been installed, the air bag system warning light flashes continuously if there are no malfunctions in the system. Perform the air bag module and pre-tensioner seat belt deployment authorization procedure. (See Section T.)



1	Connector
2	Nut
3	SAS unit

SAS UNIT BRACKET REMOVAL/INSTALLATION

1. Remove the SAS unit.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



1	Nut
2	SAS unit bracket

ON-BOARD DIAGNOSTIC

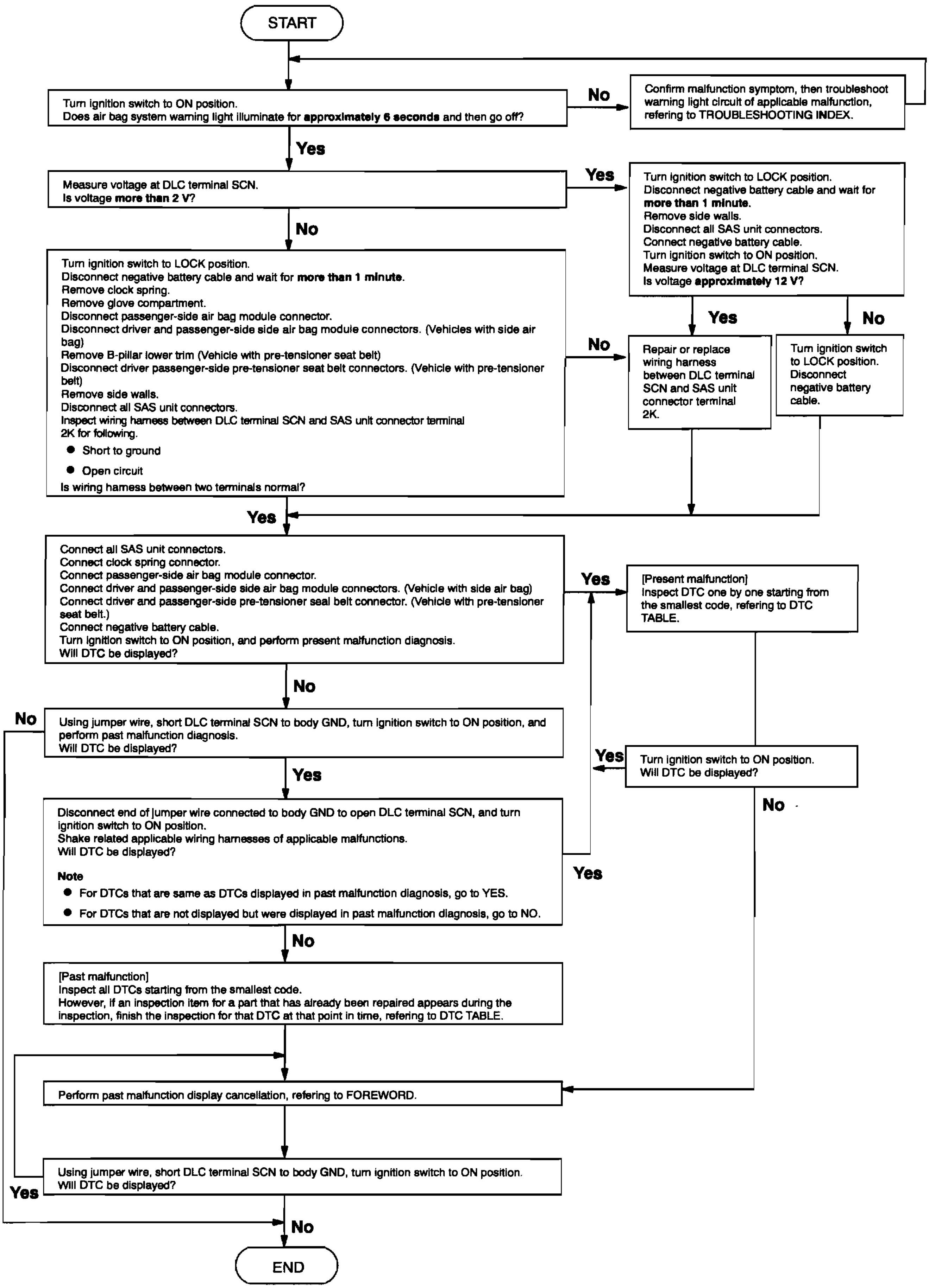
FOREWORD

- Use the following flowchart to verify the cause of the trouble.

Flowchart

Note

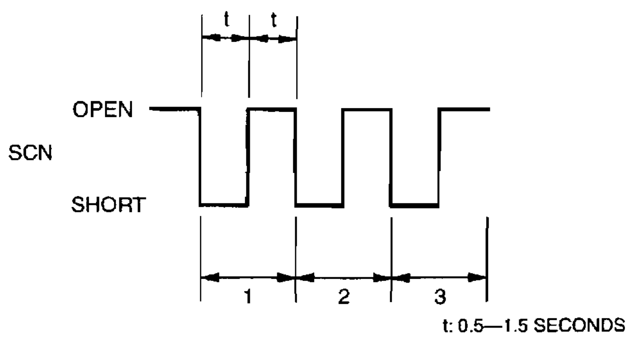
- While performing the inspection of the past malfunction code, the applicable DTCs may be added to memory by removing or disconnecting the related parts. Inspect only the DTCs that were indicated before inspecting.
- When DTCs of present malfunction are no longer output after present and/or past malfunctions have been repaired, be sure to perform past malfunction display cancellation to prevent repair of malfunctions that have already been repaired.

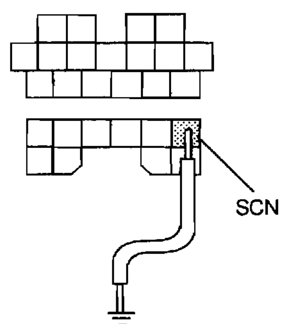

START
Turn ignition switch to ON position.
Does air bag system warning light illuminate for **approximately 6 seconds** and then go off?
No
Confirm malfunction symptom, then troubleshoot warning light circuit of applicable malfunction, refering to TROUBLESHOOTING INDEX.
Yes
Measure voltage at DLC terminal SCN.
Is voltage **more than 2 V**?
Yes
Turn ignition switch to LOCK position.
Disconnect negative battery cable and wait for **more than 1 minute**.
Remove side walls.
Disconnect all SAS unit connectors.
Connect negative battery cable.
Turn ignition switch to ON position.
Measure voltage at DLC terminal SCN.
Is voltage **approximately 12 V**?
Yes
Repair or replace wiring harness between DLC terminal SCN and SAS unit connector terminal 2K.
No
Turn ignition switch to LOCK position. Disconnect negative battery cable.
No
Turn ignition switch to LOCK position.
Disconnect negative battery cable and wait for **more than 1 minute**.
Remove clock spring.
Remove glove compartment.
Disconnect passenger-side air bag module connector.
Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag)
Remove B-pillar lower trim (Vehicle with pre-tensioner seat belt)
Disconnect driver passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner belt)
Remove side walls.
Disconnect all SAS unit connectors.
Inspect wiring harness between DLC terminal SCN and SAS unit connector terminal 2K for following.
● Short to ground
● Open circuit
Is wiring harness between two terminals normal?
No
Yes
Connect all SAS unit connectors.
Connect clock spring connector.
Connect passenger-side air bag module connector.
Connect driver and passenger-side side air bag module connectors. (Vehicle with side air bag)
Connect driver and passenger-side pre-tensioner seal belt connector. (Vehicle with pre-tensioner seat belt.)
Connect negative battery cable.
Turn ignition switch to ON position, and perform present malfunction diagnosis.
Will DTC be displayed?
Yes
[Present malfunction]
Inspect DTC one by one starting from the smallest code, refering to DTC TABLE.
No
Using jumper wire, short DLC terminal SCN to body GND, turn ignition switch to ON position, and perform past malfunction diagnosis.
Will DTC be displayed?
No
Yes
Turn ignition switch to ON position.
Will DTC be displayed?
No
Yes
Disconnect end of jumper wire connected to body GND to open DLC terminal SCN, and turn ignition switch to ON position.
Shake related applicable wiring harnesses of applicable malfunctions.
Will DTC be displayed?
Note
● For DTCs that are same as DTCs displayed in past malfunction diagnosis, go to YES.
● For DTCs that are not displayed but were displayed in past malfunction diagnosis, go to NO.
Yes
No
[Past malfunction]
Inspect all DTCs starting from the smallest code.
However, if an inspection item for a part that has already been repaired appears during the inspection, finish the inspection for that DTC at that point in time, refering to DTC TABLE.
Perform past malfunction display cancellation, refering to FOREWORD.
Using jumper wire, short DLC terminal SCN to body GND, turn ignition switch to ON position.
Will DTC be displayed?
Yes
No
END

Post-repair Operation
Past malfunction code display cancellation

Caution
- **Connecting the wrong DLC terminal may possibly cause a malfunction. Carefully connect the specified terminal only.**

1. Turn the ignition switch to the ON position.
2. Wait until the air bag system warning light illuminates **approximately 6 seconds** and goes off.
3. Perform both the following steps alternately **three times** each at **0.5—1.5 seconds** intervals.
   (1) Use a jumper wire to short the DLC terminal SCN to body GND.
   (2) Disconnect the jumper wire from body GND.





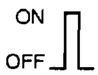
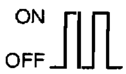
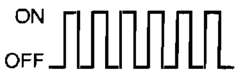
4. If the DTCs are displayed, wait until they disappear.
5. Using a jumper wire, short the DLC terminal SCN to body GND to verify that the DTCs of the past malfunction are not displayed.
   - If the DTCs are still displayed, perform the past malfunction display cancellation again.
6. Turn the ignition switch to the LOCK position.
7. Disconnect the jumper wire from the DLC.

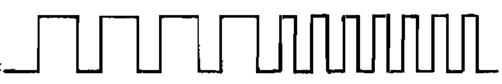
DTC TABLE

- DTCs are common for present and past malfunction diagnosis.

Note

- After a new SAS unit is installed, the air bag system warning light continuously flashes when the ignition switch is turned to the ON position. This is the deployment authorization standby code output by the SAS unit. Perform the deployment authorization and restore the system to an operational state.
- If the air bag system warning light does not illuminate or remains illuminated when the ignition switch is turned to the ON position, inspect and repair the air lighting circuit system of air bag system warning light and then confirm that the air bag system warning light is operational.

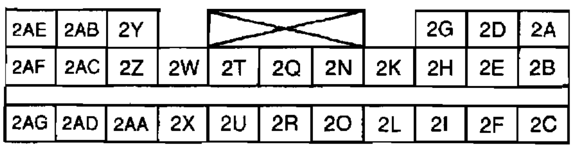
DTC	Output signal	Malfunction location
1		SAS unit connector poor connection
2		SAS unit
3		Power supply of SAS unit
6		Driver-side air bag module system
7		Passenger-side air bag module system
11		Driver-side pre-tensioner seat belt system
12		Passenger-side pre-tensioner seat belt system
22		Driver-side side air bag sensor system (Internal circuit abnormal)
25		Driver-side side air bag sensor system (Communication error)
26		Driver-side side air bag module system
32		Passenger-side side air bag sensor system (Internal circuit abnormal)
35		Passenger-side side air bag sensor system (Communication error)
37		Passenger-side side air bag module system
44		Short to ground in wiring harness between SAS unit and occupancy sensor

DTC	Output signal	Malfunction location
45	ON OFF 	Open circuit in wiring harness between SAS unit and occupancy sensor
46	ON OFF 	Passenger-side air bag cut-off indicator light system
47	ON OFF 	Occupancy sensor (Occupancy detection part)
48	ON OFF 	Occupancy sensor (Child restraint seat detection part)
91	ON OFF 	Air bag system warning light system
–	Continuously flashes	Deployment authorization standby code

DTC 1

DTC 1	SAS unit connector poor connection
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • There is no continuity between poor connection detector bar terminals of SAS unit. • SAS unit connector terminal 2AA is open. (Vehicles without side air bag)
POSSIBLE CAUSE	• Poor connection of any SAS unit connectors • Malfunction of any SAS unit connectors • Open or short circuit in wiring harness between SAS unit and ground • SAS unit malfunction

SAS UNIT CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY THAT ALL SAS unit CONNECTORS ARE CONNECTED WITH SAS unit** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove side walls. • Are all SAS unit connectors securely connected?	Yes	Go to next step.
		No	Reconnect connector properly.
2	**INSPECT ALL SAS UNIT CONNECTORS** • Remove clock spring. (See Section T) • Remove glove compartment. (Vehicle with passenger-side air bag) • Disconnect passenger-side air bag module connector. (Vehicle with passenger-side air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Disconnect all SAS unit connectors. • Are poor connection detector bars of all SAS unit connectors okay?	Yes	Go to next step.
		No	Replace wiring harnesses.
3	• Is vehicle equipped with side air bag?	Yes	**Present malfunction diagnosis:** • Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Go to next step.
4	**VERIFY THAT SAS unit CONNECTOR TERMINAL 2AA IS GROUNDED** • Inspect wiring harness between SAS unit connector terminal 2AA and ground for following. — Short to power supply — Open circuit • Is wiring harness okay?	Yes	**Present malfunction diagnosis:** • Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace wiring harness.

DTC 2

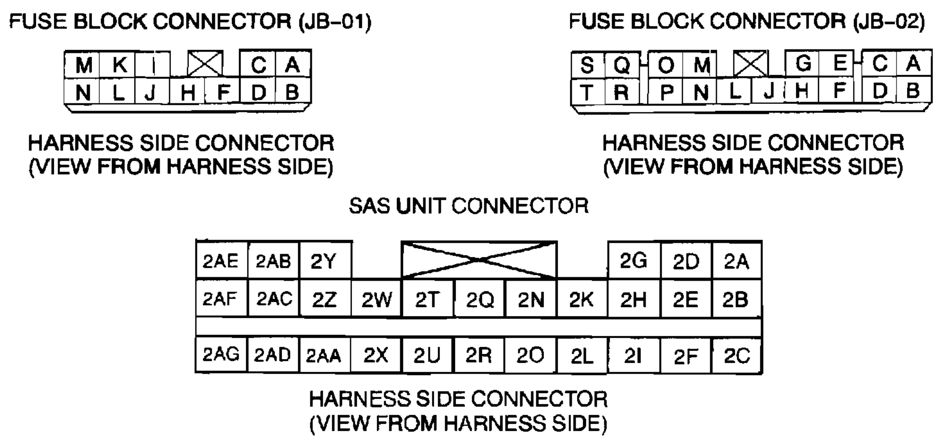
DTC 2	SAS unit
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in SAS unit inner circuit
POSSIBLE CAUSE	• SAS unit malfunction

Diagnostic procedure

ACTION
• Replace SAS unit. (See T-95 SAS UNIT REMOVAL/INSTALLATION)

DTC 3

DTC 3	Power supply of SAS unit
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Voltage detected at SAS unit terminals 2E and 2H is **9 V or less**.
POSSIBLE CAUSE	**Note** • DTC 3 is indicated when voltages in both of following wiring harnesses drop simultaneously. — Wiring harness between fuse block connector (JB–01) terminal D and SAS unit connector terminal 2E — Wiring harness between fuse block connector (JB–02) terminal F and SAS unit connector terminal 2H • Weak battery • Malfunction in wiring harness between battery and SAS unit • SAS unit malfunction

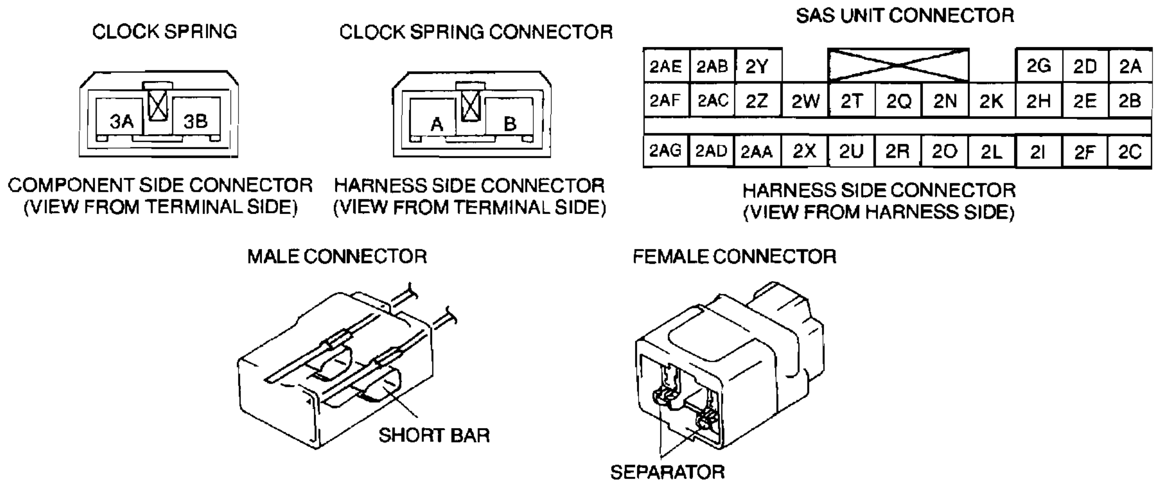


Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BATTERY** • Measure voltage of battery. • Is voltage **more than 9 V**?	Yes	Go to next step.
		No	Battery is weak. Inspect charge/discharge system. (See Section G)
2	**INSPECT WIRING HARNESS BETWEEN BATTERY AND FUSE BLOCK** • Remove driver-side front scuff plate. • Remove driver-side front side trim. • Remove fuse block without disconnecting connectors. • Turn ignition switch to ON position. • Measure voltage at terminals D (JB–01) and F (JB–02) of fuse block connectors. • Is voltage of at least either terminal **more than 9 V?**	Yes	Go to next step.
		No	Repair wiring harnesses.
3	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T–56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove clock spring. (See Section T) • Remove glove compartment. (Vehicle with passenger-side air bag) • Disconnect passenger-side air bag module connector. (Vehicle with passenger-side air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at SAS unit connector terminals 2E and 2H. • Is voltage of at least either terminal **more than 9 V?**	Yes	**Present malfunction diagnosis:** • Replace SAS unit. (See T–59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace wiring harnesses.

DTC 6

DTC 6	Driver-side air bag module system
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Abnormal resistance (other than **1.85—3.46** Ω) detected in driver-side air bag module circuit • Short circuit in wiring harness related SAS unit terminal 2D or 2G
POSSIBLE CAUSE	• Driver-side air bag module malfunction • Clock spring malfunction • Malfunction of connectors between clock spring and SAS unit • Open or short circuit in wiring harness between clock spring and SAS unit • SAS unit malfunction



Diagnostic procedure

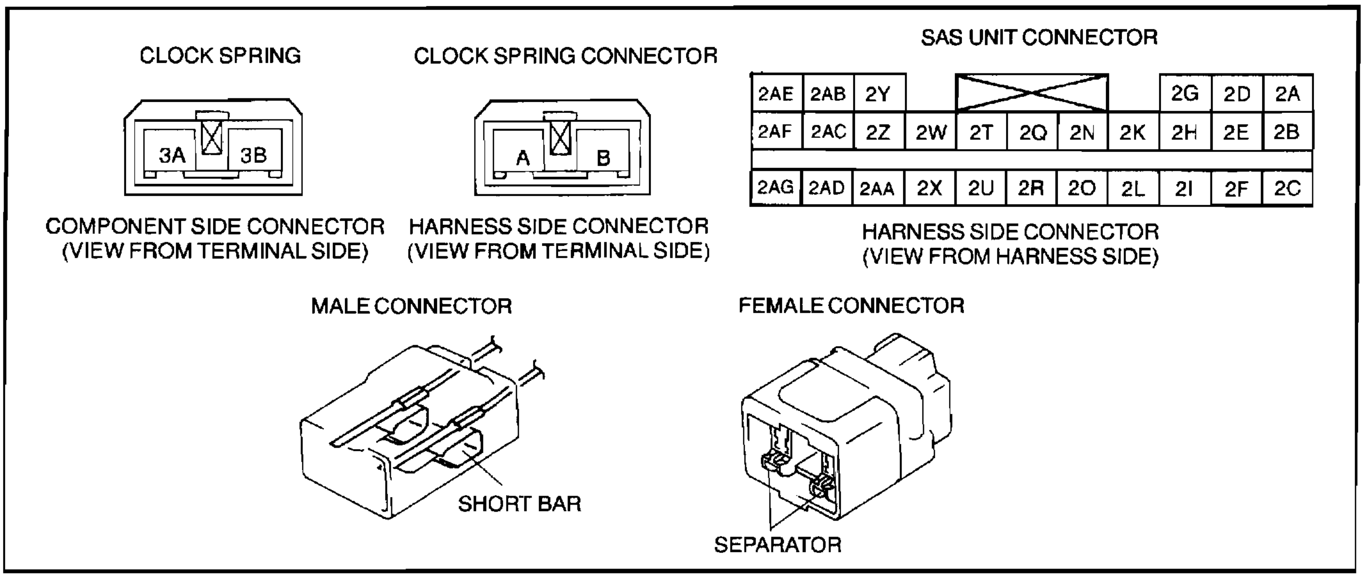
STEP	INSPECTION		ACTION
1	**INSPECT SEPARATOR* OF CLOCK SPRING** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove driver-side air bag module. (Vehicle with side air bag) (See Section T) • Is separator* of clock spring okay? *: Consists of two parts of female connector that separate short bar from terminal when connected to male connector.	Yes	**Present malfunction diagnosis:** • Go to next step. **Past malfunction diagnosis:** • Go to Step 6.
		No	Replace clock spring. (See Section T)

STEP	INSPECTION		ACTION
2	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE AIR BAG MODULE OR OTHER PARTS** • Connect leads of **SST** (Fuel And Thermometer checker) or apply **2 Ω** resistor to clock spring terminals 3A and 3B. • Set resistance of **SST** (Fuel And Thermometer checker) to **2 Ω**. • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 6 indicated?	Yes	Go to next step.
		No	Replace driver-side air bag module. (See Section T)
3	**INSPECT SEPARATOR* OF CLOCK SPRING CONNECTOR** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove clock spring. (See Section T) • Is separator* of clock spring connector okay? *: Consists of two parts of female connector that separate short bar from terminal when connected to male connector.	Yes	Go to next step.
		No	Replace wiring harness.
4	**VERIFY WHETHER MALFUNCTION IS IN CLOCK SPRING OR OTHER PARTS** • Connect leads of **SST** (Fuel And Thermometer checker) or apply **2 Ω** resistor to clock spring connector terminals A and B. • Set resistance of **SST** (Fuel And Thermometer checker) to **2 Ω**. • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 6 indicated?	Yes	Go to next step.
		No	Replace clock spring. (See Section T)
5	**INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS unit** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove glove compartment. (Vehicle with passenger-side air bag) • Disconnect passenger-side air bag module connector. (Vehicle with passenger-side air bag) • Disconnect driver and passenger-side side air bag module connectors. • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Inspect following wiring harness between SAS unit and clock spring terminals (harness side) for short to ground, short to power supply, and open circuit: — 2D and A — 2G and B • Are wiring harnesses okay?	Yes	Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace wiring harnesses.

STEP	INSPECTION		ACTION
6	**INSPECT SEPARATOR* OF CLOCK SPRING CONNECTOR** • Remove clock spring. (See Section T) • Is separator* of clock spring connector okay? *: Consists of two parts of female connector that separate short bar from terminal when connected to male connector.	Yes	Go to next step.
		No	Replace wiring harness.
7	**INSPECT CLOCK SPRING** • Inspect clock spring. (See Section T) • Is clock spring okay?	Yes	Go to next step.
		No	Replace clock spring. (See Section T)
8	**INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS UNIT** • Remove glove compartment. (Vehicle with passenger-side air bag) • Disconnect passenger-side air bag module connector. (Vehicle with passenger-side air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors • Remove side walls • Disconnect all SAS unit connectors. • Inspect following wiring harness between SAS unit and clock spring terminals (harness side) for short to ground, short to power supply, and open circuit: — 2D and A — 2G and B • Are wiring harnesses okay?	Yes	Replace driver-side air bag module. (See Section T)
		No	Replace wiring harnesses.

DTC 7

DTC 7	Passenger-side air bag module system
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** **Vehicle with passenger-side air bag** • Abnormal resistance (other than **1.63—2.71** Ω) detected in passenger-side air bag module circuit • Short circuit in wiring harness related SAS unit terminal 2Y or 2AB **Vehicle without passenger-side air bag** • Terminal 2AC of SAS unit connector is open
POSSIBLE CAUSE	**Vehicle with passenger-side air bag** • Passenger-side air bag module malfunction • Malfunction of connector between passenger-side air bag module and SAS unit • Open or short circuit in wiring harness between passenger-side air bag module and SAS unit • SAS unit malfunction **Vehicle without passenger-side air bag** • Malfunction of connector between SAS unit and ground • Open or short circuit in wiring harness between SAS unit and ground • SAS unit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is vehicle equipped with passenger-side air bag module?	Yes	Go to next step.
		No	Go to Step 5
2	**INSPECT SEPARATOR* OF PASSENGER-SIDE AIR BAG MODULE CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS**	Yes	**Present malfunction diagnosis:** • Go to next step. **Past malfunction diagnosis:** • Go to Step 4.
	• Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Is separator* of passenger-side air bag module connector okay? *: Consists of two parts of female connector that separate short bar from terminal when connected to male connector.	No	Replace wiring harness.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE OR OTHER PARTS** • Connect leads of **SST** (Fuel And Thermometer checker) or apply **2 Ω** resistor to passenger-side air bag module connector terminals A and B.	Yes	Go to next step.
	• Set resistance of **SST** (Fuel And Thermometer checker) to **2 Ω**. • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 7 indicated?	No	Replace passenger-side air bag module. (See Section T)

<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">4</td><td rowspan="2">INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG MODULE AND SAS UNIT
• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Remove clock spring.
(See Section T)
• Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag)
• Remove B-pillar lower trims.
• Disconnect driver and passenger-side pre-tensioner seat belt connectors.
• Remove side walls.
• Disconnect all SAS unit connectors.
• Inspect following wiring harness between SAS unit and passenger-side air bag module terminals (harness side) for short to ground, short to power supply, and open circuit:
— 2Y and A
— 2AB and B
• Are wiring harnesses okay?</td><td>Yes</td><td>Present malfunction diagnosis:
• Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)
Past malfunction diagnosis:
• Replace passenger-side air bag module.
(See Section T)</td></tr>
<tr><td>No</td><td>Replace wiring harnesses.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">VERIFY THAT TERMINAL 2AC OF SAS UNIT CONNECTOR IS GROUNED

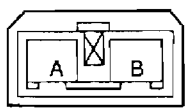
Warning
• Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS

• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Remove column cover.
• Disconnect clock spring connector.
• Remove B-pillar lower trims.
• Disconnect driver and passenger-side pre-tensioner seat belt connector.
• Remove side walls.
• Disconnect all SAS unit connectors.
• Inspect wiring harness between terminal 2AC of SAS unit and ground for following.
— Short to power supply
— Open circuit
• Is wiring harness okay?</td><td>Yes</td><td>Present malfunction diagnosis:
• Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)
Past malfunction diagnosis:
• Replace passenger-side air bag module.
(See Section T)</td></tr>
<tr><td>No</td><td>Replace wiring harnesses.</td></tr>
</table>

DTC 11

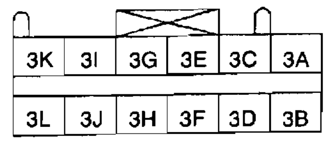
DTC 11	Driver-side pre-tensioner seat belt system
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Resistance detected between terminals 3A and 3C of SAS unit is other than **1.83—2.81Ω**. • Short circuit in wiring harness related terminal 3A or 3C of SAS unit
POSSIBLE CAUSE	• Drive-side pre-tensioner seat belt malfunction • Malfunction of connectors between driver-side pre-tensioner seat belt and SAS unit • Open or short circuit in wiring harness between driver-side pre-tensioner seat belt and SAS unit • SAS unit malfunction

DRIVER-SIDE PRE-TENSIONER
SEAT BELT CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

SAS UNIT CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

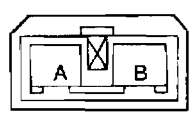
STEP	INSPECTION		ACTION
1	**INSPECT OF DRIVER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T–90 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove driver-side B-pillar lower trim. • Disconnect driver-side pre-tensioner seat belt connector. • Is there cracking or chipping in driver-side pre-tensioner seat belt connector?	Yes	Replace wiring harness.
		No	**Present malfunction diagnosis:** • Go to next step. **Past malfunction diagnosis:** • Go to Step 3.
2	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE PRE-TENSIONER SEAT BELT OR OTHER PARTS** • Connect leads of **SST** (Fuel And Thermometer checker) or apply **2 Ω** resistor to terminals A and B of driver-side pre-tensioner seat belt connector. • Set resistance of **SST** (Fuel And Thermometer checker) to **2 Ω.** • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 11 indicated?	Yes	Go to next step.
		No	Replace driver-side pre-tensioner seat belt. (See Section S)

STEP	INSPECTION		ACTION
3	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE PRE-TENSIONER SEAT BELT ANS SAS UNIT** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove clock spring. (See Section T) • Remove glove compartment. (Vehicle with passenger-side air bag) • Disconnect passenger-side air bag module connector. (Vehicle with passenger-side air bag) • Disconnect driver- and passenger-side side air bag module connectors. (Vehicle with side air bag) • Remove passenger-side B-pillar lower trim. • Disconnect passenger-side pre-tensioner seat belt connector. • Remove side walls. • Disconnect all SAS unit connectors. • Inspect wiring harness between terminal 3A of SAS unit connector and terminal A of driver-side pre-tensioner seat belt connector, and between terminal 3C of SAS unit connector and terminal B of driver-side pre-tensioner seat belt connector for following. — Short to ground — Short to power supply — Open circuit • Are wiring harnesses okay?	Yes	**Present malfunction diagnosis:** • Replace SAS unit. (See T–59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Replace passenger-side pre-tensioner seat belt. (See Section S)
		No	Replace wiring harness.

DTC 12

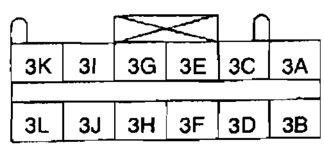
DTC 12	Passenger-side pre-tensioner seat belt system
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Resistance detected between terminals 3I and 3K of SAS unit is other than **1.83—2.81Ω.** • Short circuit in wiring harness related terminal 3I or 3K of SAS unit
POSSIBLE CAUSE	• Passenger-side pre-tensioner seat belt malfunction • Malfunction of connectors between passenger-side pre-tensioner seat belt and SAS unit • Open or short circuit in wiring harness between passenger-side pre-tensioner seat belt and SAS unit • SAS unit malfunction

PASSENGER-SIDEPRE-TENSIONER
SEAT BELT CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

SAS UNIT CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">INSPECT OF PASSEMGER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR

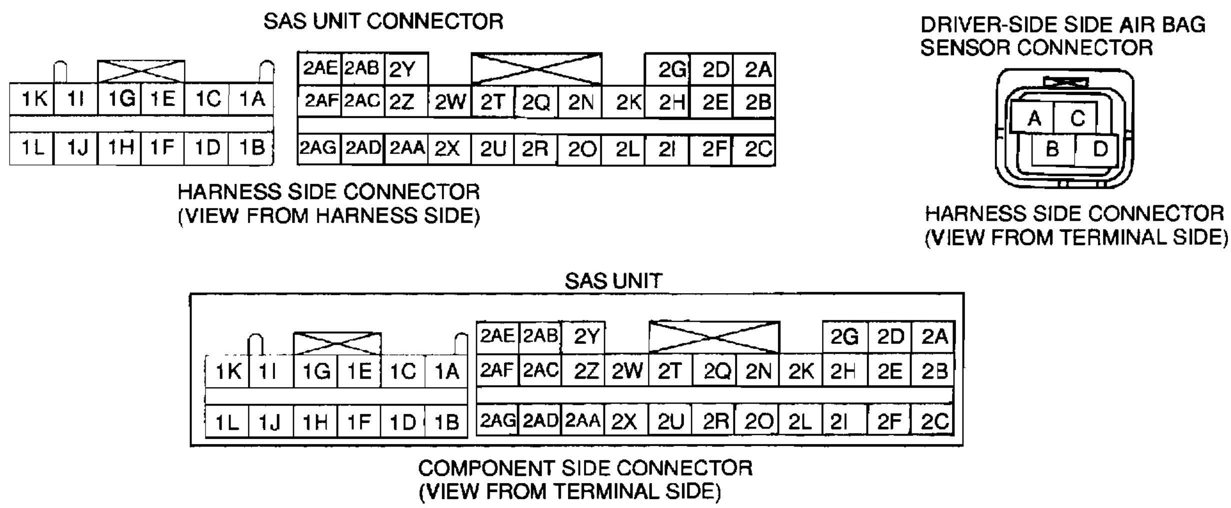
Warning
• Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS

• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Remove passenger-side B-pillar lower trim.
• Disconnect passenger-side pre-tensioner seat belt connector.
• Is there cracking or chipping in passenger-side pre-tensioner seat belt connector?</td><td>Yes</td><td>Replace wiring harness.</td></tr>
<tr><td>No</td><td>Present malfunction diagnosis:
• Go to next step.
Past malfunction diagnosis:
• Go to Step 3.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE PRE-TENSIONER SEAT BELT OR OTHER PARTS
• Connect leads of SST (Fuel And Thermometer checker) or apply 2 Ω resistor to terminals A and B of passenger-side pre-tensioner seat belt connector.
• Set resistance of SST (Fuel And Thermometer checker) to 2 Ω.
• Connect negative battery cable.
• Turn ignition switch to ON position.
• Is DTC 12 indicated?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Replace passenger-side pre-tensioner seat belt.
(See Section S)</td></tr>
</table>

STEP	INSPECTION		ACTION
3	**INSPECT WIRING HARNESS BETWEEN PASSENEGER-SIDE PRE-TENSIONER SEAT BELT AND SAS UNIT** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove clock spring. (See Section T) • Remove glove compartment. (Vehicle with passenger-side air bag) • Disconnect passenger-side air bag module connector. (Vehicle with passenger-side air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) • Remove passenger-side B-pillar lower trim. • Disconnect passenger-side pre-tensioner seat belt connector. • Remove side walls. • Disconnect all SAS unit connectors. • Inspect wiring harness between terminal 3I of SAS unit connector and terminal A of passenger-side pre-tensioner seat belt connector, and between terminal 3K of SAS unit connector and terminal B of passenger-side pre-tensioner seat belt connector for following. — Short to ground — Short to power supply — Open circuit • Are wiring harnesses okay?	Yes	**Present malfunction diagnosis:** • Replace SAS unit. (See T-56 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Replace passenger-side pre-tensioner seat belt. (See Section S)
		No	Replace wiring harness.

DTC 22

DTC 22	**Driver-side side air bag sensor system (Internal circuit abnormal)**
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** **Note** • For vehicles without side air bag, DTC 22, 25, 26, 32, 35, or 37 may be indicated concurrently. In such a case, perform only the smallest DTC troubleshooting among them. **Vehicle with side air bag** • Malfunction in wiring harness between driver-side side air bag sensor and SAS unit • Malfunction in driver-side side air bag sensor circuit **Vehicle without side air bag** • SAS unit connector terminal 2AA is open.
POSSIBLE CAUSE	**Vehicle with side air bag** • Driver-side side air bag sensor malfunction • Open or short circuit in wiring harness between driver-side side air bag sensor and SAS unit • SAS unit malfunction **Vehicle without side air bag** • Malfunction of connector between SAS unit and ground • Open or short circuit in wiring harness between SAS unit and ground • SAS unit malfunction



Diagnostic procedure

<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">• Is vehicle equipped with side air bag?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Go to Step 6.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR BAG SENSOR AND SAS UNIT

Warning
• Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS

• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Remove clock spring.
(See Section T)
• Remove glove compartment.
• Disconnect passenger-side air bag module connector.
• Disconnect driver and passenger-side side air bag module connectors.
• Remove B-pillar lower trims.
• Disconnect driver and passenger-side pre-tensioner seat belt connectors.
• Remove side walls.
• Disconnect all SAS unit connectors.
• Disconnect driver-side side air bag sensor connector.
• Inspect following wiring harness between SAS unit and driver-side side air bag sensor terminals (harness side) for short to ground, short to power supply, and open circuit:
— 1B and A
— 1D and B
— 1F and C
— 1E and D
• Are wiring harnesses okay?</td><td>Yes</td><td>Present malfunction diagnosis:
• Go to next step.
Past malfunction diagnosis:
• Replace driver-side side air bag sensor.
(See T-58 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)</td></tr>
<tr><td>No</td><td>Replace wiring harnesses.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">INSPECT GROUND CIRCUIT IN SAS UNIT
• Is there continuity between SAS unit terminals 1F and 2Q?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">INSPECT POWER SUPPLY CIRCUIT OF DRIVER-SIDE SIDE AIR BAG SENSOR
• Connect all SAS unit connectors.
• Connect clock spring connector.
• Connect passenger-side air bag module connector.
• Connect driver and passenger-side side air bag module connectors.
• Connect driver and passenger-side pre-tensioner seat belt connectors.
• Connect negative battery cable.
• Turn ignition switch to ON position.
• Measure voltage at driver-side side air bag sensor connector terminal A.
• Is voltage approximately 5 V?</td><td>Yes</td><td>Replace driver-side side air bag sensor, then go to next step.
(See T-58 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)</td></tr>
<tr><td>No</td><td>Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)</td></tr>
</table>

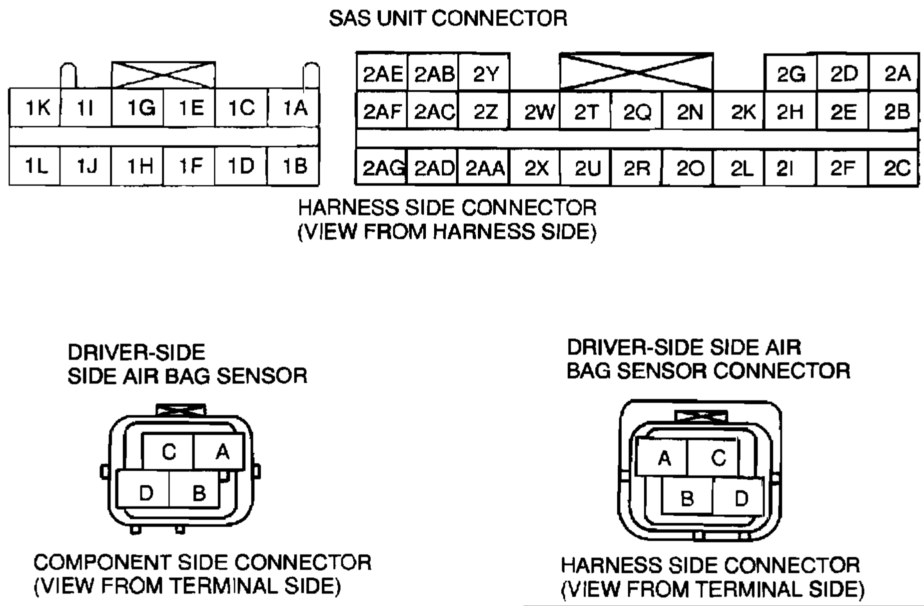
<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">VERIFY WHETHER SAS UNIT IS MALFUNCTIONING OR NOT
• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Connect driver-side side air bag sensor connector.
• Connect negative battery cable.
• Turn ignition switch to ON position.
• Is DTC 22 indicated?</td><td>Yes</td><td>Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)</td></tr>
<tr><td>No</td><td>Troubleshooting completed.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">VERIFY THAT SAS UNIT CONNECTOR TERMINAL 2AA IS GROUNDED

Warning
• Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS

• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Remove clock spring.
(See Section T)
• Remove glove compartment.
• Disconnect passenger-side air bag module connector.
• Disconnect driver and passenger-side pre-tensioner seat belt connectors.
• Remove B-pillar lower trims.
• Remove side walls.
• Disconnect all SAS unit connectors.
• Inspect wiring harness between SAS unit connector terminal 2AA and ground for following.
— Short to power supply
— Open circuit
• Is wiring harness okay?</td><td>Yes</td><td>Present malfunction diagnosis:
• Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)
Past malfunction diagnosis:
• Troubleshooting completed.</td></tr>
<tr><td>No</td><td>Replace wiring harness.</td></tr>
</table>

DTC 25

DTC 25	**Driver-side side air bag sensor system (Communication error)**
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** **Note** • For vehicles without side air bag, DTC 22, 25, 26, 32, 35, or 37 may be indicated concurrently. In such a case, perform only the smallest DTC troubleshooting among them. **Vehicle with side air bag** • Malfunction in wiring harness between driver-side side air bag sensor and SAS unit • Malfunction in driver-side side air bag sensor circuit **Vehicle without side air bag** • SAS unit connector terminal 2AA is open.
POSSIBLE CAUSE	**Vehicle with side air bag** • Driver-side side air bag sensor malfunction • Open or short circuit in wiring harness between driver-side side air bag sensor and SAS unit • SAS unit malfunction **Vehicle without side air bag** • Malfunction of connector between SAS unit and ground • Open or short circuit in wiring harness between SAS unit and ground • SAS unit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is vehicle equipped with side air bag?	Yes	Go to next step.
		No	Go to Step 5.

STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR BAG SENSOR AND SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Disconnect driver-side side air bag sensor connector. • Inspect following wiring harness between SAS unit and driver-side side air bag sensor terminals (harness side) for short to ground, short to power supply, and open circuit: — 1B and A — 1D and B — 1F and C — 1E and D • Are wiring harnesses okay?	Yes	**Present malfunction diagnosis:** • Go to next step. **Past malfunction diagnosis:** • Replace driver-side side air bag sensor. (See T-58 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
		No	Replace wiring harnesses.
3	**INSPECT DRIVER-SIDE SIDE AIR BAGSENSOR** • Measure resistance between driver-side side air bag sensor terminal C and D? • Is resistance **approximately 1kΩ?**	Yes	Go to next step.
		No	Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
4	**VERIFY WHETHER DRIVER-SIDE SIDE AIR BAG SENSOR IS MALFUNCTIONING OR NOT** • Connect all SAS unit connectors. • Connect driver-side side air bag sensor connector. • Connect clock spring connector. • Connect passenger-side air bag module connector. • Connect driver- and passenger-side side air bag module connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. • Connect negative battery cable. • Turn ignition switch to **ON** position. • Is DTC 25 indicated?	Yes	Replace driver-side side air bag sensor, then go to next step. (See T-58 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
		No	Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION)

<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">VERIFY THAT SAS UNIT CONNECTOR TERMINAL 2AA IS GROUNDED

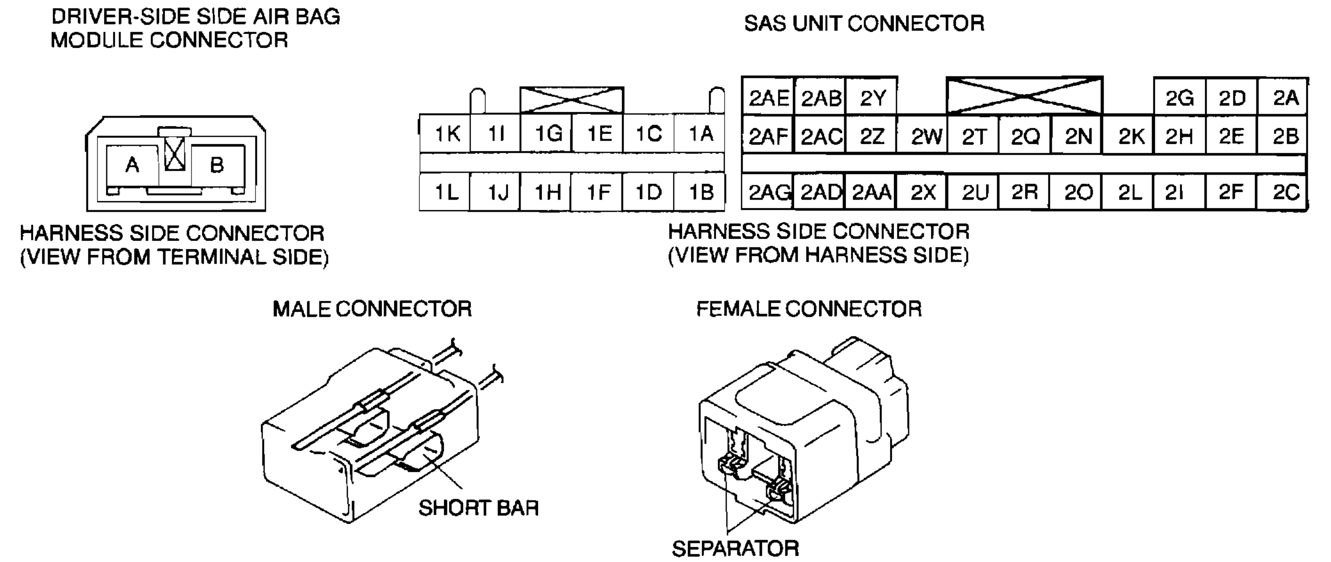
Warning
• Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS

• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Remove clock spring.
(See Section T)
• Remove glove compartment.
• Remove B-pillar lower trims.
• Disconnect driver and passenger-side pre-tensioner seat belt connectors.
• Disconnect passenger-side air bag module connector.
• Remove side walls.
• Disconnect all SAS unit connectors.
• Inspect wiring harness between SAS unit connector terminal 2AA and ground for following.
— Short to power supply
— Open circuit
• Is wiring harness okay?</td><td>Yes</td><td>Present malfunction diagnosis:
• Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)
Past malfunction diagnosis:
• Troubleshooting completed.</td></tr>
<tr><td>No</td><td>Replace wiring harness.</td></tr>
</table>

DTC 26

DTC 26	**Driver-side side air bag module system**
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** **Note** • For vehicles without side air bag, DTC 22, 25, 26, 32, 35, or 37 may be indicated concurrently. In such a case, perform only the smallest DTC troubleshooting among them. **Vehicle with side air bag** • Abnormal resistance (other than 1.63—2.71 Ω) detected in driver-side side air bag module circuit • Short circuit in wiring harness related SAS unit terminal 1A or 1C **Vehicle without side air bag** • SAS unit connector terminal 2AA is open.

POSSIBLE CAUSE	**Vehicle with side air bag** • Driver-side side air bag module malfunction • Malfunction of connector between driver-side side air bag module and SAS unit • Open or short circuit in wiring harness between driver-side side air bag module and SAS unit • SAS unit malfunction **Vehicle without side air bag** • Malfunction of connector between SAS unit and ground • Open or short circuit in wiring harness between SAS unit and ground • SAS unit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is vehicle equipped with side air bag?	Yes	Go to next step.
		No	Go to Step 5.
2	**INSPECT SEPARATOR* OF DRIVER-SIDE SIDE AIR BAG MODULE CONNECTOR** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components.** See **T–56 SERVICE WARNINGS**	Yes	**Present malfunction diagnosis:** • Go to next step. **Past malfunction diagnosis:** • Go to Step 4.
	• Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Disconnect driver-side side air bag module connector. • Is separator* of driver-side side air bag module connector okay? *: Consists of two parts of female connector that separate short bar from terminal when connected to male connector.	No	Replace wiring harness.

STEP	INSPECTION		ACTION
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE SIDE AIR BAG MODULE OR OTHER PARTS** • Connect leads of **SST** (Fuel And Thermometer checker) or apply **2 Ω** resistor to driver-side side air bag module connector terminals A and B. • Set resistance of **SST** (Fuel And Thermometer checker) to **2 Ω**. • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 26 indicated?	Yes	Go to next step.
		No	Replace driver-side side air bag module. (See Section T)
4	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR BAG MODULE AND SAS UNIT** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect passenger-side side air bag module connector. • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Inspect following wiring harness between SAS unit and driver-side side air bag module terminals (harness side) for short to ground, short to power supply, and open circuit : — 1A and A — 1C and B • Are wiring harnesses okay?	Yes	**Present malfunction diagnosis:** • Remove SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Replace driver-side side air bag module. (See Section T)
		No	Replace wiring harnesses.

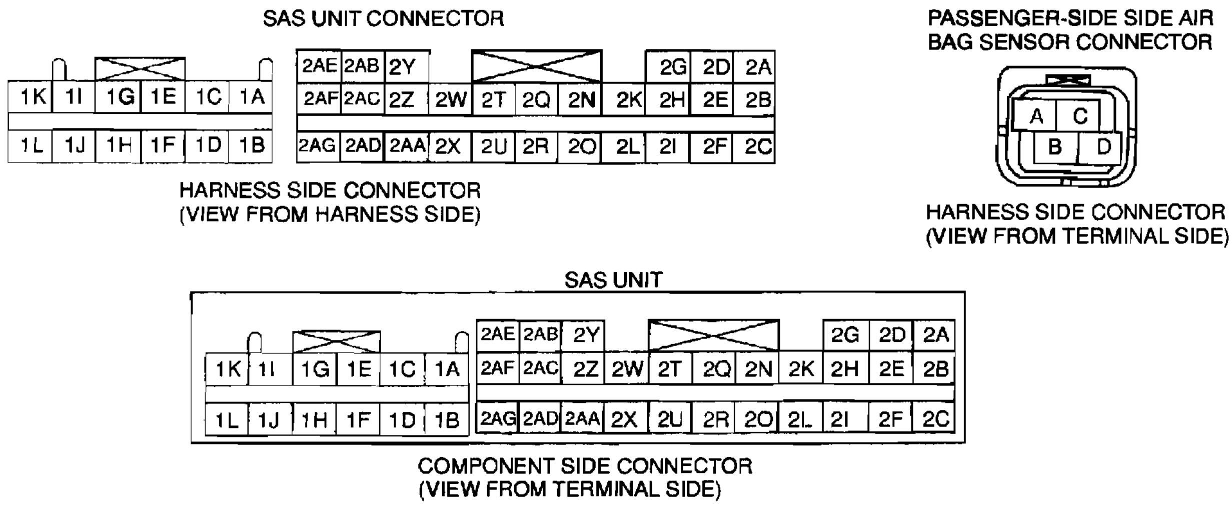
<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">VERIFY THAT SAS UNIT CONNECTOR TERMINAL 2AA IS GROUNDED
Warning
• Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-90 SERVICE WARNINGS

• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Remove clock spring.
(See Section T)
• Remove glove compartment.
• Disconnect passenger-side air bag module connector.
• Remove B-pillar lower trims.
• Disconnect driver and passenger-side pre-tensioner seat belt connectors.
• Remove side walls.
• Disconnect all SAS unit connectors.
• Inspect wiring harness between SAS unit connector terminal 2AA and ground for following.
— Short to power supply
— Open circuit
• Is wiring harness okay?</td><td>Yes</td><td>Present malfunction diagnosis:
• Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)
Past malfunction diagnosis:
• Troubleshooting completed.</td></tr>
<tr><td>No</td><td>Replace wiring harness.</td></tr>
</table>

DTC 32

DTC 32	Passenger-side side air bag sensor system (Internal circuit abnormal)
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** **Note** • For vehicles without side air bag, DTC 22, 25, 26, 32, 35, or 37 may be indicated concurrently. In such a case, perform only the smallest DTC troubleshooting among them. **Vehicle with side air bag** • Malfunction in wiring harness between passenger-side side air bag sensor and SAS unit • Malfunction in passenger-side side air bag sensor circuit **Vehicle without side air bag** • SAS unit connector terminal 2AA is open.

POSSIBLE CAUSE	**Vehicle with side air bag** • Passenger-side side air bag sensor malfunction • Open or short circuit in wiring harness between passenger-side side air bag sensor and SAS unit • SAS unit malfunction **Vehicle without side air bag** • Malfunction of connector between SAS unit and ground • Open or short circuit in wiring harness between SAS unit and ground • SAS unit malfunction



Diagnostic procedure

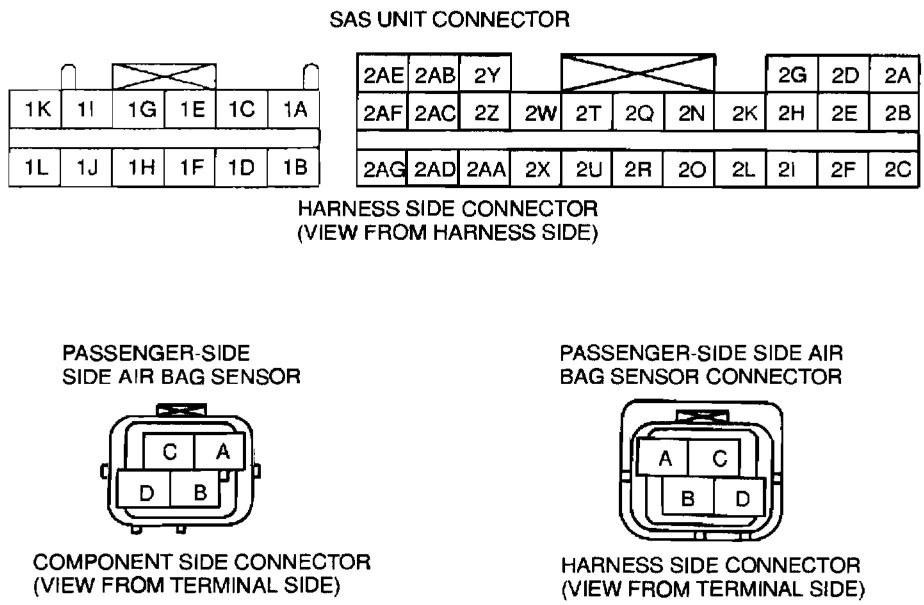
STEP	INSPECTION		ACTION
1	• Is vehicle equipped with side air bag?	Yes	Go to next step.
		No	Go to Step 6.
2	**INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE SIDE AIR BAG SENSOR AND SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Disconnect passenger-side side air bag sensor connector. • Inspect following wiring harness between SAS unit and passenger-side side air bag sensor terminals (harness side) for short to ground, short to power supply, and open circuit: — 1L and A — 1J and B — 1H and C — 1G and D • Are wiring harnesses okay?	Yes	**Present malfunction diagnosis:** • Go to next step. **Past malfunction diagnosis:** • Replace passenger-side side air bag sensor. (See T-58 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
		No	Replace wiring harnesses.
3	**INSPECT GROUND CIRCUIT IN SAS UNIT** • Is there continuity between SAS unit terminals 1H and 2Q?	Yes	Go to next step.
		No	Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
4	**INSPECT POWER SUPPLY CIRCUIT OF PASSENGER-SIDE SIDE AIR BAG SENSOR** • Connect all SAS unit connectors. • Connect clock spring connector. • Connect passenger-side air bag module connector. • Connect driver and passenger-side side air bag module connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at passenger-side side air bag sensor connector terminal A. • Is voltage **approximately 5 V**?	Yes	Replace passenger-side side air bag sensor, then go to next step. (See T-58 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
		No	Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION)

STEP	INSPECTION		ACTION
5	**VERIFY WHETHER SAS UNIT IS MALFUNCTIONING OR NOT** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Connect passenger-side side air bag sensor connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 32 indicated?	Yes	Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
		No	Troubleshooting completed.
6	**VERIFY THAT SAS UNIT CONNECTOR TERMINAL 2AA IS GROUNDED** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove clock spring. (See Section T) • Remove glove compartment. • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Disconnect passenger-side air bag module connector. • Remove side walls. • Disconnect all SAS unit connectors. • Inspect wiring harness between SAS unit connector terminal 2AA and ground for following. — Short to power supply — Open circuit • Is wiring harness okay?	Yes	**Present malfunction diagnosis:** • Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace wiring harness.

DTC 35

DTC 35	Passenger-side side air bag sensor system (Communication error)
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** **Note** • For vehicles without side air bag, DTC 22, 25, 26, 32, 35, or 37 may be indicated concurrently. In such a case, perform only the smallest DTC troubleshooting among them. **Vehicle with side air bag** • Malfunction in wiring harness between passenger-side side air bag sensor and SAS unit **Vehicle without side air bag** • SAS unit connector terminal 2AA is open.

POSSIBLE CAUSE	**Vehicle with side air bag** • Passenger-side side air bag sensor malfunction • Open or short circuit in wiring harness between passenger-side side air bag sensor and SAS unit • SAS unit malfunction **Vehicle without side air bag** • Malfunction of connector between SAS unit and ground • Open or short circuit in wiring harness between SAS unit and ground • SAS unit malfunction



Diagnostic procedure

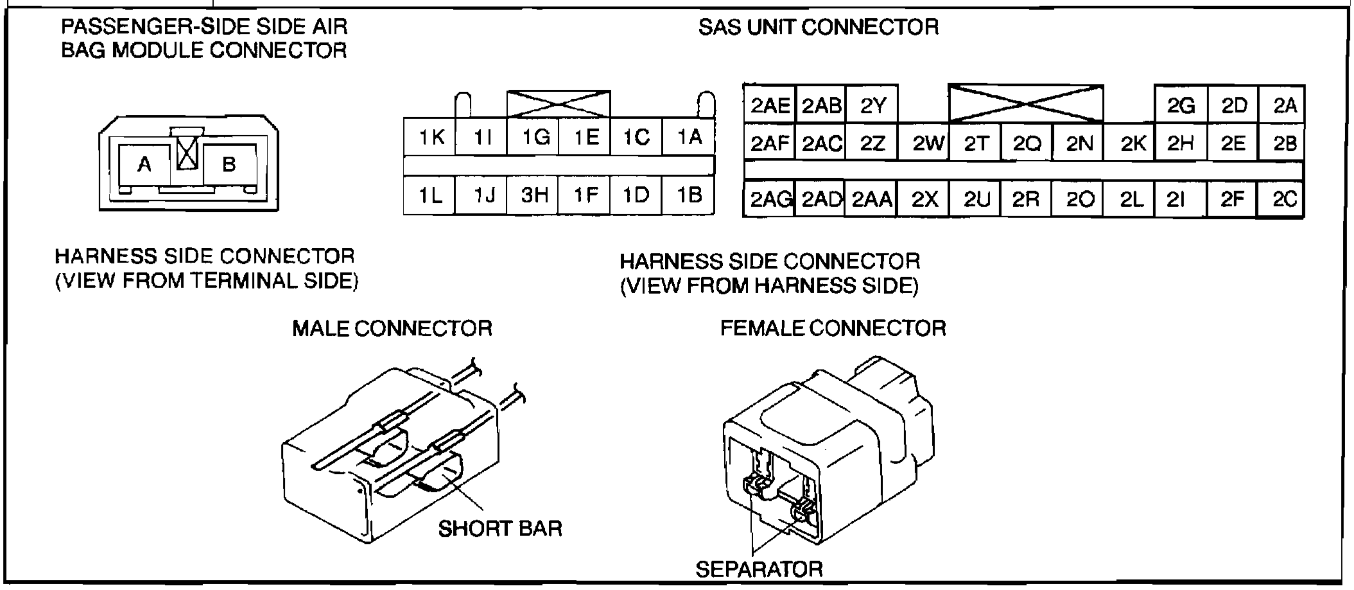
STEP	INSPECTION		ACTION
1	• Is vehicle equipped with side air bag?	Yes	Go to next step.
		No	Go to Step 5.

STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE SIDE AIR BAG SENSOR AND SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Disconnect passenger-side side air bag sensor connector. • Inspect following wiring harness between SAS unit and passenger-side side air bag sensor terminals (harness side) for short to ground, short to power supply, and open circuit: — 1L and A — 1J and B — 1H and C — 1G and D • Are wiring harnesses okay?	Yes	**Present malfunction diagnosis:** • Go to next step. **Past malfunction diagnosis:** • Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace wiring harnesses.
3	**INSPECT PASSENGER-SIDE SIDE AIR BAG SENSOR** • Measure resistance between passenger-side side air bag sensor terminals C and **D.** • Is resistance **approximately 1 kΩ**?	Yes	Replace SAS unit, then go to next step. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace passenger-side side air bag sensor. (See T-58 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)

STEP	INSPECTION		ACTION
4	**VERIFY WHETHER PASSENGER-SIDE SIDE AIR BAG SENSOR IS MALFUNCTIONING OR NOT** • Connect all SAS unit connectors. • Connect passenger-side side air bag sensor connector. • Remove clock spring. (See Section T) • Connect passenger-side air bag module connector. • Connect driver and passenger-side side air bag module connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 35 indicated?	Yes	Replace passenger-side side air bag sensor. (See T-58 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
		No	Troubleshooting completed.
5	**VERIFY THAT SAS unit CONNECTOR TERMINAL 2AA IS GROUNDED** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) • Remove side walls. • Disconnect all SAS unit connectors. • Inspect wiring harness between SAS unit connector terminal 2AA and ground for following. — Short to power supply — Open circuit • Is wiring harness okay?	Yes	**Present malfunction diagnosis:** • Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace wiring harness.

DTC 37

DTC 37	Passenger-side side air bag module system
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** **Note** • For vehicles without side air bag, DTC 22, 25, 26, 32, 35, or 37 may be indicated concurrently. In such a case, perform only the smallest DTC troubleshooting among them. **Vehicle with side air bag** • Abnormal resistance (other than **1.63—2.71** Ω) detected in passenger-side side air bag module circuit • Short circuit in wiring harness related SAS unit terminal 1I or 1K **Vehicle without side air bag** • SAS unit connector terminal 2AA is open.
POSSIBLE CAUSE	**Vehicle with side air bag** • Passenger-side side air bag module malfunction • Malfunction of connector between passenger-side side air bag module and SAS unit • Open or short circuit in wiring harness between passenger-side side air bag module and SAS unit • SAS unit malfunction **Vehicle without side air bag** • Malfunction of connector between SAS unit and ground • Open or short circuit in wiring harness between SAS unit and ground • SAS unit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is vehicle equipped with side air bag?	Yes	Go to next step.
		No	Go to Step 5.

<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">2</td><td rowspan="2">INSPECT SEPARATOR* OF PASSENGER-SIDE SIDE AIR BAG MODULE CONNECTOR

Warning
• Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS

• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Disconnect passenger-side side air bag module connector.
• Is separator* of passenger-side side air bag module connector okay?

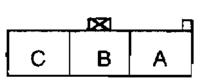
*: Consists of two parts of female connector that separate short bar from terminal when connected to male connector.</td><td>Yes</td><td>Present malfunction diagnosis:
• Go to next step.
Past malfunction diagnosis:
• Go to Step 4.</td></tr>
<tr><td>No</td><td>Replace wiring harness.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE SIDE AIR BAG MODULE OR OTHER PARTS
• Connect leads of SST (Fuel And Thermometer checker) or apply 2 Ω resistor to passenger-side side air bag module connector terminals A and B.
• Set resistance of SST (Fuel And Thermometer checker) to 2 Ω.
• Connect negative battery cable.
• Turn ignition switch to ON position.
• Is DTC 37 indicated?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Replace passenger-side side air bag module.
(See Section T)</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE SIDE AIR BAG MODULE AND SAS UNIT
• Turn ignition switch to LOCK position.
• Disconnect negative battery cable and wait for more than 1 minute.
• Remove clock spring.
(See Section T)
• Remove glove compartment.
• Disconnect passenger-side air bag module connector.
• Disconnect driver-side side air bag module connector.
• Remove B-pillar lower trims.
• Disconnect driver and passenger-side pre-tensioner seat belt connectors.
• Remove side walls.
• Disconnect all SAS unit connectors.
• Inspect following wiring harness between SAS unit and passenger-side side air bag module terminals (harness side) for short to ground, short to power supply, and open circuit:
— 1I and A
— 1K and B
• Are wiring harnesses okay?</td><td>Yes</td><td>Present malfunction diagnosis:
• Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)
Past malfunction diagnosis:
• Replace passenger-side side air bag module.
(See Section T)</td></tr>
<tr><td>No</td><td>Replace wiring harnesses.</td></tr>
</table>

STEP	INSPECTION		ACTION
5	**VERIFY THAT SAS UNIT CONNECTOR TERMINAL 2AA IS GROUNDED** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Inspect wiring harness between SAS unit connector terminal 2AA and ground for following. — Short to power supply — Open circuit • Is wiring harness okay?	Yes	**Present malfunction diagnosis:** • Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** • Troubleshooting completed.
		No	Replace wiring harness.

DTC 44

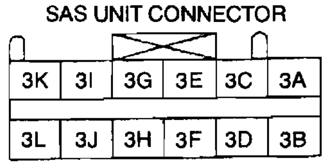
DTC 44	**Short to ground in wiring harness between SAS unit and occupancy sensor**
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Terminal 3H of SAS unit connector is shorted to ground.
POSSIBLE CAUSE	• Occupancy sensor malfunction • Short to ground in wiring harness between SAS unit and occupancy sensor • SAS unit malfunction

OCCUPANCY SENSOR CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

SAS UNIT CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

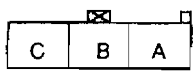
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**Note** • If occupancy sensor connector (3 terminals) is located on bottom of passenger's seat, vehicle has passenger-side air bag cut-off function. • Is vehicle equipped with passenger-side air bag cut-off function?	Yes	Go to next step.
		No	**Present malfunction diagnosis:** Replace SAS unit. (See T–59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** Troubleshooting completed.
2	**INSPECT WIRING HARNESS BETWEEN OCCUPANCY SENSOR AND SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T–56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) • Remove B-pillar lower trim. • Disconnect driver and passenger-side pre-tensioner seat belt connector. • Remove side walls. • Disconnect all SAS unit connectors. • Disconnect occupancy sensor connector. • Inspect wiring harness between terminal B of occupancy sensor connector and terminal 3H of SAS unit connector for following. — Short to ground • Is wiring harness okay?	Yes	**Present malfunction diagnosis:** Go to next step. **Past malfunction diagnosis:** Troubleshooting completed.
		No	Replace wiring harness.
3	**VERIFY WHETHER MALFUNCTION IS IN OCCUPANCY SENSOR OR SAS UNIT** • Connect all SAS unit connectors. • Connect clock spring connector. • Connect passenger-side side bag sensor connector. (Vehicle with side air bag) • Connect driver-side air bag module connector. • Connect driver- and passenger-side pre-tensioner seat belt connectors. • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 44ndicated?	Yes	Replace SAS unit. (See T–59 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace seat cushion. (See Section S)

DTC 45

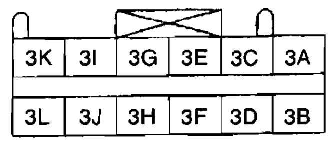
DTC 45	**Open circuit in wiring harness between SAS unit and occupancy sensor**
DETECTION CONDITION	**Warning** **• Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in wiring harness between SAS unit and occupancy sensor
POSSIBLE CAUSE	• Occupancy sensor malfunction • Open circuit in wiring harness between SAS unit and occupancy sensor • Open circuit in wiring harness between occupancy sensor and ground • Open circuit in wiring harness between METER 7.5 A fuse and occupancy sensor • SAS unit malfunction

OCCUPANCY SENSOR CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

SAS UNIT CONNECTOR



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

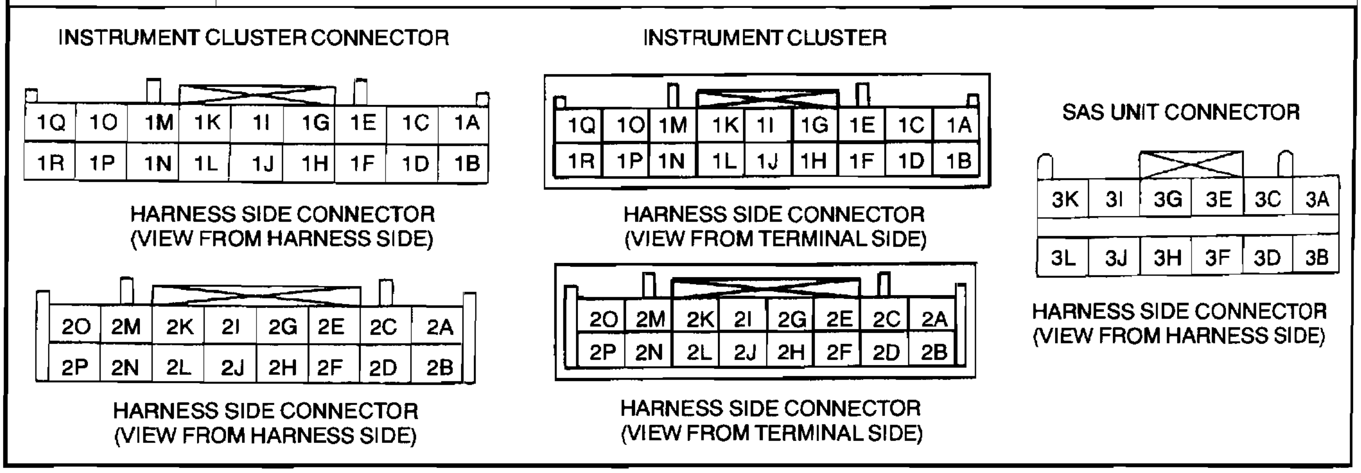
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**Note** • If occupancy sensor connector (3 terminals) is located on bottom of passenger's seat, vehicle has passenger-side air bag cut-off function. • Is vehicle equipped with passenger-side air bag cut-off function?	Yes	Go to next step.
		No	**Present malfunction diagnosis:** Replace SAS unit. (See T–59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** Troubleshooting completed.

STEP	INSPECTION		ACTION
2	**INSPECT FOR CONTINUITY BETWEEN OCCUPANCY SENSOR AND SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules, and pre-tensioner seat belts which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T–56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. • Remove B-pillar lower trim. • Disconnect driver and passerger-side pre-tensioner seat belt connector. • Remove side walls. • Disconnect all SAS unit connectors. • Disconnect occupancy sensor connector. • Is there continuity between terminal B of occupancy sensor and terminal 3H of SAS unit?	Yes	Go to next step.
		No	Replace wiring harness.
3	**INSPECT FOR CONTINUITY BETWEEN OCCUPANCY SENSOR AND GROUND** • Is there continuity between terminal C of occupancy sensor connector and ground?	Yes	Go to next step.
		No	Replace wiring harness.
4	**INSPECT FOR CONTINUITY BETWEEN METER 10 A FUSE AND OCCUPANCY SENSOR** • Connect negative battery cable. • Measure voltage at terminal A of occupancy sensor connector. • Is voltage **more than 9 V**?	Yes	**Present malfunction diagnosis:** Turn ignition switch to LOCK position and disconnect negative battery cable. Then go to next step. **Past malfunction diagnosis:** Troubleshooting completed.
		No	Replace wiring harness.
5	**VERIFY WHETHER MALFUNCTION IS IN OCCUPANCY SENSOR OR SAS UNIT** • Connect all SAS unit connectors. • Connect clock spring connector. • Connect passenger-side air bag module connector. • Connect passenger-side side bag sensor connector. (Vehicle with side air bag) • Connect driver and passenger-side pre-tensioner seat belt connectors. • Short terminal B of occupancy sensor connector to ground. • Connect negative battery cable. • Turn ignition switch to ON position. • Is DTC 45 indicated?	Yes	Replace SAS unit. (See T–59 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace seat cushion. (See Section S)

DTC 46

DTC 46	Passenger-side air bag cut-off indicator light system
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in passenger-side air bag cut-off indicator light circuit
POSSIBLE CAUSE	• Passenger-side air bag cut-off indicator light bulb malfunction • Open or short circuit in wiring harness between SAS unit and instrument cluster • Open circuit in wiring harness between METER 7.5 A fuse and instrument cluster • Instrument cluster malfunction • SAS unit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**Note** • If occupancy sensor connector (3 terminals) is located on bottom of passenger's seat, vehicle has passenger-side air bag cut-off function. • Is vehicle equipped with passenger-side air bag cut-off function?	Yes	**Present malfunction diagnosis:** Go to next step. **Past malfunction diagnosis:** Go to Step 4.
		No	**Present malfunction diagnosis:** Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION) **Past malfunction diagnosis:** Troubleshooting completed.
2	**INSPECT OPERATION OF PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT** • Turn ignition switch to LOCK position and wait for **more than 1 minute**. • Turn ignition switch to ON position. • Does passenger-side air bag cut-off indicator light illuminate?	Yes	Go to next step.
		No	Go to Step 6.
3	**INSPECT OPERATION OF PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT** • Without child restraint seat on passenger's seat, does passenger-side air bag cut-off indicator light go off after **approximately 6 seconds**?	Yes	Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
		No	Go to next step.

<table>
<tr><th>STEP</th><th colspan="2">INSPECTION</th><th>ACTION</th></tr>
<tr><td rowspan="2">4</td><td rowspan="2">INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER ANS SAS UNIT

Warning
● Handling air bag system components improperly can accidentally deploy air bag modules, and pre-tensioner seat belts which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS

● Turn ignition switch to LOCK position.
● Disconnect negative battery cable and wait for more than 1 minute.
● Remove clock spring.
(See Section T)
● Remove glove compartment.
● Disconnect passenger-side air bag module connector.
● Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag)
● Remove B-pillar lower trim.
● Disconnect drive- and passenger-side pre-tensioner seat belt connectors.
● Remove side walls.
● Disconnect all SAS unit connectors.
● Connect negative battery cable.
● Turn ignition switch to ON position.
● Measure voltage at 3G of SAS unit connector.
● Is voltage more than 9V?</td><td>Yes</td><td>Present malfunction diagnosis:
Replace SAS unit.
(See T-59 SAS UNIT REMOVAL/INSTALLATION)
Past malfunction diagnosis:
Go to next step.</td></tr>
<tr><td>No</td><td>Go to next step.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND SAS UNIT
● Turn ignition switch to LOCK position.
● Disconnect negative battery cable.
● Remove instrument cluster.
● Inspect wiring harness between terminal 2F of instrument cluster connector and terminal 3G of SAS unit connector for following.
— Short to ground
● Is wiring harness okay?</td><td>Yes</td><td>Present malfunction diagnosis:
Replace instrument cluster.
Past malfunction diagnosis:
Go to next step.</td></tr>
<tr><td>No</td><td>Replace wiring harness.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">INSPECT PASENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT BULB
● Turn ignition switch to LOCK position.
● Disconnect negative battery cable and wait for more than 1 minutes.
● Remove instrument cluster.
● Is passenger-side air bag cut-off indicator light bulb okay?</td><td>Yes</td><td>Reinstall passenger-side air bag cut-off indicator light bulb, then go to next step.</td></tr>
<tr><td>No</td><td>Replace passenger-side air bag cut-off indicator light bulb.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">INSPECT INSTRUMENT CLUSTER
● Is there continuity between terminals 1J and 2F of instrument cluster?</td><td>Yes</td><td>Go to next step.</td></tr>
<tr><td>No</td><td>Replace instrument cluster.</td></tr>
</table>

STEP	INSPECTION		ACTION
8	**INSPECT FOR CONTINUITY BETWEEN METER 7.5 A FUSE AND INSTRUMENT CLUSTER** • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at terminal 1J of instrument cluster connector. • Is voltage **more than 9V**?	Yes	Go to next step.
		No	Replace wiring harness.
9	**INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules, and pre-tensioner seat belts which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Inspect wiring harness between terminal 2F of instrument cluster and terminal 3G of SAS unit connector for following. — Short to power supply — Open circuit • Is wiring harness okay?	Yes	**Present malfunction diagnosis:** Replace SAS unit. (See T-59 SAS UNIT REMOVAL/INSTALLATION) **Part malfunction diagnosis:** Troubleshooting completed.
		No	Replace wiring harness.

DTC 47

DTC 47	Occupancy sensor (occupancy detection part)
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow Inspection procedure.** • Malfunction in occupancy sensor circuit

Diagnostic procedure

ACTION
Replace seat cushion. (See Section S)

DTC 48

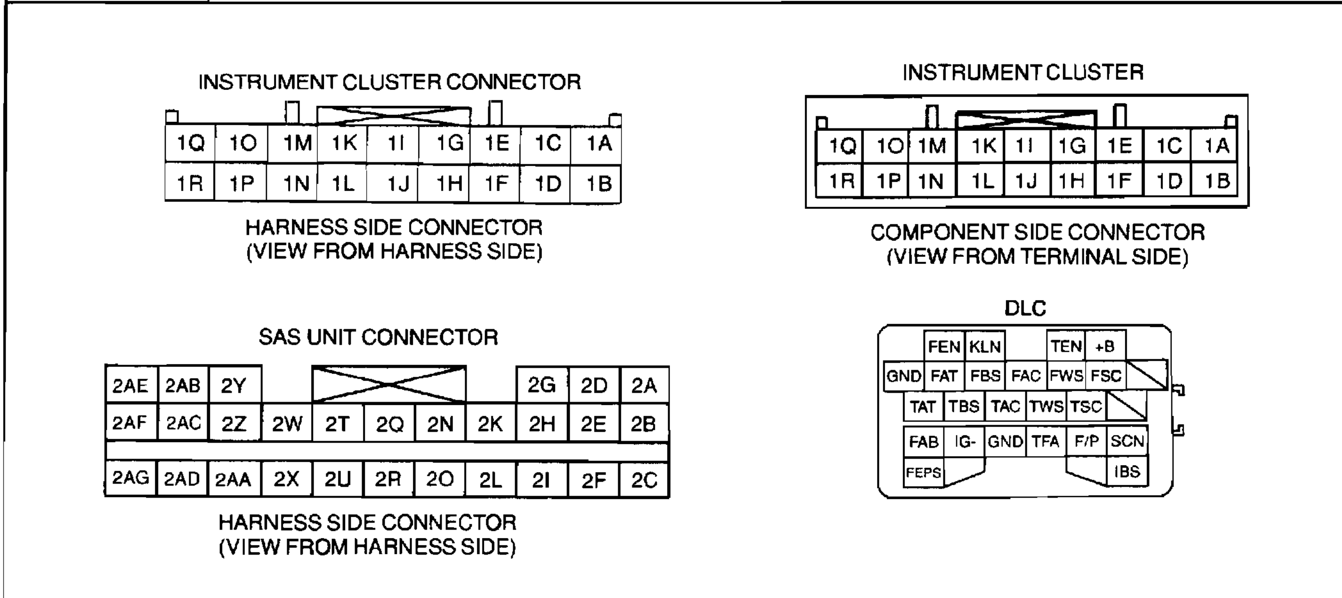
DTC 48	Occupancy sensor (child restraint seat detection part)
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in occupancy sensor circuit

Diagnostic procedure

ACTION
Replace seat cushion. (See Section S)

DTC 91

DTC 91	Air bag system warning light circuit
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.** • Malfunction in air bag system warning light circuit
POSSIBLE CAUSE	• Air bag system warning light bulb malfunction • METER 7.5 A fuse malfunction • Instrument cluster malfunction • Malfunction of connectors between instrument cluster and SAS unit • Open or short circuit in wiring harness between METER 10 A fuse and instrument cluster • Open or short circuit in wiring harness between instrument cluster and SAS unit • SAS unit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is this present malfunction diagnosis?	Yes	Replace SAS unit. (See T–59 SAS UNIT REMOVAL/INSTALLATION)
		No	Go to next step.

STEP	INSPECTION		ACTION
2	**INSPECT METER 7.5 A FUSE** • Turn ignition switch to LOCK position. • Disconnect negative battery cable. • Remove METER 7.5 A fuse. • Is fuse okay?	Yes	Reinstall METER 7.5 A fuse, then go to next step.
		No	Replace METER 7.5 A fuse.
3	**INSPECT AIR BAG SYSTEM WARNING LIGHT BULB** • Remove instrument cluster. • Remove air bag system warning light bulb. • Is bulb okay?	Yes	Reinstall air bag system warning light bulb, then go to next step.
		No	Replace air bag system warning light bulb.
4	**INSPECT INSTRUMENT CLUSTER** • Is there continuity between instrument cluster terminals 1J and 1R?	Yes	Go to next step.
		No	Replace instrument cluster.
5	**INSPECT FOR CONTINUITY BETWEEN METER 7.5 A FUSE AND INSTRUMENT CLUSTER** • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at instrument cluster connector terminal 1J. • Is voltage **more than 9 V**?	Yes	Go to next step.
		No	Repair wiring harness.
6	**INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. See T–56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove clock spring. (See Section T) • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. • Remove side walls. • Disconnect all SAS unit connectors. • Inspect wiring harness between instrument cluster connector terminal 1R and SAS unit connector terminal 2W for following. — Short to ground — Short to power supply — Open circuit • Is wiring harness okay?	Yes	Go to next step.
		No	Replace wiring harness.

STEP	INSPECTION		ACTION
7	**INSPECT WIRING HARNESS BETWEEN DLC AND SAS UNIT** • Inspect wiring harness between DLC terminal FAB and SAS unit connector terminal 2W for following. — Short to ground — Short to power supply • Is wiring harness okay?	Yes	Troubleshooting completed.
		No	Replace wiring harness.

TROUBLESHOOTING

TROUBLESHOOTING INDEX

- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Air bag system warning light does not illuminate.	Malfunction in air bag system warning circuit (open circuit or short to power supply).	T-104 No. 1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE.
2	Air bag system warning light is illuminated all the time.	Malfunction in air bag system warning circuit (short to ground).	T-106 No. 2 AIR BAG SYSTEM WARNING LIGHT IS ILLUMINATED ALL THE TIME.
3	Passenger-side air bag cut-off indicator light does not dim.	Malfunction in TNS relay circuit (open circuit). (Child restraint seat's built in resonator is attached to side passenger's seat.)	T-108 No. 3 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT DOES NOT DIM.
4	Passenger-side air bag cut-off indicator light is illuminated all the time.	Malfunction in TNS relay circuit (short to B+). (Child restraint seat's built in resonator is attached to side passenger's seat.)	T-110 No. 4 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT IS ILLUMINATED ALL THE TIME.

No. 1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE.

1	**Air bag system warning light does not illuminate.**
DETECTION CONDITION	**Malfunction in air bag system warning circuit (open circuit or short to power supply)**
POSSIBLE CAUSE	• SAS unit malfunction • Instrument cluster (print plate) malfunction • Air bag system warning light bulb malfunction • Poor contact in instrument cluster connector (18-pin) • Open or short circuit in wiring harness between instrument cluster and SAS unit • Simultaneous poor contact at terminals 2T and 2Q of SAS unit connector. • Simultaneous poor contact at terminals 2E and 2H of SAS unit connector. • Poor contacts in wiring harness between terminal 2T of SAS unit connector and ground, and between terminal 2Q and ground at the same time. • Poor contacts or short circuits in wiring harness between METER 7.5 A fuse and SAS unit, and between ENGINE 10 A fuse and SAS unit at the same time.

Diagnostic procedure

- When performing an asterisked(*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**CHECK TO SEE WHETHER MALFANCTION IS IN AIR BAG SYSTEM WARNING LIGHT CIRCUIT OR OTHER WARNING AND INDICATOR LIGHT CIRCUIT IN INSTRUMENT CLUSTER** • Turn ignition switch to ON position. • Do other warning and indicator lights illuminate?	Yes	Turn ignition switch to LOCK position, then go to next step.
		No	Inspect instrument cluster power supply system and ground system, then go to Step 6.

STEP	INSPECTION		ACTION
2	**INSPECT AIR BAG SYSTEM WARNING LIGHT BULB** • Disconnect negative battery cable. • Remove instrument cluster. • Is air bag system warning light bulb functional?	Yes	Reinstall it properly, then go to next step.
		No	Replace bulb, then go to Step 6.
*3	**INSPECT WIRING HARNESS BETWEEN SAS UNIT AND INSTRUMENT CLUSTER FOR CONTINUITY** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read SERVICE WARNINGS before handling air bag system components. See T–56 SERVICE WARNINGS** • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. (With passenger-side air bag) • Disconnect passenger-side air bag module connector. (With passenger-side air bag) • Disconnect driver- and passenger-side side air bag module connectors. (With side air bag) • Remove B-pillar lower trims. • Disconnect driver- and passenger-side pre-tensioner seat belt connectors. • Remove left side side wall. • Disconnect all SAS unit connectors. • Disconnect instrument cluster connector. • Is there continuity between terminal 2W of SAS unit connector and terminal 1R of instrument cluster connector (18-pin)?	Yes	Go to next step.
		No	Replace wiring harness, then go to Step 6.
*4	**INSPECT WIRING HARNESS BETWEEN SAS UNIT AND INSTRUMENT CLUSTER FOR SHORT TO POWER SUPPLY** • Connect negative battery cable. **Caution** • **Be sure not to cause damage to short bar when inserting insulation. If short bar is damaged, you may not be able to properly inspect SAS unit connectors.** • Insert insulating material between terminals 2W and 2T of SAS unit connector so short bar cannot function. • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at terminal 1R of instrument cluster connector (18-pin). • Is voltage more than approximately 9 V?	Yes	Replace wiring harness, then go to Step 6.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**CHECK TO SEE WHETHER MALFUNCTION IS IN AIR BAG SYSTEM WARNING LIGHT IN INSTRUMENT CLUSTER OR SAS UNIT** • Connect instrument cluster connector terminal 1R to ground, then re-connect connector. • Does air bag system warning light illuminate with ignition switch on?	Yes	Replace SAS unit, then go to next step. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace instrument cluster, then go to next step. (See Section T)
6	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT REOCCUR AFTER REPAIR** • Connect all SAS unit connectors. • Connect driver- and passenger-side pre-tensioner seat belt connectors. • Connect driver- and passenger-side side air bag module connectors. (With side air bag) • Connect passenger-side air bag module connector. (With passenger-side air bag) • Connect clock spring connector. • Connect instrument cluster connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Does air bag system warning light operate properly?	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

No. 2 AIR BAG SYSTEM WARNING LIGHT IS ILLUMINATED ALL THE TIME.

2	**Air bag system warning light is illuminated all the time.**
DETECTION CONDITION	**Malfunction in air bag system warning circuit (short to ground).**
POSSIBLE CAUSE	• SAS unit malfunction • Instrument cluster (print plate) malfunction • Malfunction of short bar between terminals 2W and 2T of SAS unit connector • No connection in SAS unit connector • Short circuit in wiring harness between instrument cluster and SAS unit

Diagnostic procedure

- When performing an asterisked(*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**VERIFY THAT SAS UNIT IS CONNECTED** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute.** • Remove left side side wall. • Are all SAS unit connectors securely connected?	Yes	Go to next step.
		No	Reconnect it properly, then go to Step 6.

STEP	INSPECTION		ACTION
2	**INSPECT SAS UNIT CONNECTOR TERMINAL 2W AND 2T** • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. (With passenger-side air bag) • Disconnect passenger-side air bag module connector. (With passenger-side air bag) • Disconnect driver- and passenger-side side air bag module connectors. (With side air bag) • Remove B-pillar lower trims. • Disconnect driver- and passenger-side pre-tensioner seat belt connectors. • Disconnect all SAS unit connectors. • Is short bar between terminals 2W and 2T of SAS unit connector bent?	Yes	Replace wiring harness, then go to Step 6.
		No	Go to next step.
3	**INSPECT SAS UNIT SHORT BAR HOOK** • Is short bar hook of SAS unit okay?	Yes	Go to next step.
		No	Replace SAS unit, then go to Step 6. (See T–59 SAS UNIT REMOVAL/INSTALLATION)
*4	**INSPECT WIRING HARNESS BETWEEN SAS UNIT AND INSTRUMENT CLUSTER FOR SHORT TO GROUND** • Remove instrument cluster. **Caution** • **Be sure not to cause damage to short bar when inserting insulation. If short bar is damaged, you may not be able to properly inspect SAS unit connectors.** • Insert insulating material between terminals 2W and 2T of SAS unit connector so short bar cannot function. • Is there continuity between terminal 2W of SAS unit connector and ground?	Yes	Replace wiring harness, then go to Step 6.
		No	Go to next step.
5	**INSPECT FOR SHORT TO GROUND CIRCUITS IN INSTRUMENT CLUSTER** • Is there continuity between terminal 1R and any of following terminals of print plate on instrument cluster? — Terminal 1D — Terminal 1A — Terminal 2B (Without ABS or ABS/TCS only) — Terminal 1G (Without ABS or ABS/TCS only) — Terminal 1M (Without panel light control only)	Yes	Replace instrument cluster, then go to next step.
		No	Replace SAS unit, then go to next step. (See T–59 SAS UNIT REMOVAL/INSTALLATION)

STEP	INSPECTION		ACTION
6	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT REOCCUR AFTER REPAIR** • Connect all SAS unit connectors. • Connect driver- and passenger-side pretensioner seat belt connectors. • Connect driver- and passenger-side side air bag module connectors. (With side air bag) • Connect passenger-side air bag module connector. (With passenger-side air bag) • Connect clock spring connector. • Connect instrument cluster connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Does air bag system warning light operate properly?	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

No. 3 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT DOES NOT DIM.

3	**Passenger-side air bag cut-off indicator light does not dim.**
DETECTION CONDITION	**Malfunction in TNS relay circuit (open circuit).** **(Child restraint seat's built in resonator is attached to passengers seat)**
POSSIBLE CAUSE	• SAS unit malfunction • TNS signal circuit malfunction • Terminal 3F of SAS unit connector malfunction • Poor connection at terminal 3F of SAS unit connector • Open circuit in wiring harness between TNS relay and SAS unit

Diagnostic procedure

- When performing an asterisked(*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**CHECK TO SEE WHETHER MALFUNCTION IS IN TNS SIGNAL CIRCUIT OR ELSEWHERE** • Does parking light illuminate when headlight switch is turned to TNS or headlight position?	Yes	Go to next step.
		No	Inspect TNS signal circuit, then go to Step 5.

STEP	INSPECTION		ACTION
2	**INSPECT SAS UNIT TERMINAL 3F** **Warning** ● **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** ● Turn ignition switch to LOCK position. ● Disconnect negative battery cable and wait for **more than 1 minute**. ● Remove column cover. ● Disconnect clock spring connector. ● Remove glove compartment. (With passenger-side air bag) ● Disconnect passenger-side air bag module connector. (With passenger-side air bag) ● Disconnect driver- and passenger-side side air bag module connectors. (With side air bag) ● Remove B-pillar lower trims. ● Disconnect driver- and passenger-side pre-tensioner seat belt connectors. ● Remove left side side wall. ● Disconnect all SAS unit connectors. ● Is terminal 3F of SAS unit damaged?	Yes	Replace SAS unit, then go to Step 5. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
		No	Go to next step.
3	**INSPECT SAS UNIT CONNECTOR TERMINAL 3F** ● Is terminal 3F of SAS unit connector damaged?	Yes	Replace wiring harness, then go to Step 5.
		No	Go to next step.
*4	**INSPECT WIRING HARNESS BETWEEN SAS UNIT AND TNS RELAY FOR CONTINUITY** ● Disconnect TNS relay connector. ● Is there continuity between terminal 3F of SAS unit connector and terminal C of TNS relay connector?	Yes	Replace SAS unit, then go to next step. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace wiring harness between SAS unit and TNS relay, then go to next step.

STEP	INSPECTION		ACTION
5	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT REOCCUR AFTER REPAIR** • Connect all SAS unit connectors. • Connect driver- and passenger-side pretensioner seat belt connectors. • Connect driver- and passenger-side side air bag module connectors. (With side air bag) • Connect passenger-side air bag module connector. (With passenger-side air bag) • Connect clock spring connector. • Connect TNS relay connector. • Connect instrument cluster connector. • Connect negative battery cable. • Attach child restraint seat built in resonator to passenger-side seat. • Turn headlight switch to TNS or headlight position. • Turn ignition switch to ON position. • Does passenger-side air bag cut-off indicator light illuminate for **approximately 6 seconds** and then dim?	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

No. 4 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT IS ILLUMINATED ALL THE TIME.

4	**Passenger–side air bag cut–off indicator light is illuminated all the time.**
DETECTION CONDITION	**Malfunction in TNS relay circuit (short to B+).** **(Child restraint seat's built in resonator is attached to passengers seat.)**
POSSIBLE CAUSE	• SAS unit malfunction • TNS signal circuit malfunction • Short circuit in wiring harness between TNS relay and SAS unit

Diagnostic procedure
- When performing an asterisked(*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**CHECK TO SEE WHETHER MALFUNCTION IS IN TNS SIGNAL CIRCUIT IN SAS UNIT OR ELSEWHERE** • Does parking light illuminate even when headlight switch is turned off?	Yes	Go to next step.
		No	Replace SAS unit, then go to Step 5. (See T–59 SAS UNIT REMOVAL/INSTALLATION)
2	**CHECK TO SEE WHETHER MALFUNCTION IS IN TNS RELAY SYSTEM B+ CIRCUIT OR GROUND CIRCUIT** • Does parking light illuminate when TNS relay connector is disconnected?	Yes	Go to next step.
		No	Go to Step 4.

STEP	INSPECTION		ACTION
*3	**CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN SAS UNIT AND TNS RELAY FOR SHORT TO B+) OR SAS UNIT** **Warning** • **Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read SERVICE WARNINGS before handling air bag system components. See T-56 SERVICE WARNINGS** • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for **more than 1 minute**. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. (With passenger-side air bag) • Disconnect passenger-side air bag module connector. (With passenger-side air bag) • Disconnect driver- and passenger-side side air bag module connectors. (With side air bag) • Remove B-pillar lower trims. • Disconnect driver-and passenger-side pre-tensioner seat belt connectors. • Remove left side side wall. • Disconnect all SAS unit connectors. • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at terminal 3F of SAS unit connector. • Is voltage **more than approximately 9 V**?	Yes	Replace wiring harness between SAS unit and TNS relay, then go to Step 5.
		No	Replace SAS unit, then go to next step. (See T-59 SAS UNIT REMOVAL/INSTALLATION)
4	**INSPECT TNS SIGNAL CIRCUITS** • Inspect following TNS signal circuit: — TNS relay — Combination switch (headlight switch) — Related wiring harnesses. • Are they okay?	Yes	System is normal now.
		No	Replace or repair malfunctioning part(s), then go to next step.

STEP	INSPECTION		ACTION
5	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT REOCCUR AFTER REPAIR** • Connect all SAS unit connectors. • Connect driver- and passenger-side pre-tensioner seat belt connectors. • Connect driver- and passenger-side side air bag module connectors. (With side air bag) • Connect passenger-side air bag module connector. • Connect clock spring connector. • Connect TNS relay connector. • Connect negative battery cable. • Attach child restraint seat built in resonator to passenger-side seat. • Turn headlight switch off. • Turn ignition switch to ON position. • Does passenger-side air bag cut-off indicator light illuminate for **approximately 6 seconds** and then stay on without dimming?	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

HEATER AND AIR CONDITIONER SYSTEMS

FEATURES

SERVICE

U

ABBREVIATIONS

CPU	Central processing unit
DEF	Defroster
HI	High
IG	Ignition
LED	Light emitting diode
L.H.D.	Left hand drive

MAX	Maximum
OFF	Switch off
ON	Switch on
REC	Recirculate
SW	Switch
TNS	Tail number side lights

OUTLINE

OUTLINE OF CONSTRUCTION

- The construction and operation of the air conditioner system is essentially carried over from the current 626 model. (See 626 Training Manual 3303-10-97D.)

FEATURES

Improved visibility

- To improve windshield and front door glasses from defogging, the climate control unit is designed to automatically turn the air intake mode to FRESH when the airflow mode selector dial is turned to DEFROSTER position. (Manual air conditioner with defroster control)
- To improve the effectiveness of windshield defrosting, a part of the full-auto air conditioner control systems airflow volume control and the airflow mode control have been changed. (Full-auto air conditioner)

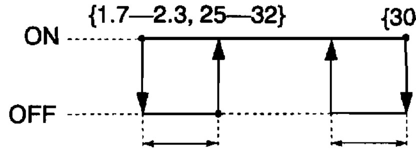
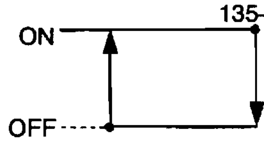
Improved comfort

- The air filter can deodorize and remove pollen and dust.
- The coolant temperature correction has been changed to stabilize the passenger compartment temperature when the ambient temperature is low. (RF Turbo full-auto air conditioner)

Improved quality

- The full-and semi-logic type climate control units have been added. (European (L.H.D.) specs.)

SPECIFICATIONS

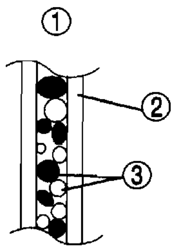
Item		Specification	
		FP, FS, FS (Hi-power)	RF Turbo
Heating capacity	(kW {kcal/h})	4.302 {3700}	5.116 {4400}
Airflow volume (during heater operation)	Blower motor (m^3/h)	300	
Electricity consumption (during heater operation)	Blower motor (W)	191	
Cooling capacity	(kW {kcal/h})	4.244 {3650}	
Airflow volume (during air conditioner operation)	Blower motor (m^3/h)	435	
Electricity consumption (during air conditioner operation)	Blower motor (W)	252	
	Magnetic clutch (W)	32	
	Condenser fan (W)	70	80
Fan type	Blower motor	Sirocco fan	
	Condenser fan	Axial flow fan	
Refrigerant	Type	R-134a	
	Regular amount (g {oz})	625 {22.1}: condenser 26 lines 700 {24.7}: condenser 32 lines	
A/C compressor	Type	Vane-rotary : H12A0	
	Discharge capacity (ml {cc, fl oz})	120 {120, 4.06}	
	Max. allowable speed (rpm)	6,400	
	Lube oil — Type	ATMOS GU10	
	Lube oil — Sealed volume (ml {cc, fl oz})	150 {150, 5.07}	
	Magnetic clutch clearance (mm {in})	0.4—0.6 {0.016—0.023}	
Condenser	Type	Multiflow	
	Radiated heat (kW {kcal/h})	6.163 {5300}: condenser 32 lines 4.826 {4150}: condenser 26 lines	
Receiver/drier	Capacity (ml {cc, fl oz})	310 {310, 10.5}	
	Desiccant	Synthetic zeolite	
Expansion valve	Type	External pressure equalizer	
Evaporator	Type	Single-tank drawn cup	
Refrigerant pressure switch	Type	Dual-pressure type	
	Operating pressure (MPa {kgf/cm^2, psi})	 0.17—0.22 {1.7—2.3, 25—32} 3.0—3.3 {30—34, 427—483} ON OFF 0.02 {0.25, 3.56} or less 0.4—0.8 {4.0—8.0, 57—113}	
Thermal protector	Type	Bimetallic	
	Operating temperature (°C {°F})	 135—145 {275—293} ON OFF 113—127 {236—260}	
Fusible plug	Melting point (°C {°F})	100—107 {212—224}	
Temperature control		Reheat full air mix type	

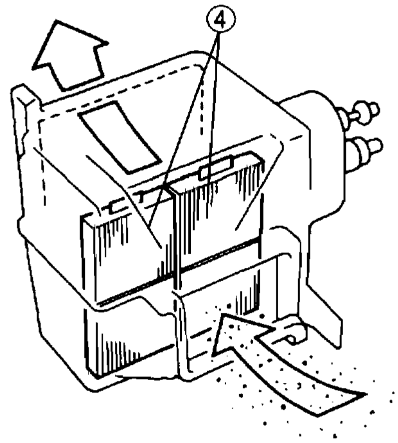
U

BASIC SYSTEM

AIR FILTER

- An air filter with deodorizing and dust removing functions has been added.
- The air filter cannot be reused and must be replaced periodically. Compared to previous air filters, the new air filter is gray even when new. Be careful not to mistake the new filter for a dirty filter due to its gray color.





1	Profile of air filter
2	Staple fiber

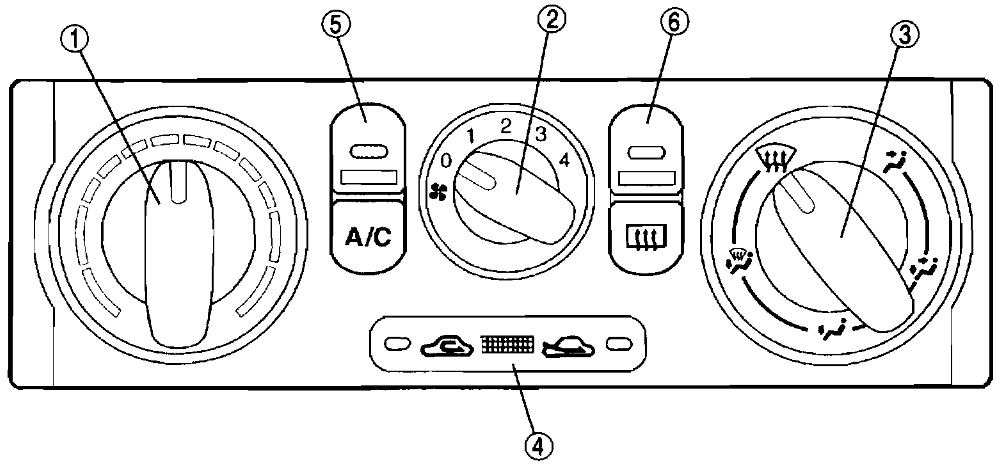
3	Deodorant
4	Air filter

CONTROL SYSTEM

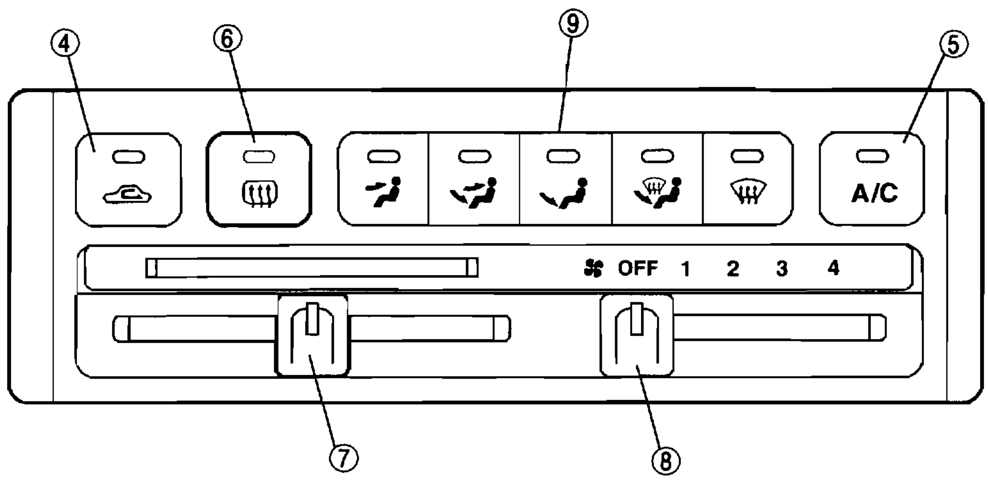
CLIMATE CONTROL UNIT

- Two types of climate control units with a defroster control function are available with the manual air conditioner.

SEMI-LOGIC TYPE



FULL-LOGIC TYPE



1	Temperature control dial
2	Fan control switch
3	Airflow mode selector dial
4	Air intake selector switch
5	A/C switch
6	Rear window defroster switch
7	Temperature control lever
8	Fan control lever
9	Airflow mode selector switch

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MANUAL AIR CONDITIONER CONTROL SYSTEM

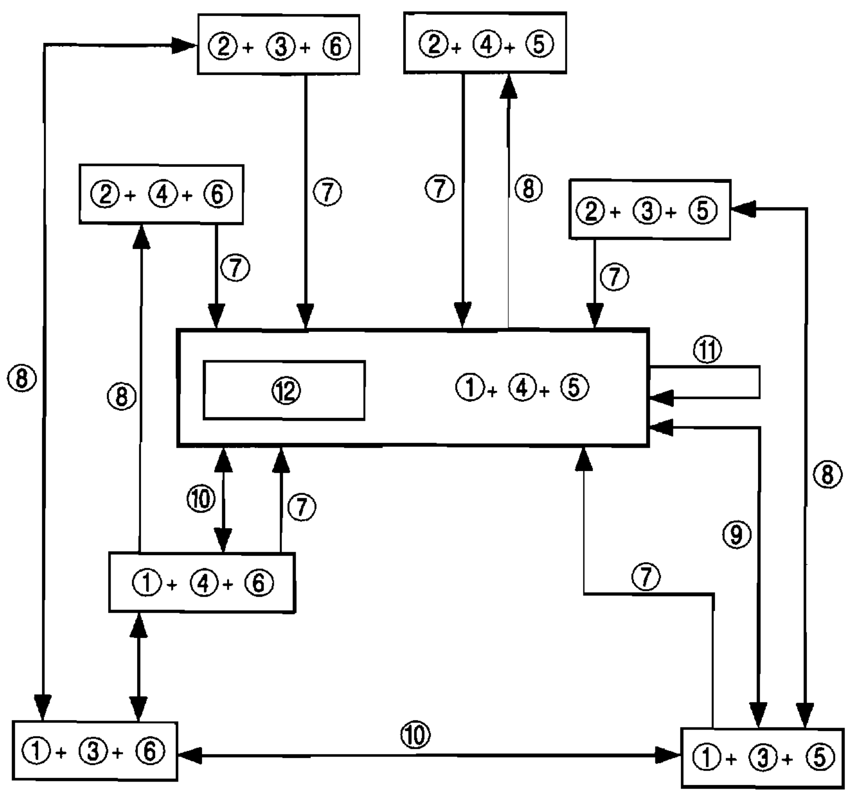
DEFROSTER CONTROL

Semi-logic Type

- The construction and operation is the same as that of the current PREMACY (CP) model. (See PREMACY Training Manual 3336-1*-99C.)

Full-logic Type

- The defroster control starts when the DEFROSTER switch is turned on. When the defroster control starts, air intake mode and A/C ON/OFF are controlled based on the input signal of each switch.
- The transition of air intake mode and A/C ON/OFF when the defroster control operates is as follows.



1	Airflow mode is DEFROSTER
2	Airflow mode is except DEFROSTER
3	Air intake mode is REC
4	Air intake mode is FRESH
5	A/C compressor is ON
6	A/C compressor is OFF
7	DEFROSTER switch is pushed

8	Except defroster switch is pushed
9	Air intake selector switch is pushed
10	A/C switch is pushed
11	Airflow mode is not changed even if DEFROSTER switch is pushed
12	Defroster control operation

FULL-AUTO AIR CONDITIONER CONTROL SYSTEM

OUTLINE OF CONTROL SYSTEM

- In the full-auto air conditioner system, the climate control unit carries out five basic types of control based on signals from various sensors and control signals from the climate control unit. The climate control unit also has three supplementary functions.

Basic control	Control description	Correction
Airflow temperature control	Airflow temperature automatic control	• Cabin temperature correction • Air intake correction • A/C correction • MAX HOT and MAX COLD correction • Air mix actuator opening angle regulation • Coolant temperature correction (RF Turbo only) • Fail-safe function
Airflow volume control	Airflow volume automatic control	• Coolant temperature correction (warm-up correction) • Mild start correction • MAX HOT and MAX COLD correction • Windshield mist prevention correction • Airflow volume regulation • Start compensation correction • Defroster correction • Fail-safe function
	Airflow volume manual control	• Defroster correction • Fail-safe function
Airflow mode control	Airflow mode automatic control	• Coolant temperature correction • Ambient temperature correction • Fail-safe function
	Airflow mode manual control	• Fail-safe function
Air intake control	Air intake automatic control	• MAX COLD correction • Defroster correction
	Air intake manual control	• Defroster correction
A/C compressor control	A/C compressor automatic control	• Defroster correction • Ambient temperature correction • Windshield mist prevention correction • MAX HOT and MAX COLD correction
	A/C compressor manual control	• Defroster correction • Ambient temperature correction • Windshield mist prevention correction

Supplementary function
Sensor fail-safe function
Sensor signal delay function
On-board diagnostic function

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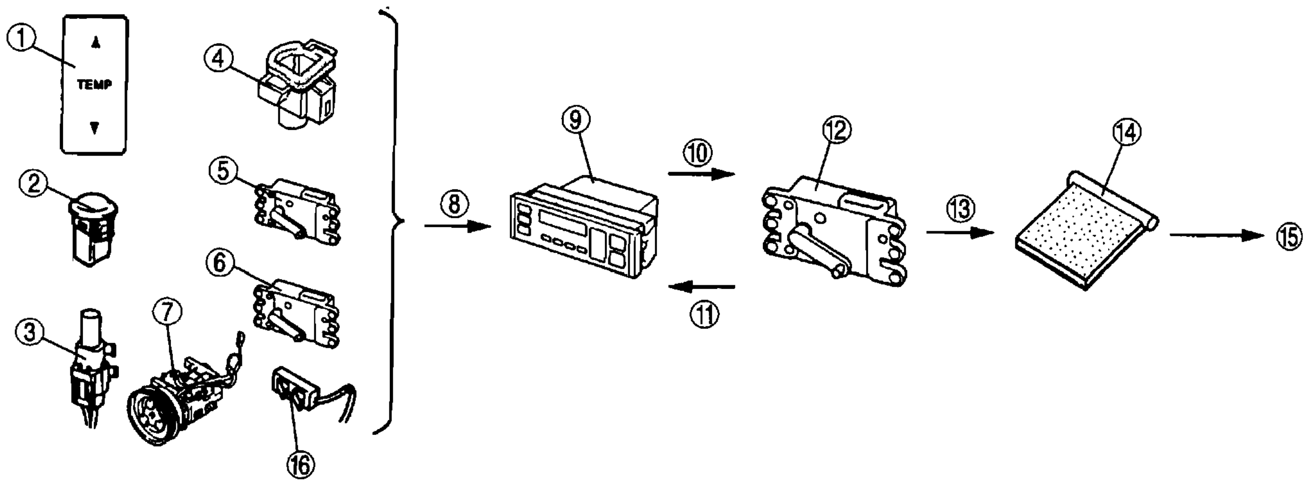
AIRFLOW TEMPERATURE CONTROL

- Airflow temperature is controlled by the air mix actuator so that passenger compartment temperature remains at the target temperature.



1	Set temperature		9	Climate control unit
2	Sunlight intensity		10	Output
3	Ambient temperature		11	Feedback
4	Cabin temperature		12	Air mix actuator
5	Airflow mode		13	Operation
6	Air intake mode		14	Air mix door
7	A/C compressor control condition		15	Airflow temperature changes
8	Signals		16	Coolant temperature

Correction

Coolant temperature correction (RF Turbo only)

- There are cases where the engine coolant temperature is lowered when continuously idling in extremely low outside temperatures. To prevent lower airflow temperature in this situation, the climate control unit adjusts the air mix actuator opening to HOT according to the engine coolant temperature.

AIRFLOW VOLUME CONTROL

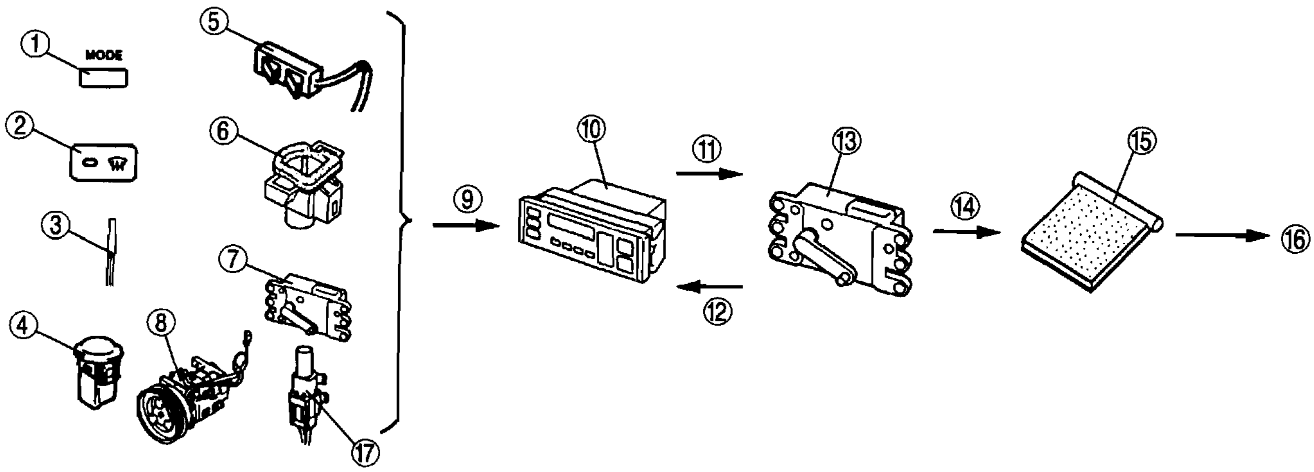
Correction

Defroster correction

- To improve defrosting and heating, blower motor applied voltage is fixed in AUTO–HI when the defroster switch is turned on.

AIRFLOW MODE CONTROL

- Airflow mode is controlled by the airflow mode actuator to improve efficiency, heating, and A/C comfort.



1	Mode switch		10	Climate control unit	
2	Defroster switch		11	Output	
3	Evaporator temperature		12	Feedback	
4	Sunlight intensity		13	Airflow mode actuator	
5	Coolant temperature		14	Operation	
6	Cabin temperature		15	Airflow mode doors	
7	Air mix actuator opening degree		16	Airflow mode changes	
8	A/C compressor control condition		17	Ambient temperature	
9	Signals				

Correction

Ambient temperature correction

- To improve windshield and front door glasses from fogging, airflow mode is fixed at HEAT/DEF when the ambient temperature is low. However, ambient temperature correction does not operate when the temperature is set at 15.0 °C.

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A/C COMPRESSOR CONTROL

Correction

Ambient temperature correction

- When the ambient temperature is below –5 °C {23 °F}, this correction fixes the A/C compressor in OFF mode to protect the A/C compressor (that is, to prevent A/C compressor fluid compression). If the A/C switch is pressed, only the indicator will illuminate; the A/C compressor will not operate.

SUPPLEMENTAL SERVICE INFORMATION

The following changes and/or additions have been made since publication of the Mazda 626 Workshop Manual (1577-10-97D), Mazda 626 Station Wagon Workshop Manual Supplement (1603-10-97K) and Mazda 626 626 Station Wagon Workshop Manual Supplement (1614-10-98D).

Blower relay
- Inspection procedure has been modified.

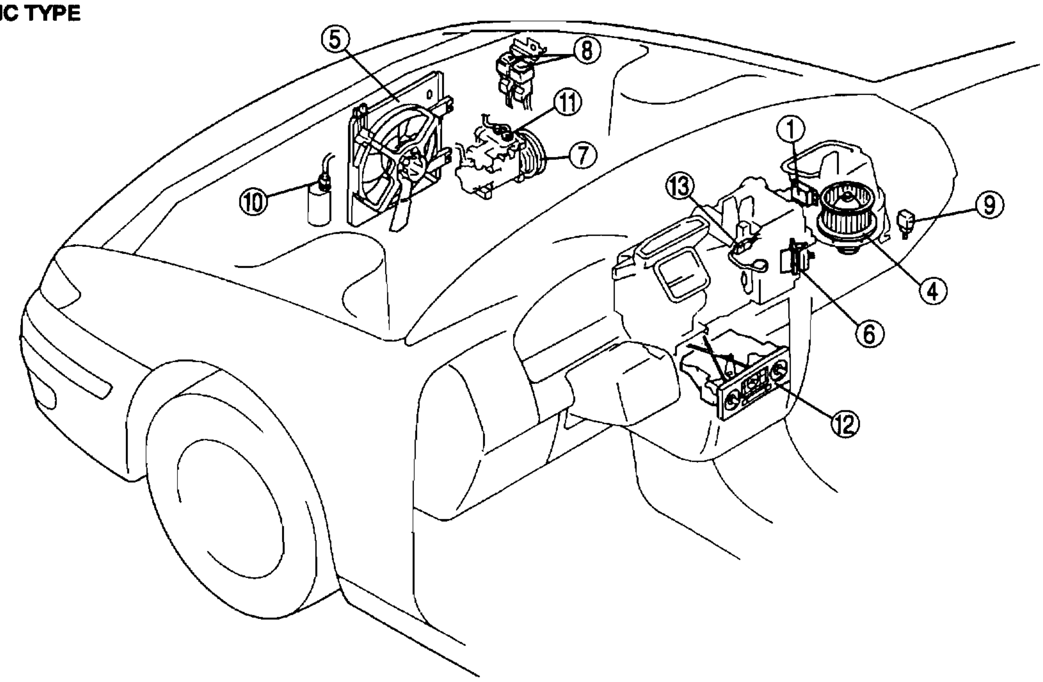
Climate control unit
- Disassembly/assembly procedure has been modified.
- Inspection procedure has been modified.

Semi-and full-logic type manual air conditioner systems
- Troubleshooting has been modified.

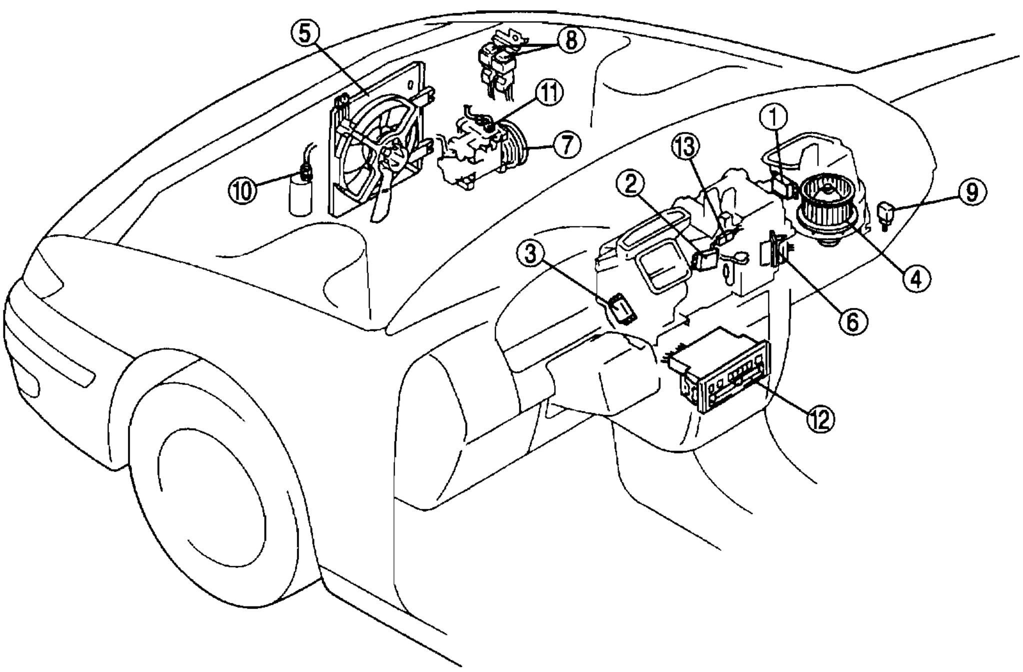
CONTROL SYSTEM

STRUCTURAL VIEW
Manual Air Conditioner

SEMI-LOGIC TYPE



FULL-LOGIC TYPE



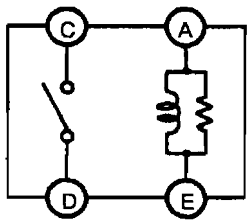
1	Air intake actuator
2	Air mix actuator
3	Airflow mode actuator
4	Blower motor
5	Condenser fan
6	Resistor
7	Magnetic clutch

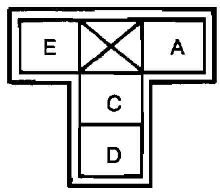
8	A/C relay and condenser fan relay
9	Blower relay
10	Refrigerant pressure switch
11	Thermal protector
12	Climate control unit
13	A/C amplifier

BLOWER RELAY INSPECTION
1. Remove the blower relay.
2. Inspect for continuity between the blower relay terminals using an ohmmeter.
   - If not as specified, replace the blower relay.

O—O : Continuity

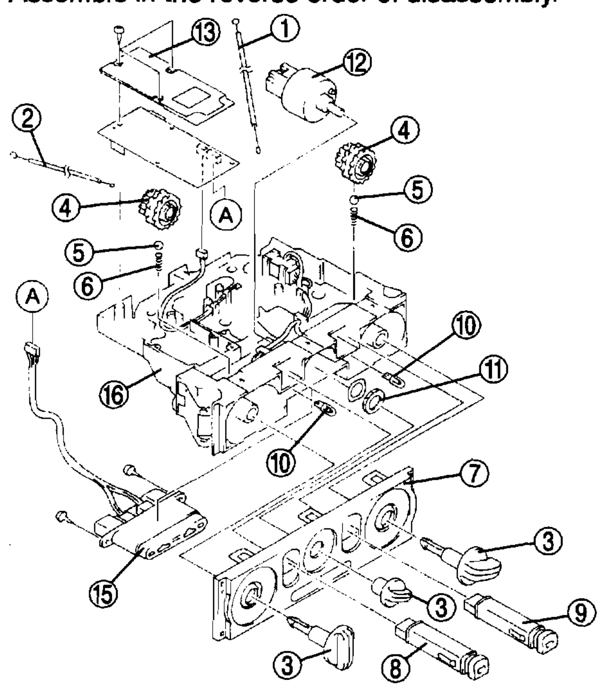
Step	Terminal			
	A	E	C	D
1	O—	—O		
2	B+	GND	O—	—O





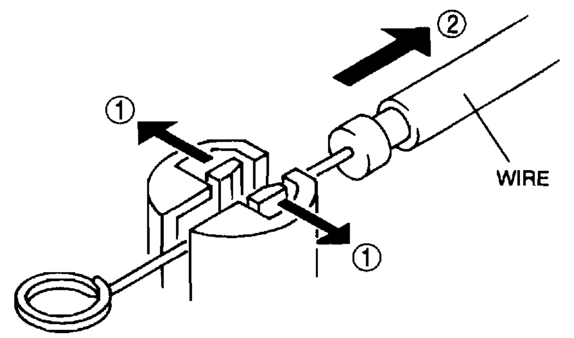
COMPONENT SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY
Semi-logic Type
1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

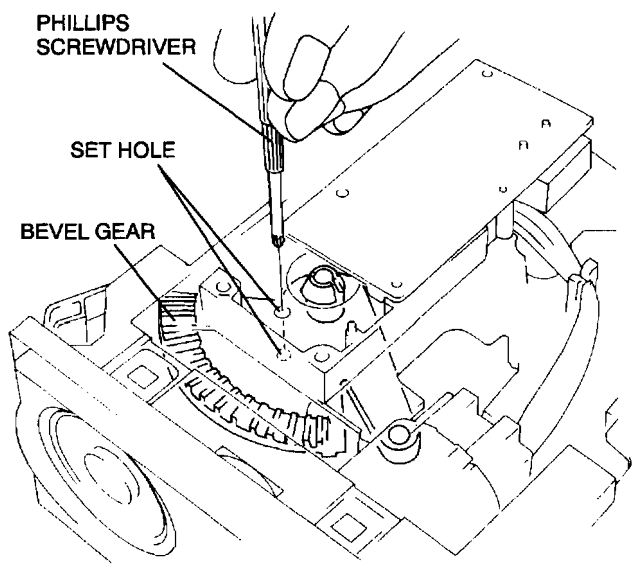


1	Air mix wire (See U-12 Wire disassembly note)
2	Airflow mode wire (See U-12 Wire disassembly note)
3	Dial (See U-12 Dial assembly note)
4	Pinion gear
5	Steel ball
6	Spring
7	Panel
8	A/C switch
9	Rear window defroster switch
10	Illumination bulb
11	Nut
12	Fan switch
13	Cover
14	CPU
15	Air intake selector switch
16	Body

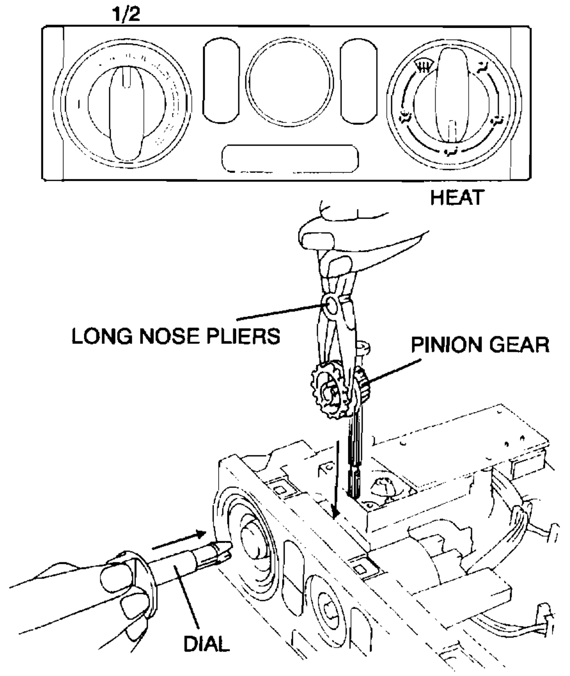
Wire disassembly note
1. Disassemble the wires in the order shown in the figure.



Dial assembly note
1. Adjust the position of the bevel gear, and then insert a Phillips screwdriver into the set hole.

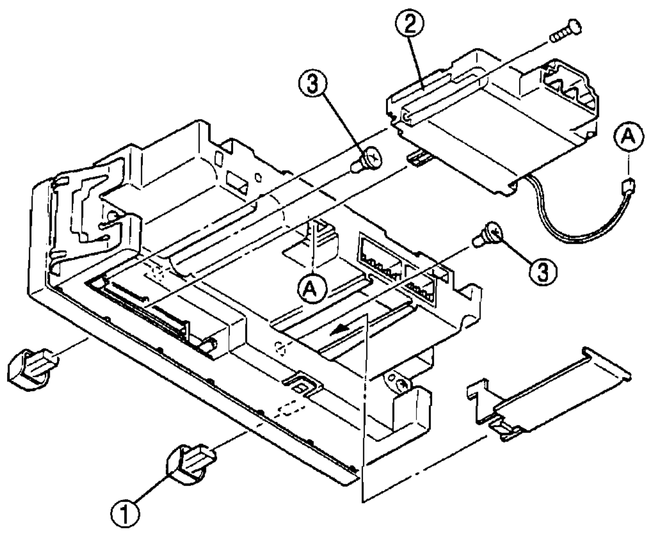


2. Insert the dials into the pinion gears in the straight up and straight down positions as shown.



Full-logic Type

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



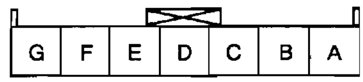
1	Knob
2	Fan switch
3	Illumination bulb

CLIMATE CONTROL UNIT INSPECTION

Semi-logic Type

1. Remove the glove compartment.
2. Disconnect the air mix and airflow mode wires from each wire clamp and link.
3. Slide out the climate control unit toward you with the connector still connected.
4. Turn the ignition switch to ON position.
5. Measure the voltage at each climate control unit terminal and refer to the terminal voltage list.
6. Disconnect the climate control unit connector before inspecting for continuity at terminal B.
   - If not as specified, inspect the parts listed under "Action."
   - If the inspection area is okay, replace the body of climate control unit.

Terminal voltage list (Reference)



CLIMATE CONTROL UNIT CONNECTOR
(VIEW FROM HARNESS SIDE)

Terminal	Signal	Connected to	Test condition		Voltage (V)/ Continuity	Action
A	Power supply	HEATER 40 A fuse	Under any condition		B+	• Inspect related harness • Inspect HEATER 40 A fuse
B	GND	GND	Under any condition : inspect for continuity to ground		Yes	-
C	Panel light control	Panel light control SW	Inspect terminal C of panel light control switch		-	• Inspect related harness • Inspect panel light control SW
D	TNS	TNS relay	Headlight switch at first or second position		B+	• Inspect related harness • Inspect TNS relay
			Other		0	
E	IG2	A/C 15 A fuse	Ignition switch at ON position		B+	• Inspect related harness • Inspect A/C 15 A fuse
			Ignition switch at LOCK position		Below 1.0	
F	RECIRCULAT E	Air intake actuator	Airflow mode at except DEFROSTER	Air intake mode at FRESH	B+	• Inspect related harness • Inspect air intake actuator
				Air intake mode at RECIRCULATE	Below 1.0	
			Airflow mode at DEFROSTER		B+	
G	FRESH	Air intake actuator	Airflow mode at except DEFROSTER	Air intake mode at FRESH	B+	• Inspect related harness • Inspect air intake actuator
				Air intake mode at RECIRCULATE	Below 1.0	
			Airflow mode at DEFROSTER		B+	

A/C switch

- The A/C switch inspection is the same as that of the current 626 model. (See 626 Workshop Manual 1577-10-97D.)

Fan switch

- The fan switch inspection is the same as that of the current 626 model. (See 626 Workshop Manual 1577-10-97D.)

Full-logic Type

1. Slide out the climate control unit toward you with the connector still connected.
2. Turn the ignition switch to ON position.
3. Measure the voltage at each climate control unit terminal and refer to the terminal voltage list.
4. Disconnect the climate control unit connector before inspecting for continuity at terminal 1K.
   - If not as specified, inspect the parts listed under "Action."
   - If the inspection area is okay, replace the body of climate control unit.

Terminal voltage list (Reference)

1K	1I	1G	*	*	1A
1L	1J	*	*	1D	1B

*	2M	*	2I	*	2E	*	2A
*	2N	*	2J	2H	2F	2D	2B

CLIMATE CONTROL UNIT CONNECTOR
(VIEW FROM HARNESS SIDE)

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
1A	IG2	A/C 15A fuse	Ignition switch at ON position	B+	• Inspect related harness • Inspect A/C 15 A fuse
			Ignition switch at LOCK position	0	
1B	Motor drive	Air mix actuator	Moving to HOT	0	• Inspect related harness • Inspect air mix actuator
			Moving to COLD	10.5	
1D	Motor drive	Airflow mode actuator	Moving to DEFROSTER	10.5	• Inspect related harness • Inspect airflow mode actuator
			Moving to VENT	0	
1G	Power supply	ROOM 10 A fuse	Under any condition	B+	• Inspect related harness • Inspect ROOM 10 A fuse
1I	Potentiometer GND	• Air mix actuator • Airflow mode actuator	Under any condition	0	• Inspect related harness • Inspect air mix actuator • Inspect airflow mode actuator • Inspect terminal voltage climate control unit (1K)
1J	Motor drive	Airflow mode actuator	Moving to VENT	10.5	• Inspect related harness • Inspect airflow mode actuator
			Moving to DEFROSTER	0	
1K	GND	GND	Under any condition : inspect for continuity to ground	Yes	-
1L	Motor drive	Air mix actuator	Moving to COLD	0	• Inspect related harness • Inspect air mix actuator
			Moving to HOT	10.5	
2A	A/C	Fan switch	Fan switch is ON	0	• Inspect related harness • Inspect fan switch
			Fan switch is OFF	B+	
2B	Motor drive	Air intake actuator	Moving to RECIRCULATE	0	• Inspect related harness • Inspect air intake actuator
			Moving to FRESH	B+	
2D	A/C	A/C amplifier	A/C switch and fan switch are ON	0	• Inspect related harness • Inspect A/C amplifier
			Other	B+	

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
2E	Potentiometer input	Airflow mode actuator	Airflow mode at VENT	4.25	• Inspect related harness • Inspect airflow mode actuator • Inspect terminal voltage climate control unit (2N)
			Airflow mode at DEFROSTER	0.75	
2F	TNS	TNS relay	Other	0	• Inspect related harness • Inspect air intake actuator
			Headlight switch at first or second position	B+	
2H	Rear window defroster switch	Instrument cluster	Rear window defroster switch is on	0.5→5	• Inspect related harness • Inspect instrument cluster
			Rear window defroster switch is off	5	
2I	Rear window defroster indicator light	Instrument cluster	Rear window defroster is on	0	• Inspect related harness • Inspect instrument cluster
			Rear window defroster is off	5	
2J	Potentiometer input	Air mix actuator	Set temperature is at MAX COLD	0.75	• Inspect related harness • Inspect air mix actuator • Inspect terminal voltage climate control unit (2N)
			Set temperature is at MAX HOT	4.75	
2M	Motor drive	Air intake actuator	Moving to RECIRCULATE	B+	• Inspect related harness • Inspect air intake actuator
			Moving to FRESH	0	
2N	+5V	• Air mix actuator • Airflow mode actuator	Ignition switch at ON position	5	• Inspect related harness • Inspect air mix actuator • Inspect airflow mode actuator • Inspect terminal voltage climate control unit (1A, 1K)
			Ignition switch at LOCK position	0	

Fan switch

- The fan switch inspection is the same as that of the current 626 model. (See 626 Workshop Manual 1577-10-97D.)

TROUBLESHOOTING

FOREWORD

- The areas for inspection (steps) are given according to various circuit malfunctions. Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

TROUBLESHOOTING INDEX

No.	TYPE	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Semi-logic (With front defroster control)	Windshield fogged.	• Air intake mode does not change when climate control unit is in DEFROSTER mode. • Climate control unit FRESH indicator light does not illuminate while climate control unit is in DEFROSTER mode.	U-18 NO. 1 WINDSHIELD FOGGED.
2	Full-logic	No air conditioning system functions operate.	• None of the air conditioning system functions operate, or else climate control unit indicator light does not work.	U-20 NO. 2 NO AIR CONDITIONING SYSTEM FUNCTIONS OPERATE.
3		Indications of climate control unit indicator light are incorrect.	• Some indicator lights of switches on climate control unit do not illuminate, or their indications are incorrect.	U-21 NO. 3 INDICATIONS OF CLIMATE CONTROL UNIT INDICATOR LIGHT ARE INCORRECT.
4		Insufficient air (or no air) blown from vents.	• Problem with each vent and/or duct.	U-23 NO. 4 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS.
5		Amount of air blown from vents does not change.	• Malfunction in blower system.	U-24 NO. 5 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE.
6		Airflow mode does not change.	• Airflow mode does not change when operating airflow mode.	U-24 NO. 6 AIRFLOW MODE DOES NOT CHANGE.
7		Air intake mode does not change.	• Air intake mode does not change when operating REC/FRESH mode. • Air intake mode does not change when climate control unit is in DEFROSTER mode.	U-27 NO. 7 AIR INTAKE MODE DOES NOT CHANGE.
8		No temperature control.	• Temperature does not change when operating temperature control lever.	U-28 NO. 8 NO TEMPERATURE CONTROL.
9		Air from vents not cold enough.	• Magnetic clutch operates but A/C system malfunctions.	U-31 NO. 9 AIR FROM VENTS NOT COLD ENOUGH.
10		No cool air.	• Magnetic clutch does not operate.	U-34 NO. 10 NO COOL AIR.

NO. 1 WINDSHIELD FOGGED

1	Windshield fogged.
DESCRIPTION	• Air intake mode does not change when climate control unit is in DEFROSTER mode. • Climate control unit FRESH indicator light does not illuminate while climate control unit is in DEFROSTER mode.
POSSIBLE CAUSE	• Climate control unit (IG2 signal) system malfunction (Steps 1, 3) • Air intake actuator malfunction (Steps 2, 6) • Climate control unit (GND signal) system malfunction (Step 4) • Climate control unit (RECIRCULATE, FRESH signal) system malfunction (Steps 7-10) Malfunction in blower unit air intake door (Steps 11, 12)

Diagnostic procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**INSPECT CLIMATE CONTROL UNIT POWER SUPPLY FUSE** • Is climate control unit power supply fuse okay?	Yes	Go to next step.
		No	Check for a short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse.
2	**INSPECT AIR INTAKE ACTUATOR LINK AND CRANK** • Is there grease on the link and crank?	Yes	Go to next step.
		No	Apply grease, then go to Step 13.
*3	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT FOR CONTINUITY** • Turn ignition switch to ON position. • Disconnect climate control unit connector (7-pin). • Test voltage at climate control unit connector (7-pin) terminal E (IG2 signal). • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and climate control unit, then go to Step 13.
*4	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND GROUND FOR CONTINUITY** • Turn ignition switch to LOCK position. • Is there continuity between climate control unit connector (7-pin) terminal B and ground?	Yes	Reconnect climate control unit connector, then go to next step.
		No	Repair wiring harness between climate control unit and ground, then go to Step 13.
5	**CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT AIR INTAKE DOOR OR ELSEWHERE** • Remove air intake actuator. • Turn ignition switch to ON position. • Set fan control switch at 4th position. • Does air intake mode (RECIRCULATE, FRESH) change smoothly when air intake link is operated by hand?	Yes	Go to next step.
		No	Go to Step 11.
6	**INSPECT AIR INTAKE ACTUATOR** • Inspect air intake actuator. • Is it okay?	Yes	Install air intake actuator, then go to next step.
		No	Replace air intake actuator, then go to Step 13.
*7	**CHECK TO SEE WHETHER AIR INTAKE SYSTEM IS CORRECT OR NOT** • Test voltage at following climate control unit connector (7-pin) terminals G, F. (See U-14 CLIMATE CONTROL UNIT INSPECTION) • Are they okay?	Yes	System is okay.
		No	Go to next step.

STEP	INSPECTION		ACTION
*8	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR CONTINUITY** • Turn ignition switch to LOCK position. • Disconnect climate control unit connector (7-pin) and air intake actuator connector. • Is there continuity between following climate control unit connector (7-pin) terminals and air intake actuator connector terminals? — Terminal G and Terminal F (FRESH signal) — Terminal F and Terminal A (RECIRCULATE signal)	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 13.
*9	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO GROUND** • Is there continuity between following climate control unit connector (7-pin) terminals and ground? — Terminal G (FRESH signal) — Terminal F (RECIRCULATE signal)	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 13.
		No	Go to next step.
*10	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO B+** • Turn ignition switch to ON position. • Test voltage at following climate control unit connector (7-pin) terminals. — Terminal G (FRESH signal) — Terminal F (RECIRCULATE signal) • Is voltage **approximately 12 V?**	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 13.
		No	Replace climate control unit, then go to Step 13.
11	**INSPECT BLOWER UNIT AIR INTAKE DOOR** • Is there any foreign material or obstructions in blower unit air intake door?	Yes	Remove material/obstruction, then go to Step 13.
		No	Go to next step.
12	**VERIFY THAT BLOWER UNIT AIR INTAKE DOOR IS POSITIONED SECURELY AND PROPERLY** • Is blower unit air intake door securely and properly positioned?	Yes	Check air intake door for cracks or damage, then go to next step.
		No	Install air intake door securely in proper position, then go to next step.
13	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does malfunction disappear?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 2 NO AIR CONDITIONING SYSTEM FUNCTIONS OPERATE

2	No air conditioning system functions operate.
DESCRIPTION	None of the air conditioning system functions operate, or else climate control unit indicator light does not work.
POSSIBLE CAUSE	• Malfunction in climate control unit GND system (Step 2) • Malfunction in climate control unit power system (Steps 3, 4)

Diagnostic procedure

- When performing an asterisked(*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**CHECK TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT GND SYSTEM OR POWER SYSTEM** • Do all indicator lights for each switch on climate control unit illuminate when ignition switch is turned to ON position?	Yes	Go to next step.
		No	Go to Step 3.
*2	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND GROUND)** • Turn ignition switch to LOCK position. • Disconnect climate control unit connector (12-pin). • Is there continuity between climate control unit connector (12-pin) terminal 1K (GND signal) and ground?	Yes	Replace climate control unit, then go to Step 5.
		No	Repair wiring harness between climate control unit and ground, then go to Step 5.
3	**INSPECT CLIMATE CONTROL UNIT POWER SUPPLY FUSES** • Are climate control unit power supply fuses okay?	Yes	Go to next step.
		No	Check for short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse.
*4	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT)** • Turn ignition switch to ON position. • Test voltage at following climate control unit connector (12-pin) terminals. — 1A (IG2 signal) — 1G (B+ signal) • Is voltage **approximately 12 V**?	Yes	Replace climate control unit, then go to next step.
		No	Repair wiring harness between fuse block and climate control unit, then go to next step.
5	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does A/C system operate correctly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 3 INDICATIONS OF CLIMATE CONTROL UNIT INDICATOR LIGHT ARE INCORRECT

3	Indications of climate control unit indicator light are incorrect.
DESCRIPTION	Some indicator lights of switches on climate control unit do not illuminate, or their indications are incorrect.
POSSIBLE CAUSE	• Malfunction in A/C switch indicator light system (Steps 1, 2) • Malfunction in rear window defroster switch LED system (Steps 3–10) • Malfunction in other indicator light system (Step 11)

Diagnostic procedure

- When performing an asterisked(*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**INSPECT A/C SWITCH INDICATOR LIGHT OPERATION** • Turn ignition switch to ON position. • Turn both A/C switch and fan switch on. • Does A/C switch indicator light illuminate?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index **NO.** 10.
2	**CHECK AIR CONDITIONING SYSTEM FUNCTIONS** • Are all of the air conditioning system functions inoperative?	Yes	Go to Step 1 of troubleshooting index NO. 2.
		No	Go to next step.
3	**CHECK TO SEE WHETHER MALFUNCTION IS IN REAR WINDOW DEFROSTER SWITCH LED SYSTEM OR ELSEWHERE** • Does LED in rear window defroster switch illuminate when switch is turned on?	Yes	Go to Step 11.
		No	Go to next step.
4	**CHECK FOR DTC 17 IN INSTRUMENT CLUSTER** • Inspect rear window defroster switch LED using instrument cluster input/output check mode. (See T–26 INSTRUMENT CLUSTER INSPECTION) • Does DTC 17 function properly?	Yes	Go to next step.
		No	Go to Step 8.
*5	**CHECK TO SEE WHETHER MALFUNCTION IS IN REAR WINDOW DEFROSTER SWITCH CIRCUIT OR ELSEWHERE** • Short climate control unit connector (16–pin) terminal 2H and ground. • Turn ignition switch to ON position. • Does rear window defroster switch LED illuminate?	Yes	Replace climate control unit, then go to Step 12. (Malfunction in rear window defroster switch circuit)
		No	Undo short, then go to next step.
*6	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND INSTRUMENT CLUSTER FOR CONTINUITY** • Turn ignition switch to LOCK position. • Disconnect climate control unit connector (16–pin) and instrument cluster connector (20–pin). • Is there continuity between climate control unit connector (16–pin) terminal 2H and instrument cluster connector (20–pin) terminal 3R?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and instrument cluster, then go to Step 12.

STEP	INSPECTION		ACTION
*7	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND INSTRUMENT CLUSTER)** • Turn ignition switch to ON position. • Test voltage at climate control unit connector (16-pin) terminal 2H. • Is voltage **approximately 12 V?**	Yes	Repair wiring harness between climate control unit and instrument cluster, then go to Step 12.
		No	Replace instrument cluster, then go to Step 12.
*8	**CHECK TO SEE WHETHER MALFUNCTION IS IN INSTRUMENT CLUSTER OR ELSEWHERE** • Disconnect instrument cluster connector (20-pin). • Ground instrument cluster connector (20-pin) terminal 3N. • Turn ignition switch to ON position. • Does rear window defroster switch's LED illuminate?	Yes	Replace instrument cluster, then go to Step 12.
		No	Go to next step.
*9	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND INSTRUMENT CLUSTER FOR CONTINUITY** • Turn ignition switch to LOCK position. • Disconnect climate control unit connector (16-pin). • Is there continuity between climate control unit connector (16-pin) terminal 2I and instrument cluster connector (20-pin) terminal 3N?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and instrument cluster, then go to Step 12.
*10	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND INSTRUMENT CLUSTER)** • Turn ignition switch to ON position. • Test voltage at climate control unit connector (16-pin) terminal 2I. • Is voltage **approximately 12 V?**	Yes	Repair wiring harness between climate control unit and instrument cluster, then go to Step 12.
		No	Replace climate control unit, then go to Step 12. (Malfunction in rear window defroster switch LED circuit)
11	**CHECK OTHER INDICATOR LIGHTS** • Are other lights indicating correctly?	Yes	Operation is okay. Recheck malfunction symptoms.
		No	Replace climate control unit, then go to next step.
12	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Is climate control unit operating correctly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 4 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS

4	Insufficient air (or no air) blown from vents.
DESCRIPTION	Problem with each vent and/or duct.
POSSIBLE CAUSE	• Malfunction in airflow mode control system (Step 1) • Malfunction in VENT mode system (Steps 2, 3, 5) • Malfunction in blower system (Step 4) • Malfunction in HEAT mode system (Step 6) • Malfunction in DEFROSTER mode system (Steps 7–9)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT AIRFLOW MODE CONTROL SYSTEM** • Does airflow mode change when airflow mode selector switch is operated?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index NO. 6.
2	**CHECK TO SEE WHETHER MALFUNCTION IS IN VENT MODE OR ANOTHER MODE** • Does air blow out when in VENT mode?	Yes	Go to Step 6.
		No	Go to next step.
3	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 10.
		No	Go to next step.
4	**INSPECT BLOWER SYSTEM** • Inspect following systems and electrical parts. — Blower relay — Blower motor — Resistor — Fan switch — Related wiring harnesses • Are they okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part, then go to Step 10.
5	**VERIFY THAT DUCT IN DASHBOARD IS INSTALLED** • Is duct in dashboard properly installed?	Yes	Check duct for clogging, deformity, and air leakage, then go to Step 10.
		No	Install duct securely in proper position, then go to Step 10.
6	**CHECK TO SEE WHETHER MALFUNCTION IS IN HEAT MODE OR DEFROSTER MODE** • Does air blow out when in HEAT mode?	Yes	Go to next step.
		No	Check vent for clogging, then go to Step 10.
7	**INSPECT DEFROSTER MODE** • Does air blow out when in DEFROSTER mode?	Yes	Operation is okay. Recheck malfunction symptoms.
		No	Go to next step.
8	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 10.
		No	Go to next step.
9	**VERIFY THAT DEFROSTER DUCT IS INSTALLED** • Is defroster duct properly installed?	Yes	Check duct for clogging, deformity, and air leakage, then go to next step.
		No	Install duct securely in proper position, then go to next step.
10	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 5 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

5	Amount of air blown from vents does not change.
DESCRIPTION	Malfunction in blower system.
POSSIBLE CAUSE	• Blower unit malfunction (Steps 2–4)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	CHECK TO SEE WHETHER AIR BLOWS OUT FROM VENT OR NOT • Does air blow out?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index NO. 4.
2	CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR ELSEWHERE • Turn ignition switch to ON position. • Turn fan switch on. • Is noise coming from blower unit?	Yes	Go to next step.
		No	Go to Step 4.
3	INSPECT BLOWER UNIT • Inspect fan in blower unit. — Is fan free of interference from blower unit case? — Is fan free of foreign material and obstructions? • Is fan okay?	Yes	Go to next step.
		No	Remove obstruction, repair or replace fan and blower unit case, then go to Step 5.
4	INSPECT BLOWER UNIT INTAKE VENT • Is blower unit intake vent clogged?	Yes	Remove obstruction, then go to next step.
		No	Check if there are any obstructions in passage between blower unit and heater unit, then go to next step.
5	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 6 AIRFLOW MODE DOES NOT CHANGE

6	Airflow mode does not change.
DESCRIPTION	Airflow mode does not change when operating airflow mode.
POSSIBLE CAUSE	• Airflow mode actuator (+5V signal) system malfunction (Steps 2–6, 9) • Climate control unit (potentiometer GND signal) system malfunction (Steps 7, 8) • Airflow mode actuator (potentiometer input signal) system malfunction (Steps 10–12) • Airflow mode actuator (potentiometer GND signal, motor drive signal) system malfunction (Step 13) • Malfunction in airflow mode actuator system (Steps 14, 15) • Malfunction in heater unit airflow mode door (Steps 16, 17)

Diagnostic procedure

- When performing an asterisked(*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	CHECK CIRCUITS COMMON TO BOTH AIR MIX ACTUATOR AND AIRFLOW MODE ACTUATOR • Does temperature of blown air change when operating temperature control lever?	Yes	Go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
2	**CHECK TO SEE WHETHER MALFUNCTION IS IN AIRFLOW MODE ACTUATOR +5 V SIGNAL OR POTENTIOMETER GND SIGNAL** • Is air mix actuator set at MAX HOT and airflow mode actuator at VENT? (Verify the positions of air mix actuator link and airflow mode actuator link.)	Yes	Go to next step.
		No	Go to Step 7. (Set actuators at MAX COLD and DEFROSTER.)
*3	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR) OR ELSEWHERE** • Turn ignition switch to ON position. • Is there voltage of **approximately 5 V** at climate control unit connector (16–pin) terminal 2N (+5 V signal)?	Yes	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
		No	Go to next step.
*4	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN AIR MIX ACTUATOR OR ELSEWHERE** • Disconnect air mix actuator connector. • Is there voltage of **approximately 5 V** at climate control unit connector (16–pin) terminal 2N (+5 V signal)?	Yes	Inspect air mix actuator, then go to Step 18.
		No	Go to next step.
*5	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN AIRFLOW MODE ACTUATOR OR ELSEWHERE** • Disconnect airflow mode actuator connector. • Is there voltage of **approximately 5 V** at climate control unit connector (16–pin) terminal 2N (+5 V signal)?	Yes	Inspect airflow mode actuator, then go to Step 18.
		No	Go to next step.
*6	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR)** • Disconnect climate control unit connector (16–pin). • Is there continuity between climate control unit connector (16–pin) terminal 2N (+5 V signal) and ground?	Yes	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
		No	Replace climate control unit, then go to Step 18.
*7	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR) OR ELSEWHERE** • Disconnect climate control unit connector (12–pin) and airflow mode actuator connector. • Is there continuity between climate control unit connector (12–pin) terminal 1I (potentiometer GND signal) and airflow mode actuator connector terminal E?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
*8	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR)** • Turn ignition switch to ON position. • Test voltage at climate control unit connector (12–pin) terminal 1I (potentiometer GND signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
		No	Replace climate control unit, then go to Step 18.

STEP	INSPECTION		ACTION
*9	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR) ELSEWHERE** • Turn ignition switch to ON position. • Test voltage at following airflow mode actuator connector terminal C (+5 V signal). • Is voltage **approximately 5 V**?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
*10	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect climate control unit connector (16-pin) and airflow mode actuator connector. • Is there continuity between climate control unit connector (16-pin) terminal 2E (potentiometer input signal) and airflow mode actuator connector terminal B?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
*11	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR) OR ELSEWHERE** • Is there continuity between climate control unit connector (16-pin) terminal 2E (potentiometer input signal) and ground?	Yes	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
		No	Go to next step.
*12	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR) OR ELSEWHERE** • Turn ignition switch to ON position. • Test voltage at climate control unit connector (16-pin) terminal 2E (potentiometer input signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
		No	Go to next step.
*13	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIRFLOW MODE ACTUATOR) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Is there continuity between following climate control unit connector (12-pin) terminals and airflow mode actuator connector terminals? — Terminal 1I and Terminal E (potentiometer GND signal) — Terminal 1D and Terminal F (motor drive signal) — Terminal 1J and Terminal A (motor drive signal)	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and airflow mode actuator, then go to Step 18.
14	**INSPECT HEATER UNIT AIRFLOW MODE ACTUATOR LINK AND CRANK** • Is there grease on the link and crank?	Yes	Go to next step.
		No	Apply grease, then go to Step 18.
15	**INSPECT AIRFLOW MODE ACTUATOR** • Inspect airflow mode actuator. • Is it okay?	Yes	Go to next step.
		No	Replace airflow mode actuator, then go to Step 18.

STEP	INSPECTION		ACTION
16	**VERIFY THAT HEATER UNIT AIR FLOW MODE DOORS DO NOT HAVE FOREIGN MATERIAL OR OBSTRUCTIONS** • Is there any foreign material or obstructions in any of the heater unit doors?	Yes	Remove material/obstruction, then go to Step 18.
		No	Go to next step.
17	**INSPECT HEATER UNIT AIRFLOW MODE DOORS** • Are all doors within heater unit securely and properly positioned? • Inspect heater unit doors. — Are doors cracked or damaged? — Are doors securely and properly installed? • Are they okay?	Yes	Replace climate control unit, then go to next step. (Malfunction in climate control unit airflow mode selector switch circuit)
		No	Replace or install door(s) in their proper position(s), then go to next step.
18	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does airflow mode change when operating airflow mode selector switch?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 7 AIR INTAKE MODE DOES NOT CHANGE

7	Air intake mode does not change.
DESCRIPTION	• Air intake mode does not change when operating REC/FRESH mode. • Air intake mode does not change when climate control unit is in **DEFROSTER** mode.
POSSIBLE CAUSE	• Climate control unit (motor drive signal) system malfunction (Steps 2–4) • Malfunction in air intake actuator system (Steps 5, 6) • Malfunction in blower unit air intake door (Steps 7, 8)

Diagnostic procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
*1	**CHECK TO SEE WHETHER MALFUNCTION IS IN AIR INTAKE ACTUATOR MOTOR DRIVE SIGNAL CIRCUIT OR ELSEWHERE** • Turn ignition switch to ON position. • Test voltage at the following climate control unit connector (16-pin) terminals: • Terminal 2B (motor drive signal) • Terminal 2M (motor drive signal) • Is voltage as shown below? — Terminal 2B: **approximately 0 V** during RECIRCULATE and **approximately 12 V** during FRESH — Terminal 2M: **approximately 12 V** during RECIRCULATE and **approximately 0 V** during FRESH	Yes	Go to Step 6.
		No	Go to next step.
*2	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR CONTINUITY** • Turn ignition switch to LOCK position. • Disconnect climate control unit connector (16-pin) and air intake actuator connector. • Is there continuity between following climate control unit connector (16-pin) terminals and air intake actuator connector terminals? — Terminal 2B and Terminal B — Terminal 2M and Terminal A	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 9.

STEP	INSPECTION		ACTION
*3	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO GROUND** • Is there continuity between following climate control unit connector (16-pin) terminals and ground? — Terminal 2B — Terminal 2M	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 9.
*4	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO B+** • Turn ignition switch to ON position. • Test voltage at climate control unit connector (16-pin) terminals 2B and 2M. • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 9.
5	**INSPECT AIR INTAKE ACTUATOR** • Inspect air intake actuator. • Is it okay?	Yes	Replace climate control unit, then go to Step 9.
		No	Replace air intake actuator, then go to Step 9.
6	**INSPECT BLOWER UNIT AIR INTAKE ACTUATOR LINK AND CRANK** • Is there grease on air intake actuator link and crank?	Yes	Go to next step.
		No	Apply grease, then go to Step 9.
7	**INSPECT BLOWER UNIT AIR INTAKE DOOR** • Is there any foreign material or obstructions in blower unit air intake door?	Yes	Remove material/obstruction, then go to Step 9.
		No	Go to next step.
8	**VERIFY THAT BLOWER UNIT AIR INTAKE DOOR IS POSITIONED SECURELY AND PROPERLY** • Is blower unit air intake door securely and properly positioned?	Yes	Check air intake door for cracks or damage, then go to next step.
		No	Install air intake door securely in proper position, then go to next step.
9	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does air intake mode change when operating air intake selector switch?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 8 NO TEMPERATURE CONTROL

8	No temperature control.
DESCRIPTION	• Temperature does not change when operating temperature control lever.
POSSIBLE CAUSE	• Air mix actuator (+5 V signal) system malfunction (Steps 3-7, 10) • Climate control unit (potentiometer GND signal) system malfunction (Steps 8, 9) • Air mix actuator (potentiometer input signal) system malfunction (Steps 11-13) • Air mix actuator (potentiometer GND signal, motor drive signal) system malfunction (Step 14) • Malfunction in air mix actuator system (Steps 15, 16) • Malfunction in heater unit air mix door (Steps 17, 18)

Diagnostic procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**INSPECT COOLANT TEMPERATURE** • Is coolant sufficiently warmed up?	Yes	Go to next step.
		No	Warm engine up, then go to Step 19.
2	**CHECK CIRCUITS COMMON TO BOTH AIR MIX ACTUATOR AND AIRFLOW MODE ACTUATOR** • Does airflow mode change when operating airflow mode selector switch?	Yes	Go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
3	**CHECK TO SEE WHETHER PROBLEM IS IN AIR MIX ACTUATOR +5 V SIGNAL OR POTENTIOMETER GND SIGNAL** • Is air mix actuator set at MAX HOT and airflow mode actuator at VENT? (Verify position of air mix actuator link and airflow mode actuator link.)	Yes	Go to next step.
		No	Go to Step 8. (Set actuators at MAX COLD and DEFROSTER.)
*4	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn ignition switch to ON position. • Is there voltage of **approximately 5 V** at climate control unit connector (16–pin) terminal 2N (+5 V signal)?	Yes	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
		No	Go to next step.
*5	**CHECK TO SEE WHETHER MALFUNCTION IS IN AIR MIX ACTUATOR (SHORT TO GROUND) OR ELSEWHERE** • Disconnect air mix actuator connector. • Is there voltage of **approximately 5 V** at climate control unit connector (16–pin) terminal 2N (+5 V signal)?	Yes	Inspect air mix actuator, then go to Step 19.
		No	Go to next step.
*6	**CHECK TO SEE WHETHER MALFUNCTION IS IN AIRFLOW MODE ACTUATOR (SHORT TO GROUND) OR ELSEWHERE** • Disconnect airflow mode actuator connector. • Is there voltage of **approximately 5 V** at climate control unit connector (16–pin) terminal 2N (+5 V signal)?	Yes	Inspect airflow mode actuator, then go to Step 19.
		No	Go to next step.
*7	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR)** • Disconnect climate control unit connector (16–pin). • Is there continuity between climate control unit connector (16–pin) terminal 2N (+5 V signal) and ground?	Yes	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
		No	Replace climate control unit, then go to Step 19.
*8	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE** • Disconnect climate control unit connector (12–pin) and air mix actuator connector. • Is there continuity between climate control unit connector (12–pin) terminal 1I (potentiometer GND signal) and air mix actuator connector terminal C?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
*9	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR)** • Turn ignition switch to ON position. • Test voltage at climate control unit connector (12–pin) terminal 1I (potentiometer GND signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
		No	Replace climate control unit, then go to Step 19.

STEP	INSPECTION		ACTION
*10	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn ignition switch to ON position. • Test voltage at following air mix actuator connector terminal E (+5 V signal). • Is voltage **approximately 5 V**?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
*11	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect climate control unit connector (16-pin) and air mix actuator connector. • Is there continuity between climate control unit connector (16-pin) terminal 2J (potentiometer input signal) and air mix actuator connector terminal B?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
*12	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE** • Is there continuity between climate control unit connector (16-pin) terminal 2J (potentiometer input signal) and ground?	Yes	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
		No	Go to next step.
*13	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn ignition switch to ON position. • Test voltage at climate control unit connector (16-pin) terminal 2J (potentiometer input signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
		No	Go to next step.
*14	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Is there continuity between following climate control unit connector (12-pin) terminals and air mix actuator connector terminals? — Terminal 1I and Terminal C (potentiometer GND signal) — Terminal 1B and Terminal A (motor drive signal) — Terminal 1L and Terminal F (motor drive signal)	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air mix actuator, then go to Step 19.
15	**INSPECT HEATER UNIT AIR MIX ACTUATOR LINK AND CRANK** • Is there grease on the link and crank?	Yes	Go to next step.
		No	Apply grease, then go to Step 19.
16	**INSPECT AIR MIX ACTUATOR** • Inspect air mix actuator. • Is it okay?	Yes	Go to next step.
		No	Replace air mix actuator, then go to Step 19.

STEP	INSPECTION		ACTION
17	**VERIFY THAT HEATER UNIT AIR MIX DOORS DO NOT HAVE ANY FOREIGN MATERIAL OR OBSTRUCTION** • Is there any foreign material or obstructions on any heater unit door?	Yes	Remove material/obstruction, then go to Step 19.
		No	Go to next step.
18	**INSPECT HEATER UNIT AIR MIX DOORS** • Are all doors within heater unit securely and properly positioned? • Inspect heater unit doors. — Are doors cracked or damaged? — Are doors securely and properly installed? • Are they okay?	Yes	Replace climate control unit, then go to next step. (Malfunction in climate control unit temperature control lever circuit)
		No	Replace or install door(s) in proper position, then go to next step.
19	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does temperature change when operating temperature control lever?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 9 AIR FROM VENTS NOT COLD ENOUGH

9	Air from vents not cold enough.
DESCRIPTION	Magnetic clutch operates but A/C system malfunctions.
POSSIBLE CAUSE	• Drive belt malfunction (Step 1) • Malfunction in blower unit or condenser (Steps 4, 5) • Malfunction in receiver/drier, expansion valve (valve closes too much); or else expansion valve heat-sensing tube installed incorrectly (Steps 8, 9) • Malfunction in refrigerant lines (Steps 10–13) • A/C compressor system malfunction; insufficient compressor oil (Step 16) • Too much compressor oil; expansion valve heat-sensing tube installed incorrectly; malfunction in expansion valve (valve opens too much); malfunction in heater unit air mix link system (Steps 18–20)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVE BELT** • Inspect drive belt. • Is it okay?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 21.
2	**INSPECT REFRIGERANT SYSTEM PERFORMANCE** • Carry out refrigerant system performance test. • Is operation normal?	Yes	Operation is normal. (Recheck malfunction symptoms.)
		No	Go to next step.
3	**CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT INTAKE AND CONDENSER OR ELSEWHERE** • Are refrigerant high-pressure and low-pressure values both high?	Yes	Go to next step.
		No	Go to Step 6.
4	**INSPECT BLOWER UNIT INTAKE** • Is blower unit intake clogged?	Yes	Remove obstruction, then go to Step 21. (If air does not reach evaporator within cooling unit, heat exchange does not occur and refrigerant pressure becomes high. Therefore, removal of obstruction is necessary.)
		No	Go to next step.
5	**INSPECT CONDENSER** • Inspect condenser. • Is it okay?	Yes	Adjust refrigerant to specified amount, then go to Step 21. (Excessive amount of refrigerant.)
		No	Replace condenser, or repair and clean condenser fins, then go to Step 21.
6	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, RECEIVER/DRIER AND REFRIGERANT LINES OR ELSEWHERE** • Are refrigerant high-pressure and low-pressure values both low?	Yes	Go to next step.
		No	Go to Step 14.

STEP	INSPECTION		ACTION
7	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE AND RECEIVER/DRIER OR ELSEWHERE** • Immediately after A/C compressor operates, does refrigerant high-pressure value momentarily rise to correct value, then fall and stay below it? (Is there negative pressure on low-pressure side?)	Yes	Go to next step.
		No	Go to Step 10.
8	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR RECEIVER/DRIER** • Turn A/C switch off and let air conditioner stop for **10 minutes.** • Start engine. • Turn both A/C switch and fan switch on. • Does malfunction occur after A/C compressor turns on?	Yes	Go to next step.
		No	Install the manifold gauge set and vacuum pump. Start the vacuum pump and let it operate for **30 minutes**. Replace receiver/drier, then go to Step 21. (Since water has intermixed in receiver/drier and it is saturated, replacement is necessary.)
9	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN COOLING UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is expansion valve heat-sensing tube within cooling unit securely installed proper position?	Yes	Replace expansion valve, then go to Step 21. (Since valve closes too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to Step 21.
10	**INSPECT REFRIGERANT LINES** • Inspect refrigerant lines. — Is piping free of damage and cracks? — Are piping connections free of oil grime? (Visual inspection) — Are piping connections free of gas leakage? — Are piping installation points on condenser free of gas leakage? — Are piping installation points on receiver/drier free of gas leakage? — Are piping installation points on A/C compressor free of gas leakage? — Are piping installation points on cooling unit free of gas leakage? *Perform gas leak inspection using gas leak tester. • Are above items okay?	Yes	Go to next step.
		No	If piping or A/C component is damaged or cracked, replace it. Then go to Step 21. If there is no damage, go to Step 13.
11	**INSPECT EVAPORATOR PIPING CONNECTIONS IN COOLING UNIT FOR GAS LEAKAGE** • Are piping connections for evaporator in cooling unit free of gas leakage?	Yes	If the vane makes a noise, add **10 ml {10 cc, 0.338 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Adjust refrigerant to specified amount, then go to Step 21.
		No	If piping is damaged or cracked, replace it. Then go to Step 21. If there is no damage, go to next step.
12	**INSPECT EVAPORATOR PIPING CONNECTIONS IN COOLING UNIT FOR LOOSE** • Are piping connections for evaporator in cooling unit loose?	Yes	Tighten connections to specified torque. If the vane makes a noise, add **10 ml {10 cc, 0.338 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Adjust refrigerant to specified amount, then go to Step 21.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.338 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 21.

STEP	INSPECTION		ACTION
13	**INSPECT PIPING CONNECTIONS FOR LOOSE** • Are piping connections loose?	Yes	Tighten connections to specified torque. If the vane makes a noise, add **10 ml {10 cc, 0.338 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Adjust refrigerant to specified amount, then go to Step 21.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.338 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 21.
14	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, AIR MIX ACTUATOR AND COMPRESSOR OIL OR ELSEWHERE** • Does refrigerant high-pressure value hardly increase?	Yes	Go to next step. (Pressure hardly increases.)
		No	Go to Step 17.
15	**CHECK TO SEE WHETHER PROBLEM IS IN COMPRESSOR OIL AMOUNT AND A/C COMPRESSOR OR ELSEWHERE** • When engine is racing, does high-pressure value increase?	Yes	Return to Step 3.
		No	Go to next step.
16	**CHECK TO SEE WHETHER PROBLEM IS IN COMPRESSOR OIL AMOUNT OR A/C COMPRESSOR** • After compressor oil is replenished each **10 ml {10 cc, 0.338 fl oz}**, does high-pressure value increase?	Yes	Troubleshooting completed. (Explain to customer that cause was insufficient compressor oil.)
		No	Replace A/C compressor, then go to Step 21. (Cause is defective A/C compressor.)
17	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR ELSEWHERE** • Is only refrigerant low-pressure value high?	Yes	Go to Step 20.
		No	Go to next step.
18	**VERIFY THAT AIR MIX ACTUATOR IS INSTALLED SECURELY AND PROPERLY** • Are heater unit air mix links, air mix cranks, and air mix rods securely and properly installed?	Yes	Go to next step.
		No	Repair or install links, cranks, and rods securely in proper position, then go to Step 21.
19	**ADJUST COMPRESSOR OIL** • Set the fan control lever at 4th position. • Turn the A/C switch on. • Set to FRESH mode. • Set the temperature control to MAX COLD. • Set to VENT mode. • Run engine at a constant **1,500 rpm** for **10 minutes**. • Run engine at idle speed for **1 minute**. • One engine speed cycle is defined as going from idle speed to **4,000 rpm** and back to idle speed over a period of **12 seconds**. Perform **5 cycles**. • Run engine at idle speed for **30 seconds**. • Remove all compressor oil from A/C compressor and verify that it is **100 ml {100 cc, 3.38 fl oz}**. • If it is more than **100 ml {100 cc, 3.38 fl oz}**, put only **100 ml {100 cc, 3.38 fl oz}** back into A/C compressor. • Carry out above Steps 1 to 10 again and verify that compressor oil is **100 ml {100 cc, 3.38 fl oz}**. • Is there **100 ml {100 cc, 3.38 fl oz}** of compressor oil in A/C compressor?	Yes	Go to Step 21.
		No	Follow Steps 1 to 10 again until compressor oil is **100 ml {100 cc, 3.38 fl oz}**.

STEP	INSPECTION		ACTION
20	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN COOLING UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is expansion valve heat-sensing tube within cooling unit securely installed in proper position?	Yes	Replace expansion valve, then go to next step. (Since valve opens too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to next step.
21	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does cool air blow out? (Are results of refrigerant system performance test okay?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO. 10 NO COOL AIR

10	No cool air.
DESCRIPTION	Magnetic clutch does not operate.
POSSIBLE CAUSE	• A/C compressor system malfunction (Step 2) • Incorrect amount of refrigerant (Step 3) • A/C switch indicator light malfunction (Steps 4, 5) • PCM A/C cut-off control system malfunction (Step 6) • A/C relay malfunction (Step 8) • Malfunctions in A/C amplifier and/or climate control unit (Steps 9–15) • PCM (A/C signal) system malfunction (Steps 16, 17) • Refrigerant pressure switch malfunction (Step 18) • Malfunctions in PCM (IG1 signal) system and/or PCM condenser fan control system (Steps 19–21) • Malfunctions in magnetic clutch, magnetic clutch thermal protector and/or A/C relay (A/C control signal) system (Steps 22–24)

Diagnostic procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**INSPECT AIR BLOW OUT** • Does air blow out?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index NOs. 4, 5.
2	**INSPECT A/C COMPRESSOR OPERATION** • Start engine. • Turn both A/C switch and fan switch on. • Does A/C compressor operate?	Yes	Go to Step 1 of troubleshooting index NO. 9.
		No	Go to next step.
3	**INSPECT REFRIGERANT AMOUNT** • Inspect refrigerant amount. • Is it okay?	Yes	Go to next step.
		No	Add or subtract refrigerant to specified level, then go to Step 25.
4	**INSPECT A/C SWITCH INDICATOR LIGHT** • Does A/C switch indicator light illuminate?	Yes	Go to Step 6.
		No	Go to next step.
*5	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND RESISTOR)** • Turn ignition switch to ON position. • Test voltage at climate control unit connector (16-pin) terminal 2A (A/C signal). • Is voltage **approximately 12 V** when fan switch is off and **0 V** when it is on?	Yes	Replace climate control unit, then go to Step 25.
		No	Repair wiring harness between climate control unit and resistor, then go to Step 25.

STEP	INSPECTION		ACTION
6	**CHECK FOR DTCS IN PCM** • Check for DTCs relating to the PCM on-board diagnostic system. • Are any DTCs displayed? — FP, FS, FS(Hi-power) (See F1-37 DTC TABLE) — RF Turbo (See F2-23 DTC INSPECTION)	Yes	Go to appropriate inspection procedure.
		No	Go to next step.
7	**CHECK TO SEE WHETHER MALFUNCTION IS IN MAGNETIC CLUTCH SYSTEM OR ELSEWHERE** • Remove A/C relay. • Turn ignition switch to ON position. • When A/C relay connector terminals C and D (on wiring harness side) are shorted, does magnetic clutch operate?	Yes	Undo short, then go to next step.
		No	Undo short, reconnect A/C relay, then go to Step 22.
8	**INSPECT A/C RELAY** • Inspect A/C relay. • Is it okay?	Yes	Reconnect A/C relay, then go to next step.
		No	Replace A/C relay, then go to Step 25.
*9	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C AMPLIFIER SYSTEM OR ELSEWHERE** • Turn ignition switch to LOCK position. • Remove radiator grille. • Disconnect refrigerant pressure switch. • Turn ignition switch to ON position. • Set fan switch to first speed. • Test voltage at refrigerant pressure switch connector terminal B (A/C signal) on wiring harness side. • Is voltage **approximately 12 V** when A/C switch is off and **0 V** when it is on?	Yes	Go to Step 16.
		No	Reconnect refrigerant pressure switch, then go to next step.
10	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN A/C AMPLIFIER AND WIRING HARNESS (BETWEEN FUSE BLOCK AND A/C AMPLIFIER) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect A/C amplifier. • Start engine. • Turn both A/C switch and fan switch on. • When A/C amplifier connector terminals B and C (on wiring harness side) are shorted, does cool air blow out?	Yes	Undo short, then go to next step.
		No	Undo short, then go to Step 12.
*11	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN A/C AMPLIFIER OR WIRING HARNESS (BETWEEN FUSE BLOCK AND A/C AMPLIFIER)** • Turn ignition switch to ON position. • Test voltage at A/C amplifier connector terminal A (IG2 signal) on wiring harness side. • Is voltage **approximately 12 V**?	Yes	Inspect A/C amplifier, then go to Step 25.
		No	Repair wiring harness between fuse block and A/C amplifier, then go to Step 25.
*12	**INSPECT WIRING HARNESS BETWEEN REFRIGERANT PRESSURE SWITCH AND A/C AMPLIFIER FOR SHORT TO B+** • Turn ignition switch to ON position. • Test voltage at A/C amplifier connector terminal B (A/C signal) on wiring harness side. • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between refrigerant pressure switch and A/C amplifier, then go to Step 25.
		No	Go to next step.

STEP	INSPECTION		ACTION
*13	**INSPECT WIRING HARNESS BETWEEN REFRIGERANT PRESSURE SWITCH AND A/C AMPLIFIER FOR CONTINUITY** • Turn ignition switch to LOCK position. • Is there continuity between A/C amplifier connector terminal B (A/C signal) and refrigerant pressure switch connector terminal B?	Yes	Go to next step.
		No	Repair wiring harness between refrigerant pressure switch and A/C amplifier, then go to Step 25.
*14	**INSPECT WIRING HARNESS FOR CONTINUITY BETWEEN CLIMATE CONTROL UNIT AND A/C AMPLIFIER** • Disconnect climate control unit connector(16-pin). • Is there continuity between climate control unit connector (16-pin) terminal 2D and A/C amplifier connector terminal C?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and A/C amplifier, then go to Step 25.
*15	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND A/C AMPLIFIER)** • Turn ignition switch to ON position. • Test voltage at A/C amplifier connector terminal C (A/C signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between climate control unit and A/C amplifier, then go to Step 25.
		No	Replace climate control unit, then go to Step 25.
*16	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN PCM AND WIRING HARNESS (BETWEEN PCM AND REFRIGERANT PRESSURE SWITCH) OR ELSEWHERE** • Turn ignition switch to ON position. • Test voltage at refrigerant pressure switch connector terminal A (A/C signal) on wiring harness side. • Is voltage **approximately** 12 V?	Yes	Go to Step 18.
		No	Go to next step.
*17	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN PCM OR WIRING HARNESS (BETWEEN PCM AND REFRIGERANT PRESSURE SWITCH)** • Test voltage at PCM connector terminal 41 (A/C signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between PCM and refrigerant pressure switch, then go to Step 25.
		No	Inspect PCM, then go to Step 25.
18	**CHECK TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH OR ELSEWHERE** • When refrigerant pressure switch connector terminals A and B (on wiring harness side) are shorted, does cool air blow out?	Yes	Inspect refrigerant pressure switch, then go to Step 25.
		No	Undo short, reconnect refrigerant pressure switch, then go to next step.
19	**INSPECT A/C RELAY (COIL-SIDE) POWER SUPPLY FUSE** • Is A/C replay power supply fuse okay?	Yes	Go to next step.
		No	Check for a short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse
*20	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND A/C RELAY (COIL-SIDE) FOR CONTINUITY** • Turn ignition switch to ON position. • Test voltage at A/C relay connector terminal A (IG1 signal). • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and A/C relay, then go to Step 25.

STEP	INSPECTION		ACTION
*21	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN A/C RELAY AND PCM) OR CONDENSER FAN CONTROL SYSTEM** • Turn ignition switch to ON position. • Turn A/C switch off. • Test voltage at PCM connector terminal 96 (IG1 signal). • Is voltage **approximately 12 V**?	Yes	Inspect condenser fan control system. (See F1-154 Cooling Fan Control Inspection)
		No	Repair wiring harness between A/C relay and PCM (Terminal 96), then go to Step 25.
22	**INSPECT A/C RELAY (SWITCH-SIDE) POWER SUPPLY FUSE** • Is A/C replay power supply fuse okay?	Yes	Go to next step.
		No	Check for a short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse.
*23	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND A/C RELAY (SWITCH-SIDE) FOR CONTINUITY** • Turn ignition switch to ON position. • Test voltage at A/C relay connector terminal C (A/C control signal). • Is voltage **approximately** 12 V?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and A/C relay, then go to Step 25.
*24	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN MAGNETIC CLUTCH AND THERMAL PROTECTOR OR WIRING HARNESS (BETWEEN A/C RELAY AND MAGNETIC CLUTCH)** • Test voltage at magnetic clutch connector terminal A (A/C control signal). • Is voltage **approximately 12 V**?	Yes	Inspect magnetic clutch. **If magnetic clutch is normal:** Replace thermal protector, then go to next step. **If magnetic clutch is malfunctioning:** Replace magnetic clutch, then go to next step.
		No	Repair wiring harness between A/C relay and magnetic clutch, then go to next step.
25	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does cool air blow out? (Is refrigerant system performance test result correct?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

TECHNICAL DATA

TECHNICAL DATA

AUTOMATIC TRANSAXLE

Item			Specification
			FN4A-EL
Line pressure (kPa {kgf/cm^2, psi})	D, S, L range	Idle	330—470 {3.4—4.8, 48—68}
		Stall	1158—1323 {11.8—13.5, 168—191}
	R position	Idle	490—710 {5.0—7.2, 71—102}
		Stall	1913—2128 {19.5—21.7, 278—308}
Engine stall speed (rpm)	D, S, L range		2200—2500
	R position		2200—2500
Time lag (sec)	N±D		0.4—0.7
	N±R		0.4—0.7
Transaxle fluid temperature sensor (kΩ)	-20 °C {-4 °F}		236—324
	0 °C {32 °F}		84.3—110
	20 °C {68 °F}		33.5—42.0
	40 °C {104 °F}		14.7—17.9
	60 °C {140 °F}		7.08—8.17
	80 °C {176 °F}		3.61—4.15
	100 °C {212 °F}		1.96—2.24
	120 °C {248 °F}		1.13—1.28
	130 °C {266 °F}		0.87—0.98
Input/turbine speed sensor (Ω)	ATF temperature: -40—160 °C {-40—320 °F}		250—600
Solenoid valve (Ω)	Shift solenoid A		1.0—4.2
	Shift solenoid B		1.0—4.2
	Shift solenoid C		1.0—4.2
	Shift solenoid D		10.9—26.2
	Shift solenoid E		10.9—26.2
	Pressure control solenoid		2.4—7.3
Automatic transaxle fluid (ATF)	Type		ATF M-III or equivalent (e.g.Dexron®II)
	Capacity (L {US qt, Imp, qt})		7.2 {7.6, 6.3}

FRONT AND REAR AXLES

Item		Engine					
		FP	FS (Sedan, Hatcback)		FS (Wagon)		RF Turbo
Transaxle		**MTX**	**MTX**	**ATX (FN4A-EL)**	**MTX**	**ATX (GF4A-EL)**	**MTX**
Drive shaft							
Shaft length (Air in boot at atmospheric pressure) (mm {in})	Left side	646.0—656.0 {25.43—25.83}	646.0—656.0 {25.43—25.83}	637.8—647.8 {25.11—25.50}	641.7—651.7 {25.26—25.66}	644.2—654.2 {25.36—25.76}	641.7—651.7 {25.26—25.66}
	Right side	596.5—606.5 {23.48—23.88}	596.5—606.5 {23.48—23.88}	586.9—596.9 {23.11—23.50}	593.2—603.2 {23.35—23.75}	587.2—597.2 {23.12—23.51}	593.2—603.2 {23.35—23.75}

SUSPENSION

Wheel and Tires

Item		Specification
Tire	Size	205/50 R16 87V
Wheel	Size	16 6JJ
	Offset (mm {in})	50 {1.97}
Unbalance limit (at rim edge) (g {oz})		8 {0.28} max.

- One balance weight: max. 60 g {2.1 oz}.
- If the total weight exceeds 100 g {3.5 oz} on one side, rebalance after moving the tire around on the rim.
- Do not use more than two balance weights on the inner or outer side of the wheel.

BODY ELECTRICAL SYSTEM

Item		Specifications
Exterior light bulb capacity (W)	Headlight	55+55/55 2
	Parking light	5 2
	Front fog light	55 2
	Front turn light	21 2
	Front side turn light	5 2
	Brake light/taillight	21/5 2
	Rear turn light	21 2
	Back-up light	18 2
	Rear fog light	21 1
	License plate light	5 2
	High-mount brake light	Interior type 21 1, Spoiler type 4 1
Interior light bulb capacity (W)	Interior light	L.H.D. 8 1, R.H.D. 10 1
	Map light	5 2
	Cargo compartment light	5HB 5 1, Station wagon 8 1
	Trunk compartment light	5 1
	Glove compartment light	1.2 1
	Ignition key illumination	1.6 1
	Front ashtray illumination	1.4 1
	Instrument cluster illumination	3.4 2, 1.4 2
Warning and indicator light bulb capacity (W)	Air bag system warning light	1.4 1
	Oil pressure warning light	1.4 1
	Brake system warning light	1.4 1
	Fuel-level warning light	1.4 1
	ABS warning light	1.4 1
	High beam indicator light	1.4 1
	Turn indicator light	1.4 2
	Front fog light indicator light	1.4 1
	Rear fog light indicator light	1.4 1
	HOLD indicator light	1.4 1
	Cruise set indicator light	1.4 1
	Passenger-side air bag system cut-off indicator light	2 1
	Glow indicator light	1.4 1
	High beam indicator light	1.4 1
	TCS OFF light	1.4 1
	TCS indicator light	1.4 1

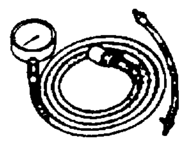
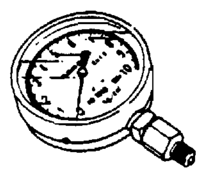
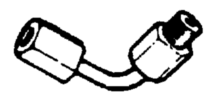
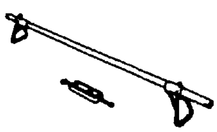
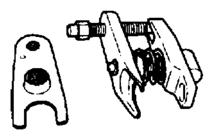
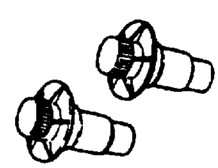
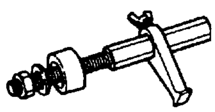
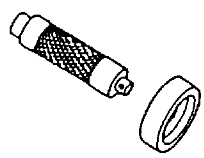
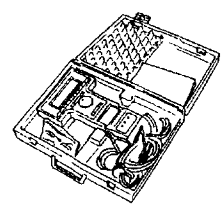
SPECIAL TOOLS

SPECIAL TOOLS

FUEL AND EMISSION CONTROL SYSTEMS

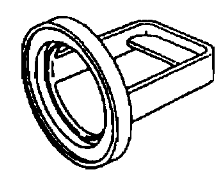
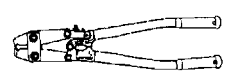
Program card 	SST No. for Program card varies with language • 49 T088 030F (English/French) • 49 T088 031F (English/German) • 49 T088 032F (English/Dutch) • 49 T088 033F (English/Swedish) • 49 T088 034D (English/Spanish) • 49 T088 035D (English/Portuguese) • 49 T088 036D (English/Italian)	• 49 T088 037C (English/Danish) • 49 T088 038C (English/Norwegian) • 49 T088 039C (English/Czech) • 49 T088 040A (English/Finnish) • 49 T088 041C (English/Greek) • 49 T088 042C (English/Hungarian) • 49 T088 043C (nglish/Polish) • 49 T088 053B (English/Turkish)

AUTOMATIC TRANSAXLE

49 0378 400B Oil pressure gauge set 	49 B019 901A Oil pressure gauge set 	49 H019 002 Adapter 
49 G017 5A0 Engine support 	49 T028 3A0 Ball joint puller set 	49 G030 455 Diff side gear holder 
49 E011 1A0 Ring gear brake set 	49 G030 795 Oil seal installer 	49 T088 0A4 49 T088 0A5 NGS tester set 

Program card 	SST No. for Program card varies with language • 49 T088 030F (English/French) • 49 T088 031F (English/German) • 49 T088 032F (English/Dutch) • 49 T088 033F (English/Swedish) • 49 T088 034D (English/Spanish) • 49 T088 035D (English/Portuguese) • 49 T088 036D (English/Italian)	• 49 T088 037C (English/Danish) • 49 T088 038C (English/Norwegian) • 49 T088 039C (English/Czech) • 49 T088 040A (English/Finnish) • 49 T088 041C (English/Greek) • 49 T088 042C (English/Hungarian) • 49 T088 043C (nglish/Polish) • 49 T088 053B (English/Turkish)

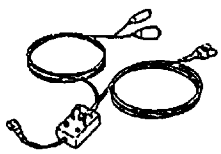
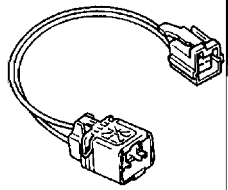
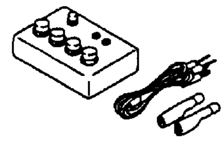
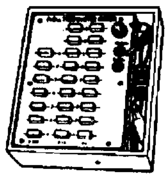
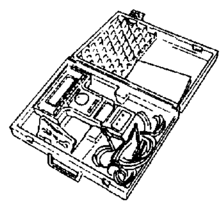
FRONT AND REAR AXLES

49 G025 001 Sensor rotor installer 	49 T025 001 Boot clamp crimper 	—

BRAKING SYSTEM

49 0259 770B Flare nut wrench 	—	—

BODY ELECTRICAL SYSTEM

49 H066 002 Deployment tool 	49 D066 002 Adapter harness 	49 N088 0A0 Fuel and thermometer checker (New) 
49 0839 285 Fuel and thermometer checker (Old) 	49 T088 0A4 49 T088 0A5 NGS tester set 	—
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