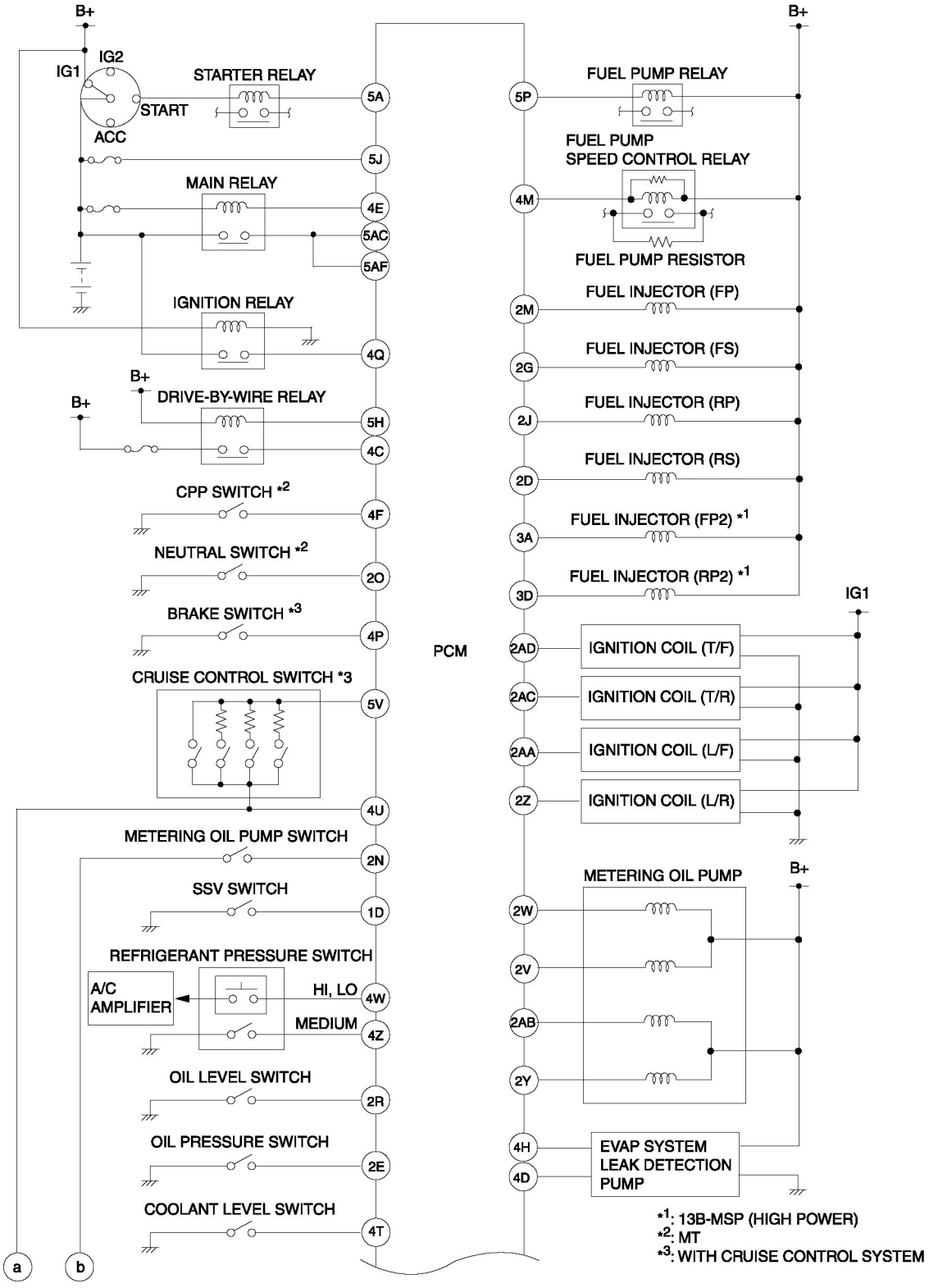
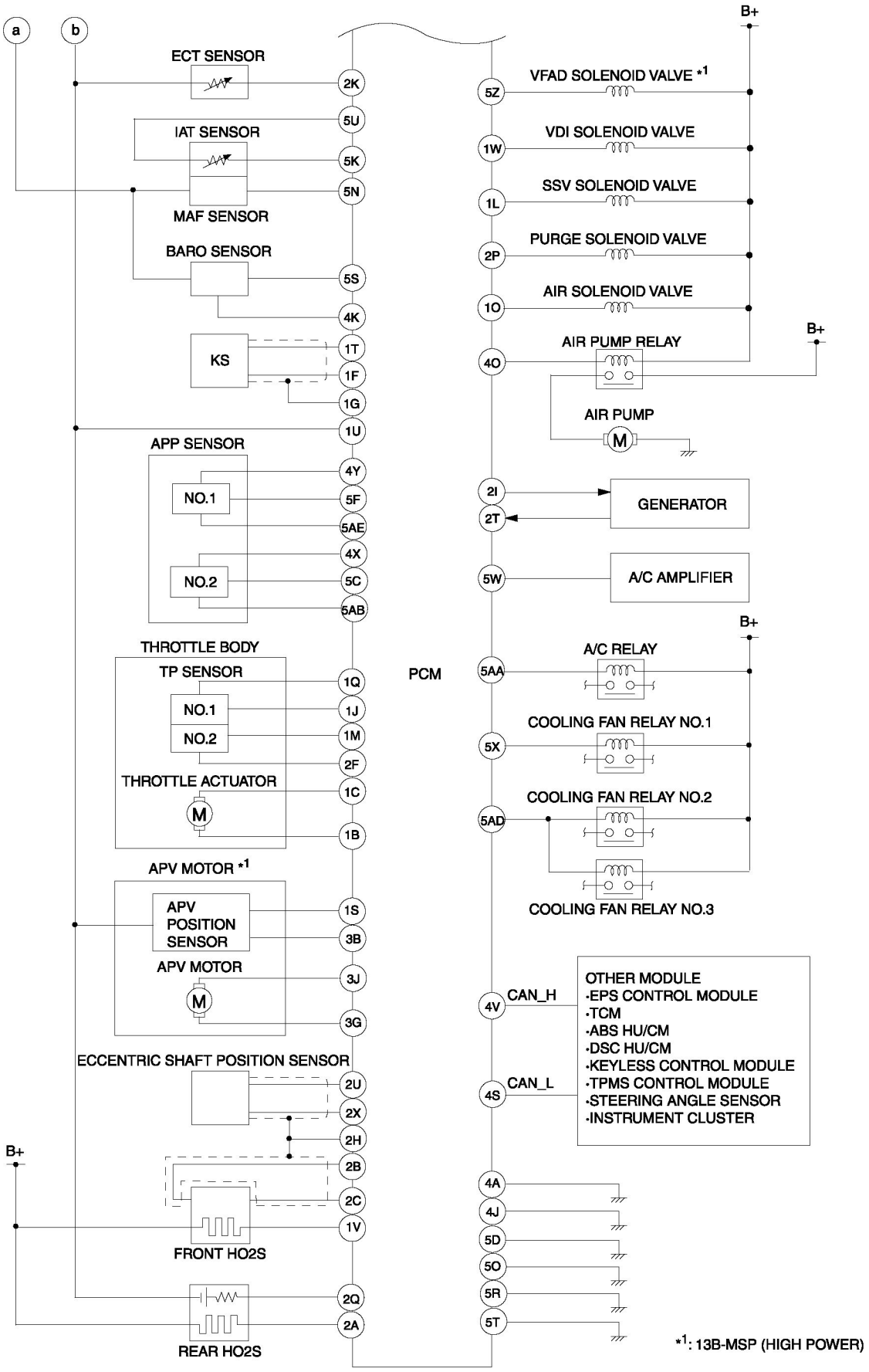
ENGINE DIAGNOSTICS & CONTROL

CONTROL SYSTEM WIRING DIAGRAM (w)




a
b
ECT SENSOR
2K
IAT SENSOR
5U
5K
MAF SENSOR
5N
BARO SENSOR
5S
4K
KS
1T
1F
1G
1U
APP SENSOR
NO.1
4Y
5F
5AE
NO.2
4X
5C
5AB
THROTTLE BODY
TP SENSOR
NO.1
NO.2
THROTTLE ACTUATOR
1Q
1J
1M
2F
1C
1B
APV MOTOR *1
APV POSITION SENSOR
APV MOTOR
1S
3B
3J
3G
ECCENTRIC SHAFT POSITION SENSOR
2U
2X
2H
2B
2C
1V
FRONT HO2S
2Q
2A
REAR HO2S
PCM
B+
VFAD SOLENOID VALVE *1
5Z
VDI SOLENOID VALVE
1W
SSV SOLENOID VALVE
1L
PURGE SOLENOID VALVE
2P
AIR SOLENOID VALVE
1O
B+
AIR PUMP RELAY
4O
AIR PUMP
2I
2T
GENERATOR
5W
A/C AMPLIFIER
B+
A/C RELAY
5AA
COOLING FAN RELAY NO.1
5X
COOLING FAN RELAY NO.2
5AD
COOLING FAN RELAY NO.3
CAN_H
4V
CAN_L
4S
OTHER MODULE
·EPS CONTROL MODULE
·TCM
·ABS HU/CM
·DSC HU/CM
·KEYLESS CONTROL MODULE
·TPMS CONTROL MODULE
·STEERING ANGLE SENSOR
·INSTRUMENT CLUSTER
4A
4J
5D
5O
5R
5T
*1: 13B-MSP (HIGH POWER)

MONITORING SYSTEM AND CONTROL SYSTEM DEVICE RELATIONSHIP CHART

×: Applicable

Component	HO2S	HO2S heater	Thermostat	Fuel system	Misfire	AIR system	Catalyst	EVAP system
Input								
Battery		×			×			×
Ignition switch	×	×						×
A/C switch, refrigerant pressure switch (high, low pressure)			×					
TP sensor	×			×	×		×	×
ECT sensor	×	×	×	×	×	×	×	×
IAT sensor	×	×	×	×	×	×	×	×
MAF sensor	×	×	×	×	×	×	×	
Front HO2S	×	×		×		×	×	
Rear HO2S	×	×		×			×	
BARO sensor	×	×	×	×	×		×	×
Eccentric shaft position sensor	×	×	×	×	×	×	×	×
Fuel gauge sender unit					×			×
ABS HU/CM or DSC HU/CM					×			
Output								
Fuel injector				×				
Front HO2S heater		×						
Rear HO2S heater		×						
Purge solenoid valve	×			×			×	×
AIR solenoid valve						×		
EVAP system leak detection pump								×
AIR pump relay						×		
Cooling fan relay (No.1, No.2 and No.3)								×
MIL	×	×	×	×	×	×	×	×

OBD-II PENDING TROUBLE CODE

- These appear when a problem is detected in a monitored system. The code for a failed system is stored in the PCM memory in the first drive cycle. This code is called the pending code. If the problem is not found in a second drive cycle, the PCM judges that the system returned to normal or the problem was mistakenly detected, and deletes the pending code. If the problem is found in a second drive cycle too, the PCM judges that the system has failed, and the DTC is stored.

OBD-II FREEZE FRAME DATA

- This is the technical data which indicates the engine condition at the time of the first malfunction. This data will remain in the memory even if another emission-related DTC is stored, with the exception of Fuel system or Misfire DTCs. Once freeze frame data for Fuel system or Misfire DTC is stored, it will overwrite any previous data and the freeze frame will not be overwritten again.

OBD-II ON-BOARD SYSTEM READINESS TEST

- This shows the OBD-II systems operating status. If any monitor function is incomplete, WDS or equivalent will identify which monitor function has not been completed. The Fuel system, Misfire and CCM are continuous monitoring-type functions. The HO2S, Thermostat, AIR system, Catalyst and EVAP system will be monitored under drive cycles. The OBD-II diagnostic system is initialized by performing the DTC cancellation procedure or disconnecting the negative battery cable.

OBD-II DIAGNOSTIC MONITORING TEST RESULT

- The results from the technical data of the intermittent monitor system are used to determine whether the system is normal or not. They also display the system thresholds and diagnostic results. The intermittent monitor system monitors the HO2S, Thermostat, AIR system, Catalyst and EVAP system.

OBD-II READ/CLEAR DIAGNOSTIC TEST RESULT

- This retrieves all stored DTCs in the PCM and clears the on-board readiness test results, freeze frame data, DTC, diagnostic monitoring test results and pending trouble code.

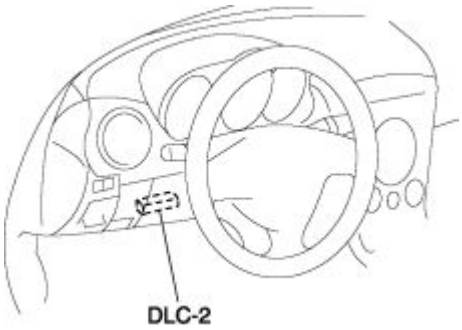
OBD-II PARAMETER IDENTIFICATION (PID) ACCESS

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

ON-BOARD DIAGNOSTIC TEST

DTC Reading Procedure

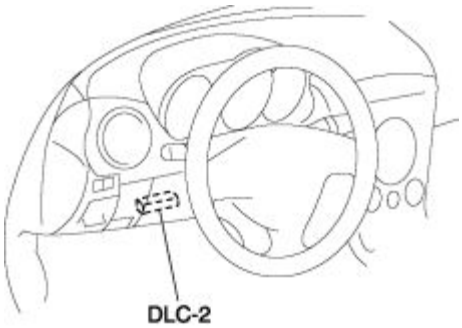
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located in the driver compartment.



3. Retrieve the DTCs using the WDS or equivalent.

Pending Trouble Code Access Procedure

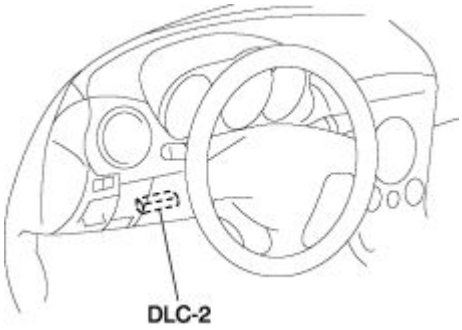
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located in the driver compartment.



3. Retrieve the pending trouble codes using the WDS or equivalent.

Freeze Frame PID Data Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located in the driver compartment.

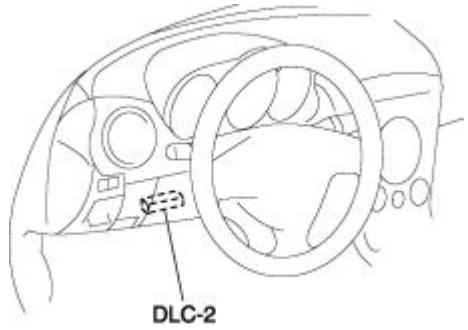


3. Record the freeze frame PID data using the WDS or equivalent.

On-Board System Readiness Tests Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.

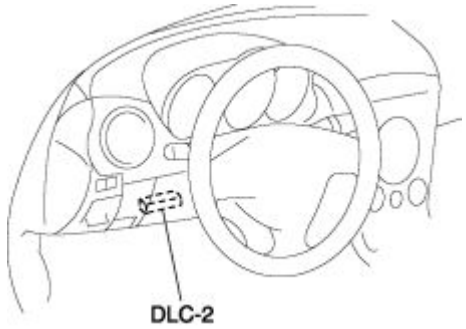
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located in the driver compartment.



3. Monitor the OBD-II systems operating status using the WDS or equivalent.

PID/DATA Monitor and Record Procedure

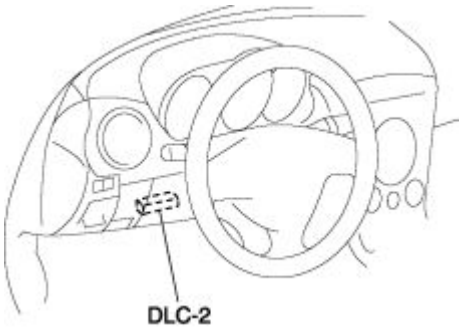
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located in the driver compartment.



3. Access and monitor PIDs using the WDS or equivalent.

Diagnostic Monitoring Test Results Access Procedure

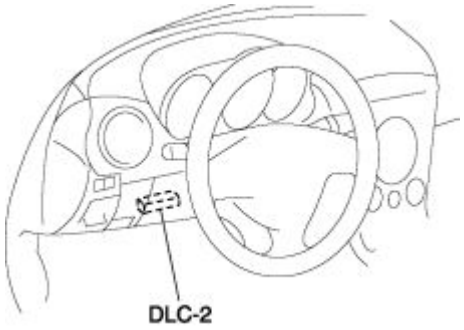
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the WDS or equivalent to the vehicle DLC-2 16-pin connector located in the driver compartment.



3. Access to the diagnostic monitoring test results and read the test results using the WDS or equivalent.

AFTER REPAIR PROCEDURE

1. Connect the WDS or equivalent to the DLC-2.



2. Cycle the ignition switch off, then to the ON position (Engine off).
3. Record DTC if retrieved.
4. Clear all diagnostic data using the WDS or equivalent.

OBD-II DRIVE MODE

- Performing the Drive Mode inspects the OBD-II system for proper operation and must be performed to ensure that no additional DTCs are present.
- During the Drive Mode, the following systems are inspected:
  - HO2S heater
  - HO2S
  - TWC
  - Fuel system, Misfire and EVAP system

CAUTION:

- While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.
- When the WDS or equivalent is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the WDS or equivalent using the PID/DATA MONITOR AND RECORD function and inspect later.

NOTE:

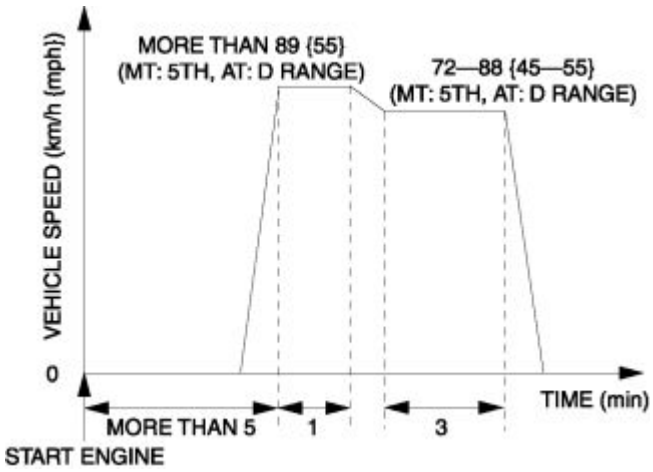
- Vehicle speed and engine speed detected by the PCM may differ from that indicated by the speedometer and tachometer. Use the WDS or equivalent to monitor vehicle speed.
- If the OBD-II system inspection is not completed during the Drive Mode, the following causes are considered:
  - The OBD-II system detected a malfunction.
  - The Drive Mode procedure was not completed correctly.
- Disconnecting the battery will reset the memory. Do not disconnect the battery during and after the Drive Mode.
- The WDS or equivalent can be used at anytime through the course of the Drive Mode to monitor the completion status. Monitoring can be done by viewing the ON BOARD SYSTEM READINESS menu.

Mode 1 (PCM Adaptive Memory Produce Drive Mode)

1. Start the engine and warm it up completely.
2. Verify the following conditions and correct if necessary:
   - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
   - Initial ignition timing and idle speed are within specification.
3. Perform no load racing at the engine speed of **2,500—3,500 rpm** for **more than 15 s** .
4. Continuously perform no load racing at the engine speed of **4,500—5,000 rpm** for **more than 15 s** .
5. Idle the engine for **more than 60 s** after the cooling fan stopped.
6. Turn the ignition switch off.

Mode 3 (HO2S heater, HO2S, and TWC Repair Verification Drive Mode)

1. Perform the Mode 1 first.
2. Verify that all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph. The driving condition before driving at constant speed is not specified.



4. Stop the vehicle and access the ON BOARD SYSTEM READINESS to inspect the Drive Mode completion status.
   - If completed, RFC changes from No to Yes.
   - If not completed, turn the ignition switch off, then go back to Step 3.
5. Access the DIAGNOSTIC MONITORING TEST RESULTS to inspect the monitor results.
   - If MEAS are not within specification, repair has not been completed.
6. Verify that no DTCs are available.

Mode 6 (EVAP System Repair Verification Drive Mode)

NOTE:

- If the Mode 6 cannot be performed (you cannot drive the vehicle under the Mode 6 condition), perform the "Evaporative System Test" as an alternative. (See Evaporative System Test .)

1. Verify that all of the following PIDs are within the stated specifications. All PIDs must be within specifications before the engine is started to initiate the evaporative system test.
    - BARO: **More than 72.3 kPa {542 mmHg, 21.3 inHg}**
    - IAT: **5—35 °C {41—95 °F}**
    - FLI: **15—85 %**
    - B+: **10.9—14.6 V**
2. Clear the DTC from the PCM memory using the WDS or equivalent.
3. Start the engine and idle it for **more than 10 s** , then turn the ignition switch off.
4. Leave the vehicle is this condition for **more than 5 hours** .
5. Start the engine and idle it for **more than 15 min** .
6. Drive the vehicle at the engine speed of **65—80 km/h {40—50 mph}** for **more than 5 min** .
7. Stop the vehicle and turn the ignition switch off.
8. Leave the vehicle in this condition for **more than 10 min** .
9. Start the engine.
10. Access the ON BOARD SYSTEM READINESS to inspect the Drive Mode completion status.
    - If completed, RFC changes from No to Yes.
    - If not completed, turn the ignition switch off, then go back to Step 1.
11. Access the DIAGNOSTIC MONITORING TEST RESULTS to inspect the monitor results.
    - If MEAS are not within specification, repair has not been completed.
12. Verify that no DTCs are available.

Notes:

DIAGNOSTIC MONITORING TEST RESULTS

- The purpose of this test mode is to confirm the result of OBD-II monitor diagnostic test results. The result values stored when a particular monitor is completed are displayed. If the monitor is not completed, the initial value is displayed.

Test ID	Description	Related system
10:01:80	Response lean to rich	HO2S (front HO2S)
10:01:81	Response rich to lean	
10:02:01	Rich to lean sensor threshold voltage	HO2S (rear HO2S)
10:02:03	Low sensor voltage for switch time calculation	
10:02:04	High sensor voltage for switch time calculation	
10:02:05	Rich to lean sensor switching time	
10:21:80	Front and rear HO2S switching time ratio	Catalyst
10:3A:80	Large leak check	EVAP system
10:3B:80	Small leak check	
10:3C:80	Very small leak check	
10:3D:80	Purge flow monitor	
10:71:80	Secondary airflow test	AIR system
10:E1:80	Heat radiation ratio	Thermostat
10:E1:81	ECT	

DTC TABLE

×: Applicable

—: Not applicable

DTC No.	Condition	MIL	DC	Monitor item*	Memory function	Page
P0030	Front HO2S heater control circuit problem	ON	2	HO2S heater	×	(See DTC P0030)
P0031	Front HO2S heater control circuit low	ON	2	HO2S heater	×	(See DTC P0031)
P0032	Front HO2S heater control circuit high	ON	2	HO2S heater	×	(See DTC P0032)
P0037	Rear HO2S heater control circuit low	ON	2	HO2S heater	×	(See DTC P0037)
P0038	Rear HO2S heater control circuit high	ON	2	HO2S heater	×	(See DTC P0038)
P0076	VDI solenoid valve control circuit low	OFF	2	CCM	×	(See DTC P0076)
P0077	VDI solenoid valve control circuit high	OFF	2	CCM	×	(See DTC P0077)
P0101	MAF sensor circuit range/performance problem	ON	2	CCM	×	(See DTC P0101)
P0102	MAF sensor circuit low input	ON	1	CCM	×	(See DTC P0102)
P0103	MAF sensor circuit high input	ON	1	CCM	×	(See DTC P0103)
P0107	BARO sensor circuit low input	ON	1	CCM	×	(See DTC P0107)
P0108	BARO sensor circuit high input	ON	1	CCM	×	(See DTC P0108)
P0111	IAT sensor circuit range/performance problem	ON	2	CCM	×	(See DTC P0111)
P0112	IAT sensor circuit low input	ON	1	CCM	×	(See DTC P0112)
P0113	IAT sensor circuit high input	ON	1	CCM	×	(See DTC P0113)
P0117	ECT sensor circuit low input	ON	1	CCM	×	(See DTC P0117)
P0118	ECT sensor circuit high input	ON	1	CCM	×	(See DTC P0118)
P0122	TP sensor No.1 circuit low input	ON	1	CCM	×	(See DTC P0122)
P0123	TP sensor No.1 circuit high input	ON	1	CCM	×	(See DTC

						P0123)
P0125	Insufficient coolant temperature for closed loop fuel control	ON	2	CCM	×	(See DTC P0125)
P0126	Insufficient coolant temperature for stable operation	ON	2	Thermostat	×	(See DTC P0126, P0128)
P0128	Coolant thermostat problem	ON	2	Thermostat	×	
P0130	Front HO2S circuit problem	ON	2	HO2S	×	(See DTC P0130)
P0131	Front HO2S circuit low voltage	ON	2	HO2S	×	(See DTC P0131)
P0132	Front HO2S circuit high voltage	ON	2	HO2S	×	(See DTC P0132)
P0133	Front HO2S circuit slow response	ON	2	HO2S	×	(See DTC P0133)
P0138	Rear HO2S circuit high voltage	ON	2	HO2S	×	(See DTC P0138)
P0139	Rear HO2S circuit slow response	ON	2	HO2S	×	(See DTC P0139)
P0171	System too lean	ON	2	Fuel system	×	(See DTC P0171)
P0172	System too rich	ON	2	Fuel system	×	(See DTC P0172)
P0222	TP sensor No.2 circuit low input	ON	1	CCM	×	(See DTC P0222)
P0223	TP sensor No.2 circuit high input	ON	1	CCM	×	(See DTC P0223)
P0300	Random misfire detected	Flash/ON	1 or 2	Misfire	×	(See DTC P0300)
P0301	Front rotor misfire detected	Flash/ON	1 or 2	Misfire	×	(See DTC P0301, P0302)
P0302	Rear rotor misfire detected	Flash/ON	1 or 2	Misfire	×	
P0327	KS circuit low input	ON	1	CCM	×	(See DTC P0327)
P0328	KS circuit high input	ON	1	CCM	×	(See DTC P0328)
P0335	Eccentric shaft position sensor circuit problem	ON	1	CCM	×	(See DTC P0335)
P0336	Eccentric shaft position sensor circuit range/performance problem	ON	1	CCM	×	(See DTC P0336)
P0410	AIR system problem	ON	2	AIR system	×	(See DTC P0410)
P0420	Catalyst system efficiency below threshold	ON	2	Catalyst	×	(See DTC P0420)

P0441	EVAP system incorrect purge flow	ON	2	EVAP system	×	(See DTC P0441)
P0442	EVAP system leak detected (small leak)	ON	2	EVAP system	×	(See DTC P0442)
P0443	Purge solenoid valve circuit problem	ON	2	CCM	×	(See DTC P0443)
P0446	EVAP system vent control circuit problem	ON	2	EVAP system	×	(See DTC P0446)
P0455	EVAP system leak detected (large leak)	ON	2	EVAP system	×	(See DTC P0455)
P0456	EVAP system leak detected (very small leak)	ON	2	EVAP system	×	(See DTC P0456)
P0461	Fuel gauge sender unit circuit range/performance problem	ON	2	CCM	×	(See DTC P0461)
P0462	Fuel gauge sender unit circuit low input	ON	2	CCM	×	(See DTC P0462)
P0463	Fuel gauge sender unit circuit high input	ON	2	CCM	×	(See DTC P0463)
P0480	Cooling fan No.1 control circuit problem	OFF	2	Other	×	(See DTC P0480)
P0481	Cooling fan No.2 control circuit problem	OFF	2	Other	×	(See DTC P0481)
P0500	VSS circuit problem	ON	2	CCM	×	(See DTC P0500)
P0505	Idle air control system problem	OFF	—	—	—	(See DTC P0505)
P0506	Idle air control system RPM lower than expected	ON	2	CCM	×	(See DTC P0506)
P0507	Idle air control system RPM higher than expected	ON	2	CCM	×	(See DTC P0507)
P0562	System voltage low (KAM)	ON	1	CCM	×	(See DTC P0562)
P0564	Cruise control switch input circuit problem	OFF	1	Other	×	(See DTC P0564)
P0571	Brake switch input circuit problem	OFF	1	Other	×	(See DTC P0571)
P0601	PCM memory check sum error	ON	1	CCM	×	(See DTC P0601)
P0602	PCM programming error	ON	1	CCM	×	(See DTC P0602)
P0604	PCM random access memory error	ON	1	CCM	×	(See DTC P0604)
P0610	PCM vehicle options error	ON	1	CCM	×	(See DTC P0610)

P0638	Throttle actuator control circuit range/performance problem	ON	1	CCM	×	(See DTC P0638)
P0661	SSV solenoid valve control circuit low	ON	2	CCM	×	(See DTC P0661)
P0662	SSV solenoid valve control circuit high	ON	2	CCM	×	(See DTC P0662)
P0703	Brake switch No.1 input circuit problem	ON	2	CCM	×	(See DTC P0703)
P0704	Clutch switch input circuit problem	ON	2	CCM	×	(See DTC P0704)
P0850	Neutral switch input circuit problem	ON	2	CCM	×	(See DTC P0850)
P1260	Immobilizer system problem	OFF	1	Other	—	(See DTC P1260)
P1574	TP sensor output incongruent	ON	1	CCM	×	(See DTC P1574)
P1577	APP sensor output incongruent	ON	1	CCM	×	(See DTC P1577)
P1686	Metering oil pump control circuit low flow side problem	ON	1	Other	×	(See DTC P1686)
P1687	Metering oil pump control circuit high flow side problem	ON	1	Other	×	(See DTC P1687)
P1688	Metering oil pump control circuit initial check problem	ON	1	Other	×	(See DTC P1688)
P2004	APV stuck open	ON	2	CCM	×	(See DTC P2004)
P2006	APV motor control circuit IC problem	ON	2	CCM	×	(See DTC P2006)
P2008	APV motor control circuit/open	ON	2	CCM	×	(See DTC P2008)
P2017	APV position sensor circuit problem	ON	2	CCM	×	(See DTC P2017)
P2070	SSV stuck open	ON	2	CCM	×	(See DTC P2070)
P2096	Target A/F feedback system too lean	ON	2	Fuel system	×	(See DTC P2096)
P2097	Target A/F feedback system too rich	ON	2	Fuel system	×	(See DTC P2097)
P2101	Drive-by-wire relay control circuit problem	ON	1	CCM	×	(See DTC P2101)
P2106	Throttle actuator control system-forced limited power	ON	1	CCM	×	(See DTC P2106)
P2107	Throttle actuator control module processor error	ON	1	CCM	×	(See DTC P2107)

P2108	Throttle actuator control module performance error	ON	1	CCM	×	(See DTC P2108)
P2109	TP sensor minimum stop range/performance problem	ON	1	CCM	×	(See DTC P2109)
P2112	Throttle actuator control system range/performance problem	ON	1	CCM	×	(See DTC P2112)
P2119	Throttle actuator control throttle body range/performance problem	ON	2	CCM	×	(See DTC P2119)
P2122	APP sensor No.1 circuit low input	ON	1	CCM	×	(See DTC P2122)
P2123	APP sensor No.1 circuit high input	ON	1	CCM	×	(See DTC P2123)
P2127	APP sensor No.2 circuit low input	ON	1	CCM	×	(See DTC P2127)
P2128	APP sensor No.2 circuit high input	ON	1	CCM	×	(See DTC P2128)
P2135	TP sensor No.1/No.2 voltage correlation problem	ON	1	CCM	×	(See DTC P2135)
P2136	TP sensor No.1/No.3 voltage correlation problem	ON	1	CCM	×	(See DTC P2136)
P2138	APP sensor No.1/No.2 voltage correlation problem	ON	1	CCM	×	(See DTC P2138)
P2195	Front HO2S signal stuck lean	ON	2	HO2S	×	(See DTC P2195)
P2196	Front HO2S signal stuck rich	ON	2	HO2S	×	(See DTC P2196)
P2257	AIR pump relay control circuit low	ON	2	CCM	×	(See DTC P2257)
P2258	AIR pump relay control circuit high	ON	2	CCM	×	(See DTC P2258)
P2259	AIR solenoid valve control circuit low	ON	2	CCM	×	(See DTC P2259)
P2260	AIR solenoid valve control circuit high	ON	2	CCM	×	(See DTC P2260)
P2270	Rear HO2S signal stuck lean	ON	2	HO2S	×	(See DTC P2270)
P2271	Rear HO2S signal stuck rich	ON	2	HO2S	×	(See DTC P2271)
P2401	EVAP system leak detection pump control circuit low	ON	2	EVAP system	×	(See DTC P2401)
P2402	EVAP system leak detection pump control circuit high	ON	2	EVAP system	×	(See DTC P2402)
P2404	EVAP system leak detection pump sense circuit range/performance problem	ON	2	EVAP system	×	(See DTC P2404)

P2405	EVAP system leak detection pump sense circuit low	ON	2	EVAP system	×	(See DTC P2405)
P2406	EVAP system leak detection pump sense circuit high	ON	2	EVAP system	×	(See DTC P2406)
P2407	EVAP system leak detection pump sense circuit intermittent/erratic problem	ON	2	EVAP system	×	(See DTC P2407)
P2502	Charging system voltage problem	OFF	1	Other	×	(See DTC P2502)
P2503	Charging system voltage low	OFF	1	Other	×	(See DTC P2503)
P2504	Charging system voltage high	OFF	1	Other	×	(See DTC P2504)
U0073	CAN system communication error	(See DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM])				
U0101	Communication error to TCM					
U0121	Communication error to ABS HU/CM					
U0155	Communication error to instrument cluster					
U0167	Communication error to keyless control module					

*

Indicates the applicable item in On-Board System Readiness Test defined by CARB.

DTC P00XX

DTC P0030

DTC P0030	Front HO2S heater control circuit problem
DETECTION CONDITION	• The PCM monitors the front HO2S impedance when under the front HO2S heater control for **200 s** . If the impedance is **more than 44 ohms** , the PCM determines that there is a front HO2S heater control circuit problem. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • PCM malfunction

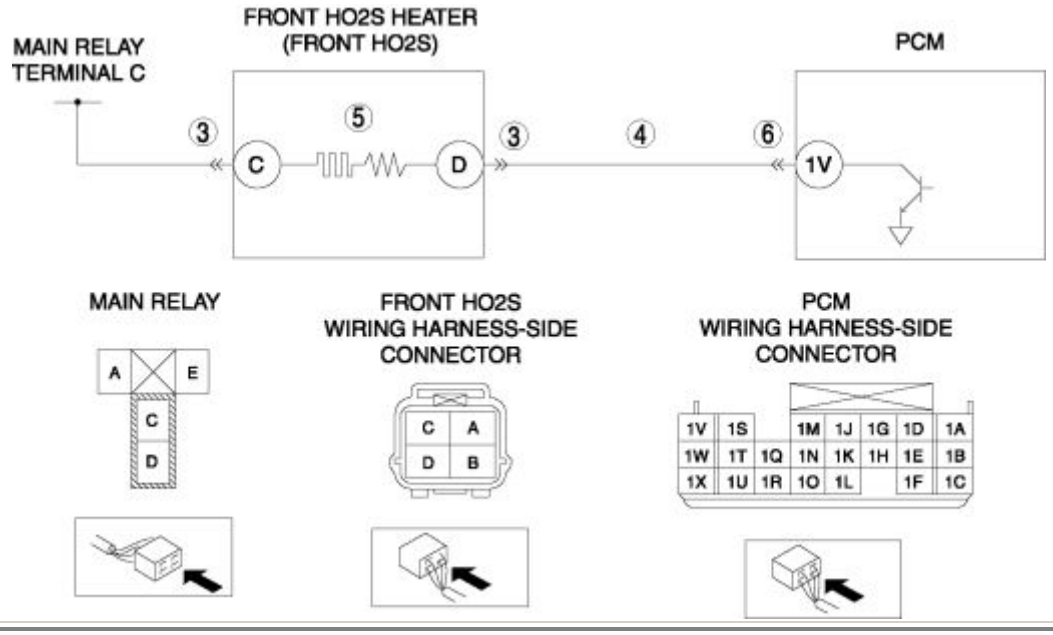
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	INSPECT FRONT HO2S HEATER • Inspect the front HO2S heater. (See FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the front HO2S, then go to Step 7. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to the next step.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0030 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0031

DTC P0031	Front HO2S heater control circuit low
DETECTION CONDITION	• The PCM monitors the front HO2S heater control voltage when the PCM turns the front HO2S heater off. If the control voltage **exceeds 25 %** of the battery voltage, the PCM determines that the front HO2S heater control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between front HO2S terminal D and PCM terminal 1V • PCM malfunction



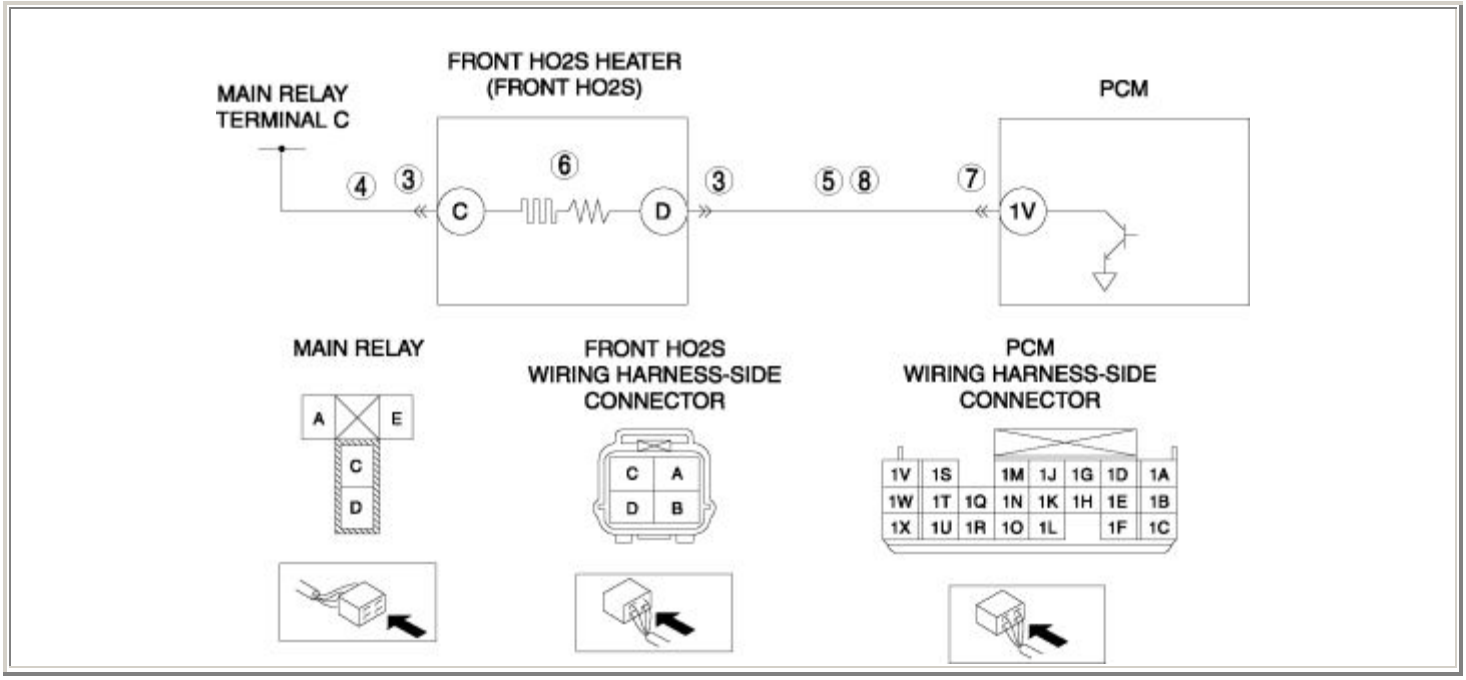
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between front HO2S terminal D (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT FRONT HO2S HEATER • Inspect the front HO2S heater. (See FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the front HO2S, then go to Step 7. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0032

DTC P0032	Front HO2S heater control circuit high
DETECTION CONDITION	• The PCM monitors the front HO2S heater control voltage when the PCM turns the front HO2S heater on. If the control voltage is **less than 25 %** of the battery voltage, the PCM determines that the front HO2S heater control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and front HO2S terminal C • Short to GND in wiring harness between main relay terminal C and front HO2S terminal C • Open circuit in wiring harness between front HO2S terminal D and PCM terminal 1V • Short to GND in wiring harness between front HO2S terminal D and PCM terminal 1V • PCM malfunction


FRONT HO2S HEATER
(FRONT HO2S)
MAIN RELAY
TERMINAL C
PCM
4
3
6
C
D
3
5
8
7
1V
MAIN RELAY
A
E
C
D
FRONT HO2S
WIRING HARNESS-SIDE
CONNECTOR
C
A
D
B
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

Notes:

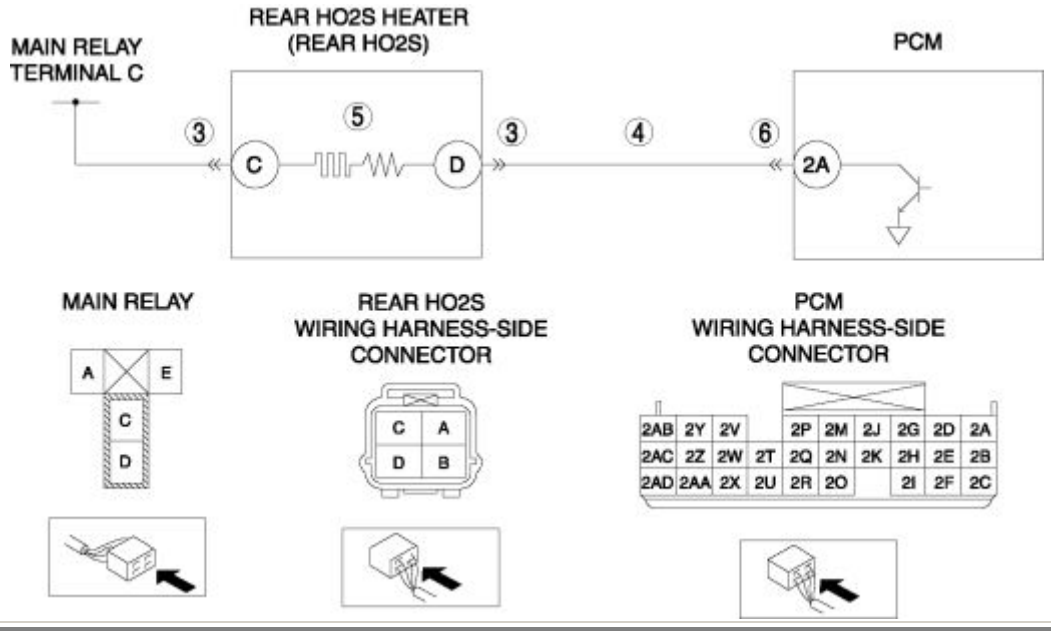
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT FRONT HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between front HO2S terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 9.
5	INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between front HO2S terminal D (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.

6	INSPECT FRONT HO2S HEATER • Inspect the front HO2S heater. (See FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the front HO2S, then go to Step 9. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between front HO2S terminal D (wiring harness-side) and PCM terminal 1V (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0037

DTC P0037	Rear HO2S heater control circuit low
DETECTION CONDITION	• The PCM monitors the rear HO2S heater control voltage when the PCM turns the rear HO2S heater off. If the control voltage **exceeds 57 %** of the battery voltage, the PCM determines that the rear HO2S heater control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between rear HO2S terminal D and PCM terminal 2A • PCM malfunction



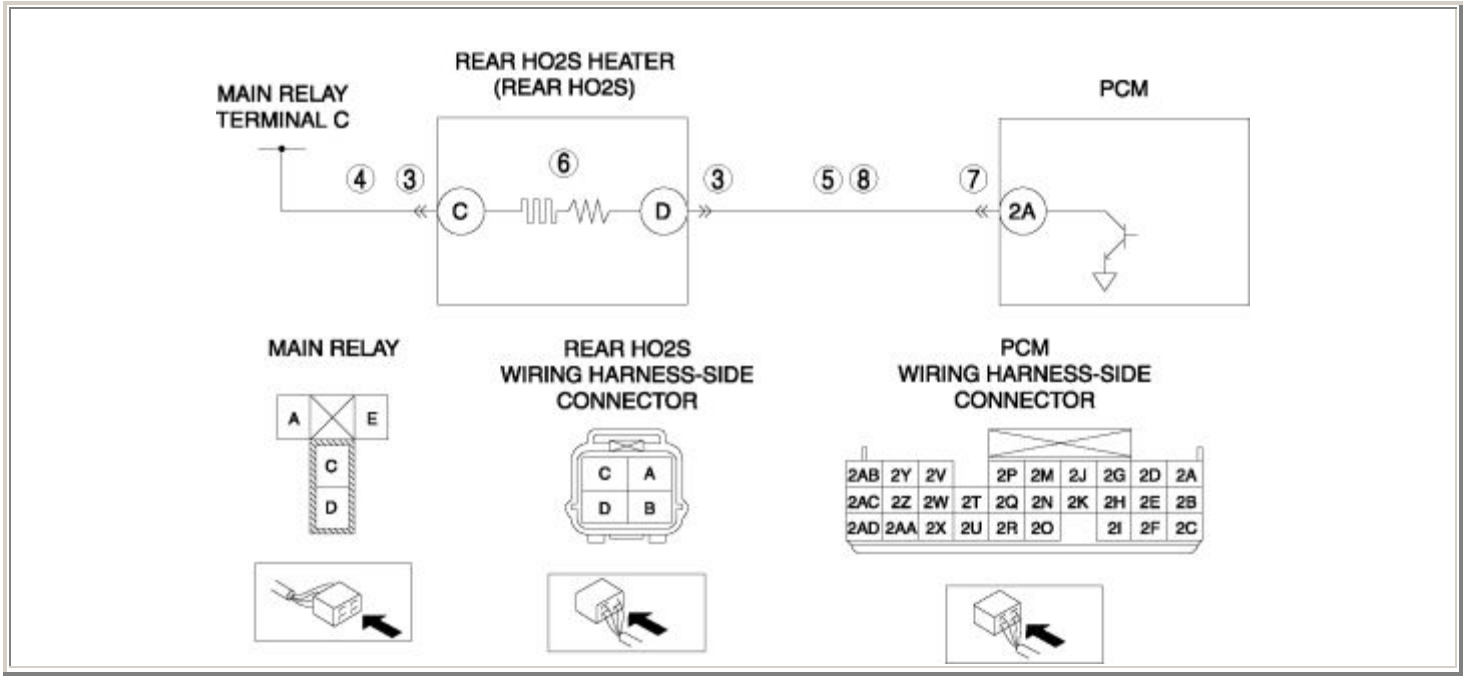
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal D (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT REAR HO2S HEATER • Inspect the rear HO2S heater. (See REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the rear HO2S, then go to Step 7. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0038

DTC P0038	Rear HO2S heater control circuit high
DETECTION CONDITION	• The PCM monitors the rear HO2S heater control voltage when the PCM turns the rear HO2S heater on. If the control voltage is **less than 57 %** of the battery voltage, the PCM determines that the rear HO2S heater control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S heater malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and rear HO2S terminal C • Short to GND in wiring harness between main relay terminal C and rear HO2S terminal C • Open circuit in wiring harness between front HO2S terminal D and PCM terminal 2A • Short to GND in wiring harness between front HO2S terminal D and PCM terminal 2A • PCM malfunction


REAR HO2S HEATER
(REAR HO2S)
MAIN RELAY
TERMINAL C
PCM
4
3
6
C
D
3
5
8
7
2A
MAIN RELAY
REAR HO2S
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR
A
E
C
D
C
A
D
B
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

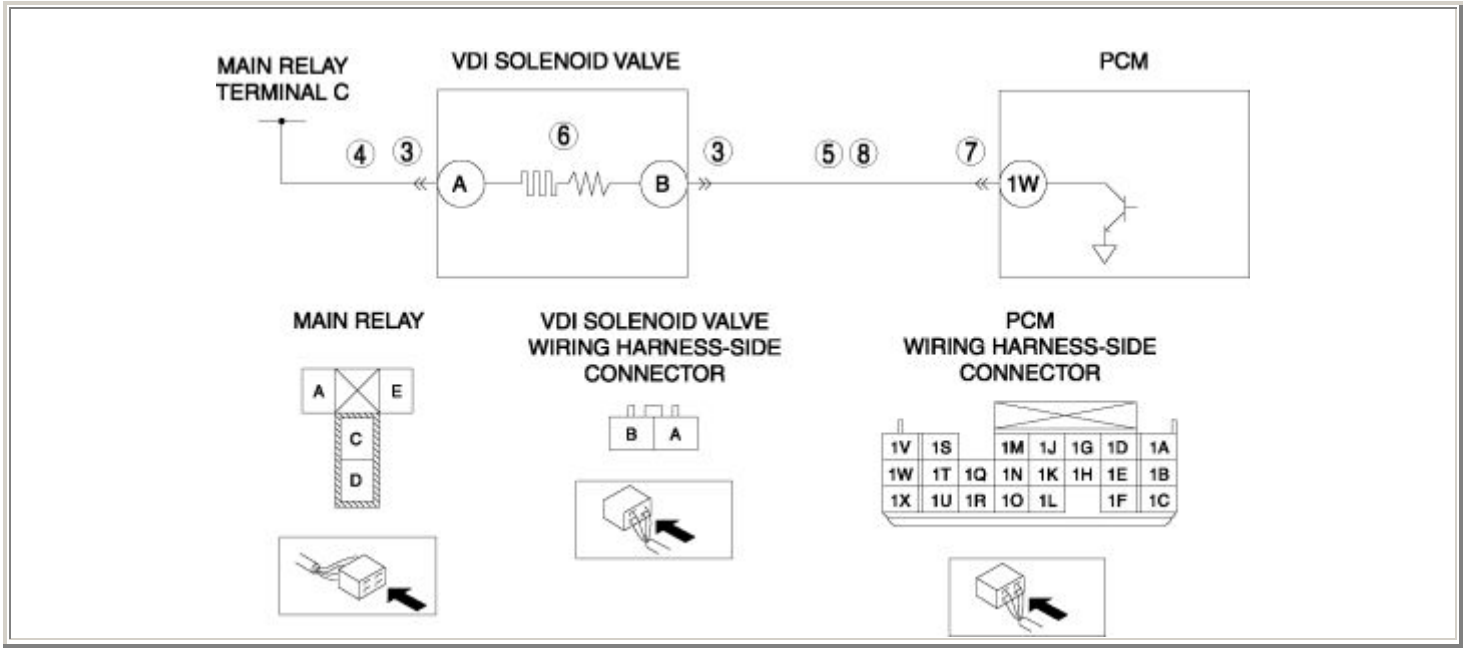
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT REAR HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 9.
5	INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between rear HO2S terminal D (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.

6	INSPECT REAR HO2S HEATER • Inspect the rear HO2S heater. (See REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the rear HO2S, then go to Step 9. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between rear HO2S terminal D (wiring harness-side) and PCM terminal 2A (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0076

DTC P0076	VDI solenoid valve control circuit low
DETECTION CONDITION	• The PCM monitors the VDI solenoid valve control voltage when the PCM turns the VDI solenoid valve off. If the control voltage is low, the PCM determines that the VDI solenoid valve control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VDI solenoid valve malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and VDI solenoid valve terminal A • Short to GND in wiring harness between main relay terminal C and VDI solenoid valve terminal A • Open circuit in wiring harness between VDI solenoid valve terminal B and PCM terminal 1W • Short to GND in wiring harness between VDI solenoid valve terminal B and PCM terminal 1W • PCM malfunction


MAIN RELAY
TERMINAL C
VDI SOLENOID VALVE
PCM
4
3
6
A
B
3
5
8
7
1W
MAIN RELAY
A
E
C
D
VDI SOLENOID VALVE
WIRING HARNESS-SIDE
CONNECTOR
B
A
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

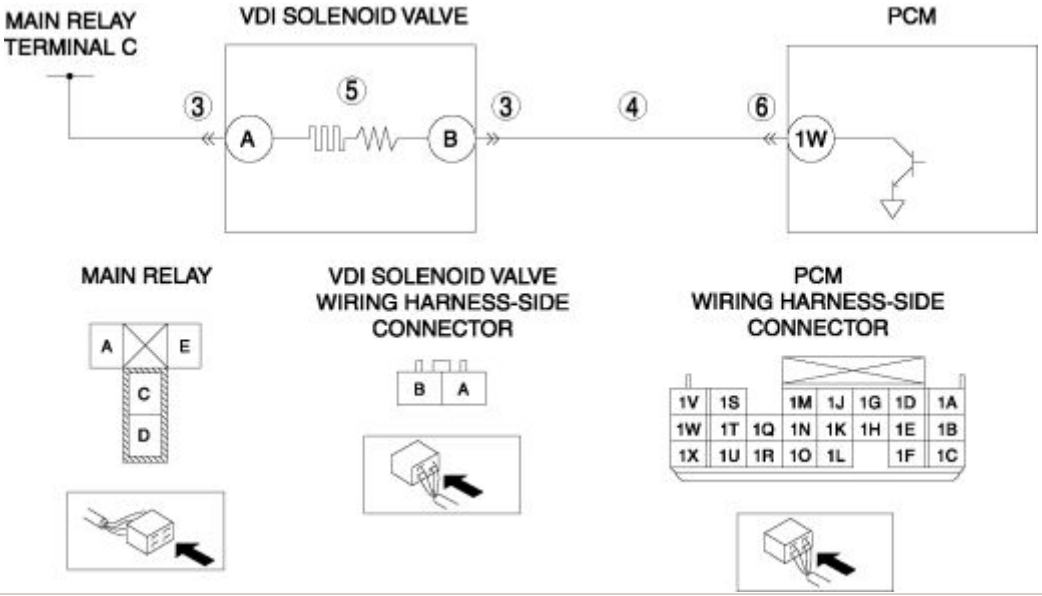
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT VDI SOLENOID VALVE CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the VDI solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT VDI SOLENOID VALVE POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between VDI solenoid valve terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 9.
5	INSPECT VDI SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between VDI solenoid valve terminal B (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.

6	INSPECT VDI SOLENOID VALVE • Inspect the VDI solenoid valve. (See VARIABLE DYNAMIC EFFECT INTAKE-AIR (VDI) SOLENOID VALVE INSPECTION .) • Is there any malfunction ?	Yes	Replace the VDI solenoid valve, then go to Step 9. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT VDI SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between VDI solenoid valve terminal B (wiring harness-side) and PCM terminal 1W (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0076 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0077

DTC P0077	VDI solenoid valve control circuit high
DETECTION CONDITION	• The PCM monitors the VDI solenoid valve control voltage when the PCM turns the VDI solenoid valve on. If the control voltage is high, the PCM determines that the VDI solenoid valve control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VDI solenoid valve malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between VDI solenoid valve terminal B and PCM terminal 1W • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT VDI SOLENOID VALVE CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the VDI solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT VDI SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between VDI solenoid valve terminal B (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT VDI SOLENOID VALVE • Inspect the VDI solenoid valve.	Yes	Replace the VDI solenoid valve, then go to Step 7. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)

	(See VARIABLE DYNAMIC EFFECT INTAKE-AIR (VDI) SOLENOID VALVE INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0077 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0101

DTC P0101	MAF sensor circuit range/performance problem

DETECTION CONDITION	• The PCM compares the actual MAF amount with the expected MAF amount when the engine is running.
	  ▪ If the throttle opening angle is **more than 50 %** and the MAF amount is **less than 5 g/s {0.66 lb/min}** , the PCM determines that there is a MAF sensor circuit range/performance problem.
	  ▪ If the ECT is **more than 70 °C {158 °F}** , the engine speed is **less than 2,000 rpm** and the MAF amount is **more than 130 g/s {17.20 lb/min}** (MT) **110 g/s {14.55 lb/min}** (AT), the PCM determines that there is a MAF sensor circuit range/performance problem.
	
	Diagnostic support note
	
	• This is a continuous monitor (CCM).
	• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.
	• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.
	• FREEZE FRAME DATA is available.
	• The DTC is stored in the PCM memory.

POSSIBLE CAUSE	• MAF sensor malfunction • Eccentric shaft position sensor malfunction • PCM malfunction

Diagnostic procedure

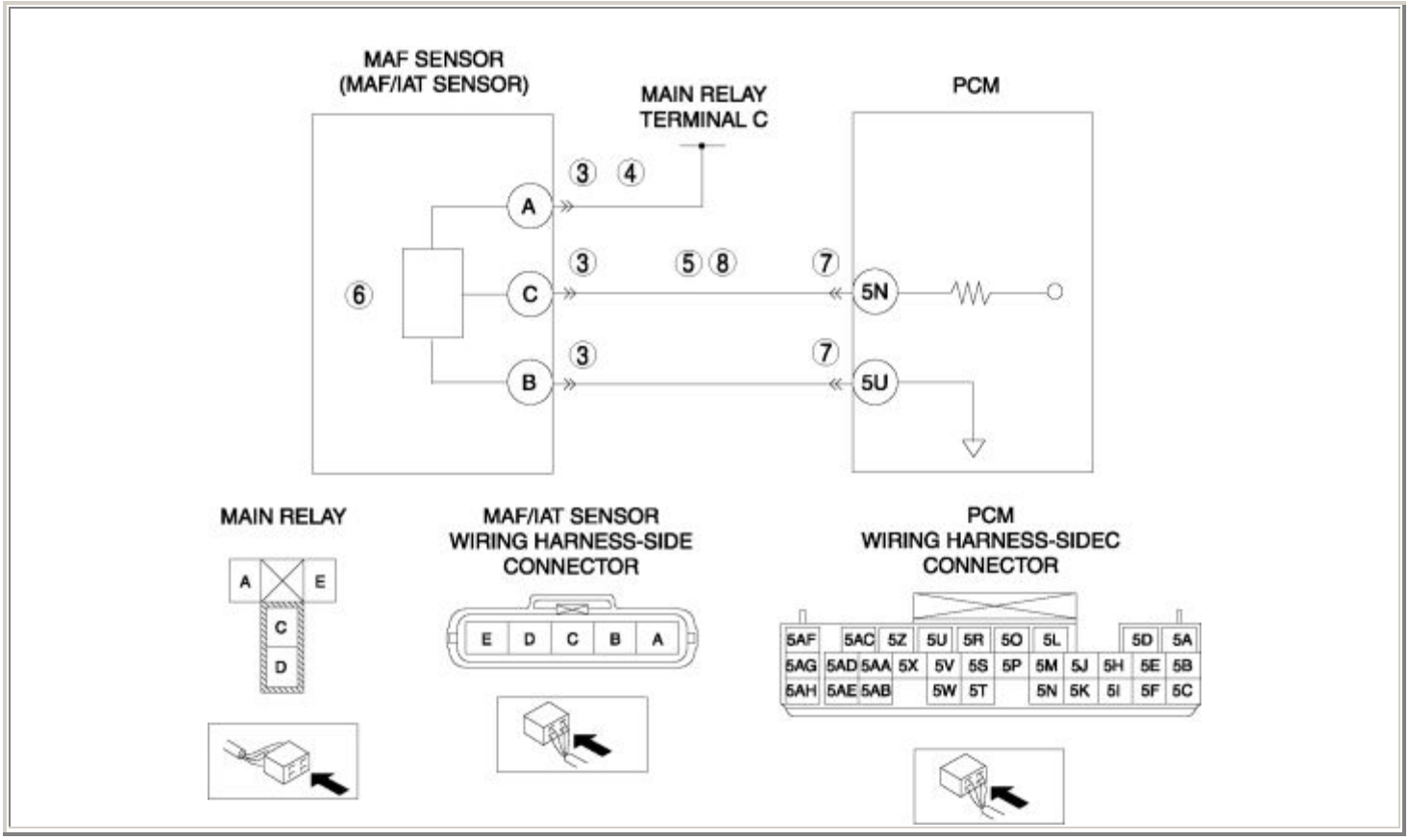
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY CURRENT INPUT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT? • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the TP and MAF PIDs. • Read the MAF PID when the TP PID is **more than 50 %** . • Is the MAF PID **less than 5 g/s {0.66 lb/min}** ?	Yes	Verify that the TP PID changes smoothly while gradually opening throttle valve. • If changes smoothly, go to Step 5. • If does not change smoothly, replace the throttle body and go to Step 5. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT? • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the ECT, RPM and MAF PIDs. • Warm-up the engine until the ECT PID is **more than 70 °C {158 °F}** . • Read the MAF PID when the RPM PID is **less than 2,000 rpm** . • Is the MAF PID **more than 130 g/s {17.20 lb/min} (MT) 110 g/s {14.55 lb/min} (AT)** ?	Yes	Go to Step 6.
		No	Intermittent concern exists. Perform the "INTERMITTENT CONCERNS TROUBLESHOOTING". (See INTERMITTENT CONCERN TROUBLESHOOTING .)

5	VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Access the TP PID. • Drive the vehicle for **5 s or more** when the TP PID is **more than 50 %** . • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to Step 9. (See PCM REMOVAL/INSTALLATION .)
		No	Go to Step 10.
6	INSPECT MAF SENSOR • Inspect the MAF sensor. (See MASS AIR FLOW (MAF) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the MAF/IAT sensor, then go to Step 8. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the eccentric shaft position sensor, then go to the next step. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Access the ECT and RPM PIDs. • Warm-up the engine until the ECT PID is **more than 70 °C {158 °F}** . • Drive the vehicle for **5 s or more** when the RPM PID is **less than 2,000 rpm** . • Is the PENDING CODE same as the DTC present?	No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0102

DTC P0102	MAF sensor circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the MAF sensor when the engine is running. If the input voltage is **less than 0.5 V** , the PCM determines that the MAF sensor circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and MAF/IAT sensor terminal A • Short to GND in wiring harness between main relay terminal C and MAF/IAT sensor terminal A • Open circuit in wiring harness between MAF/IAT sensor terminal C and PCM terminal 5N • Short to GND in wiring harness between MAF/IAT sensor terminal C and PCM terminal 5N • PCM malfunction


MAF SENSOR
(MAF/IAT SENSOR)
MAIN RELAY
TERMINAL C
PCM
3
4
A
3
5
8
7
6
C
5N
3
7
B
5U
MAIN RELAY
A
E
C
D
MAF/IAT SENSOR
WIRING HARNESS-SIDE
CONNECTOR
E
D
C
B
A
PCM
WIRING HARNESS-SIDEC
CONNECTOR
5AF
5AC
5Z
5U
5R
5O
5L
5D
5A
5AG
5AD
5AA
5X
5V
5S
5P
5M
5J
5H
5E
5B
5AH
5AE
5AB
5W
5T
5N
5K
5I
5F
5C

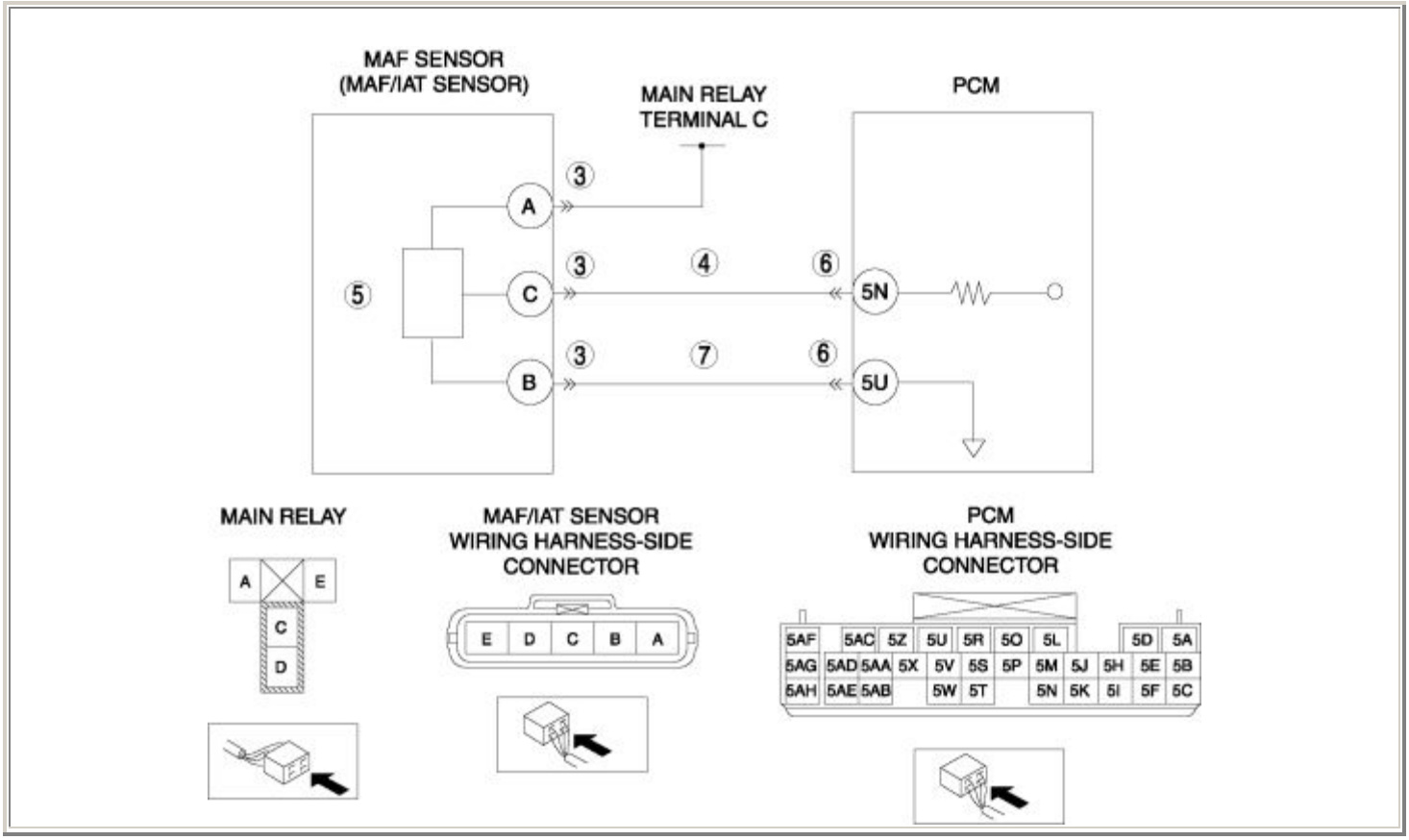
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT MAF SENSOR POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between MAF/IAT sensor terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 9.
5	INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between MAF/IAT sensor terminal C (wiring harness-side) and body GND. • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.

6	INSPECT MAF SENSOR • Inspect the MAF sensor. (See MASS AIR FLOW (MAF) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the MAF/IAT sensor, then go to Step 9. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between MAF/IAT sensor terminal C (wiring harness-side) and PCM terminal 5N (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0103

DTC P0103	MAF sensor circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the MAF sensor when the engine is running. If the input voltage is **more than 5.0 V** , the PCM determines that the MAF sensor circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between MAF/IAT sensor terminal C and PCM terminal 5N • Open circuit in wiring harness between MAF/IAT sensor terminal B and PCM terminal 5U • PCM malfunction


MAF SENSOR
(MAF/IAT SENSOR)
MAIN RELAY
TERMINAL C
PCM
3
A
3
4
6
5
C
5N
3
7
6
B
5U
MAIN RELAY
A
E
C
D
MAF/IAT SENSOR
WIRING HARNESS-SIDE
CONNECTOR
E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C

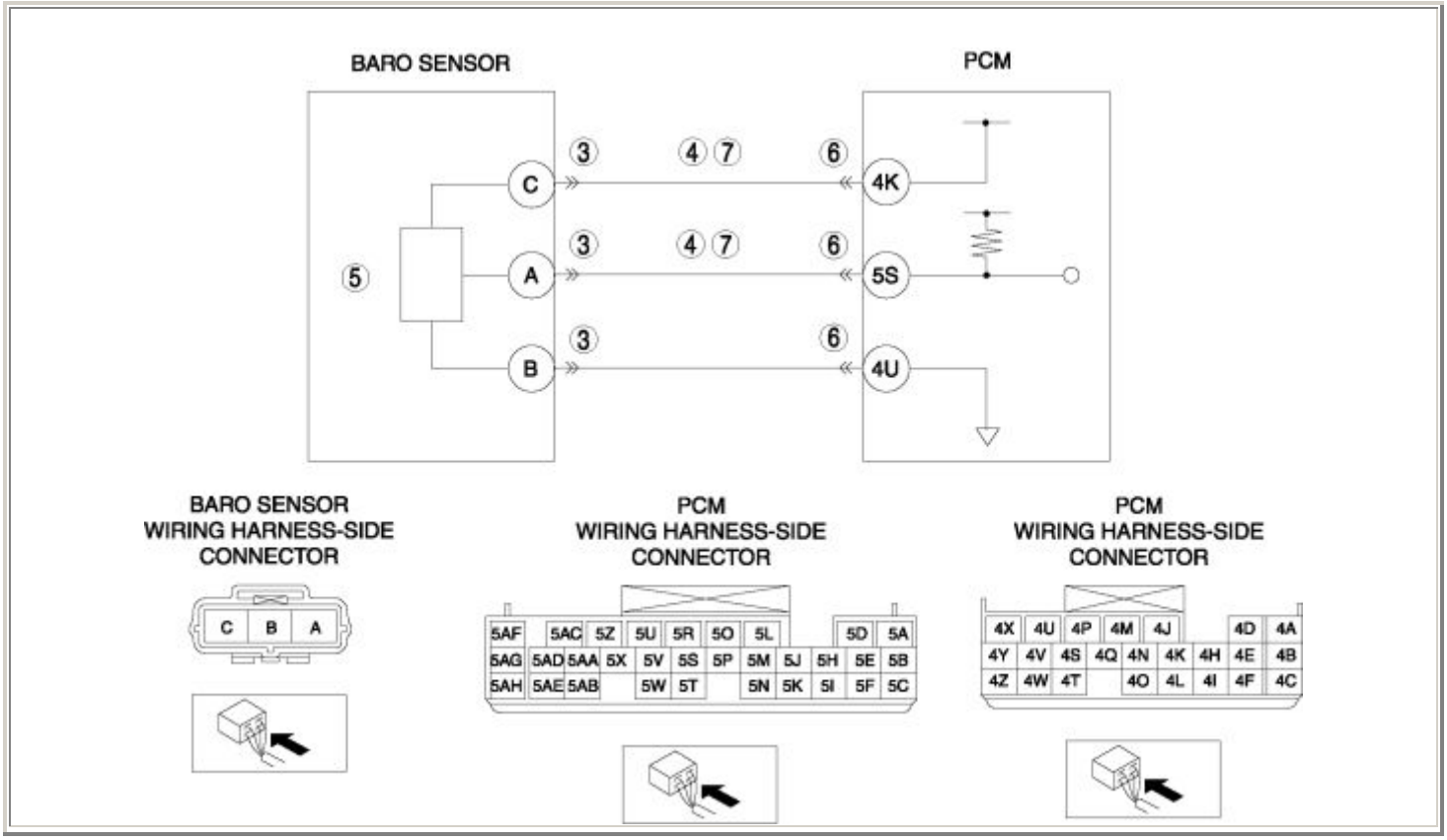
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between MAF/IAT sensor terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	INSPECT MAF SENSOR • Inspect the MAF sensor. (See MASS AIR FLOW (MAF) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the MAF/IAT sensor, then go to Step 8. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
6		Yes	Repair or replace the terminal, then go to Step 8.

	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT MAF SENSOR GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between MAF/IAT sensor terminal B (wiring harness-side) and PCM terminal 5U (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0107

DTC P0107	BARO sensor circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the BARO sensor when the engine is running. If the input voltage is **less than 0.2 V** , the PCM determines that the BARO sensor circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• BARO sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between BARO sensor terminal C and PCM terminal 4K • Short to GND in wiring harness between BARO sensor terminal C and PCM terminal 4K • Open circuit in wiring harness between BARO sensor terminal A and PCM terminal 5S • Short to GND in wiring harness between BARO sensor terminal A and PCM terminal 5S • PCM malfunction


BARO SENSOR
PCM
C
A
B
5
3
4 7
6
4K
5S
4U
BARO SENSOR
WIRING HARNESS-SIDE
CONNECTOR
C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

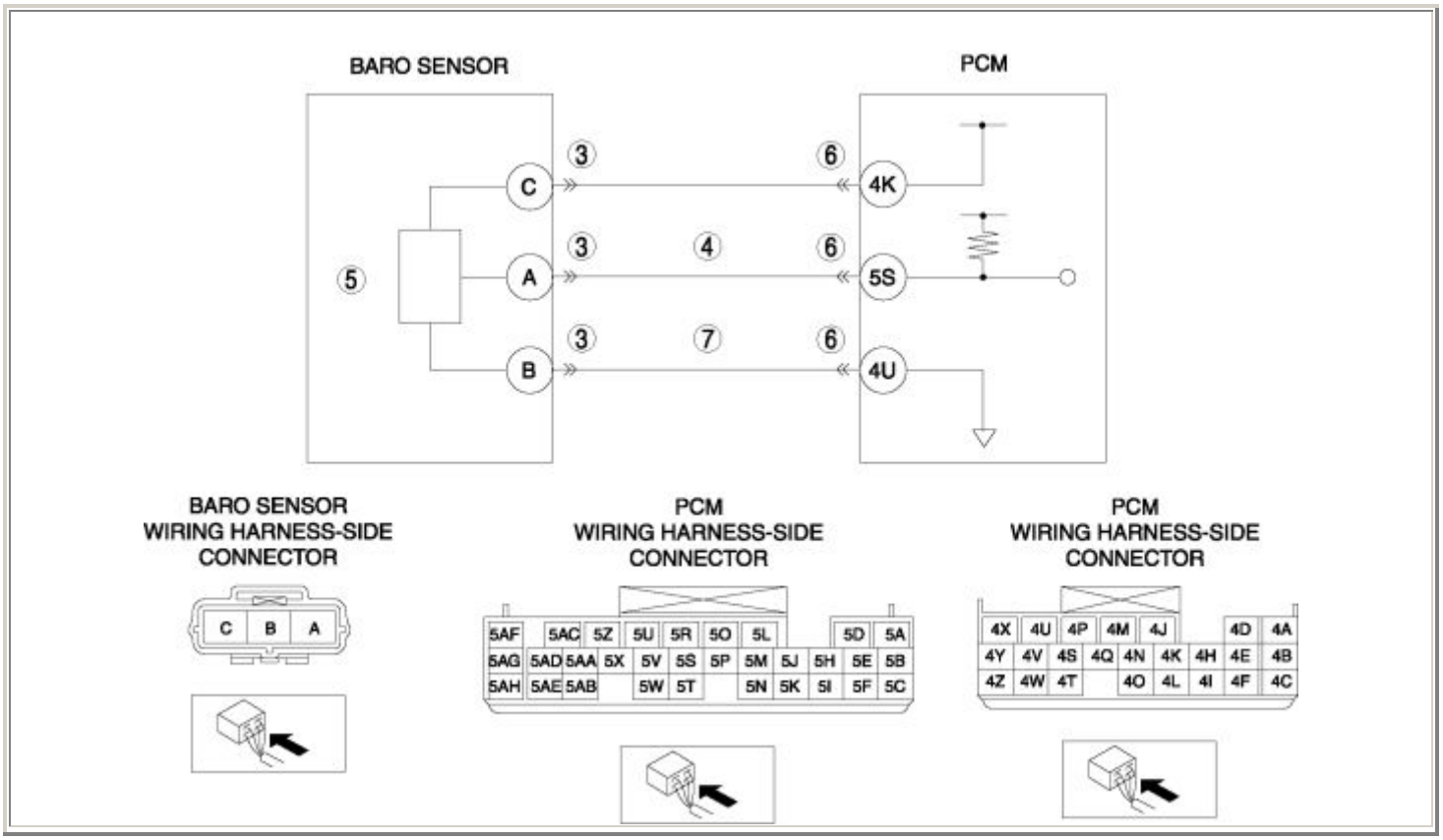
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT BARO SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the BARO sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT BARO SENSOR CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ BARO sensor terminal C (wiring harness-side) and body GND ▪ BARO sensor terminal A (wiring harness-side) and body GND • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	INSPECT BARO SENSOR • Inspect the BARO sensor. (See BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the BARO sensor, then go to Step 8. (See BAROMETRIC PRESSURE (BARO) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	INSPECT BARO SENSOR CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ BARO sensor terminal C (wiring harness-side) and PCM terminal 4K (wiring harness-side) ▪ BARO sensor terminal A (wiring harness-side) and PCM terminal 5S (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0107 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0108

DTC P0108	BARO sensor circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the BARO sensor when the engine is running. If the input voltage is **more than 4.8 V** , the PCM determines that the BARO sensor circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• BARO sensor malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between BARO sensor terminal A and PCM terminal 5S • Open circuit in wiring harness between BARO sensor terminal B and PCM terminal 4U • PCM malfunction


BARO SENSOR
PCM
C
A
B
5
3
4
7
6
4K
5S
4U
BARO SENSOR
WIRING HARNESS-SIDE
CONNECTOR
C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

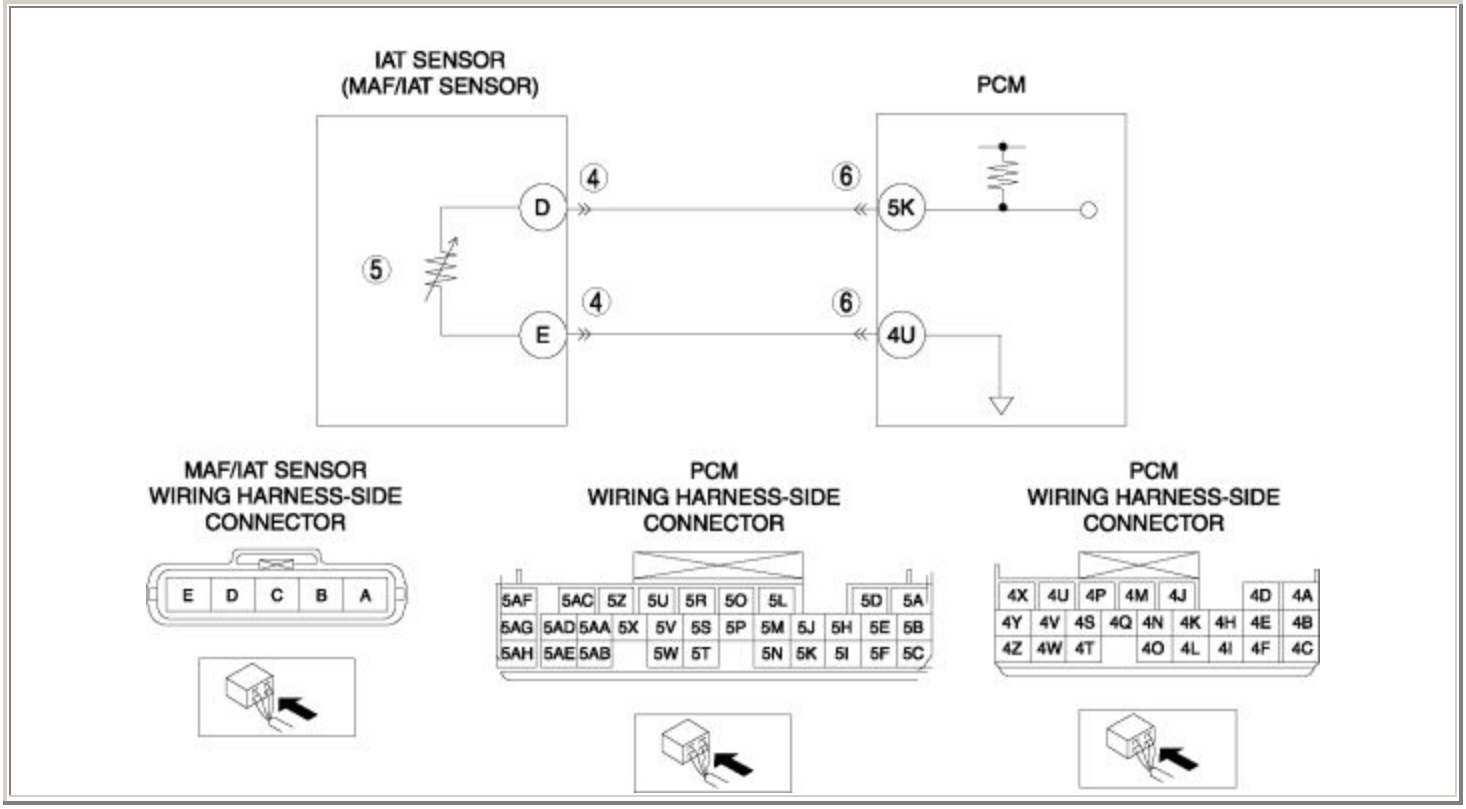
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT BARO SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the BARO sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT BARO SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between BARO sensor terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	INSPECT BARO SENSOR • Inspect the BARO sensor. (See BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the BARO sensor, then go to Step 8. (See BAROMETRIC PRESSURE (BARO) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to Step 8.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT BARO SENSOR GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between BARO sensor terminal B (wiring harness-side) and PCM terminal 4U (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0108 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0111

DTC P0111	IAT sensor circuit range/performance problem
DETECTION CONDITION	• The PCM compares the IAT with the ECT when the engine is running. If the IAT is higher than the ECT by **40 °C {104 °F}** , the PCM determines that there is an IAT sensor circuit range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Connector or terminal malfunction • PCM malfunction


IAT SENSOR
(MAF/IAT SENSOR)
PCM
D
E
5
4
4
6
6
5K
4U
MAF/IAT SENSOR
WIRING HARNESS-SIDE
CONNECTOR
E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

Notes:

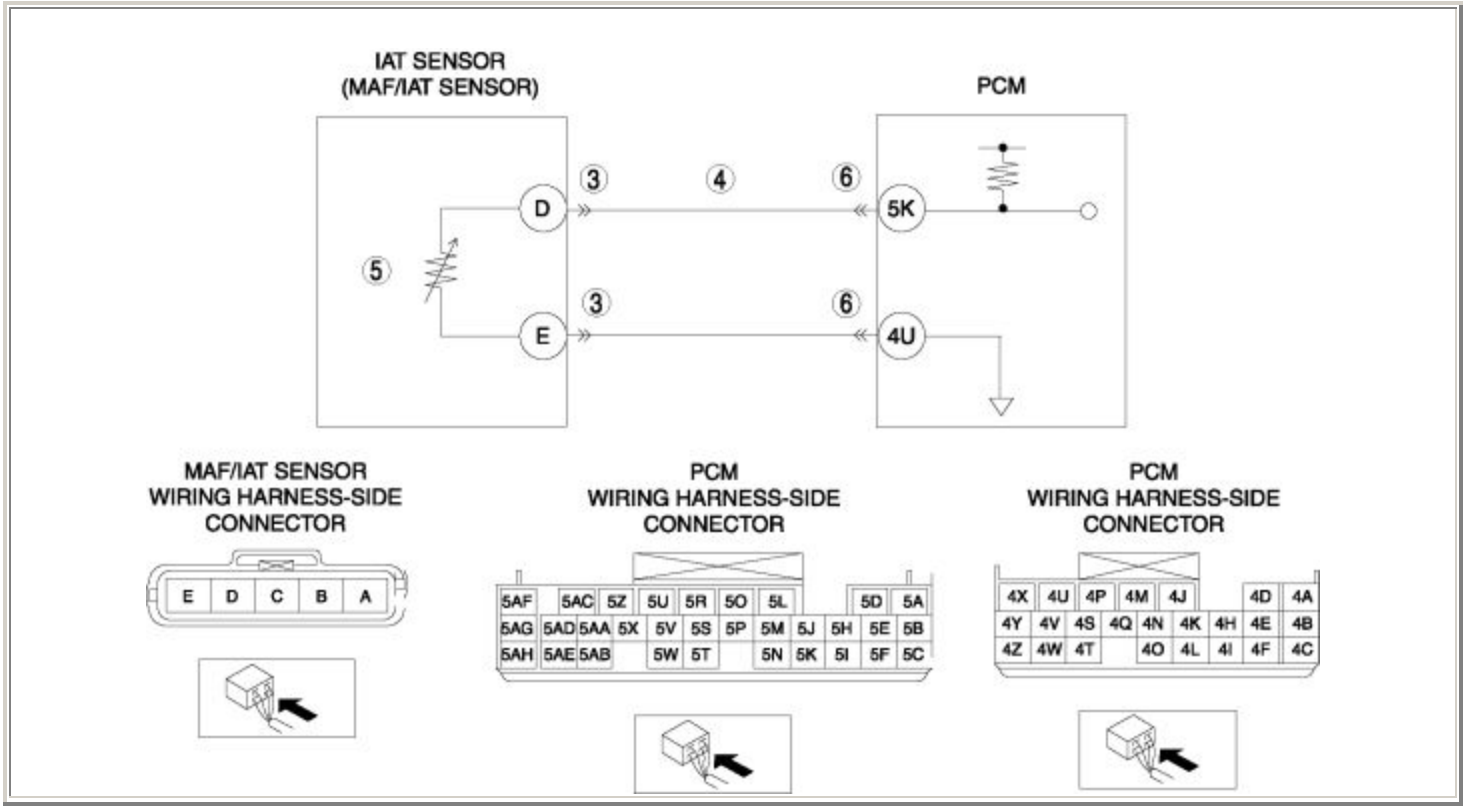
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	INSPECT IAT SENSOR • Inspect the IAT sensor.	Yes	Replace the MAF/IAT sensor, then go to Step 7. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)

	(See INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine and warm it up completely. • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0112

DTC P0112	IAT sensor circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the IAT sensor when the engine is running. If the input voltage is **less than 0.1 V** , the PCM determines that the IAT sensor circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Connector or terminal malfunction • Short to GND in wiring harness between MAF/IAT sensor terminal D and PCM terminal 5K • PCM malfunction


IAT SENSOR
(MAF/IAT SENSOR)
PCM
3
4
6
D
5K
5
3
6
E
4U
MAF/IAT SENSOR
WIRING HARNESS-SIDE
CONNECTOR
E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

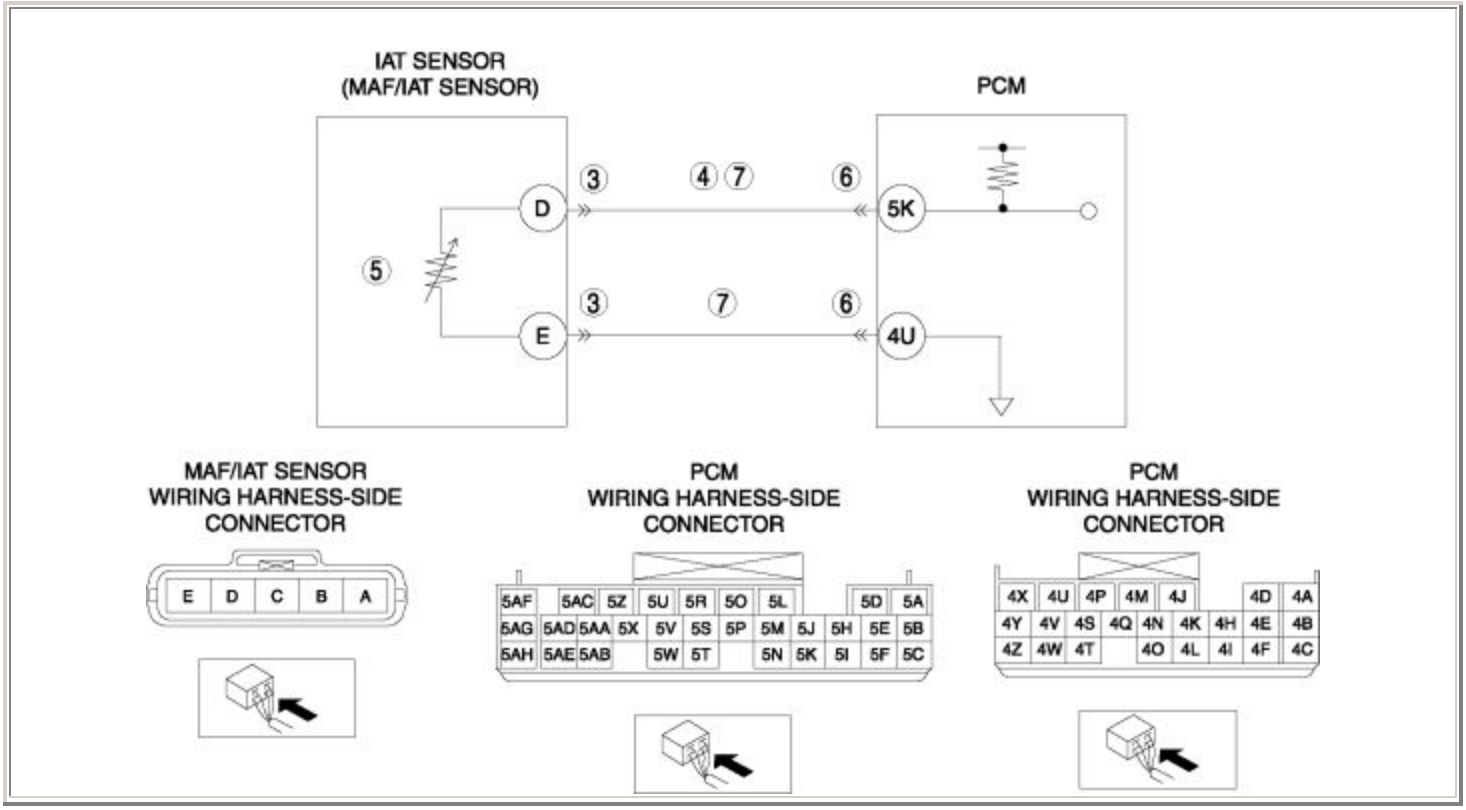
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between MAF/IAT sensor terminal D (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	INSPECT IAT SENSOR • Inspect the IAT sensor. (See INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the MAF/IAT sensor, then go to Step 7. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0113

DTC P0113	IAT sensor circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the IAT sensor when the engine is running. If the input voltage is **more than 4.8 V** , the PCM determines that the IAT sensor circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between MAF/IAT sensor terminal D and PCM terminal 5K • Short to power supply in wiring harness between MAF/IAT sensor terminal D and PCM terminal 5K • Open circuit in wiring harness between MAF/IAT sensor terminal E and PCM terminal 4U • PCM malfunction


IAT SENSOR
(MAF/IAT SENSOR)
PCM
3
4 7
6
D
5K
5
3
7
6
E
4U
MAF/IAT SENSOR
WIRING HARNESS-SIDE
CONNECTOR
E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

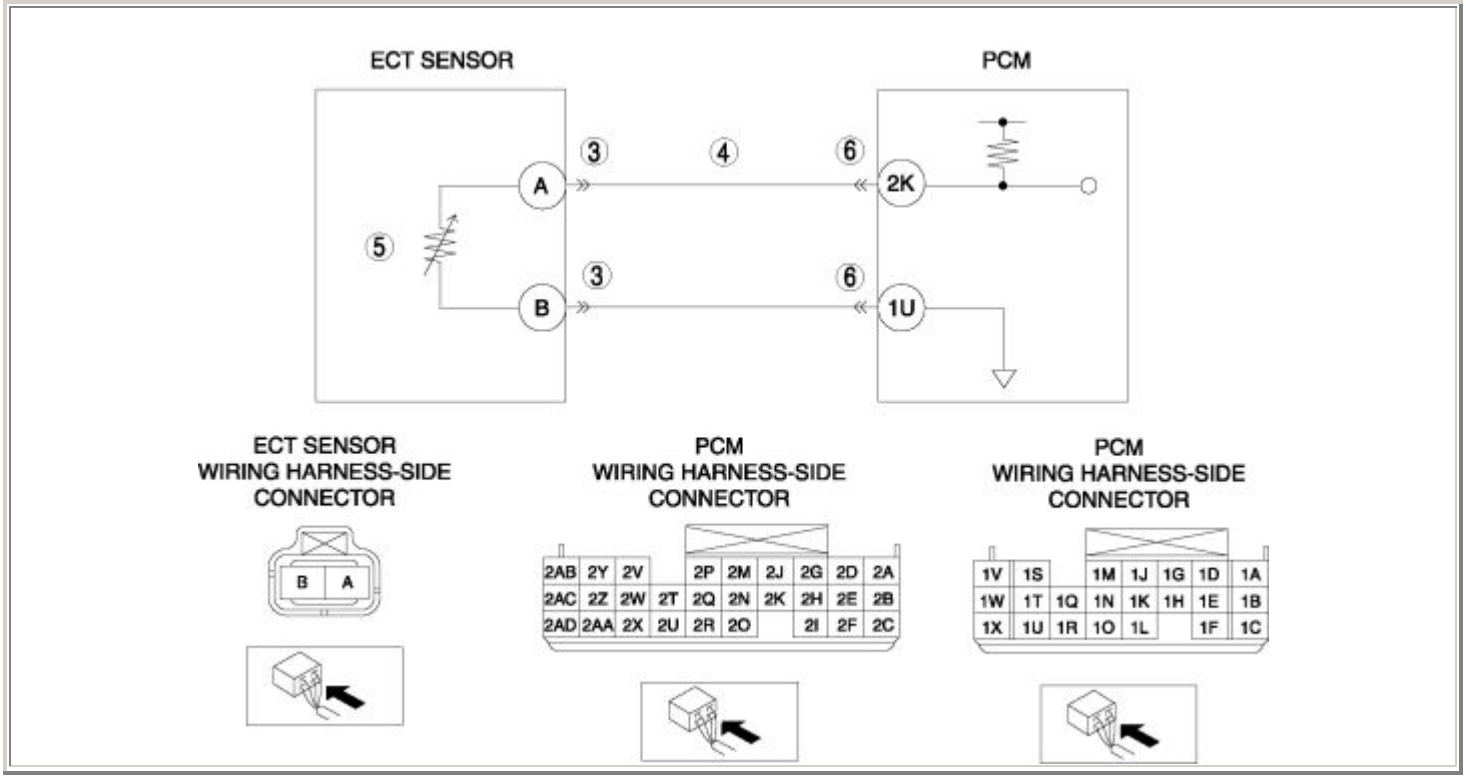
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between MAF/IAT sensor terminal D (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	INSPECT IAT SENSOR • Inspect the IAT sensor. (See INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the MAF/IAT sensor, then go to Step 8. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
6		Yes	Repair or replace the terminal, then go to Step 8.

	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT IAT SENSOR CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ MAF/IAT sensor terminal D (wiring harness-side) and PCM terminal 5K (wiring harness-side) ▪ MAF/IAT sensor terminal E (wiring harness-side) and PCM terminal 4U (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0117

DTC P0117	ECT sensor circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the ECT sensor when the engine is running. If the input voltage is **less than 0.2 V** , the PCM determines that the ECT sensor circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connector or terminal malfunction • Short to GND in wiring harness between ECT sensor terminal A and PCM terminal 2K • PCM malfunction


ECT SENSOR
PCM
3
4
6
A
2K
5
3
6
B
1U
ECT SENSOR
WIRING HARNESS-SIDE
CONNECTOR
B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

Notes:

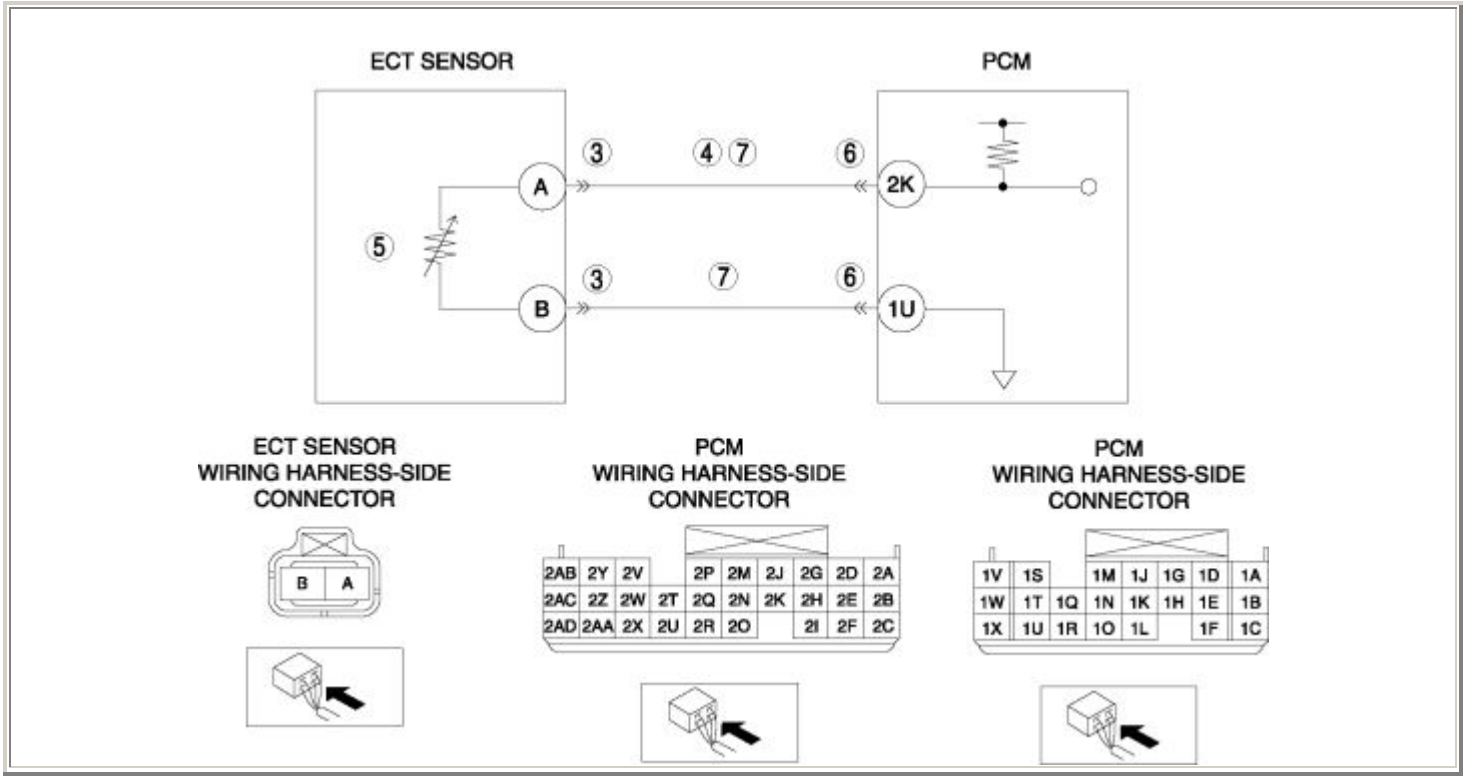
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the ECT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Disconnect the ECT sensor connector. • Inspect for continuity between ECT sensor terminal A (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	INSPECT ECT SENSOR • Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the ECT sensor, then go to Step 7. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0118

DTC P0118	ECT sensor circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the ECT sensor when the engine is running. If the input voltage is **more than 4.8 V** , the PCM determines that the ECT sensor circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between ECT sensor terminal A and PCM terminal 2K • Short to power supply in wiring harness between ECT sensor terminal A and PCM terminal 2K • Open circuit in wiring harness between ECT sensor terminal B and PCM terminal 1U • PCM malfunction


ECT SENSOR
PCM
3
4 7
6
A
2K
5
3
7
6
B
1U
ECT SENSOR
WIRING HARNESS-SIDE
CONNECTOR
B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

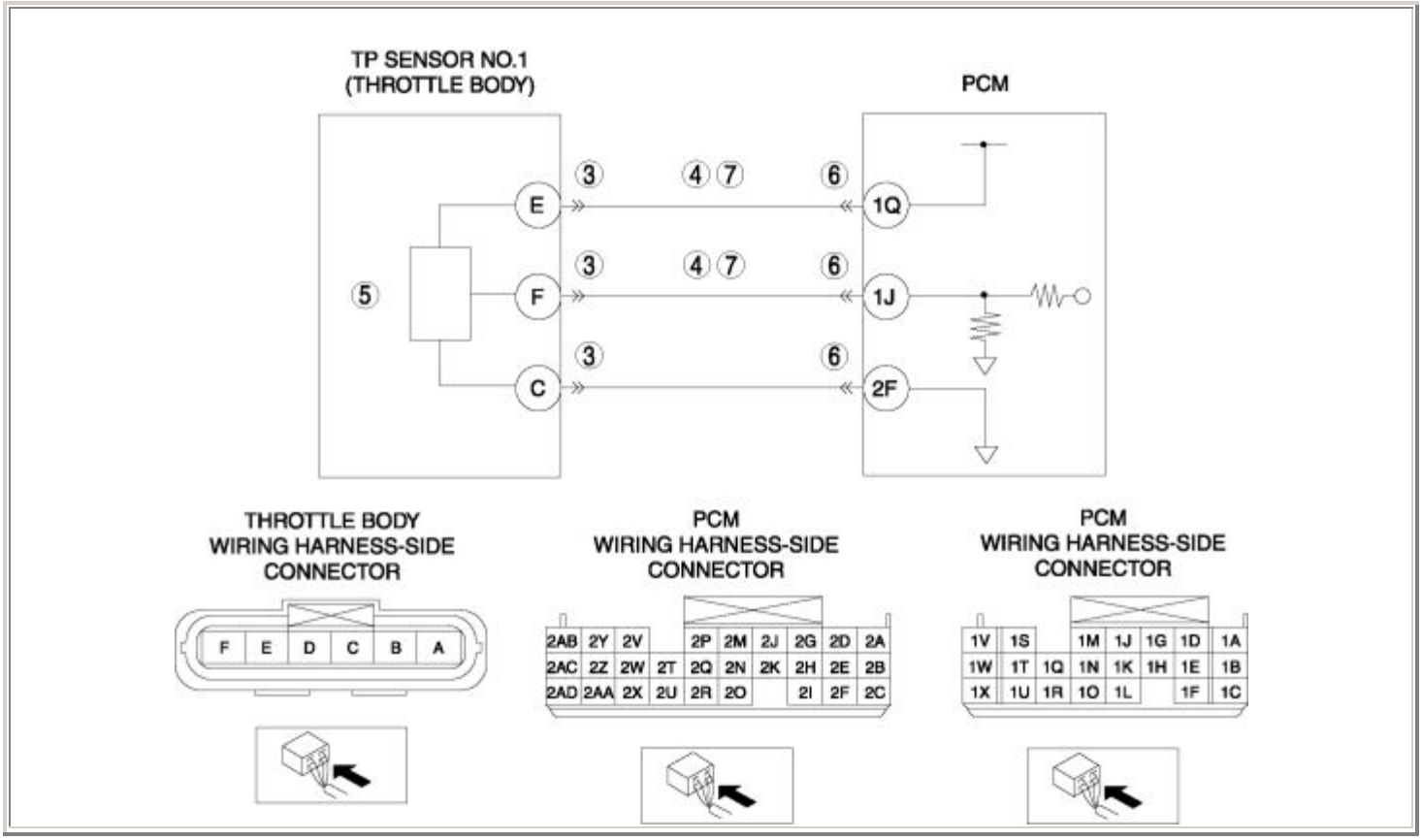
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the ECT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between ECT sensor terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	INSPECT ECT SENSOR • Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the ECT sensor, then go to Step 8. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
6		Yes	Repair or replace the terminal, then go to Step 8.

	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT ECT SENSOR CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ ECT sensor terminal A (wiring harness-side) and PCM terminal 2K (wiring harness-side) ▪ ECT sensor terminal B (wiring harness-side) and PCM terminal 1U (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0122

DTC P0122	TP sensor No.1 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the TP sensor No.1 when the engine is running. If the input voltage is **less than 0.3 V** , the PCM determines that the TP sensor No.1 circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between throttle body terminal E and PCM terminal 1Q • Short to GND in wiring harness between throttle body terminal E and PCM terminal 1Q • Open circuit in wiring harness between throttle body terminal F and PCM terminal 1J • Short to GND in wiring harness between throttle body terminal F and PCM terminal 1J • PCM malfunction


TP SENSOR NO.1
(THROTTLE BODY)
PCM
3
4 7
6
E
1Q
5
F
1J
C
2F
THROTTLE BODY
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

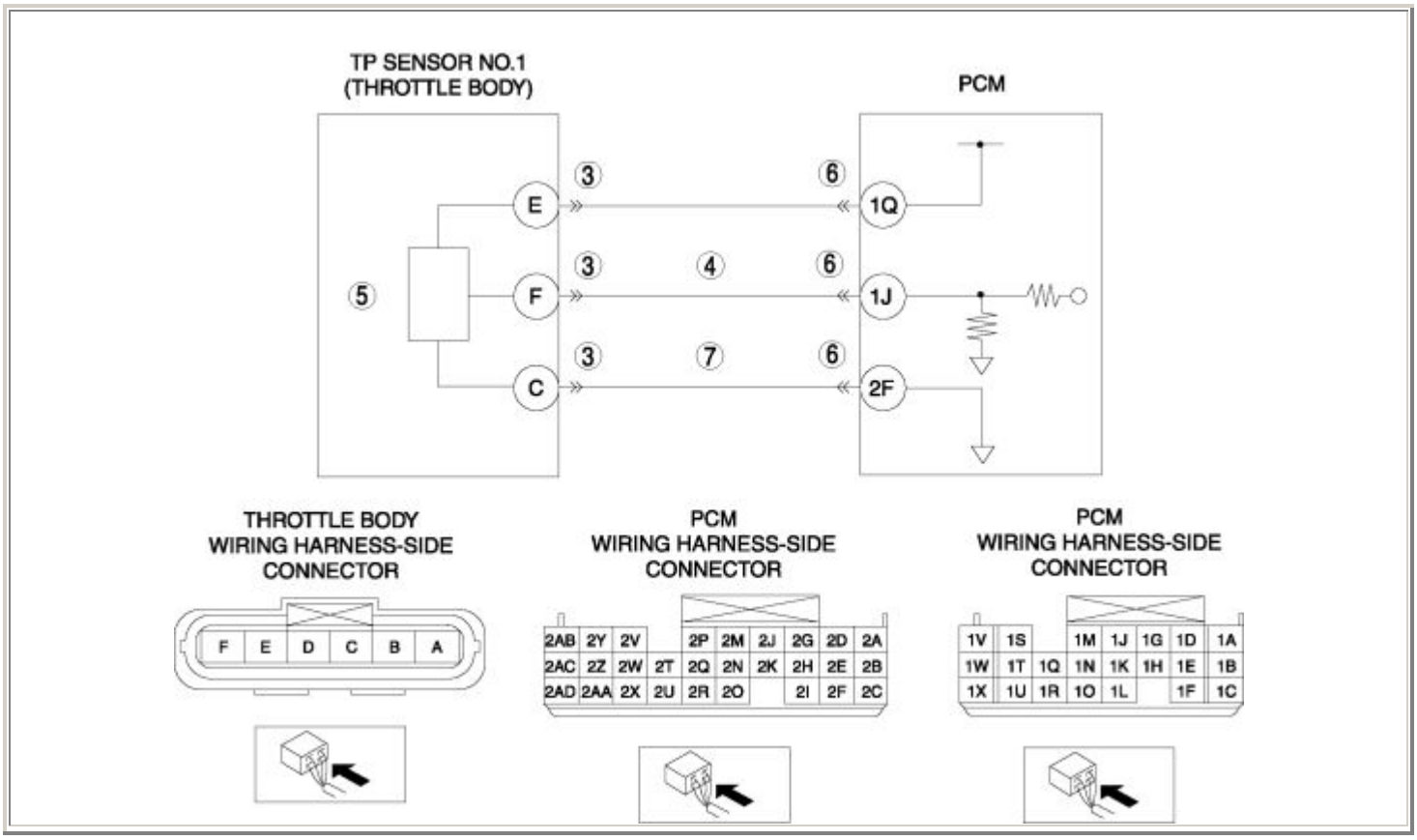
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT TP SENSOR NO.1 CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Throttle body terminal E (wiring harness-side) and body GND ▪ Throttle body terminal F (wiring harness-side) and body GND • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	INSPECT TP SENSOR NO.1 • Inspect the TP sensor No.1. (See THROTTLE POSITION (TP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 8. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	INSPECT TP SENSOR NO.1 CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Throttle body terminal E (wiring harness-side) and PCM terminal 1Q (wiring harness-side) ▪ Throttle body terminal F (wiring harness-side) and PCM terminal 1J (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0123

DTC P0123	TP sensor No.1 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the TP sensor No.1 when the engine is running. If the input voltage is **more than 4.8 V** , the PCM determines that the TP sensor No.1 circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between throttle body terminal F and PCM terminal 1J • Open circuit in wiring harness between throttle body terminal C and PCM terminal 2F • PCM malfunction


TP SENSOR NO.1
(THROTTLE BODY)
PCM
E
F
C
5
3
4
7
6
1Q
1J
2F
THROTTLE BODY
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT TP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between throttle body terminal F (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	INSPECT TP SENSOR NO.1 • Inspect the TP sensor No.1. (See THROTTLE POSITION (TP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 8. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to Step 8.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT TP SENSOR NO.1 GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between throttle body terminal C (wiring harness-side) and PCM terminal 2F (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0125

DTC P0125	Insufficient coolant temperature for closed loop fuel control
DETECTION CONDITION	• The PCM monitors the ECT after cold engine start. If the ECT does not reach the specification in a certain period, the PCM determines that the coolant temperature for closed loop fuel control is insufficient. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • MAF sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY CURRENT INPUT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT? • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the ECT PID. • Is the ECT PID **more than 70 °C {158 °F}** ?	Yes	Intermittent concern exists. Perform the "INTERMITTENT CONCERNS TROUBLESHOOTING". (See INTERMITTENT CONCERN TROUBLESHOOTING .)
		No	Go to the next step.
4	INSPECT ECT SENSOR • Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the ECT sensor, then go to Step 6. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT MAF SENSOR • Inspect the MAF sensor. (See MASS AIR FLOW (MAF) SENSOR INSPECTION .)	Yes	Replace the MAF/IAT sensor, then go to the next step. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)

	SENSOR INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Access the ECT PID. • Wait until the ECT PID **less than 20 °C {68 °F}** . • Start the engine and warm it up completely. • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0126, P0128

DTC P0126 DTC P0128	Insufficient coolant temperature for stable operation Coolant thermostat problem
DETECTION CONDITION	**DTC P0126** • The PCM monitors the ECT after the engine start for a certain period. If the the ECT never **exceeds 71 °C {160 °F}** when the following conditions are met, the PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** ▪ Soak time: **more than 6 hour** ▪ IAT: **more than –10 °C {14 °F}** ▪ Vehicle speed: **more than 10 km/h {6.2 mph}** ▪ LOAD: **more than 21.9 %** **DTC P0128** • The PCM calculates the radiator heat radiation ratio while the following conditions are met. If the calculated value exceeds the threshold, the PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** ▪ Soak time: **more than 6 hour** ▪ IAT: **more than –10 °C {14 °F}** ▪ ECT at engine start: **less than 35 °C {95 °F}** ▪ Vehicle speed: **more than 40 km/h {24.9 mph}** **Diagnostic support note** • This is a continuous monitor (Thermostat). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Coolant thermostat malfunction • VSS malfunction • IAT sensor malfunction

	• ECT sensor malfunction • PCM malfunction

Notes:

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY FOR OTHER STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify for the other stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS OF VSS • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the VSS PID. • Inspect the VSS PID. (See PCM INSPECTION .) • Is the PID normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 8.
5	INSPECT IAT SENSOR • Inspect the IAT sensor. (See INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the MAF/IAT sensor, then go to Step 8. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT ECT SENSOR • Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the ECT sensor, then go to Step 8. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT COOLANT THERMOSTAT • Inspect the coolant thermostat. (See THERMOSTAT INSPECTION .) • Is there any malfunction ?	Yes	Replace the coolant thermostat, then go to the next step. (See THERMOSTAT REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION • Soak the vehicle in a place that is at a temperature of **approx. 25 °C {77 °F}** for **more than 6 hours** . • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Access the ECT and IAT PIDs. • Verify that each PID is within following specifications. ▪ IAT: **more than –10 °C {14 °F}** ▪ ECT: **less than 35 °C {95 °F}** (for P0128 only) • Are the ECT and IAT PIDs normal?	Yes	For DTC P0126: go to the next step. For DTC P0128: go to Step 8.
		No	Inspect the malfunctioning part according to inspection the results. Then repeat this step.
9		Yes	Go to Step 9.

	VERIFY TROUBLESHOOTING OF DTC P0126 COMPLETED • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Verify that the E/L and A/C are off. • Access the DIAGNOSTIC MONITORING TEST RESULTS. • Monitor the TEST #10:E1:81 (ECT). **NOTE:** • This test requires actual driving. Chassis dynomometer cannot be used for this test. • During the test drive, constant speed should be maintained, although 2 or 3 stops during every **5 min** of driving time (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Test period depends on ECT at the engine start. (e.g. if ECT is **–10 °C {14 °F}** , monitoring period is **38 min** and ECT is **30 °C {86 °F}** , monitoring period is **8 min**) • Verify TEST #10:E1:81 (ECT) value. • Is value above minimum value?	No	Replace the PCM, then go to Step 9. (See PCM REMOVAL/INSTALLATION .)
10		Yes	Go to the next step.

	VERIFY TROUBLESHOOTING OF DTC P0128 COMPLETED • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Verify that the E/L and A/C are off. • Access the DIAGNOSTIC MONITORING TEST RESULTS. • Monitor the TEST #10:E1:80 (heat radiation ratio) or #10:E1:81 (ECT). **NOTE:** • This test requires actual driving. Chassis roller cannot be used for this test. • During the test drive, constant speed should be maintained, although 2 or 3 stops (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Verify TEST #10:E1:80 (heat radiation ratio) or #10:E1:81 (ECT) value. • Are value of TEST#10:E1:80 (heat radiation ratio) below maximum value and value of TEST#10:E1:81 (ECT) above minimum value?	No	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0130

DTC P0130	Front HO2S circuit problem
DETECTION CONDITION	• The PCM monitors the front HO2S impedance when under the front HO2S heater control. If the impedance is **more than 500 ohms** , the PCM determines that there is a front HO2S circuit problem. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • PCM malfunction

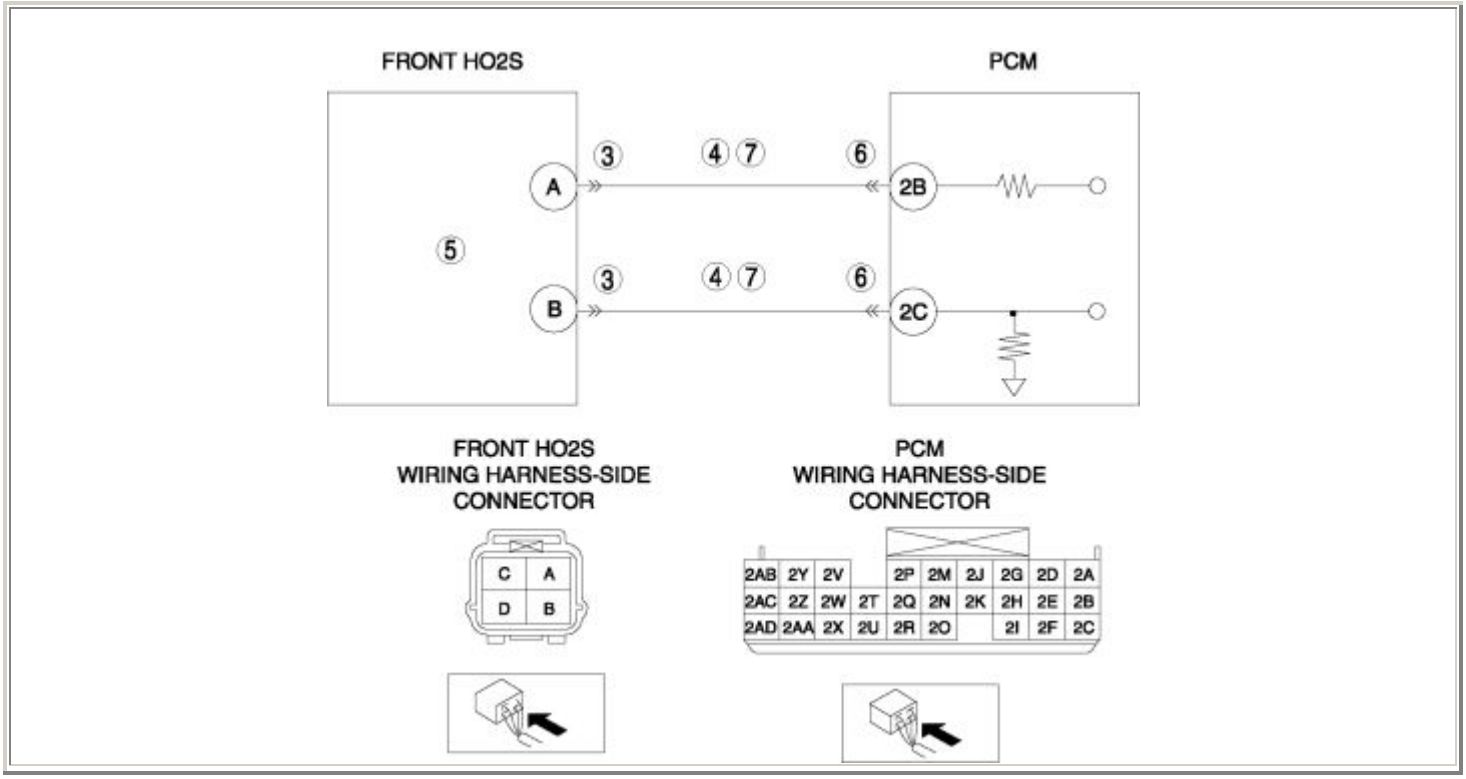
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	INSPECT FRONT HO2S • Inspect the front HO2S. (See FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the front HO2S, then go to Step 6. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	VERIFY TROUBLESHOOTING OF DTC P0130 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0131

DTC P0131	Front HO2S circuit low voltage
DETECTION CONDITION	• The PCM monitors the input voltage from the front HO2S and the front HO2S output current when the engine is running. If the input voltage is **less than 1.8 V** or the output current is **less than -5 mA** , the PCM determines that the front HO2S circuit voltage is low. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Open circuit in wiring harness between front HO2S terminal A and PCM terminal 2B • Short to GND in wiring harness between front HO2S terminal A and PCM terminal 2B • Open circuit in wiring harness between front HO2S terminal B and PCM terminal 2C • Short to GND in wiring harness between front HO2S terminal B and PCM terminal 2C • PCM malfunction


FRONT HO2S
PCM
3
4 7
6
A
2B
5
3
4 7
6
B
2C
FRONT HO2S
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR
C A
D B
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

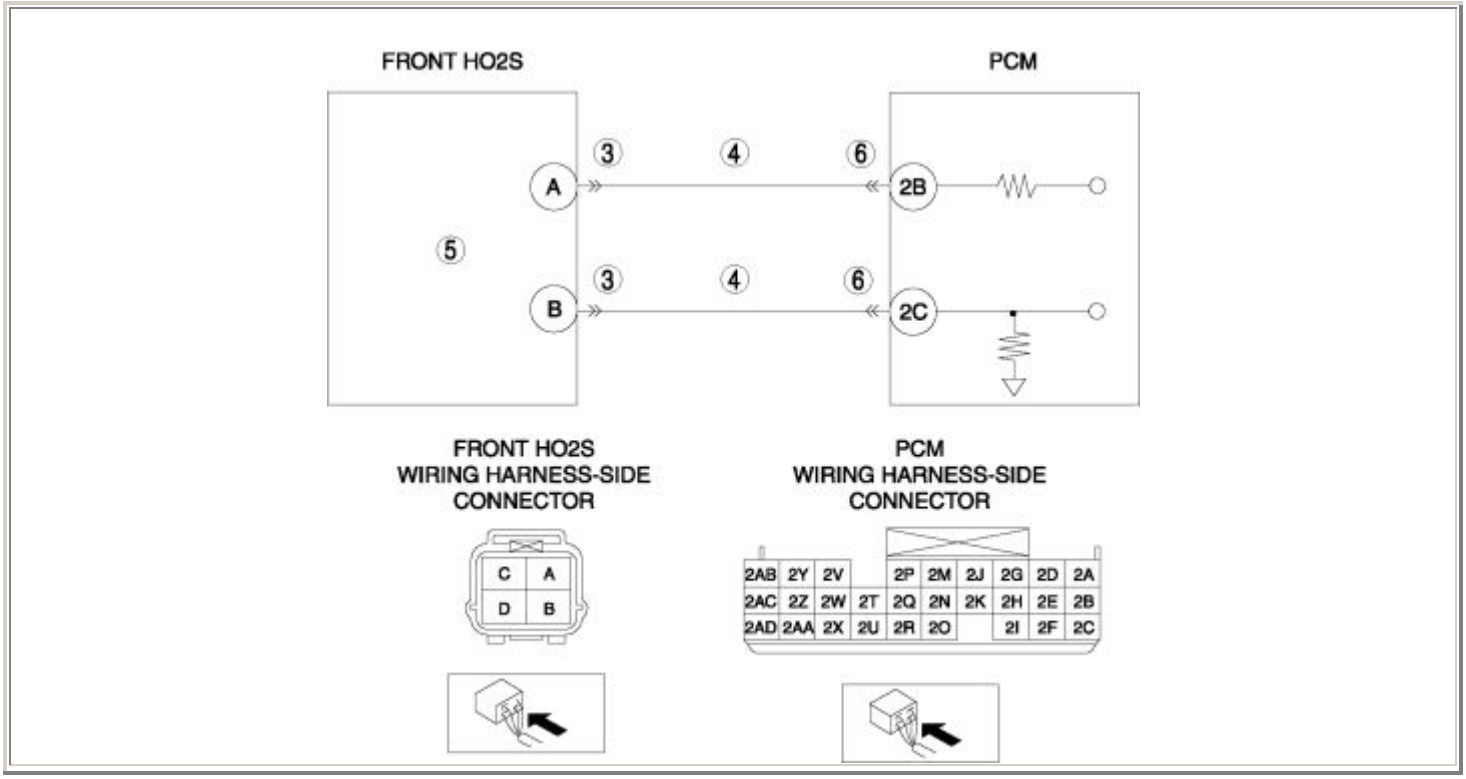
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT FRONT HO2S CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Front HO2S terminal A (wiring harness-side) and body GND ▪ Front HO2S terminal B (wiring harness-side) and body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	INSPECT FRONT HO2S • Inspect the front HO2S. (See FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the front HO2S, then go to Step 8. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	INSPECT FRONT HO2S CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Front HO2S terminal A (wiring harness-side) and PCM terminal 2B (wiring harness-side) ▪ Front HO2S terminal B (wiring harness-side) and PCM terminal 2C (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0131 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0132

DTC P0132	Front HO2S circuit high voltage
DETECTION CONDITION	• The PCM monitors the input voltage from the front HO2S and the front HO2S output current when the engine is running. If the input voltage is **more than 3.8 V** or the output current is **more than 5 mA** , the PCM determines that the front HO2S circuit voltage is high. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between front HO2S terminal A and PCM terminal 2B • Short to power supply in wiring harness between front HO2S terminal B and PCM terminal 2C • PCM malfunction


FRONT HO2S
PCM
3
4
6
A
2B
5
3
4
6
B
2C
FRONT HO2S
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR
C
A
D
B
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT FRONT HO2S CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Front HO2S terminal A (wiring harness-side) and body GND ▪ Front HO2S terminal B (wiring harness-side) and body GND • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT FRONT HO2S	Yes	Replace the front HO2S, then go to Step 7. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)

	• Inspect the front HO2S. (See FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0132 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0133

DTC P0133	Front HO2S circuit slow response
DETECTION CONDITION	• The PCM monitors the front HO2S output current and short term fuel trim (SHRTFT) when the following conditions are met. If the output current response is lower than that expected from the fuel trim, the PCM determines that the front HO2S circuit response is slow. **MONITORING CONDITION** ▪ Front HO2S heater monitor: Completed ▪ Fuel system loop status: Closed loop fuel control ▪ Engine speed: **2,000—3,500 rpm** ▪ LOAD: **30.0—50.0 %** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Looseness of front HO2S • Leakage exhaust gas • Front HO2S malfunction • Fuel line pressure malfunction • Leakage fuel • Fuel pump unit malfunction • AIR system malfunction • Leakage engine coolant • TP sensor malfunction • Eccentric shaft position sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0443 also present?	Yes	Go to the DTC P0443 inspection. (See DTC P0443 .)
		No	Go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P0133 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5		Yes	Go to Step 8.

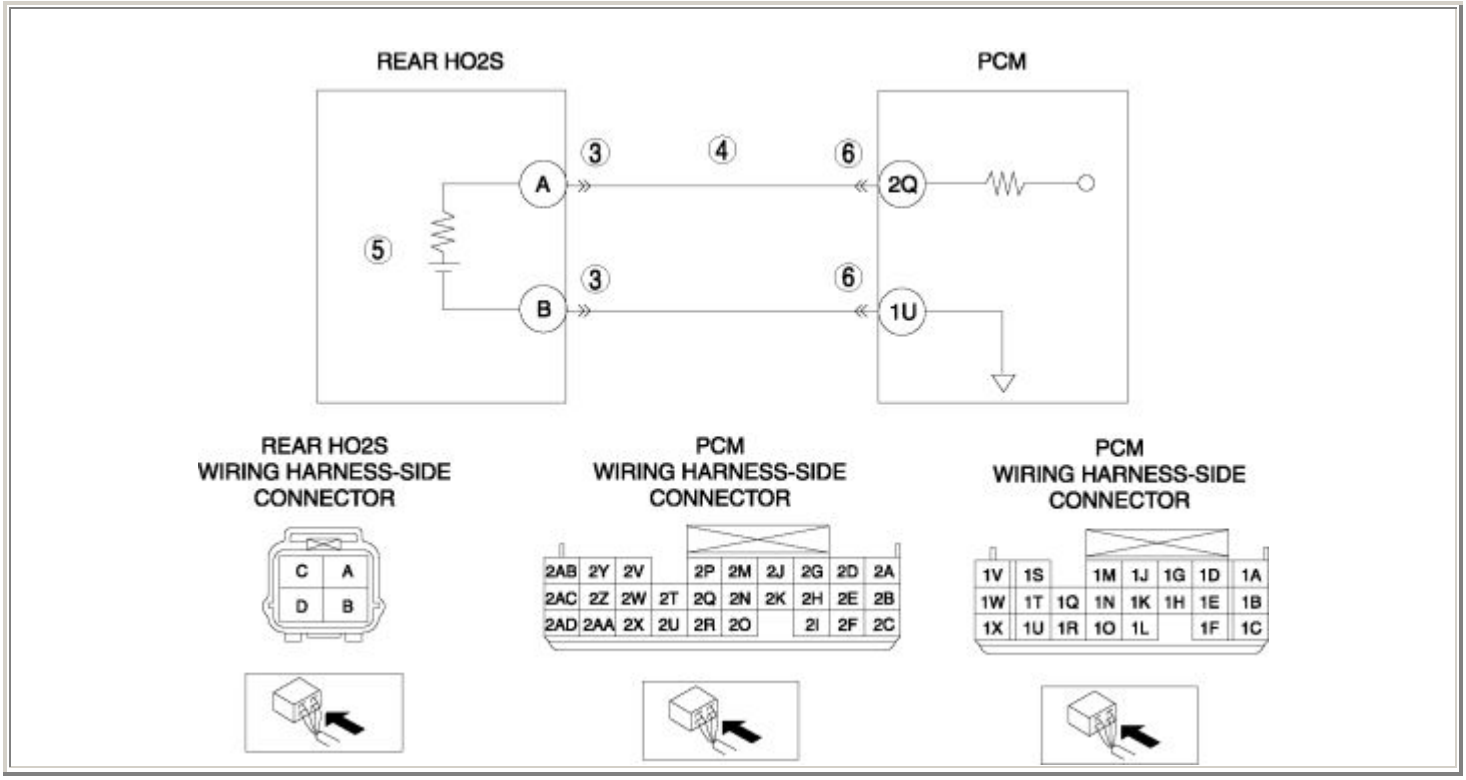
	VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S11 PID. • Read the O2S11 PID under following accelerator pedal conditions (in PARK or NEUTRAL). ▪ **Less than 1 mA** when the accelerator pedal is suddenly depressed (rich condition). ▪ **More than 1 mA** just after release of accelerator pedal (lean condition). • Is the PID normal?	No	Go to the next step.
6	INSPECT INSTALLATION OF FRONT HO2S • Inspect the front HO2S for looseness. • Is it normal?	Yes	Go to the next step.
		No	Tighten the front HO2S, then go to Step 14. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
7	INSPECT EXHAUST SYSTEM FOR EXHAUST GAS LEAKAGE • Visually inspect exhaust gas leakage in the exhaust system. • Is there exhaust gas leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 16.
		No	Replace the front HO2S, then go to Step 16. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
8	INSPECT LONG TERM FUEL TRIM • Connect the WDS or equivalent to the DLC-2. • Access the LONGFT1 PID. • Compare the LONGFT1 PID with recorded FREEZE FRAME DATA at Step 1. • Is the LONGFT1 PID below FREEZE FRAME DATA?	Yes	Engine is driven under rich condition. Go to the next step.
		No	Engine is driven under lean condition. Go to Step 10.
9	INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the Step 16.

	• Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
10	INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE) • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Go to the next step.
		No	Go to step 12.
11	INSPECT FUEL SYSTEM FOR FUEL LEAKAGE • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 16.
		No	Replace the fuel pump unit, then go to Step 16. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
12	INSPECT AIR SYSTEM OPERATION • Perform the "AIR System Inspection". (See Secondary Air Injection (AIR) System Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 16.
		No	Go to the next step.
13	INSPECT ENGINE COOLANT PASSAGE FOR ENGINE COOLANT LEAKAGE • Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See ENGINE COOLANT LEAKAGE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 16.
		No	Go to the next step.

14	INSPECT TP SENSOR • Inspect the TP sensor. (See THROTTLE POSITION (TP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 16. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
15	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the eccentric shaft position sensor, then go to the next step. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
16	VERIFY TROUBLESHOOTING OF DTC P0133 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
17	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0138

DTC P0138	Rear HO2S circuit high voltage
DETECTION CONDITION	• The PCM monitors the input voltage from the rear HO2S when the engine is running. If the input voltage is **more than 1.2 V** , the PCM determines that the rear HO2S circuit voltage is high. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between rear HO2S terminal A and PCM terminal 2Q • PCM malfunction


REAR HO2S
PCM
3
4
6
A
2Q
5
3
6
B
1U
REAR HO2S
WIRING HARNESS-SIDE
CONNECTOR
C A
D B
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT REAR HO2S CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT REAR HO2S • Inspect the rear HO2S. (See REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the rear HO2S, then go to Step 7. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to the next step.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0138 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0139

DTC P0139	Rear HO2S circuit slow response
DETECTION CONDITION	• The PCM monitors the rear HO2S inversion cycle period, lean-to-rich response time and rich-to-lean response time when under the open loop fuel control (fuel cut off control). If the average response time is more than the specification, the PCM determines that the rear HO2S circuit response is slow. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Looseness of rear HO2S • Leakage exhaust gas • Rear HO2S malfunction • Fuel line pressure malfunction • Leakage fuel • Fuel pump unit malfunction • AIR system malfunction • Leakage engine coolant • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0443 also present?	Yes	Go to the DTC P0443 inspection. (See DTC P0443 .)
		No	Go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P0139 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5		Yes	Go to Step 8.

	VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S12 PID. • Read the O2S12 PID under following accelerator pedal conditions (in PARK or NEUTRAL). ▪ **More than 0.55 V** when suddenly depress accelerator pedal (rich condition). ▪ **Less than 0.55 V** just after release of accelerator pedal (lean condition). • Is the PID normal?	No	Go to the next step.
6	INSPECT INSTALLATION OF REAR HO2S • Inspect the rear HO2S for looseness. • Is it normal?	Yes	Go to the next step.
		No	Tighten the rear HO2S, then go to Step 14. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
7	INSPECT EXHAUST SYSTEM FOR EXHAUST GAS LEAKAGE • Visually inspect exhaust gas leakage in the exhaust system. • Is there exhaust gas leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 14.
		No	Replace the rear HO2S, then go to Step 14. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
8	INSPECT LONG TERM FUEL TRIM • Connect the WDS or equivalent to the DLC-2. • Access the LONGFT1 PID. • Compare the LONGFT1 PID with recorded FREEZE FRAME DATA at Step 1. • Is the LONGFT1 PID below FREEZE FRAME DATA?	Yes	Engine is driven under rich condition. Go to the next step.
		No	Engine is driven under lean condition. Go to Step 10.
9	INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the Step 14.

	• Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
10	INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE) • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Go to the next step.
		No	Go to step 12.
11	INSPECT FUEL SYSTEM FOR FUEL LEAKAGE • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 14.
		No	Replace the fuel pump unit, then go to Step 14. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
12	INSPECT AIR SYSTEM OPERATION • Perform the "AIR System Inspection". (See Secondary Air Injection (AIR) System Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, according to inspection results. Then go to Step 14.
		No	Go to the next step.
13	INSPECT ENGINE COOLANT PASSAGE FOR ENGINE COOLANT LEAKAGE • Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See ENGINE COOLANT LEAKAGE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.

14	VERIFY TROUBLESHOOTING OF DTC P0139 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
15	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0171

DTC P0171	System too lean
DETECTION CONDITION	• The PCM monitors the short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) when under closed loop fuel control. If the fuel trim is more than the specification, the PCM determines that the system is too lean. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.

POSSIBLE CAUSE	• Front HO2S malfunction
	• Excess air suction in intake-air system
	• Leakage exhaust gas
	• MAF sensor malfunction
	• Fuel line pressure malfunction
	• Fuel pump unit malfunction
	• Leakage fuel
	• Ignition system malfunction
	  ▪ High-tension lead malfunction
	  ▪ Incorrect power supply to ignition coil
	  ▪ Ignition coil malfunction
	• Insufficient compression
	  ▪ Metering oil pump malfunction
	  ▪ Engine oil condition malfunction
	  ▪ Rised oil pressure
	  ▪ Oil passage malfunction
	  ▪ Engine malfunction
	• Fuel injector malfunction
	• PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	• If misfire DTC is present, go to Step 8. • If other DTC is present, go to the appropriate DTC inspection. (See DTC TABLE .)
		No	• If drive ability concern is present, go to Step 8. • If other, go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P0171 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	No	Inspect the malfunctioning part according to the inspection results. Then go to Step 24.
6	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 24.
7	VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S11 PID. • Read the O2S11 PID under following accelerator pedal condition (in PARK or NEUTRAL). ▪ **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). ▪ **More than 1 mA** just after	Yes	Inspect for air suction at followings due to cracks, damages and loosening parts: • From air cleaner to throttle body • From throttle body to intake manifold • Vacuum hoses **NOTE:** • Engine speed may change when rust penetrating agent (cab cleaner etc.) is sprayed on the air suction area. Repair or replace the malfunctioning part, then go to Step 24.

	release of accelerator pedal (lean condition) • Is the PID normal?	No	Go to the next step.
8	INSPECT EXHAUST SYSTEM FOR EXHAUST GAS LEAKAGE • Visually inspect exhaust gas leakage in the exhaust system. • Is there exhaust gas leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 24.
		No	Replace the front HO2S, then go to Step 24. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
9	VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to race the engine RPM. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 24. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
10	INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION • Visually inspect for loosen, cracks or damages hoses in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 24.
		No	Go to the next step.
11	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	• If the fuel line pressure is too low, go to the next step. • If the fuel line pressure is too high, replace the fuel pump unit, then go to Step 24. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
		No	Go to Step 13.
12	INSPECT FUEL SYSTEM FOR FUEL LEAKAGE • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 24.
		No	Replace the fuel pump unit, then go to Step 25. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
13		Yes	Go to Step 17.

	INSPECT IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT • Inspect the blinking condition on each high-tension lead using timing light at idle. • Do all the high-tension leads show blinking condition?	No	Go to the next step.
14	INSPECT HIGH-TENSION LEAD OF NO BLINKING HIGH-TENSION LEAD • Inspect the high-tension leads. (See HIGH-TENSION LEAD INSPECTION .) • Is there any malfunction?	Yes	Replace the malfunctioning high-tension lead, then go to Step 24. (See HIGH-TENSION LEAD REMOVAL/INSTALLATION .)
		No	Go to the next step.
15	INSPECT IGNITION COIL POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between ignition coil terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 24.
16	INSPECT IGNITION COIL • Inspect the ignition coil. (See IGNITION COIL INSPECTION .) • Is there any malfunction?	Yes	Replace the ignition coil, then go to Step 24. (See IGNITION COIL REMOVAL/INSTALLATION .)
		No	Go to the next step.
17	INSPECT AIR SYSTEM OPERATION • Perform the "AIR System Inspection". (See Secondary Air Injection (AIR) System Inspection .) • Does AIR system operate properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to the inspection results. Then go to Step 23.

18	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION .) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 23.
19	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 24.
		No	Go to the next step.
20	INSPECT ENGINE OIL CONDITION • Inspect the engine oil condition. • Is the engine oil condition normal?	Yes	Go to the next step.
		No	Replace the engine oil. Inspect the ECT sensor and related harnesses. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) Overhaul or replace the engine. Then go to Step 24.
21	INSPECT OIL PRESSURE • Inspect the oil pressure. (See OIL PRESSURE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 24.
		No	Go to the next step.
22	INSPECT OIL PASSAGE • Inspect the oil pipe between metering oil pump and metering oil nozzle. • Is there any malfunction?	Yes	Inspect and repair for leakage and/or clogged in oil passage at engine. Overhaul or replace the engine. Then go to Step 24.
		No	Overhaul or replace the engine. Then go to the next step.

23	INSPECT FUEL INJECTOR • Inspect the fuel injector. (See FUEL INJECTOR INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel injector, then go to the next step. (See FUEL INJECTOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
24	VERIFY TROUBLESHOOTING OF DTC P0171 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the "DRIVE MODE 1". (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
25	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0172

DTC P0172	System too rich
DETECTION CONDITION	• The PCM monitors the short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) when under closed loop fuel control. If the fuel trim is less than the specification, the PCM determines that the system is too rich. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel line pressure malfunction • Fuel pump unit malfunction • Purge solenoid valve malfunction • Fuel pump speed control malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	• If misfire DTC is present, go to Step 8. • If other DTC is present, go to the appropriate DTC inspection. (See DTC TABLE .)
		No	• If drive ability concern is present, go to Step 8. • If other, go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P0172 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
6	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
7		Yes	Go to the next step.

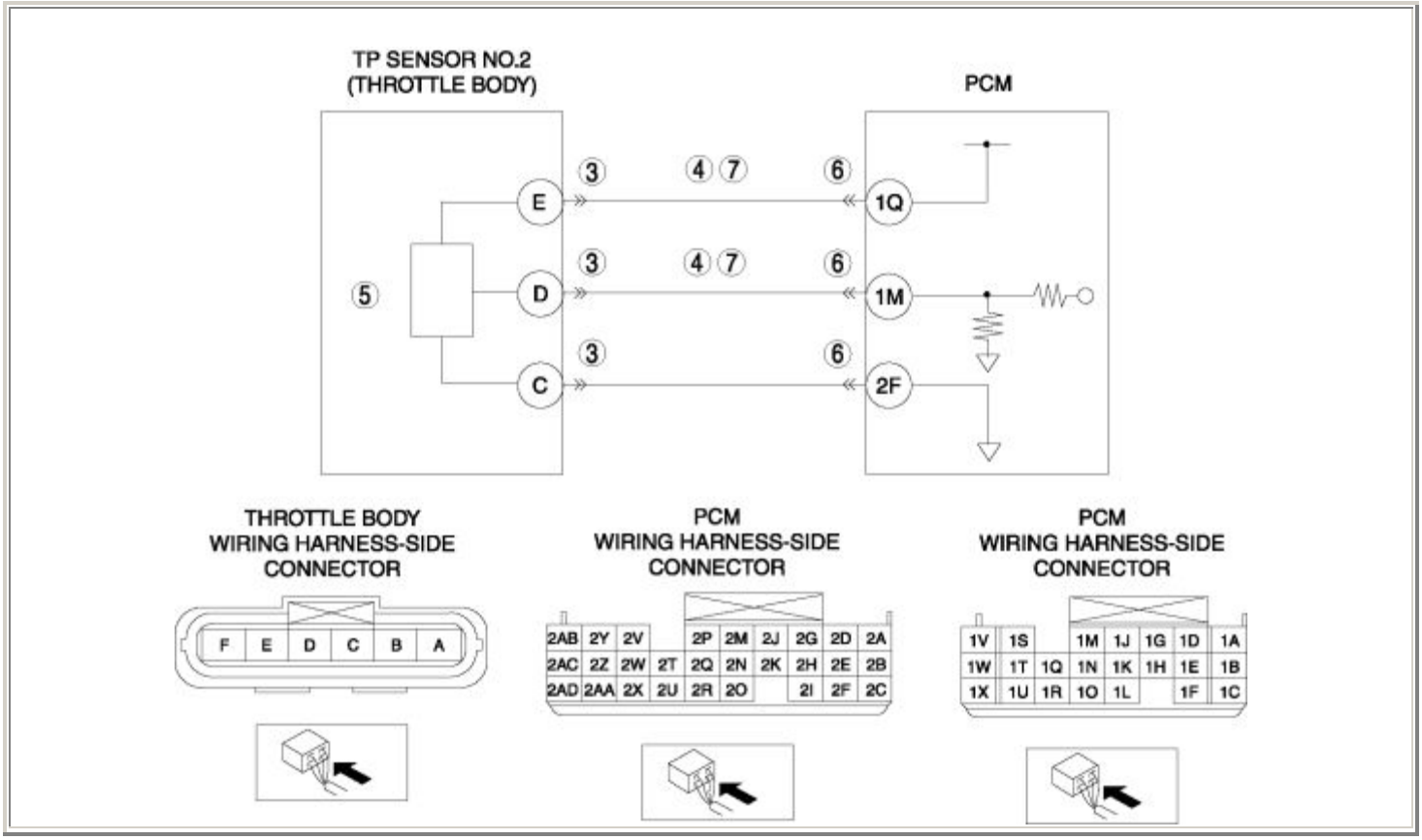
	VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S11 PID. • Read the O2S11 PID under following accelerator pedal condition (in PARK or NEUTRAL). ▪ **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). ▪ **More than 1 mA** just after release of accelerator pedal (lean condition) • Is the PID normal?	No	Replace the front HO2S, then go to Step 11. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
8	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Replace the fuel pump unit, then go to Step 11. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT LONG TERM FUEL TRIM • Connect the WDS or equivalent to the DLC-2. • Access the LONGFT1 PID. • Compare the LONGFT1 PID with recorded FREEZE FRAME DATA at Step 1. • Is the LONGFT1 PID above FREEZE FRAME DATA?	Yes	Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • If there is any malfunction, replace the purge solenoid valve. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .) Then go to Step 11.
		No	Go to the next step.
10	INSPECT FUEL PUMP SPEED CONTROL OPERATION	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.

	• Perform the "Fuel Pump Speed Control Operation Inspection". (See Fuel Pump Speed Control Operation Inspection .) • Is there any malfunction?	No	Go to the next step.
11	VERIFY TROUBLESHOOTING OF DTC P0172 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the "DRIVE MODE 1". (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
12	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P02XX

DTC P0222

DTC P0222	TP sensor No.2 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the TP sensor No.2 when the engine is running. If the input voltage is **less than 0.7 V** , the PCM determines that the TP sensor No.2 circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between throttle body terminal E and PCM terminal 1Q • Short to GND in wiring harness between throttle body terminal E and PCM terminal 1Q • Open circuit in wiring harness between throttle body terminal D and PCM terminal 1M • Short to GND in wiring harness between throttle body terminal D and PCM terminal 1M • PCM malfunction


TP SENSOR NO.2
(THROTTLE BODY)
PCM
3
4 7
6
E
D
C
5
1Q
1M
2F
THROTTLE BODY
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

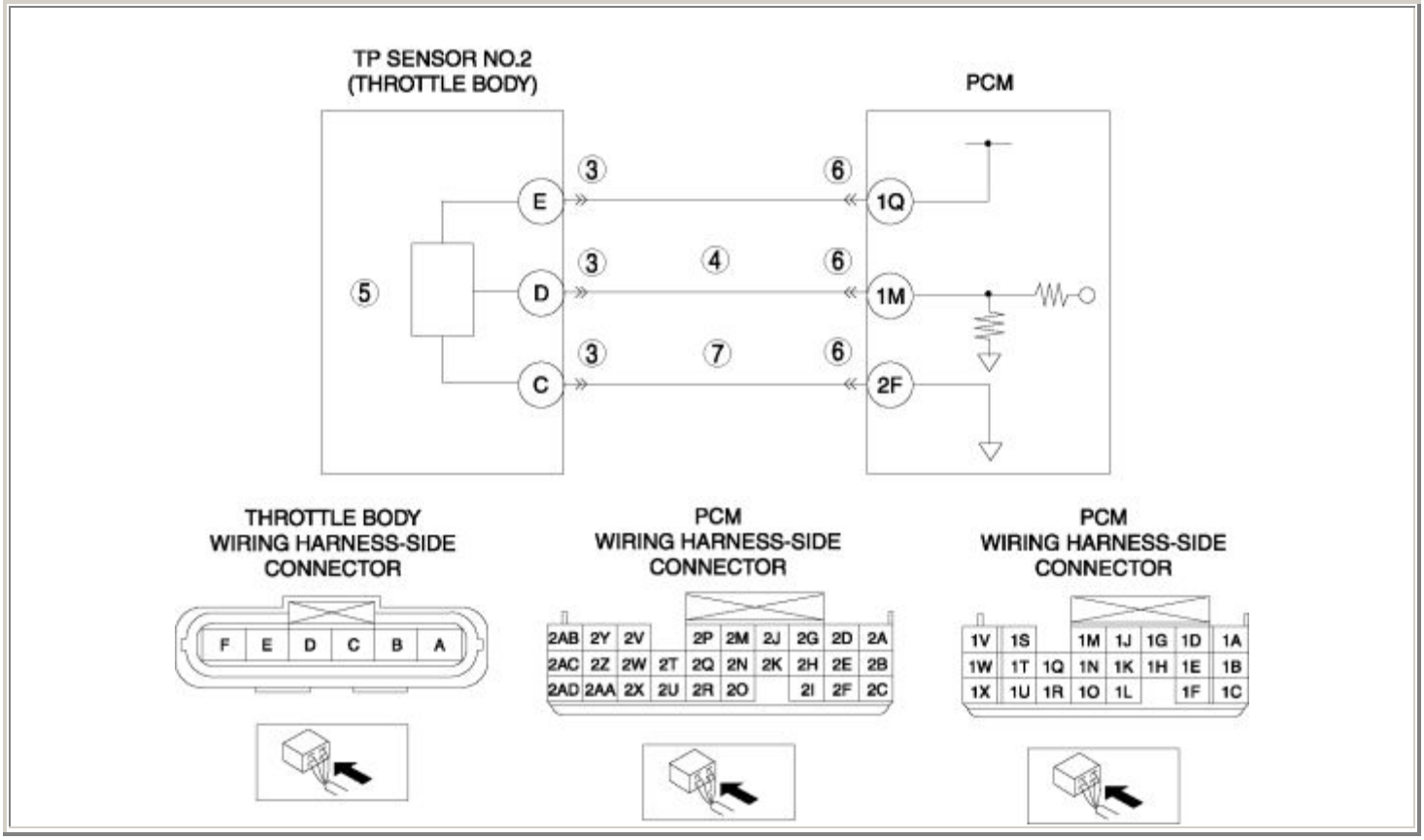
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT TP SENSOR NO.2 CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Throttle body terminal E (wiring harness-side) and body GND ▪ Throttle body terminal D (wiring harness-side) and body GND • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	INSPECT TP SENSOR NO.2 • Inspect the TP sensor No.2. (See THROTTLE POSITION (TP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 8. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	INSPECT TP SENSOR NO.2 CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Throttle body terminal E (wiring harness-side) and PCM terminal 1Q (wiring harness-side) ▪ Throttle body terminal D (wiring harness-side) and PCM terminal 1M (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0222 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0223

DTC P0223	TP sensor No.2 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the TP sensor No.2 when the engine is running. If the input voltage is **more than 4.8 V** , the PCM determines that the TP sensor No.2 circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.2 malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between throttle body terminal D and PCM terminal 1M • Open circuit in wiring harness between throttle body terminal C and PCM terminal 2F • PCM malfunction


TP SENSOR NO.2
(THROTTLE BODY)
PCM
E
D
C
5
3
4
7
6
1Q
1M
2F
THROTTLE BODY
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

Notes:

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT TP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between throttle body terminal D (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	INSPECT TP SENSOR NO.2 • Inspect the TP sensor No.2. (See THROTTLE POSITION (TP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 8. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to Step 8.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT TP SENSOR NO.2 GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between throttle body terminal C (wiring harness-side) and PCM terminal 2F (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0223 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0300

DTC P0300	Random misfire detected
DETECTION CONDITION	• The PCM monitors eccentric shaft position sensor input signal interval time. The PCM calculates the change of the interval time for each rotor. If the change of interval time exceeds the preprogrammed criteria, the PCM detects a misfire in the corresponding rotor. While the engine is running, the PCM counts the number of misfires that occurred at **200 eccentric shaft revolutions** and **1,000 eccentric shaft revolutions** and calculates misfire ratio for each eccentric shaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (Misfire). • The MIL illuminates if the PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The MIL flashes if the PCM detects the misfire which can damage the catalytic converter during the first drive cycle. Therefore, PENDING CODE is not available while the MIL flashes. • PENDING CODE is available if the PCM detects the misfire which affects emission performance during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.

POSSIBLE CAUSE	• Eccentric shaft position sensor malfunction
	• Ignition system malfunction
	  ▪ High-tension lead malfunction
	  ▪ Incorrect power supply to ignition coil
	  ▪ Ignition coil malfunction
	• MAF sensor malfunction
	• Excess air suction in intake-air system
	• Fuel line pressure malfunction
	• Fuel pump unit malfunction
	• Leakage fuel
	• Insufficient compression
	  ▪ Metering oil pump malfunction
	  ▪ Engine oil condition malfunction
	  ▪ Rised oil pressure
	  ▪ Oil passage malfunction
	  ▪ Engine malfunction
	• ECT sensor malfunction
	• Purge control system malfunction

	• Leakage engine coolant • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 22.
5		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	No	Inspect the malfunctioning part according to the inspection results. Then go to Step 22.
6	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction?	Yes	Replace the eccentric shaft position sensor, then go to Step 22. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT • Inspect the blinking condition on each high-tension leads using timing light at idle. • Do all the high-tension leads show blinking condition?	Yes	Go to Step 11.
		No	Go to the next step.
8	INSPECT HIGH-TENSION LEAD OF NO BLINKING HIGH-TENSION LEAD • Inspect the high-tension leads. (See HIGH-TENSION LEAD INSPECTION .) • Is there any malfunction?	Yes	Replace the malfunctioning high-tension lead, then go to Step 22. (See HIGH-TENSION LEAD REMOVAL/INSTALLATION .)
		No	Go to the next step.

9	INSPECT IGNITION COIL POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between ignition coil terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 22.
10	INSPECT IGNITION COIL • Inspect the ignition coil. (See IGNITION COIL INSPECTION .) • Is there any malfunction?	Yes	Replace the ignition coil, then go to Step 22. (See IGNITION COIL REMOVAL/INSTALLATION .)
		No	Go to the next step.
11	VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to race the engine RPM. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 22. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
12	INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION • Visually inspect for loosen, cracks or damages hoses in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 22.
		No	Go to the next step.
13	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .)	Yes	• If the fuel line pressure is too low, go to the next step. • If the fuel line pressure is too high, replace the fuel pump unit, then go to Step 22. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)

	• Is there any malfunction ?	No	Go to Step 15.
14	INSPECT FUEL SYSTEM FOR FUEL LEAKAGE • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 22.
		No	Replace the fuel pump unit, then go to Step 22. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
15	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION .) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 20.
16	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 22.
		No	Go to the next step.
17	INSPECT ENGINE OIL CONDITION • Inspect the engine oil condition. • Is the engine oil condition normal?	Yes	Go to the next step.
		No	Replace the engine oil. Inspect the ECT sensor and related harnesses. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) Overhaul or replace the engine. Then go to Step 22.
18	INSPECT OIL PRESSURE • Inspect the oil pressure. (See OIL PRESSURE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 22.
		No	Go to the next step.

19	INSPECT OIL PASSAGE • Inspect the oil pipe between metering oil pump and metering oil nozzle. • Is there any malfunction?	Yes	Inspect and repair for leakage and/or clogged in oil passage at engine. Overhaul or replace the engine. Then go to Step 22.
		No	Overhaul or replace the engine. Then go to Step 22.
20	INSPECT PURGE CONTROL SYSTEM OPERATION • Perform the "Purge Control System Inspection". (See Purge Control System Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 22.
		No	Go to the next step.
21	INSPECT ENGINE COOLANT PASSAGE FOR ENGINE COOLANT LEAKAGE • Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See ENGINE COOLANT LEAKAGE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
22	VERIFY TROUBLESHOOTING OF DTC P0300 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine and warm it up completely. • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
23	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

Notes:

DTC P0301, P0302

DTC P0301 DTC P0302	Front rotor misfire detected Rear rotor misfire detected
DETECTION CONDITION	• The PCM monitors eccentric shaft position sensor input signal interval time. The PCM calculates the change of the interval time for each rotor. If the change of interval time exceeds the preprogrammed criteria, the PCM detects a misfire in the corresponding rotor. While the engine is running, the PCM counts the number of misfires that occurred at **200 eccentric shaft revolutions** and **1,000 eccentric shaft revolutions** and calculates misfire ratio for each eccentric shaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (Misfire). • The MIL illuminates if the PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The MIL flashes if the PCM detects the misfire which can damage the catalytic converter during the first drive cycle. Therefore, PENDING CODE is not available while the MIL flashes. • PENDING CODE is available if the PCM detects the misfire which affects emission performance during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.

POSSIBLE CAUSE	• Eccentric shaft position sensor malfunction
	• Spark plug malfunction
	• High-tension lead malfunction
	• Excess air suction in intake-air system
	• Fuel injector malfunction
	• Leakage engine coolant
	• Insufficient compression
	  ▪ Metering oil pump malfunction
	  ▪ Engine oil condition malfunction
	  ▪ Rised oil pressure
	  ▪ Oil passage malfunction
	  ▪ Engine malfunction
	• ECT sensor malfunction
	• Fuel line pressure malfunction
	• Fuel pump unit malfunction

	• PCM malfunction

Notes:

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 19.
5		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	No	Inspect the malfunctioning part according to the inspection results. Then go to Step 19.
6	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction?	Yes	Replace the eccentric shaft position sensor, then go to Step 19. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT SPARK PLUG • Inspect the spark plug. (See SPARK PLUG INSPECTION .) • Is there any malfunction?	Yes	Replace the spark plug, then go to Step 19 (See SPARK PLUG REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	INSPECT HIGH-TENSION LEAD • Inspect the high-tension leads. (See HIGH-TENSION LEAD INSPECTION .) • Is there any malfunction?	Yes	Replace the malfunctioning high-tension lead, then go to Step 19. (See HIGH-TENSION LEAD REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION	Yes	Repair or replace the malfunctioning part, then go to Step 19.

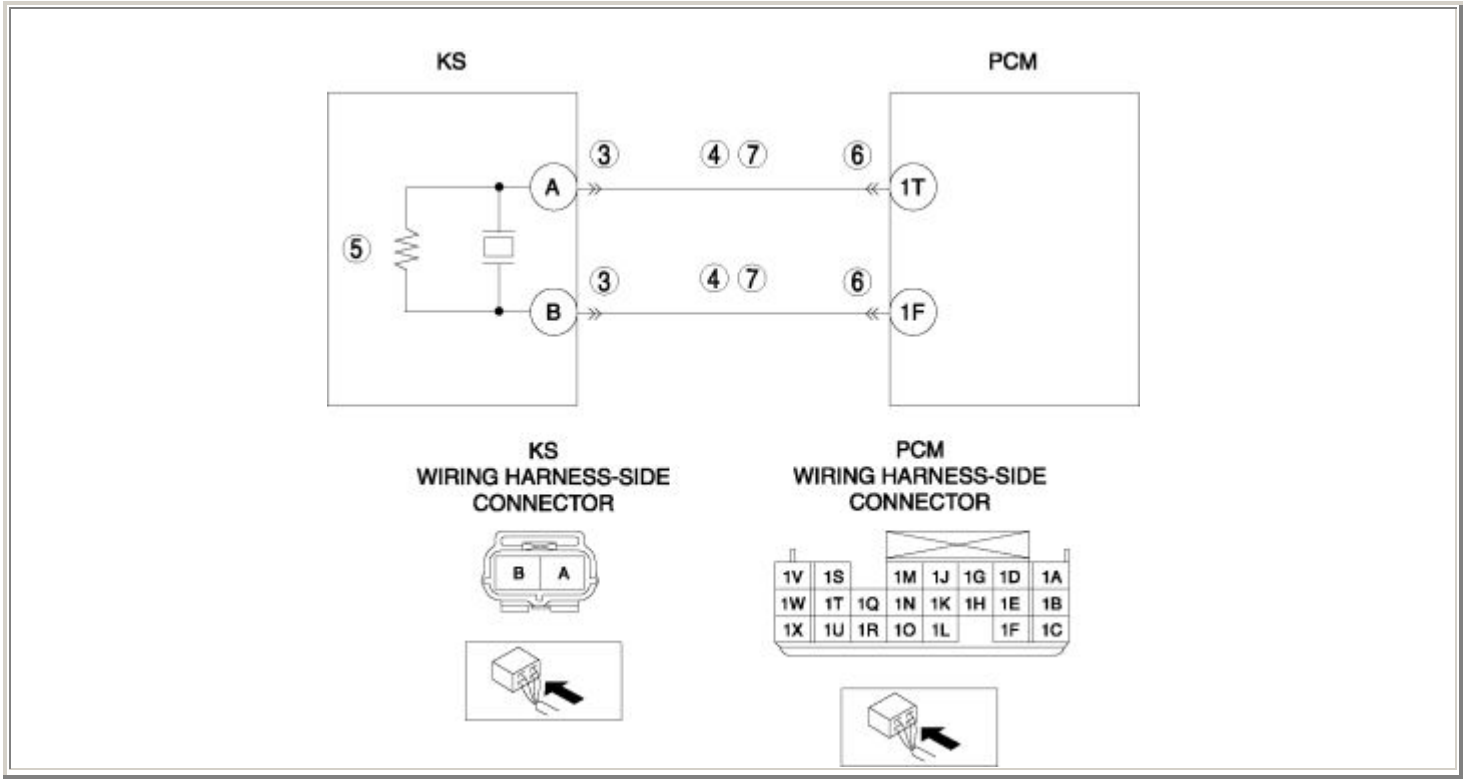
	• Visually inspect for loosen, cracks or damages hoses in intake-air system. • Is there any malfunction?	No	Go to the next step.
10	INSPECT FUEL INJECTOR WIRING HARNESS • Disconnect the fuel injector connector. • Connect the noid light to the fuel injector connector terminals. • Remove the fuel pump relay. • Inspect the dim of light during cranking. • Does noid light illuminate?	Yes	Go to the next step.
		No	Inspect for fuel injector wiring harness. • If there is any malfunction, replace the malfunctioning wiring harness. Then go to Step 19.
11	INSPECT ENGINE COOLANT PASSAGE FOR ENGINE COOLANT LEAKAGE • Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See ENGINE COOLANT LEAKAGE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 19.
		No	Go to the next step.
12	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION .) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 17.
13	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 19.
		No	Go to the next step.
14	INSPECT ENGINE OIL CONDITION	Yes	Go to the next step.

	• Inspect the engine oil condition. • Is the engine oil condition normal?	No	Replace the engine oil. Inspect the ECT sensor and related harnesses. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) Overhaul or replace the engine. Then go to Step 19.
15	INSPECT OIL PRESSURE • Inspect the oil pressure. (See OIL PRESSURE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 19.
		No	Go to the next step.
16	INSPECT OIL PASSAGE • Inspect the oil pipe between metering oil pump and metering oil nozzle. • Is there any malfunction?	Yes	Inspect and repair for leakage and/or clogged in oil passage at engine. Overhaul or replace the engine. Then go to Step 19.
		No	Overhaul or replace the engine. Then go to the next step.
17	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Replace the fuel pump unit, then go to Step 19. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
		No	Go to the next step.
18	INSPECT FUEL INJECTOR • Inspect the fuel injector. (See FUEL INJECTOR INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel injector, then go to the next step. (See FUEL INJECTOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
19	VERIFY TROUBLESHOOTING OF DTC P0301 OR DTC P0302 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine and warm it up completely. • Is the PENDING CODE same as the DTC present?	No	Go to the next step.
20	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0327

DTC P0327	KS circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the KS when the engine is running. If the input voltage is **less than 1.2 V** , the PCM determines that the KS circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• KS malfunction • Connector or terminal malfunction • Open circuit in wiring harness between KS terminal A and PCM terminal 1T • Short to GND in wiring harness between KS terminal A and PCM terminal 1T • Open circuit in wiring harness between KS terminal B and PCM terminal 1F • Short to GND in wiring harness between KS terminal B and PCM terminal 1F • PCM malfunction


KS
PCM
3
4 7
6
A
1T
5
3
4 7
6
B
1F
KS
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR
B A
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

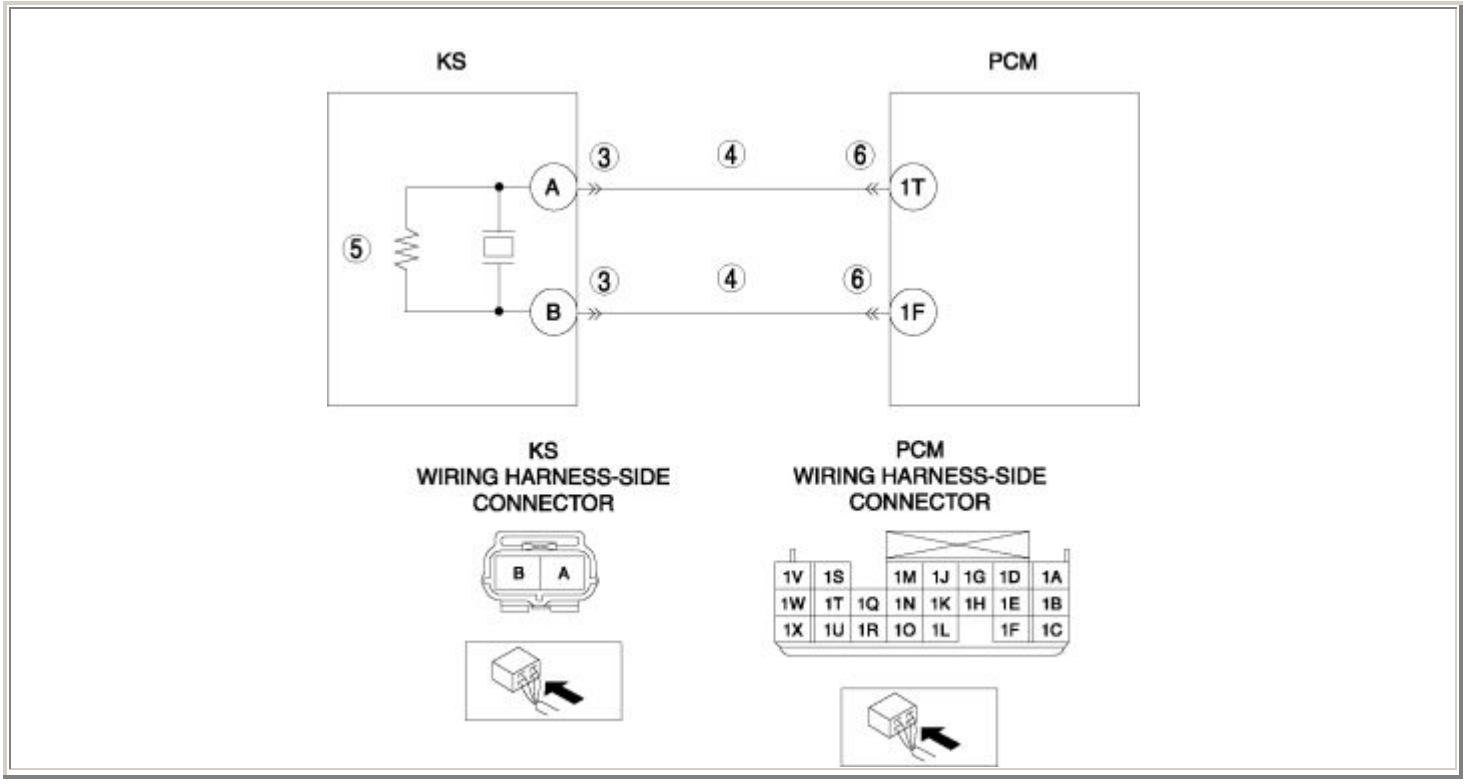
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT KS CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the KS connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT KS CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ KS terminal A (wiring harness-side) and body GND ▪ KS terminal B (wiring harness-side) and body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	INSPECT KS • Inspect the KS. (See KNOCK SENSOR (KS) INSPECTION .) • Is there any malfunction ?	Yes	Replace the KS, then go to Step 8. (See KNOCK SENSOR (KS) REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	INSPECT KS CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ KS terminal A (wiring harness-side) and PCM terminal 1T (wiring harness-side) ▪ KS terminal B (wiring harness-side) and PCM terminal 1F (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P0327 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0328

DTC P0328	KS circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the KS when the engine is running. If the input voltage is **more than 4.0 V** , the PCM determines that the KS circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• KS malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between KS terminal A and PCM terminal 1T • Short to power supply in wiring harness between KS terminal B and PCM terminal 1F • PCM malfunction


KS
PCM
3
4
6
A
1T
5
3
4
6
B
1F
KS
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR
B
A
1V
1S
1M
1J
1G
1D
1A
1W
1T
1Q
1N
1K
1H
1E
1B
1X
1U
1R
1O
1L
1F
1C

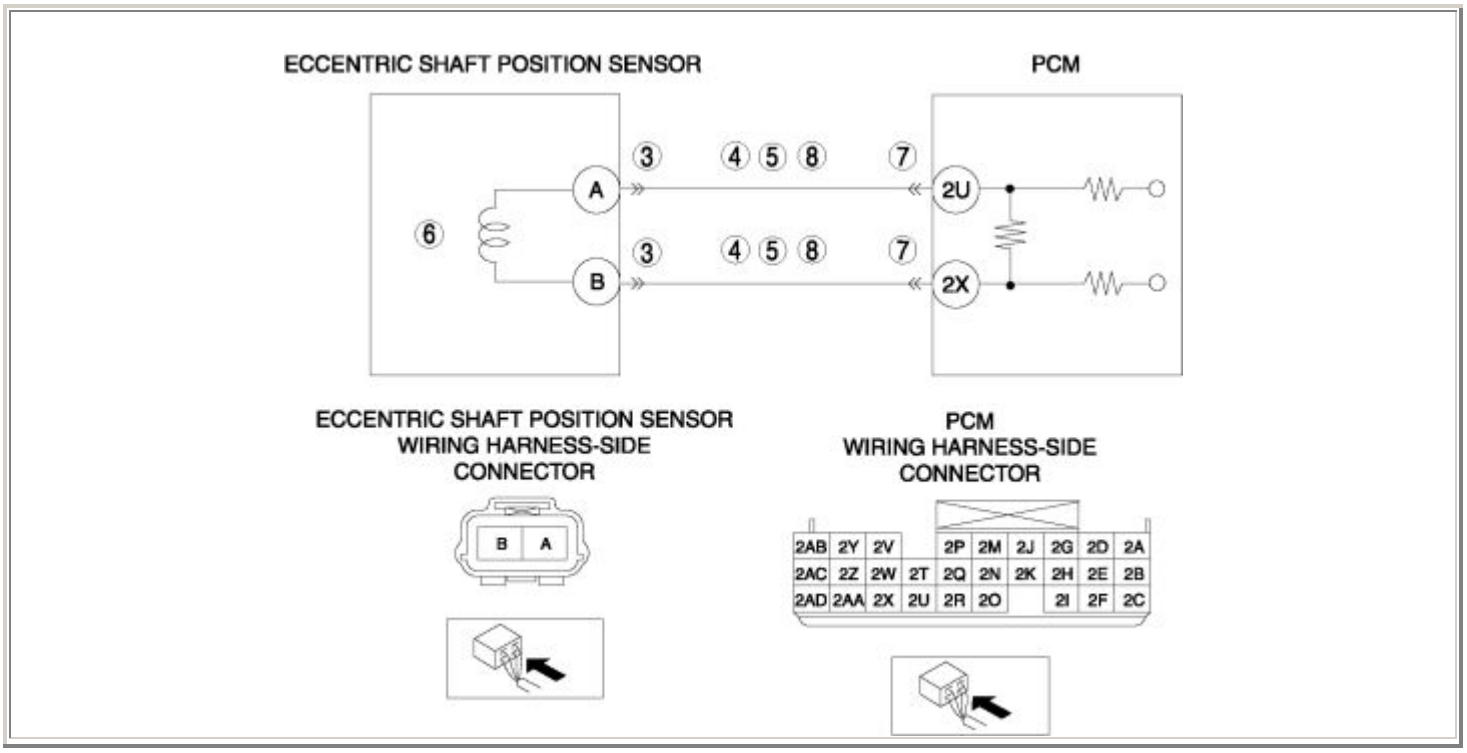
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT KS CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the KS connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT KS CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ KS terminal A (wiring harness-side) and body GND ▪ KS terminal B (wiring harness-side) and body GND • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT KS	Yes	Replace the KS, then go to Step 7. (See KNOCK SENSOR (KS) REMOVAL/INSTALLATION .)

	• Inspect the KS. (See KNOCK SENSOR (KS) INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0328 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0335

DTC P0335	Eccentric shaft position sensor circuit problem
DETECTION CONDITION	• The PCM monitors the input signal from the eccentric shaft position sensor when the mass intake airflow amount is **more than 2 g/s {0.26 lb/min}** . If the input signal is not input, the PCM determines that there is a eccentric shaft position sensor circuit malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Eccentric shaft position sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between eccentric shaft position sensor terminal A and PCM terminal 2U • Short to power supply in wiring harness between eccentric shaft position sensor terminal A and PCM terminal 2U • Short to GND in wiring harness between eccentric shaft position sensor terminal A and PCM terminal 2U • Open circuit in wiring harness between eccentric shaft position sensor terminal B and PCM terminal 2X • Short to power supply in wiring harness between eccentric shaft position sensor terminal B and PCM terminal 2X • Short to GND in wiring harness between eccentric shaft position sensor terminal B and PCM terminal 2X • Eccentric shaft position sensor is dirty • PCM malfunction


ECCENTRIC SHAFT POSITION SENSOR
PCM
3
4 5 8
7
A
2U
6
3
4 5 8
7
B
2X
ECCENTRIC SHAFT POSITION SENSOR WIRING HARNESS-SIDE CONNECTOR
B A
PCM WIRING HARNESS-SIDE CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT ECCENTRIC SHAFT POSITION SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the eccentric shaft position sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT ECCENTRIC SHAFT POSITION SENSOR CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Eccentric shaft position sensor terminal A (wiring harness-side) and body GND ▪ Eccentric shaft position sensor terminal B (wiring harness-side) and body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
5	INSPECT ECCENTRIC SHAFT POSITION SENSOR CIRCUIT FOR SHORT TO POWER SUPPLY	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 9.

	• Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Eccentric shaft position sensor terminal A (wiring harness-side) and body GND ▪ Eccentric shaft position sensor terminal B (wiring harness-side) and body GND • Is the voltage **B+** ?	No	Go to the next step.
6	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the eccentric shaft position sensor, then go to Step 9. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT ECCENTRIC SHAFT POSITION SENSOR CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Eccentric shaft position sensor terminal A (wiring harness-side) and PCM terminal 2U (wiring harness-side) ▪ Eccentric shaft position sensor terminal B (wiring harness-side) and PCM terminal 2X (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.

9	VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine and run the engine for **5 s or more.** • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0336

DTC P0336	Eccentric shaft position sensor circuit range/performance problem
DETECTION CONDITION	• The PCM monitors the input signal from the eccentric shaft position sensor when the engine is running. If the input signal is not the proper pulse number, the PCM determines that there is a eccentric shaft position sensor circuit range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Eccentric shaft position sensor malfunction • Connector or terminal malfunction • Eccentric shaft position sensor is dirty • Eccentric shaft position plate malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT ECCENTRIC SHAFT POSITION PLATE • Inspect the eccentric shaft position plate. (See ECCENTRIC SHAFT POSITION PLATE INSPECTION .) • Is there any malfunction ?	Yes	Replace the eccentric shaft position plate, then go to Step 7. (See ECCENTRIC SHAFT POSITION PLATE REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	INSPECT ECCENTRIC SHAFT POSITION SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the eccentric shaft position sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	INSPECT ECCENTRIC SHAFT POSITION SENSOR	Yes	Replace the eccentric shaft position sensor, then go to Step 7. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)

	• Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0336 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0410

DTC P0410	AIR system problem
DETECTION CONDITION	• The PCM monitors the front HO2S output current when the AIR control is operating. If the output current is more than the specification, the PCM determines that there is an AIR system problem. **Diagnostic support note** • This is an intermittent monitor (AIR system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• AIR system malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P0410 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5	INSPECT AIR SYSTEM OPERATION • Perform the "AIR System Inspection". (See Secondary Air Injection (AIR) System Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
6	VERIFY TROUBLESHOOTING OF DTC P0410 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Soak the vehicle in a place that is at a temperature of **approx. 25 °C {77 °F}** for **more than 6 hours** . • Start the engine. • Verify the SAIR_EVAL PID to Yes. ▪ If not, soak the vehicle again. • Is the PENDING CODE same as the DTC present?	No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0420

DTC P0420	Catalyst system efficiency below threshold
DETECTION CONDITION	• The PCM monitors the input voltage from the rear HO2S and the front HO2S output current when the following conditions are met. If the input voltage change is extremely large compared to the output current change, the PCM determines that the catalyst system has deteriorated. **MONITORING CONDITION** ▪ ECT: **more than 70 °C {158 °F}** ▪ Catalyst converter temperature: **more than 400 °C {752 °F}** ▪ Engine speed: **1,500— 3,500 rpm** ▪ LOAD: **20— 50%** (maximum calculated load value varies depending on engine speed.) ▪ Time with purge control system does not operate: **more than 20 s** **Diagnostic support note** • This is an intermittent monitor (Catalyst). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Looseness of front HO2S • Leakage exhaust gas • Purge control system malfunction • VSS malfunction • ECT malfunction • Eccentric shaft position sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	INSPECT INSTALLATION OF FRONT HO2S • Inspect the front HO2S for looseness. • Is it normal?	Yes	Go to the next step.
		No	Tighten the front HO2S, then go to Step 10. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
5	INSPECT EXHAUST SYSTEM FOR EXHAUST GAS LEAKAGE • Visually inspect exhaust gas leakage in the exhaust system. • Is there exhaust gas leakage?	Yes	Repair or replace the malfunctioning part, then go to the next step.
		No	Go to the next step.
6		Yes	Go to the next step.

	INSPECT PURGE CONTROL SYSTEM OPERATION • Perform the "Purge Control System Operation Inspection". (See Purge Control System Inspection .) • Does purge control system operate properly?	No	Repair or replace malfunctioning part according to the inspection results. Then go to Step 10.
7	VERIFY CURRENT INPUT SIGNAL STATUS OF VSS • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the VSS PID. • Inspect the VSS PID. (See PCM INSPECTION .) • Is the PID normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 10.
8	INSPECT ECT SENSOR • Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the ECT sensor, then go to Step 10. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction?	Yes	Replace the eccentric shaft position sensor, then go to the next step (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P0420 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as the DTC present?	No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0441

DTC P0441	EVAP system incorrect purge flow
DETECTION CONDITION	• The PCM monitors the purge line vacuum, when the following conditions are met. If the vacuum between the charcoal canister and the intake manifold does not reach the specification, the PCM determines that the EVAP system purge flow is incorrect. **MONITORING CONDITION** ▪ Vehicle speed: **25—49 km/h {16—30 mph}** ▪ Engine speed: **1,200—3,000 rpm** ▪ Throttle valve opening angle: **0—31.7 %** (changes by engine speed) **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Clogging EVAP system • Leakage EVAP system • EVAP system leak detection pump malfunction • APP sensor malfunction • Eccentric shaft position sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0443 also present?	Yes	Go to the DTC P0443 inspection. (See DTC P0443 .)
		No	Go to the next step.
4	CLASSIFY LEAK CONCERN OR BLOCKAGE CONCERN • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed?	Yes	Go to Step 6.
		No	Go to the next step.
5	INSPECT PURGE SOLENOID VALVE • Inspect the purge solenoid valve.	Yes	Replace the purge solenoid valve, then go to the Step 13. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)

	(See PURGE SOLENOID VALVE INSPECTION .) • Is there any malfunction?	No	Inspect the following parts for clogging. • Vacuum hoses between intake manifold to charcoal canister • Catch tank • Charcoal canister Repair or replace the malfunction part, then go to Step 13.
6	LOCATE LEAK POINT • Inspect for the following for leakage using ultrasonic leak detector: (See Evaporative System Test .) ▪ Charcoal canister ▪ Catch tank ▪ Fuel filler cap ▪ EVAP hoses and pipes ▪ Fuel tank • Is leakage found?	Yes	Repair or replace the malfunctioning part, then go to Step 13.
		No	Go to the next step.
7	INSPECT EVAPORATIVE SYSTEM OPERATION • Connect all disconnected connectors and hoses. • Place the clamp on the hose between EVAP system leak detection pump and air filter. • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turns on)?	Yes	Go to Step 9.
		No	Go to the next step.
8	INSPECT FOR EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE • Remove the clamp. • Perform the "Evaporative System Test".	Yes	Replace the EVAP system leak detection pump, then go to Step 13. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)

	Test". (See Evaporative System Test .) • Is test result failed (red light turns on)?	No	Go to the next step.
9	INSPECT INSTALLATION OF FUEL PUMP UNIT • Inspect the fuel pump unit for damage, insufficient sealing or poorly. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part, then go to the next step.
10	INSPECT EVAPORATIVE SYSTEM OPERATION • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turns on)?	Yes	Leakage still exists. Repair or replace the leak point, then go to the next step.
		No	Go to the next step
11	INSPECT APP SENSOR • Inspect the APP sensor. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the APP sensor, then go to Step 13. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)
		No	Go to the next step.
12	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction?	Yes	Replace the eccentric shaft position sensor, then go to the next step. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.

13	VERIFY TROUBLESHOOTING OF DTC P0441 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
14	VERIFY AFTER REPAIR PROCEDURE • Perform the "After Repair Procedure". (See AFTER REPAIR PROCEDURE .) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	Troubleshooting completed.

DTC P0442

DTC P0442	EVAP system leak detected (small leak)
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the specified period has passed after EVAP system is sealed when the following conditions are met. If the pump load current does not reach the reference current value within the specified period, the PCM determines that the EVAP system has small leak. **MONITORING CONDITION** ▪ BARO: **more than 72 kPa {542 mmHg, 21.33 inHg}** ▪ IAT: **5—40 °C {41—104 °F}** ▪ Fuel tank level: **15—85 %** ▪ Battery voltage: **11.0—14.6 V** ▪ Ignition switch: OFF **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage EVAP system • Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • PCM malfunction

Diagnostic procedure

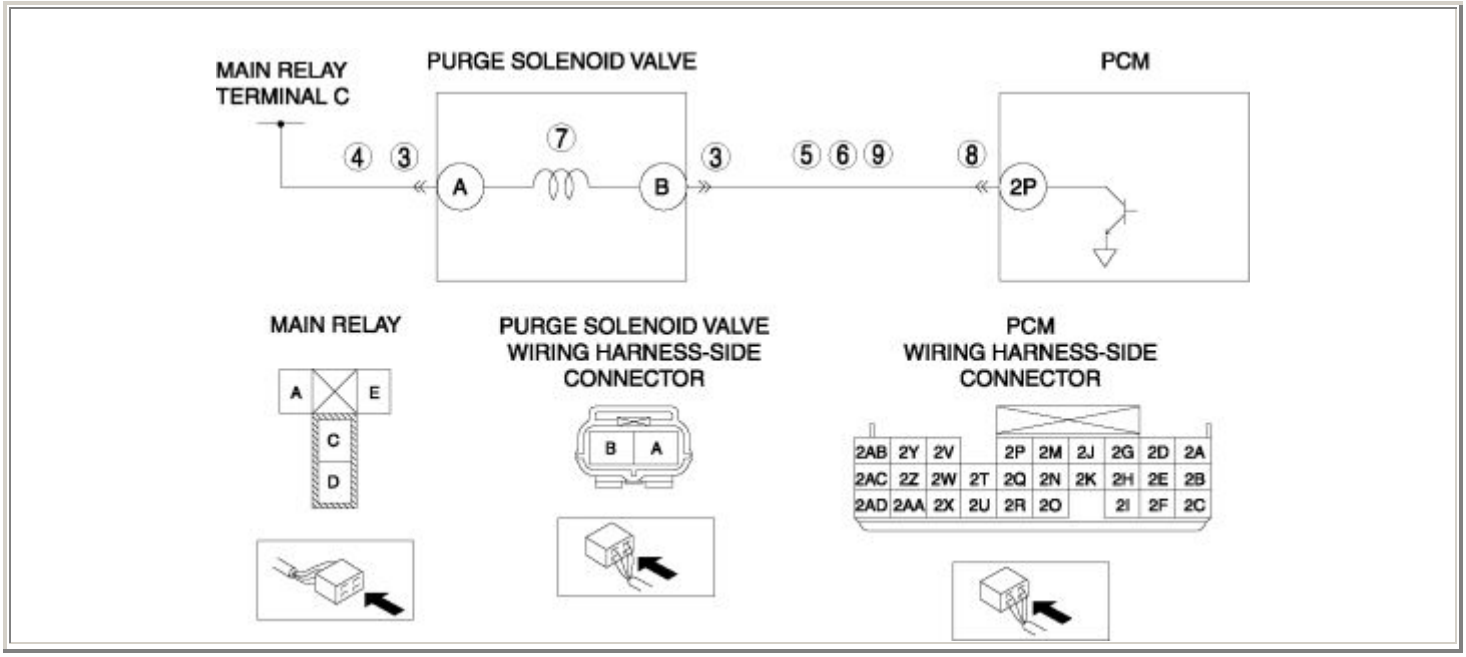
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turn on)?	Yes	Go to the next step.
		No	Intermittent concern exists. Perform the "INTERMITTENT CONCERNS TROUBLESHOOTING". (See INTERMITTENT CONCERN TROUBLESHOOTING .)
5	LOCATE LEAK POINT	Yes	Repair or replace the malfunctioning part, then go to Step 10.

	• Inspect the following for leakage using ultrasonic leak detector: (See Evaporative System Test .) ▪ Charcoal canister ▪ Catch tank ▪ Fuel-filler cap ▪ EVAP hoses and pipes ▪ Fuel tank • Is leakage found?	No	Go to the next step.
6	INSPECT PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 10. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
7	INSPECT EVAPORATIVE SYSTEM OPERATION • Connect all disconnected connectors and hoses. • Place the clamp on the hose between EVAP system leak detection pump and air filter. • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turns on)?	Yes	Go to Step 9.
		No	Go to the next step.
8	INSPECT FOR EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE • Remove the clamp. • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turns on)?	Yes	Replace the EVAP system leak detection pump, then go to Step 10. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.

9	INSPECT INSTALLATION OF FUEL PUMP UNIT • Inspect the fuel pump unit for damage, insufficient sealing or poorly. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part, then go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P0442 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "After Repair Procedure". (See AFTER REPAIR PROCEDURE .) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	Troubleshooting completed.

DTC P0443

DTC P0443	Purge solenoid valve circuit problem
DETECTION CONDITION	• The PCM monitors the purge solenoid valve control voltage when the PCM turns the purge solenoid valve off. If the control voltage is **less than 5.8 V** , the PCM determines that the purge solenoid valve control circuit voltage is low. • The PCM monitors the purge solenoid valve control voltage when the PCM turns the purge solenoid valve on. If the control voltage is **more than 11.5 V** , the PCM determines that the purge solenoid valve control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and purge solenoid valve terminal A • Short to GND in wiring harness between main relay terminal C and purge solenoid valve terminal A • Open circuit in wiring harness between purge solenoid valve terminal B and PCM terminal 2P • Short to power supply in wiring harness between purge solenoid valve terminal B and PCM terminal 2P • Short to GND in wiring harness between purge solenoid valve terminal B and PCM terminal 2P • PCM malfunction


MAIN RELAY
TERMINAL C
PURGE SOLENOID VALVE
PCM
4
3
7
A
B
3
5
6
9
8
2P
MAIN RELAY
A
E
C
D
PURGE SOLENOID VALVE
WIRING HARNESS-SIDE
CONNECTOR
B
A
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT PURGE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the purge solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
4	INSPECT PURGE SOLENOID VALVE POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between purge solenoid valve terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 10.
5	INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between purge solenoid valve terminal B (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 10.
		No	Go to the next step.

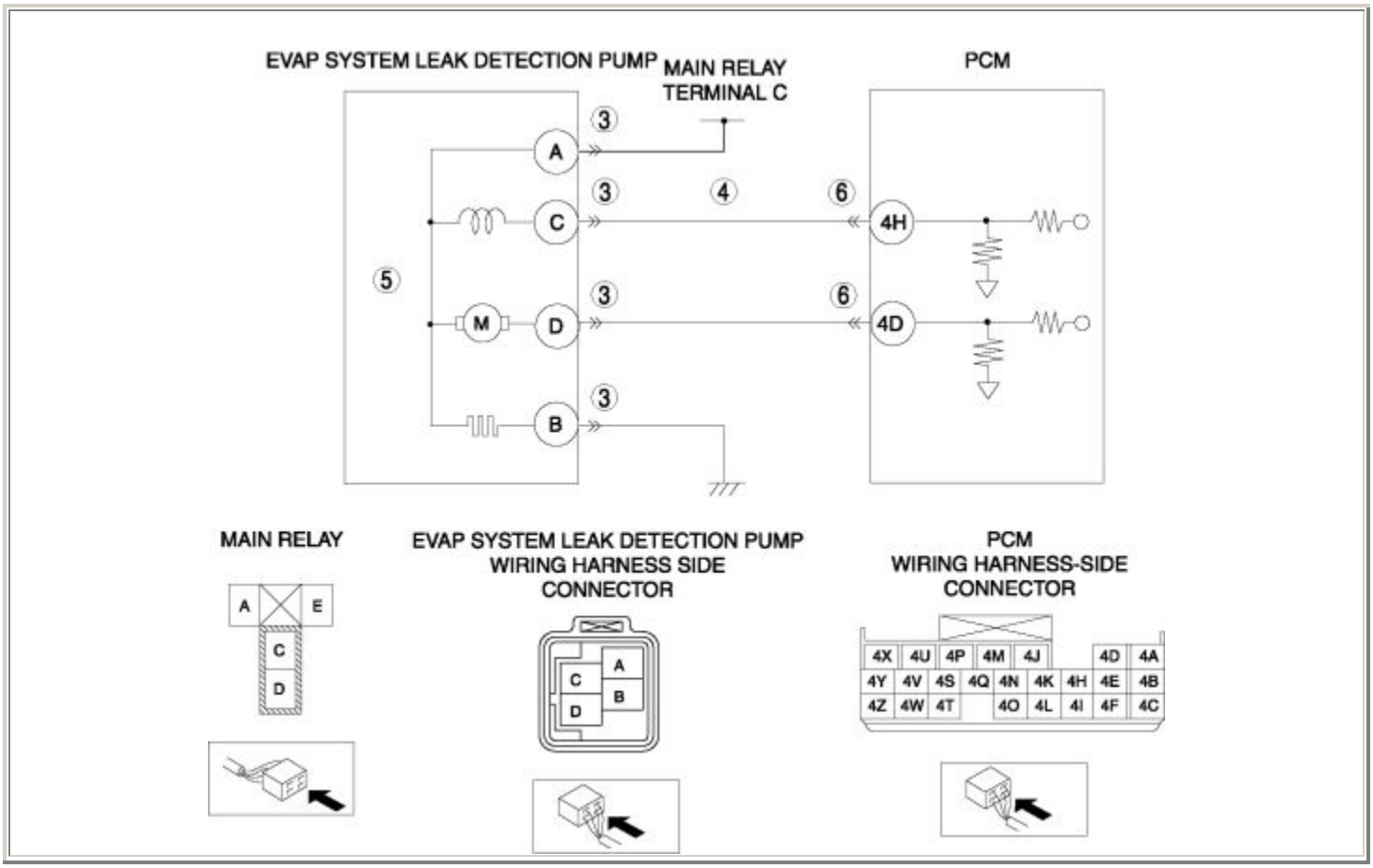
6	INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between purge solenoid valve terminal B (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace harness for short to power supply, then go to Step 10.
		No	Go to the next step.
7	INSPECT PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • Is there any malfunction ?	Yes	Replace the purge solenoid valve, then go to Step 10. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
8	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between purge solenoid valve terminal B (wiring harness-side) and PCM terminal 2P (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.

11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

Notes:

DTC P0446

DTC P0446	EVAP system vent control circuit problem
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the decrease in pump load current is less than the specification after the reference current value has been obtained, the PCM determines change over valve in EVAP system leak detection pump has a malfunction. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Change over valve malfunction (in EVAP system leak detection pump.) • Connector or terminal malfunction • Short to power supply in wiring harness between the EVAP system leak detection pump terminal C and PCM terminal 4H • PCM malfunction


EVAP SYSTEM LEAK DETECTION PUMP
MAIN RELAY TERMINAL C
PCM
A
C
M
D
B
3
4
5
6
4H
4D
MAIN RELAY
A
E
C
D
EVAP SYSTEM LEAK DETECTION PUMP WIRING HARNESS SIDE CONNECTOR
A
B
C
D
PCM WIRING HARNESS-SIDE CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the EVAP system leak detection pump connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT EVAP SYSTEM LEAK DETECTION PUMP CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (engine OFF). • Measure the voltage between EVAP system leak detection pump terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT CHANGE OVER VALVE (IN EVAP SYSTEM LEAK DETECTION PUMP) • Inspect change over valve (in EVAP system leak detection pump).	Yes	Replace the EVAP system leak detection pump, then go to Step 7. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)

	system leak detection pump). (See EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION .) • Is there any malfunction?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0446 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0455

DTC P0455	EVAP system leak detected (large leak)
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the specified period has passed after EVAP system is sealed when the following conditions are met. If the pump load current does not reach the reference current value within the specified period, the PCM determines that the EVAP system has large leak. **MONITORING CONDITION** ▪ BARO: **more than 72 kPa {542 mmHg, 21.33 inHg}** ▪ IAT: **5—40 °C {41—104 °F}** ▪ Fuel tank level: **15—85 %** ▪ Battery voltage: **11.0—14.6 V** ▪ Ignition switch: OFF **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Loose, missing or defective fuel-filler cap • Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Fuel tank malfunction • Poor connection or damaged vacuum hose • EVAP hose damaged or loose • Catch tank malfunction • Charcoal canister malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turn on)?	Yes	Go to the next step.
		No	Intermittent concern exists. Perform the "INTERMITTENT CONCERNS TROUBLESHOOTING". (See INTERMITTENT CONCERN TROUBLESHOOTING .)
5	INSPECT FUEL-FILLER CAP • Verify the fuel-filler cap is not either disconnected, loose or damaged. • Is it normal? **NOTE:** • When the fuel-filler caps other than OEM caps are attached, it is considered malfunction.	Yes	Go to the next step.
		No	Tighten the fuel-filler cap, then go to Step 17.

6	INSPECT PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 17. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
7	INSPECT CHANGE OVER VALVE (IN EVAP SYSTEM LEAK DETECTION PUMP) • Inspect the EVAP system leak detection pump inspection. (See EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION .) • Is there any malfunction?	Yes	Replace the EVAP system leak detection pump, then go to Step 17. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	INSPECT EVAP SYSTEM • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed?	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Go to the next step.
9	INSPECT EVAP LEAKAGE FROM FUEL PUMP TO CHARCOAL CANISTER • Disconnect the fuel tank side vacuum hose at charcoal canister. • Apply the vacuum **1.7 kPa {13 mmHg, 0.5 inHg}** to the disconnected vacuum hose using the vacuum pump. • Does vacuum hold for minimum of **2 min** ?	Yes	Go to Step 13.
		No	Go to the next step.
10	INSPECT VACUUM HOSE FOR POOR CONNECTION • Inspect the vacuum hose installation condition between fuel tank and charcoal canister. • Is it normal?	Yes	Go to the next step.
		No	Connect the vacuum hose correctly, then go to Step 17. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
11		Yes	Go to the next step.

	INSPECT INSTALLATION OF FUEL PUMP UNIT • Remove fuel tank. • Inspect the fuel pump unit for damage, insufficient sealing or poorly. • Is it normal?	No	Repair or replace the malfunctioning part, then go to Step 17.
12	INSPECT FUEL TANK • Inspect the fuel tank. (See FUEL TANK INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel tank, then go to Step 17. (See FUEL TANK REMOVAL/INSTALLATION .)
		No	Go to the next step.
13	INSPECT EVAP LEAKAGE FROM CHARCOAL CANISTER TO PURGE SOLENOID VALVE • Disconnect the purge solenoid valve side vacuum hose at charcoal canister. • Apply the vacuum **3.3 kPa {25 mmHg, 1.0 inHg}** to disconnected vacuum hose using vacuum pump. • Does vacuum hold for minimum of **2 min** ?	Yes	Go to Step 17.
		No	Go to the next step.
14	INSPECT VACUUM HOSE FOR POOR CONNECTION • Inspect the vacuum hose installation condition between charcoal canister and purge solenoid valve. • Is it normal?	Yes	Go to the next step.
		No	Connect the vacuum hose correctly, then go to Step 17. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
15	INSPECT CATCH TANK • Inspect the catch tank. (See CATCH TANK INSPECTION .) • Is there any malfunction?	Yes	Replace the catch tank, then go to Step 17. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.

16	INSPECT CHARCOAL CANISTER • Inspect the charcoal canister. (See CHARCOAL CANISTER INSPECTION .) • Is there any malfunction?	Yes	Replace the charcoal canister, then go to the next step. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
17	VERIFY TROUBLESHOOTING OF DTC P0455 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
18	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0456

DTC P0456	EVAP system leak detected (very small leak)
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when a specified period has passed after EVAP system is sealed after ignition switch is turned off. If the pump load current does not reach the reference load value or rate of the load increase lower than specified within a specified period, the PCM determines that the EVAP system has a very small leak. **MONITORING CONDITION** ▪ BARO: **more than 72 kPa {542 mmHg, 21.33 inHg}** ▪ IAT: **5—40 °C {41—104 °F}** ▪ Fuel tank level: **15—85 %** ▪ Battery voltage: **11.0—14.6 V** ▪ Ignition switch: OFF **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Leakage EVAP system • EVAP system leak detection pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turn on)?	Yes	Go to the next step.
		No	Intermittent concern exists. Perform the "INTERMITTENT CONCERNS TROUBLESHOOTING". (See INTERMITTENT CONCERN TROUBLESHOOTING .)
5	LOCATE LEAK POINT	Yes	Repair or replace the malfunctioning part, then go to Step 10.

	• Inspect the following for leakage using ultrasonic leak detector: (See Evaporative System Test .) ▪ Charcoal canister ▪ Catch tank ▪ Fuel-filler cap ▪ EVAP hoses and pipes ▪ Fuel tank • Is leakage found?	No	Go to the next step.
6	INSPECT PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 10. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
7	INSPECT EVAPORATIVE SYSTEM OPERATION • Connect all disconnected connectors and hoses. • Place the clamp on the hose between EVAP system leak detection pump and air filter. • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turns on)?	Yes	Go to Step 9.
		No	Go to the next step.
8	INSPECT FOR EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE • Remove the clamp. • Perform the "Evaporative System Test". (See Evaporative System Test .) • Is test result failed (red light turns on)?	Yes	Replace the EVAP system leak detection pump, then go to Step 10. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.

9	INSPECT INSTALLATION OF FUEL PUMP UNIT • Inspect the fuel pump unit for damage, insufficient sealing or poorly. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part, then go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P0456 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as the DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0461

DTC P0461	Fuel gauge sender unit circuit range/performance problem
DETECTION CONDITION	• The PCM monitors the fuel tank level difference before and after the PCM-calculated fuel consumption has reached **more than 21 L {22.2 US qt, 18.5 Imp qt}** . If the difference is **less than 5 %** , the PCM determines that there is a fuel gauge sender unit circuit range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT INSTRUMENT CLUSTER • Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE". (See INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	INSPECT FUEL GAUGE SENDER UNIT • Inspect the fuel gauge sender unit. (See FUEL GAUGE SENDER UNIT INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel gauge sender unit, then go to the next step. (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION .)
		No	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
5	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

Notes:

DTC P0462

DTC P0462	Fuel gauge sender unit circuit low input
DETECTION CONDITION	• The PCM monitors the fuel tank level and input voltage from the fuel gauge sender unit when the engine is running. If the input voltage is **less than 2.5 V** and fuel tank level is full, the PCM determines that the fuel gauge sender unit circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT INSTRUMENT CLUSTER • Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE". (See INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	INSPECT FUEL GAUGE SENDER UNIT • Inspect the fuel gauge sender unit. (See FUEL GAUGE SENDER UNIT INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel gauge sender unit, then go to the next step. (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	VERIFY TROUBLESHOOTING OF DTC P0462 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Drive the vehicle under the FREEZE FRAME DATA condition. • Is the PENDING CODE same as DTC present?	No	Go to the next step.
6	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0463

DTC P0463	Fuel gauge sender unit circuit high input
DETECTION CONDITION	• The PCM monitors the fuel tank level and input voltage from the fuel gauge sender unit when the engine is running. If the input voltage is **more than 2.5 V** and fuel tank level is empty, the PCM determines that the fuel gauge sender unit circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction

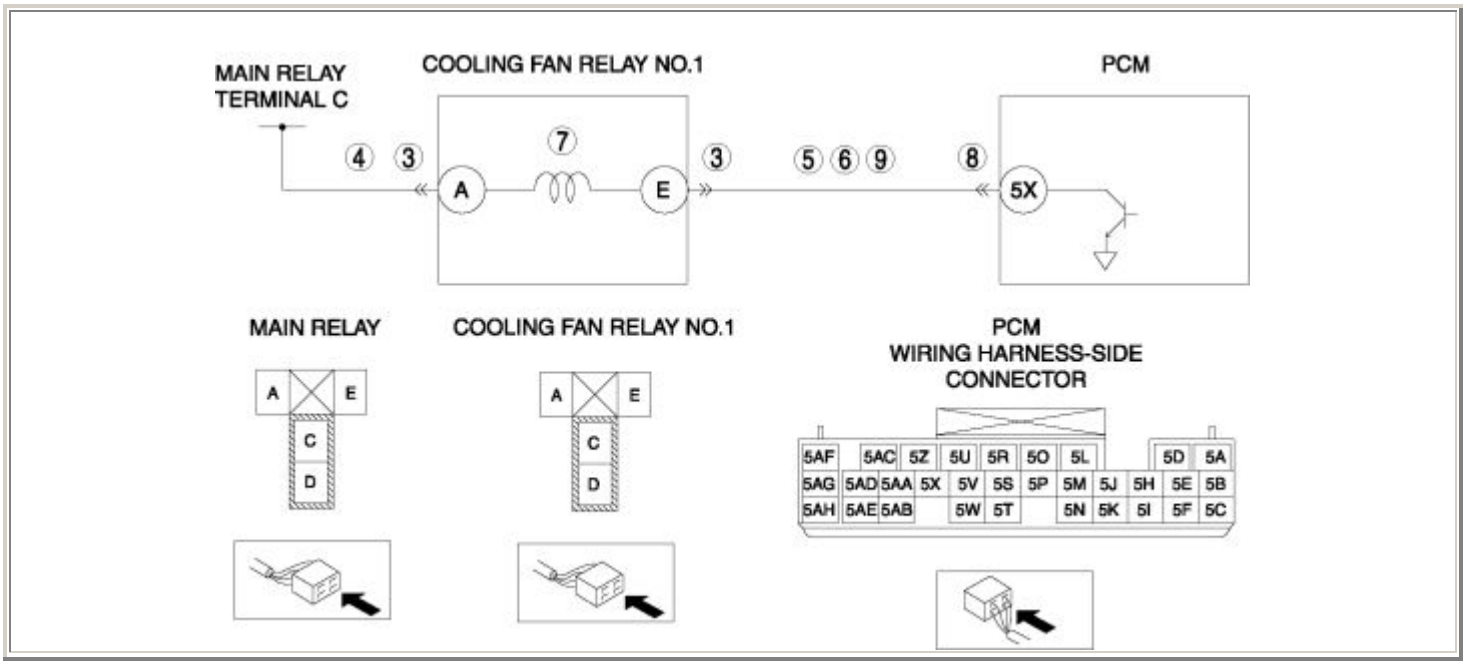
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT INSTRUMENT CLUSTER • Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE". (See INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	INSPECT FUEL GAUGE SENDER UNIT • Inspect the fuel gauge sender unit. (See FUEL GAUGE SENDER UNIT INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel gauge sender unit, then go to the next step. (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	VERIFY TROUBLESHOOTING OF DTC P0463 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Drive the vehicle under the FREEZE FRAME DATA condition. • Is the PENDING CODE same as DTC present?	No	Go to the next step.
6	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0480

DTC P0480	Cooling fan No.1 control circuit problem
DETECTION CONDITION	• The PCM monitors the cooling fan relay No.1 control voltage when the PCM turns the cooling fan relay No.1 off. If the control voltage is low, the PCM determines that the cooling fan No.1 control circuit voltage is low. • The PCM monitors the cooling fan relay No.1 control voltage when the PCM turns the cooling fan relay No.1 on. If the control voltage is high, the PCM determines that the cooling fan No.1 control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Cooling fan relay No.1 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and cooling fan relay No.1 terminal A • Short to GND in wiring harness between main relay terminal C and cooling fan relay No.1 terminal A • Open circuit in wiring harness between cooling fan relay No.1 terminal E and PCM terminal 5X • Short to power supply in wiring harness between cooling fan relay No.1 terminal E and PCM terminal 5X • Short to GND in wiring harness between cooling fan relay No.1 terminal E and PCM terminal 5X • PCM malfunction


MAIN RELAY
TERMINAL C
COOLING FAN RELAY NO.1
PCM
4
3
7
A
E
3
5
6
9
8
5X
MAIN RELAY
COOLING FAN RELAY NO.1
PCM
WIRING HARNESS-SIDE
CONNECTOR
A
E
C
D
A
E
C
D
5AF
5AC
5Z
5U
5R
5O
5L
5D
5A
5AG
5AD
5AA
5X
5V
5S
5P
5M
5J
5H
5E
5B
5AH
5AE
5AB
5W
5T
5N
5K
5I
5F
5C

Diagnostic procedure

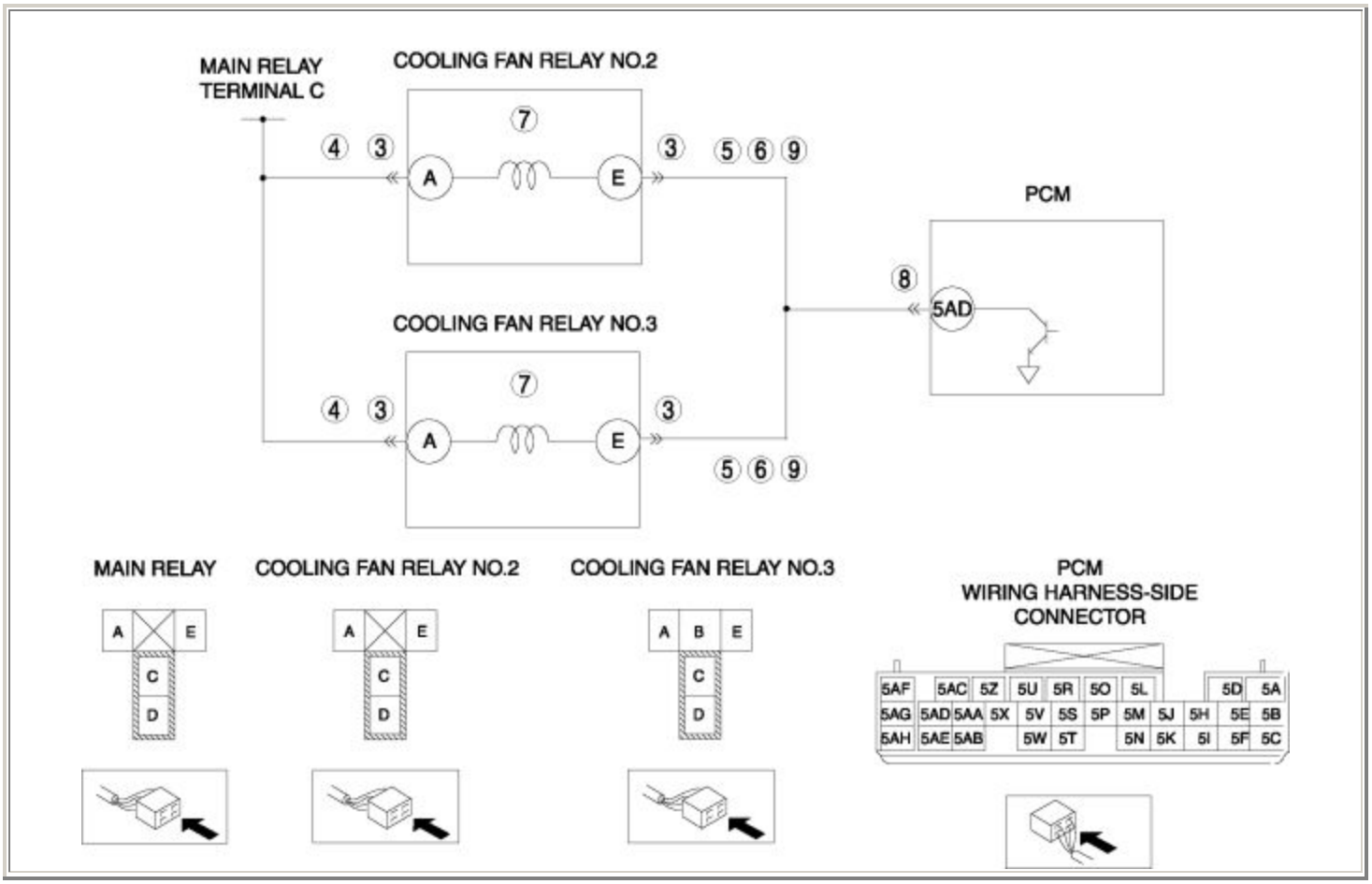
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT COOLING FAN RELAY NO.1 CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the cooling fan relay No.1 connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
4	INSPECT COOLING FAN RELAY NO.1 POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between cooling fan relay No.1 terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 10.
5	INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between cooling fan relay No.1 terminal E (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 10.
		No	Go to the next step.

6	INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between cooling fan relay No.1 terminal E (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 10.
		No	Go to the next step.
7	INSPECT COOLING FAN RELAY NO.1 • Inspect cooling fan relay No.1. (See RELAY INSPECTION .) • Is there any malfunction ?	Yes	Replace the cooling fan relay No.1, then go to Step 10. (See RELAY LOCATION .)
		No	Go to the next step.
8	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between cooling fan relay No.1 terminal E (wiring harness-side) and PCM terminal 5X (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.

11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0481

DTC P0481	Cooling fan No.2 control circuit problem
DETECTION CONDITION	• The PCM monitors the cooling fan relay No.2 control voltage when the PCM turns the cooling fan relay No.2 off. If the control voltage is low, the PCM determines that the cooling fan No.2 control circuit voltage is low. • The PCM monitors the cooling fan relay No.2 control voltage when the PCM turns the cooling fan relay No.2 on. If the control voltage is high, the PCM determines that the cooling fan No.2 control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Cooling fan relay No.2/No.3 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and cooling fan relay No.2 terminal A • Short to GND in wiring harness between main relay terminal C and cooling fan relay No.2 terminal A • Open circuit in wiring harness between main relay terminal C and cooling fan relay No.3 terminal A • Short to GND in wiring harness between main relay terminal C and cooling fan relay No.3 terminal A • Open circuit in wiring harness between cooling fan relay No.2 terminal E and PCM terminal 5AD • Short to power supply in wiring harness between cooling fan relay No.2 terminal E and PCM terminal 5AD • Short to GND in wiring harness between cooling fan relay No.2 terminal E and PCM terminal 5AD • Open circuit in wiring harness between cooling fan relay No.3 terminal E and PCM terminal 5AD • Short to power supply in wiring harness between cooling fan relay No.3 terminal E and PCM terminal 5AD • Short to GND in wiring harness between cooling fan relay No.3 terminal E and PCM terminal 5AD • PCM malfunction


MAIN RELAY
TERMINAL C
COOLING FAN RELAY NO.2
7
4 3
A
E
3
5 6 9
PCM
8
5AD
COOLING FAN RELAY NO.3
7
4 3
A
E
3
5 6 9
MAIN RELAY
A E
C
D
COOLING FAN RELAY NO.2
A E
C
D
COOLING FAN RELAY NO.3
A B E
C
D
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT COOLING FAN RELAY NO.2/NO.3 CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the cooling fan relay No.2/No.3 connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
4	INSPECT COOLING FAN RELAY NO.2/NO.3 POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Cooling fan relay No.2 terminal A (wiring harness-side) and body GND ▪ Cooling fan relay No.3 terminal A (wiring harness-side) and body GND • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 10.
5	INSPECT COOLING FAN RELAY NO.2/NO.3 CONTROL CIRCUIT FOR SHORT	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 10.

	NO.2/NO.3 CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Cooling fan relay No.2 terminal E (wiring harness-side) and body GND ▪ Cooling fan relay No.3 terminal E (wiring harness-side) and body GND • Is there continuity?	No	Go to the next step.
6	INSPECT COOLING FAN RELAY NO.2/NO.3 CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Cooling fan relay No.2 terminal E (wiring harness-side) and body GND ▪ Cooling fan relay No.3 terminal E (wiring harness-side) and body GND • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 10.
		No	Go to the next step.
7	INSPECT COOLING FAN RELAY NO.2/NO.3 • Inspect the cooling fan relay No.2/No.3. (See RELAY INSPECTION .) • Is there any malfunction ?	Yes	Replace the cooling fan relay No.2/No.3, then go to Step 10. (See RELAY LOCATION .)
		No	Go to the next step.
8	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9		Yes	Go to the next step.

	INSPECT COOLING FAN RELAY NO.2/NO.3 CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Cooling fan relay No.2 terminal E (wiring harness-side) and PCM terminal 5AD (wiring harness-side) ▪ Cooling fan relay No.3 terminal E (wiring harness-side) and PCM terminal 5AD (wiring harness-side) • Is there continuity?	No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P0481 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0500

DTC P0500	VSS circuit problem
DETECTION CONDITION	• The PCM monitors the input signal from the vehicle speed sensor when the following conditions are met. If the input signal is **less than 3.7 km/h {2.3 mph}** , the PCM determines that there is a VSS circuit malfunction. **MONITORING CONDITION** ▪ Shift lever position: gear is not in neutral position ▪ Engine speed: **more than 2,500 rpm** ▪ LOAD: **more than 40.0 %** **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ABS HU/CM malfunction (with ABS HU/CM) • DSC HU/CM malfunction (with DSC HU/CM) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY CURRENT INPUT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT? • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the VSS PID. • Read the VSS PID when the vehicle is driving. • Is the VSS PID **normal** ?	Yes	Intermittent concern exists. Perform the "INTERMITTENT CONCERNS TROUBLESHOOTING". (See INTERMITTENT CONCERN TROUBLESHOOTING .)
		No	Go to the next step.
4	INSPECT ABS HU/CM OR DSC HU/CM • For with ABS HU/CM: inspect the ABS HU/CM. (See ABS SYSTEM INSPECTION .) • For with DSC HU/CM: inspect the DSC HU/CM. (See DSC SYSTEM INSPECTION .) • Is there any malfunction ?	Yes	Repair or replace the malfunctioning part, then go to the next step.
		No	Go to the next step.
5	VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Drive the vehicle under the FREEZE FRAME DATA condition. • Is the PENDING CODE same as the DTC present?	No	Go to the next step.
6	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0505

DTC P0505	Idle air control system problem
DETECTION CONDITION	• The PCM cannot control idle speed at the target idle speed during the self-test. **Diagnostic support note** • The MIL does not illuminate. • PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The DTC is not stored in the PCM memory.

POSSIBLE CAUSE	• Drive-by-wire control system malfunction
	• A/C cut-off control malfunction
	• Generator control system malfunction
	• Intake-air line clogged
	  ▪ Air cleaner clogged
	  ▪ Throttle body clogged
	• Insufficient compression
	  ▪ Engine oil malfunction
	  ▪ Oil pressure decrease
	  ▪ Metering oil pump malfunction
	  ▪ Metering oil pump control malfunction
	  ▪ Engine malfunction
	• Fuel line pressure malfunction
	• PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION • Perform the "Drive-by-wire Control System Inspection". (See Drive-by-wire Control System Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 15.
		No	Go to the next step.
5	INSPECT A/C MAGNETIC CLUTCH OPERATION **NOTE:**	Yes	Go to the "NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.". (See NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY .)

	• The following test should be performed for A/C. Go to the next step for vehicles without A/C. • Turn the blower motor switch off. • Is magnetic clutch still on?	No	Go to the next step.
6	INSPECT GENERATOR CONTROL SYSTEM OPERATION • Apply the electrical load at idle. • Is the engine speed increased?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible short to power supply, then go to Step 9.
7	INSPECT AIR CLEANER ELEMENT • Remove the air cleaner element with engine running. • Is the engine speed increased?	Yes	Clean or replace the air cleaner element, then go to Step 14. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	INSPECT THROTTLE BODY PASSAGE • Remove the throttle body. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .) • Is throttle body clogged?	Yes	Clean the throttle body passage or replace the throttle body, then go to Step 14. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION .) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 14.
10	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 15.
		No	Go to the next step.
11	INSPECT ENGINE OIL CONDITION	Yes	Go to the next step.

	• Inspect the engine oil condition. • Is the engine oil condition normal?	No	Replace the engine oil. Inspect the ECT sensor and related harnesses. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) Overhaul or replace the engine. Then go to Step 15.
12	INSPECT OIL PRESSURE • Inspect the oil pressure. (See OIL PRESSURE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 15.
		No	Go to the next step.
13	INSPECT OIL PASSAGE • Inspect the oil pipe between metering oil pump and metering oil nozzle. • Is there any malfunction?	Yes	Inspect and repair for leakage and/or clogged in oil passage at engine. Overhaul or replace the engine. Then go to Step 15.
		No	Overhaul or replace the engine. Then go to the next step.
14	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Replace the fuel pump unit, then go to the next step. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
		No	Go to the next step.
15	VERIFY TROUBLESHOOTING OF DTC P0505 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the self-test. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.

16	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

Notes:

DTC P0506

DTC P0506	Idle air control system RPM lower than expected
DETECTION CONDITION	• The PCM compares the actual idle speed with the target idle speed when the engine is running. If the actual idle speed is lower than targeted by **100 rpm** , the PCM determines that the idle air control system RPM is lower than expected. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Drive-by-wire control system malfunction • A/C cut-off control malfunction • Generator control system malfunction • Intake-air line clogged ▪ Air cleaner clogged ▪ Throttle body clogged • Purge solenoid valve malfunction • IAT sensor malfunction • ECT sensor malfunction • APP sensor malfunction • Eccentric shaft position sensor malfunction • Insufficient compression ▪ Engine oil malfunction ▪ Oil pressure decrease ▪ Metering oil pump malfunction ▪ Metering oil pump control malfunction ▪ Engine malfunction • Fuel line pressure malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION • Perform the "Drive-by-wire Control System Inspection". (See Drive-by-wire Control System Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 20.
		No	Go to the next step.
5	INSPECT A/C MAGNETIC CLUTCH OPERATION	Yes	Go to the "NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.". (See NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY .)

	NOTE: • The following test should be performed for A/C. Go to the next step for vehicles without A/C. • Turn the blower motor switch off. • Is magnetic clutch still on?	No	Go to the next step.
6	INSPECT GENERATOR CONTROL SYSTEM OPERATION • Apply the electrical load at idle. • Is the engine speed increased?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible short to power supply, then go to Step 20.
7	INSPECT AIR CLEANER ELEMENT • Remove the air cleaner element with engine running. • Is the engine speed increased?	Yes	Clean or replace the air cleaner element, then go to Step 20. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	INSPECT THROTTLE BODY PASSAGE • Remove the throttle body. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .) • Is throttle body clogged?	Yes	Clean the throttle body passage or replace the throttle body, then go to Step 20. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 20. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
10	INSPECT IAT SENSOR • Inspect the IAT sensor. (See INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the MAF/IAT sensor, then go to Step 20. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.

11	INSPECT ECT SENSOR • Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the ECT sensor, then go to Step 20. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
12	INSPECT APP SENSOR • Inspect the APP sensor. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the APP sensor, then go to Step 20. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)
		No	Go to the next step.
13	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction?	Yes	Replace the eccentric shaft position sensor, then go to Step 20. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
14	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION .) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 19.
15	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 20.
		No	Go to the next step.
16	INSPECT ENGINE OIL CONDITION	Yes	Go to the next step.

	• Inspect the engine oil condition. • Is the engine oil condition normal?	No	Replace the engine oil. Inspect the ECT sensor and related harnesses. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) Overhaul or replace the engine. Then go to Step 20.
17	INSPECT OIL PRESSURE • Inspect the oil pressure. (See OIL PRESSURE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 20.
		No	Go to the next step.
18	INSPECT OIL PASSAGE • Inspect the oil pipe between metering oil pump and metering oil nozzle. • Is there any malfunction?	Yes	Inspect and repair for leakage and/or clogged in oil passage at engine. Overhaul or replace the engine. Then go to Step 20.
		No	Overhaul or replace the engine. Then go to the next step.
19	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Replace the fuel pump unit, then go to the next step. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
		No	Go to the next step.
20	VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.

21	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0507

DTC P0507	Idle air control system RPM higher than expected
DETECTION CONDITION	• The PCM compares the actual idle speed with the target idle speed when the engine is running. If the actual idle speed is higher than targeted by **200 rpm** , the PCM determines that the idle air control system RPM is higher than expected. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Vacuum hoses improper connection • Drive-by-wire control system malfunction • IAT sensor malfunction • ECT sensor malfunction • APP sensor malfunction • Eccentric shaft position sensor malfunction • PCM malfunction

Diagnostic procedure

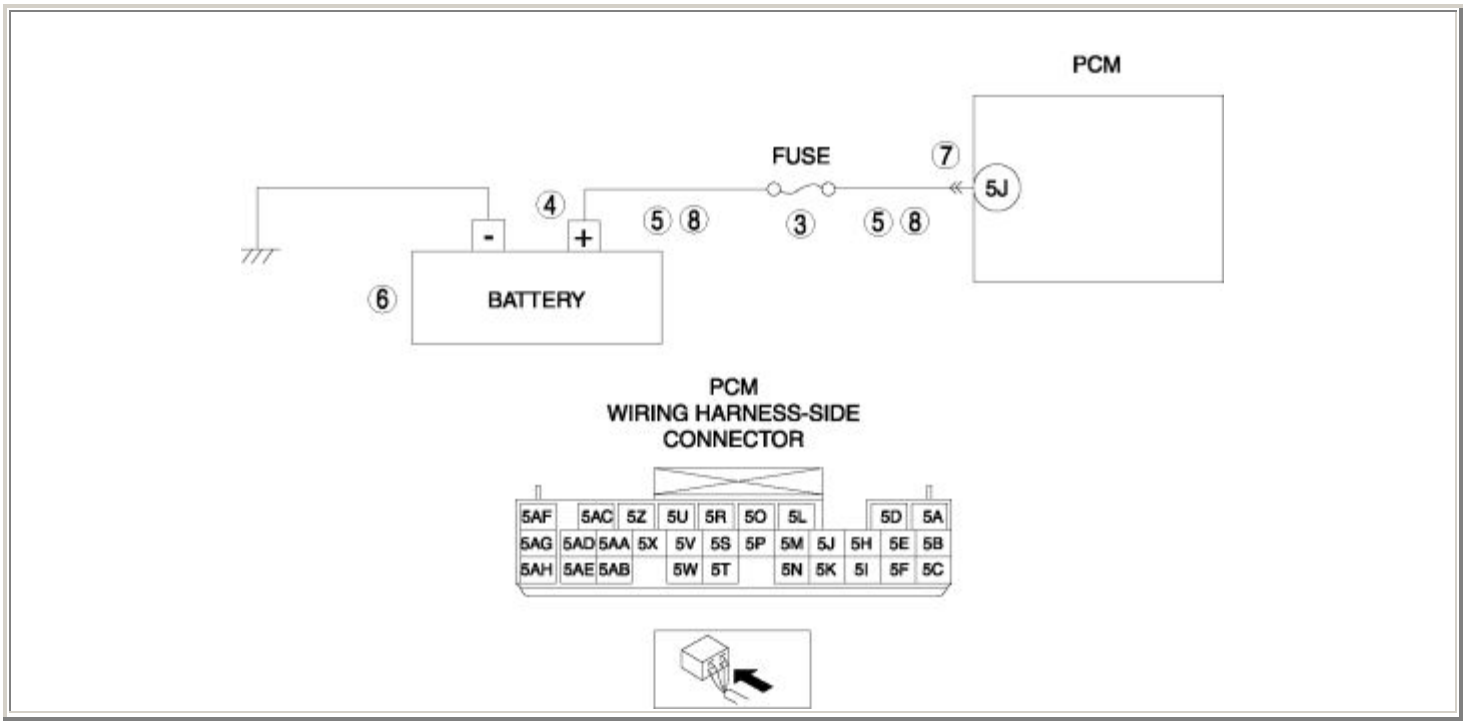
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	INSPECT VACUUM HOSE FOR POOR CONNECTION • Are the vacuum hoses connecting accurately? (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)	Yes	Go to the next step.
		No	Connect the vacuum hose accurately, then go to Step 10. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
5	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION • Perform the "Drive-by-wire Control System Inspection". (See Drive-by-wire Control System Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 10.
		No	Go to the next step.

6	INSPECT IAT SENSOR • Inspect the IAT sensor. (See INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the MAF/IAT sensor, then go to Step 10. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT ECT SENSOR • Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the ECT sensor, then go to Step 10. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	INSPECT APP SENSOR • Inspect the APP sensor. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the APP sensor, then go to Step 10. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT ECCENTRIC SHAFT POSITION SENSOR • Inspect the eccentric shaft position sensor. (See ECCENTRIC SHAFT POSITION SENSOR INSPECTION .) • Is there any malfunction?	Yes	Replace the eccentric shaft position sensor, then go to the next step. (See ECCENTRIC SHAFT POSITION SENSOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0562

DTC P0562	System voltage low (KAM)
DETECTION CONDITION	• The PCM monitors the battery voltage when the engine is running. If the voltage is **less than 2.5 V** , the PCM determines that the system voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Battery malfunction • Connector or terminal malfunction • Open circuit in wiring harness between battery positive terminal and PCM terminal 5J • Short to GND in wiring harness between battery positive terminal and PCM terminal 5J • Meltdown fuse • PCM malfunction


PCM
FUSE
7
5J
4
5 8
3
5 8
-
+
6
BATTERY
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C

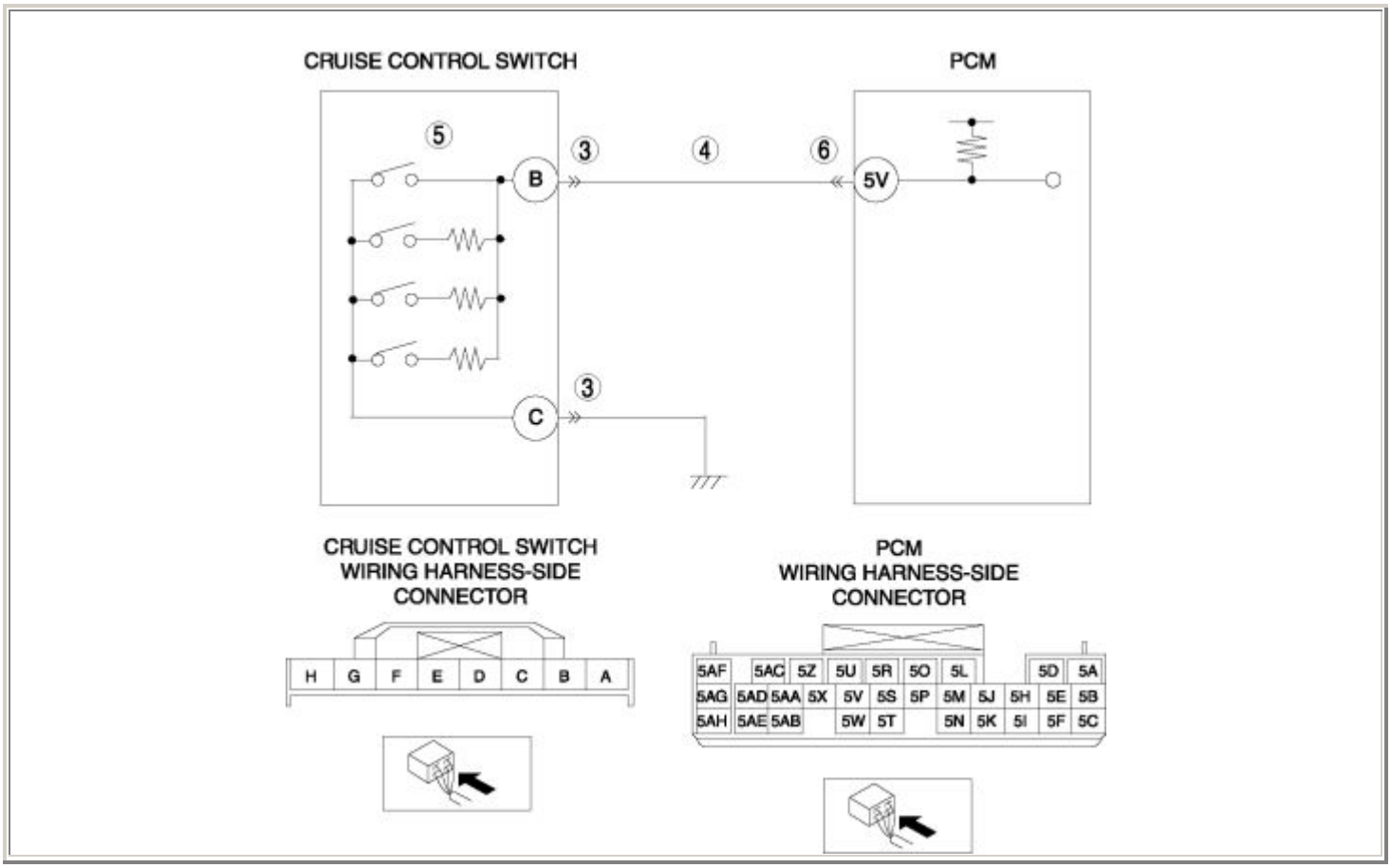
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT FUSE • Inspect the fuse. • Is there any malfunction?	Yes	Replace the fuse, then go to Step 9.
		No	Go to the next step.
4	INSPECT BATTERY POSITIVE TERMINAL FOR POOR INSTALLATION • Turn the ignition switch off. • Inspect for looseness of the battery positive terminal. • Is there any malfunction?	Yes	Connect the battery positive terminal correctly, then go to Step 9.
		No	Go to the next step.
5	INSPECT BATTERY CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between battery positive terminal (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
6	INSPECT BATTERY • Inspect the battery. (See BATTERY INSPECTION .) • Is there any malfunction?	Yes	Replace the battery, then go to Step 9. (See BATTERY REMOVAL/INSTALLATION .)
		No	Go to the next step.

7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT BATTERY CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between battery positive terminal (wiring harness-side) and PCM terminal 5J (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0562 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0564

DTC P0564	Cruise control switch input circuit problem
DETECTION CONDITION	• The PCM monitors the input voltage from the cruise control switch when the engine is running. If the input voltage is **less than 3.0 V** for **more than 2 min** , the PCM determines that there is a cruise control switch input circuit problem. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Cruise control switch malfunction • Connector or terminal malfunction • Short to GND in wiring harness between cruise control switch terminal B and PCM terminal 5V • PCM malfunction


CRUISE CONTROL SWITCH
PCM
5
3
4
6
B
5V
3
C
CRUISE CONTROL SWITCH
WIRING HARNESS-SIDE
CONNECTOR
H G F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT CRUISE CONTROL SWITCH CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the cruise control switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between cruise control switch terminal B (wiring harness-side) and body GND. • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	INSPECT CRUISE CONTROL SWITCH • Inspect the cruise control switch. (See CRUISE CONTROL SWITCH INSPECTION .) • Is there any malfunction ?	Yes	Replace the cruise control switch, then go to Step 7. (See AUDIO CONTROL SWITCH REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to the next step.

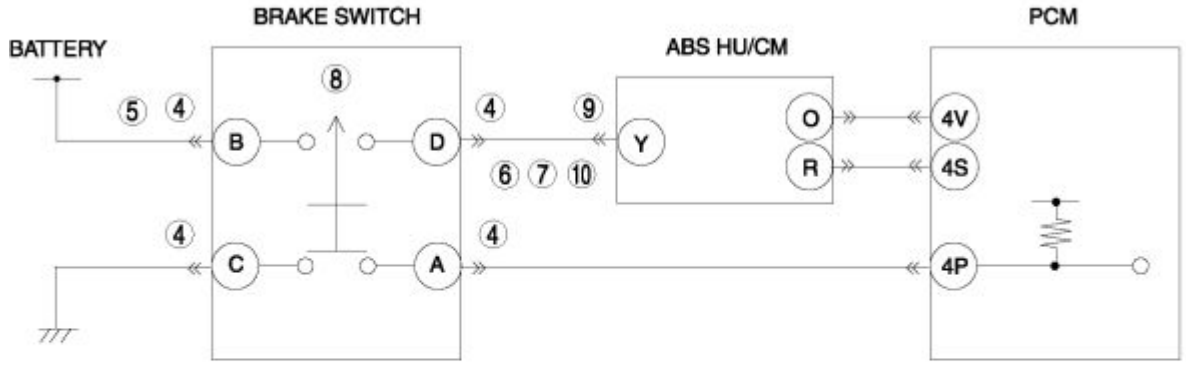
	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0564 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0571

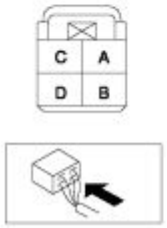
DTC P0571	Brake switch input circuit problem
DETECTION CONDITION	• The PCM monitors the input signal from brake switch No.1 and brake switch No.2 when the engine is running. If the both input signals remain on or off, the PCM determines that there is a brake switch input circuit problem. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	**With ABS HU/CM** • Brake switch malfunction • ABS HU/CM malfunction • Open circuit in wiring harness between battery positive terminal and brake switch terminal B • Short to GND in wiring harness between battery positive terminal and brake switch terminal B • Open circuit in wiring harness between brake switch terminal D and ABS HU/CM terminal Y • Short to power supply in wiring harness between brake switch terminal D and ABS HU/CM terminal Y • Short to GND in wiring harness between brake switch terminal D and ABS HU/CM terminal Y • PCM malfunction **With DSC HU/CM** • Brake switch malfunction • DSC HU/CM malfunction • Open circuit in wiring harness between battery positive terminal and brake switch terminal B • Short to GND in wiring harness between battery positive terminal and brake switch terminal B • Open circuit in wiring harness between brake switch terminal D and DSC HU/CM terminal AD • Short to power supply in wiring harness between brake switch terminal D and DSC HU/CM terminal AD • Short to GND in wiring harness between brake switch terminal D and DSC HU/CM terminal AD

	• PCM malfunction

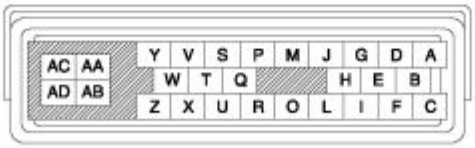
WITH ABS HU/CM



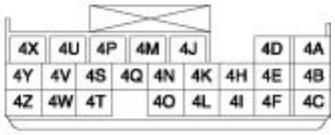
BRAKE SWITCH WIRING HARNESS-SIDE CONNECTOR



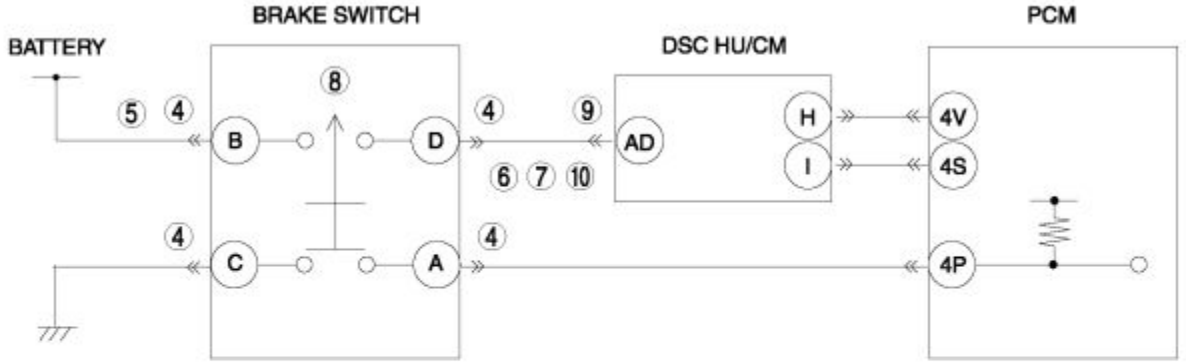
ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



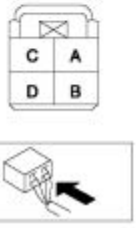
PCM WIRING HARNESS-SIDE CONNECTOR



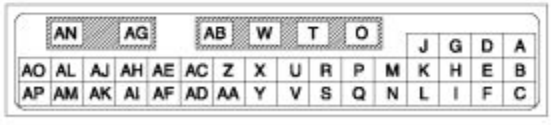
WITH DSC HU/CM



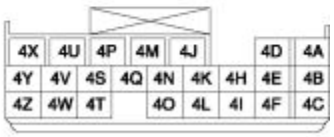
BRAKE SWITCH WIRING HARNESS-SIDE CONNECTOR



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the brake switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
5	INSPECT BRAKE SWITCH NO.1 POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between brake switch terminal B (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 11.
6	INSPECT BRAKE SWITCH NO.1 SIGNAL CIRCUIT FOR SHORT TO GND	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 11.

	• Turn the ignition switch off. • Inspect for continuity between brake switch terminal D (wiring harness-side) and body GND. • Is there continuity?	No	Go to the next step.
7	INSPECT BRAKE SWITCH NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between brake switch terminal D (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 11.
		No	Go to the next step.
8	INSPECT BRAKE SWITCH NO.1 • Inspect the brake switch No.1. (See BRAKE SWITCH INSPECTION .) • Is there any malfunction ?	Yes	Replace the brake switch, then go to Step 11. (See BRAKE PEDAL REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT ABS HU/CM OR DSC HU/CM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the ABS HU/CM or DSC HU/CM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
10		Yes	Go to the next step.

	INSPECT BRAKE SWITCH NO.1 SIGNAL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ For ABS HU/CM models: brake switch terminal D (wiring harness-side) and ABS HU/CM terminal Y (wiring harness-side) ▪ For DSC HU/CM models: brake switch terminal D (wiring harness-side) and DSC HU/CM terminal AD (wiring harness-side) • Is there continuity?	No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
11	VERIFY TROUBLESHOOTING OF DTC P0571 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Operate the brake pedal. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
12	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P06XX

DTC P0601

DTC P0601	PCM memory check sum error
DETECTION CONDITION	• PCM internal memory check sum error. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• PCM internal memory malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY TROUBLESHOOTING OF P0601 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0602

DTC P0602	PCM programming error
DETECTION CONDITION	• No configuration data in the PCM. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Complete configulation has not been completed • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Perform the "PCM CONFIGURATION", then go to the next step. (See PCM CONFIGURATION .)
3	VERIFY TROUBLESHOOTING OF DTC P0602 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0604

DTC P0604	PCM random access memory error
DETECTION CONDITION	• PCM internal random access memory error. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• PCM internal RAM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY TROUBLESHOOTING OF P0604 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0610

DTC P0610	PCM vehicle options error
DETECTION CONDITION	• PCM data configuration error. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Configulation procedure has not been completed • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Perform the "PCM CONFIGURATION", then go to the next step. (See PCM CONFIGURATION .)
3	VERIFY TROUBLESHOOTING OF DTC P0610 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0638

DTC P0638	Throttle actuator control circuit range/performance problem
DETECTION CONDITION	• The PCM compares the actual TP with the target TP when the engine is running. If the difference is more than the specification, the PCM determines that there is a throttle actuator control circuit range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Drive-by-wire control system malfunction • Throttle actuator malfunction • Throttle valve malfunction • PCM malfunction

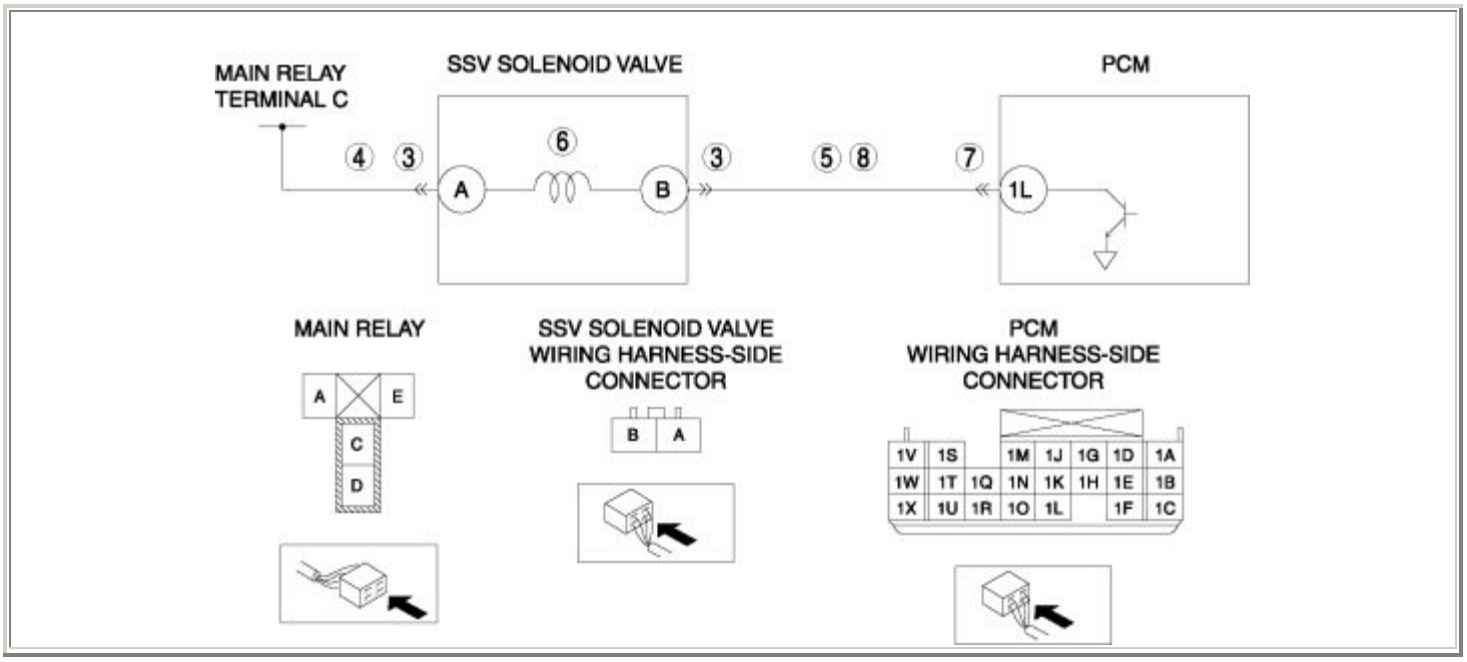
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION • Perform the "Drive-by-wire Control System Inspection". (See Drive-by-wire Control System Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 7.
		No	Go to the next step.
5	INSPECT THROTTLE ACTUATOR • Inspect the throttle actuator. (See Resistance Inspection .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 7. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	INSPECT THROTTLE VALVE • Inspect the throttle valve. (See Throttle Valve Inspection .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to the next step. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF P0638 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0661

DTC P0661	SSV solenoid valve control circuit low
DETECTION CONDITION	• The PCM monitors the SSV solenoid valve control voltage when the PCM turns the SSV solenoid valve off. If the control voltage is **less than 5.8 V** , the PCM determines that the SSV solenoid valve control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• SSV solenoid valve malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and SSV solenoid valve terminal A • Short to GND in wiring harness between main relay terminal C and SSV solenoid valve terminal A • Open circuit in wiring harness between SSV solenoid valve terminal B and PCM terminal 1L • Short to GND in wiring harness between SSV solenoid valve terminal B and PCM terminal 1L • PCM malfunction


MAIN RELAY
TERMINAL C
SSV SOLENOID VALVE
PCM
4
3
6
A
B
3
5
8
7
1L
MAIN RELAY
A
E
C
D
SSV SOLENOID VALVE
WIRING HARNESS-SIDE
CONNECTOR
B
A
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V
1S
1M
1J
1G
1D
1A
1W
1T
1Q
1N
1K
1H
1E
1B
1X
1U
1R
1O
1L
1F
1C

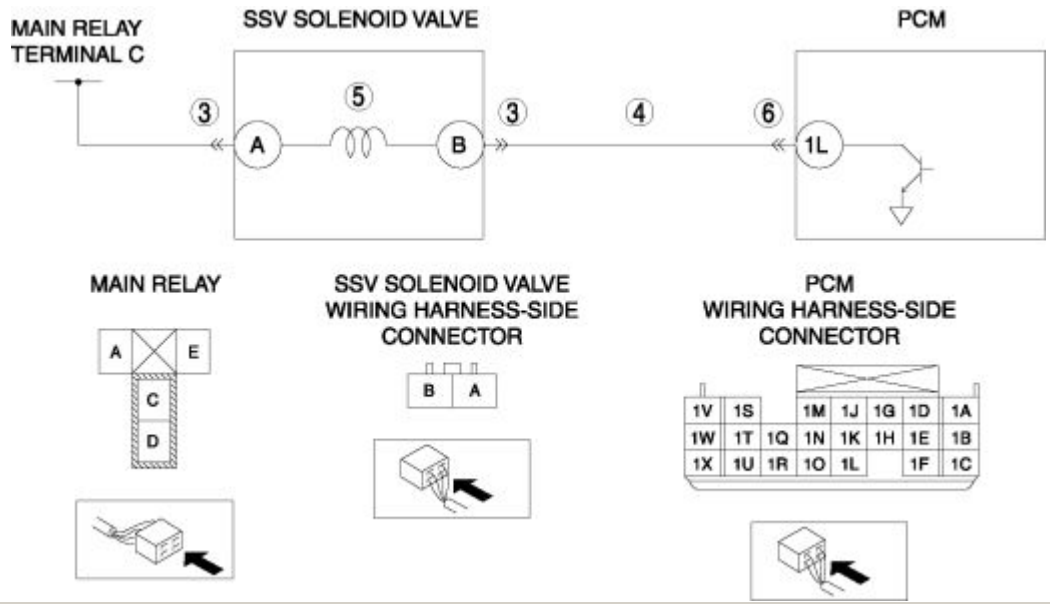
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT SSV SOLENOID VALVE CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the SSV solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT SSV SOLENOID VALVE POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between SSV solenoid valve terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 9.
5	INSPECT SSV SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between SSV solenoid valve terminal B (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.

6	INSPECT SSV SOLENOID VALVE • Inspect the SSV solenoid valve. (See SECONDARY SHUTTER VALVE (SSV) SOLENOID VALVE INSPECTION .) • Is there any malfunction ?	Yes	Replace the SSV solenoid valve, then go to Step 9. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT SSV SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between SSV solenoid valve terminal B (wiring harness-side) and PCM terminal 1L (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0661 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0662

DTC P0662	SSV solenoid valve control circuit high
DETECTION CONDITION	• The PCM monitors the SSV solenoid valve control voltage when the PCM turns the SSV solenoid valve on. If the control voltage is **more than 11.5 V** , the PCM determines that the SSV solenoid valve control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• SSV solenoid valve malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between SSV solenoid valve terminal B and PCM terminal 1L • PCM malfunction



Diagnostic procedure

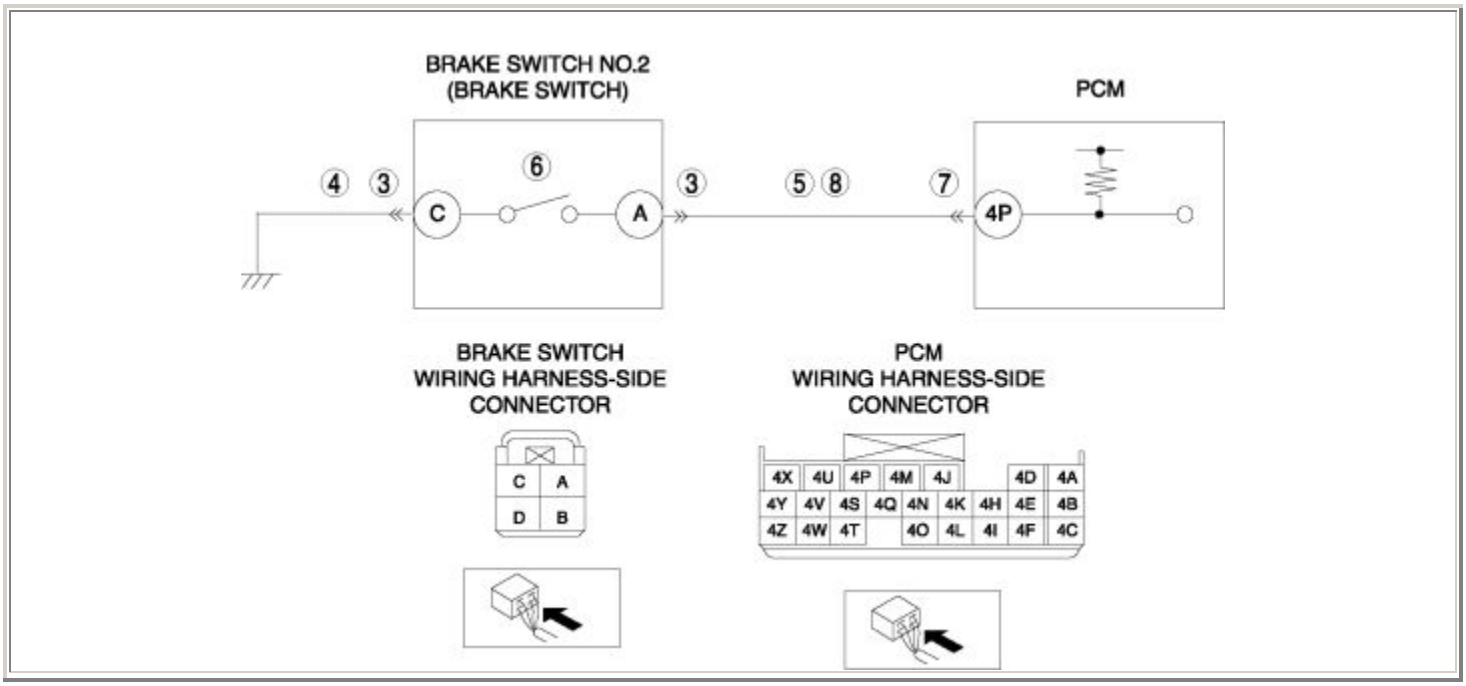
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT SSV SOLENOID VALVE CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the SSV solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT SSV SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between SSV solenoid valve terminal B (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT SSV SOLENOID VALVE • Inspect the SSV solenoid valve.	Yes	Replace the SSV solenoid valve, then go to Step 7. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)

	(See SECONDARY SHUTTER VALVE (SSV) SOLENOID VALVE INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P0662 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P07XX

DTC P0703

DTC P0703	Brake switch No.1 input circuit problem
DETECTION CONDITION	• The PCM monitors the input signal from the brake switch No.2 when the following conditions are met. If the input signal does not change while alternately accelerating and decelerating **8 times** , the PCM determines that there is a brake switch No.2 input circuit malfunction. **MONITORING CONDITION** ▪ Vehicle speed: decelerating **more than 30 km/h {19 mph}** to **0 km/h {0 mph}** ▪ Deceleration: **more than 4 km/h {2 mph} per s** **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Brake switch No.2 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between brake switch terminal A and PCM terminal 4P • Short to GND in wiring harness between brake switch terminal A and PCM terminal 4P • Open circuit in wiring harness between brake switch terminal C and GND • PCM malfunction


BRAKE SWITCH NO.2
(BRAKE SWITCH)
PCM
4
3
6
C
A
3
5
8
7
4P
BRAKE SWITCH
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR
C
A
D
B
4X
4U
4P
4M
4J
4D
4A
4Y
4V
4S
4Q
4N
4K
4H
4E
4B
4Z
4W
4T
4O
4L
4I
4F
4C

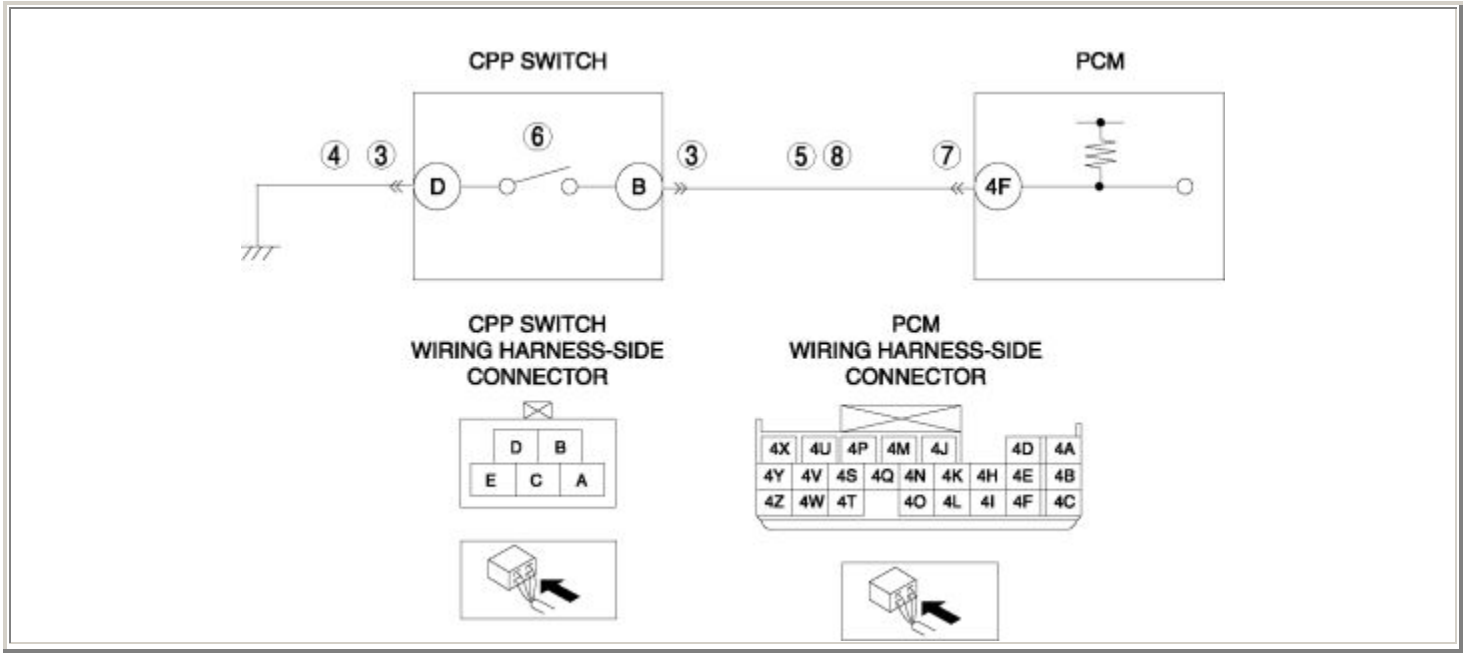
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the brake switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT BRAKE SWITCH NO.2 GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between brake switch terminal C (wiring harness-side) and body GND. • Is there any continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 9.
5	INSPECT BRAKE SWITCH NO.2 SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between brake switch terminal A (wiring harness-side) and body GND. • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
6	INSPECT BRAKE SWITCH NO.2	Yes	Replace the brake switch, then go to Step 9. (See BRAKE PEDAL REMOVAL/INSTALLATION .)

	• Inspect the brake switch No.2. (See BRAKE SWITCH INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT BRAKE SWITCH NO.2 SIGNAL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between brake switch terminal A (wiring harness-side) and PCM terminal 4P (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the following procedures **8 times** alternately. ▪ Drive the vehicle **more than 30 km/h {19 mph}** . ▪ Decelerate to **0 km/h {0 mph} within 7 s** . • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P0704

DTC P0704	CPP switch input circuit problem
DETECTION CONDITION	• The PCM monitors the input signal from the CPP switch when the vehicle speed is **more than 30 km/h {19 mph}** . If the input signal does not change while alternately accelerating and decelerating **10 times** , the PCM determines that there is a CPP switch input circuit malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CPP switch malfunction • Connector or terminal malfunction • Open circuit in wiring harness between CPP switch terminal B and PCM terminal 4F • Short to GND in wiring harness between CPP switch terminal B and PCM terminal 4F • Open circuit in wiring harness between CPP switch terminal D and GND • PCM malfunction


CPP SWITCH
PCM
4
3
6
D
B
3
5
8
7
4F
CPP SWITCH
WIRING HARNESS-SIDE
CONNECTOR
PCM
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CONNECTOR
D
B
E
C
A
4X
4U
4P
4M
4J
4D
4A
4Y
4V
4S
4Q
4N
4K
4H
4E
4B
4Z
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Diagnostic procedure

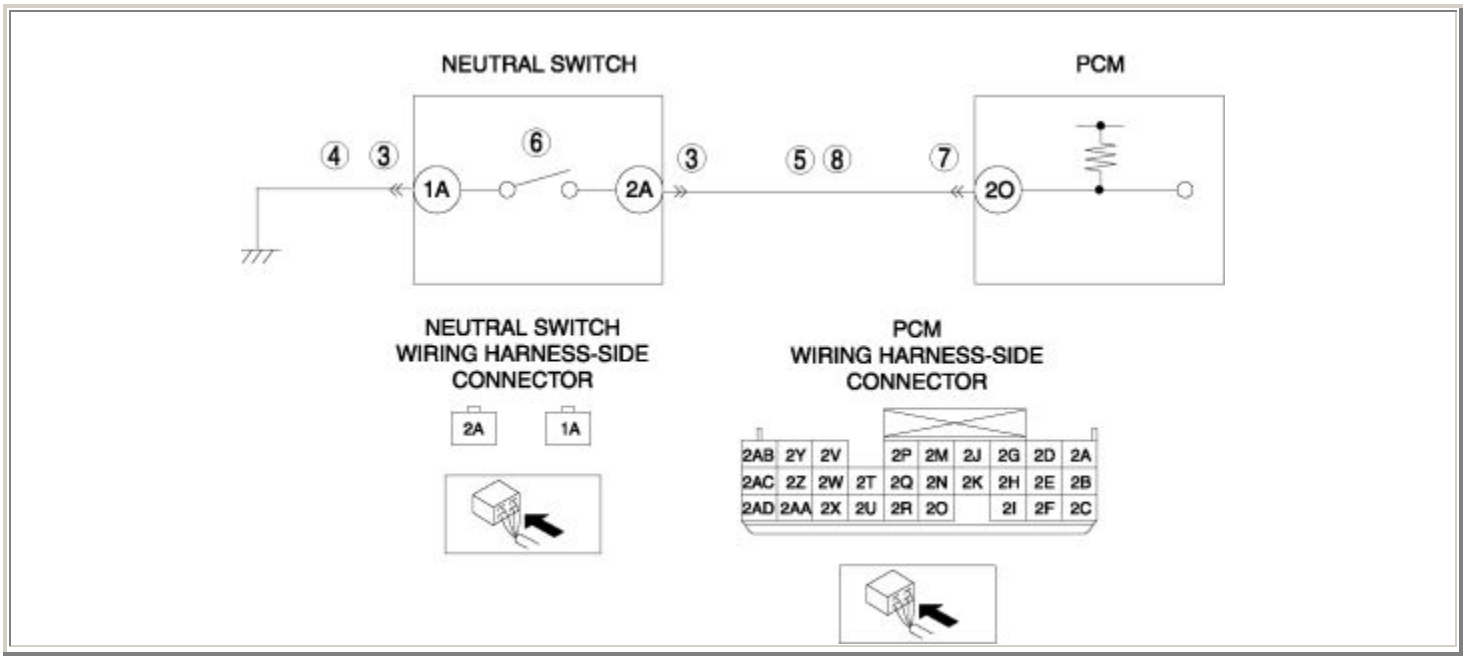
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT CPP SWITCH CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the CPP switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT CPP SWITCH GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between CPP switch terminal D (wiring harness-side) and body GND. • Is there any continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 9.
5	INSPECT CPP SWITCH SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between CPP switch terminal B (wiring harness-side) and body GND. • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
6	INSPECT CPP SWITCH	Yes	Replace the CPP switch, then go to Step 9. (See CLUTCH PEDAL REMOVAL/INSTALLATION .)

	• Inspect the CPP switch. (See CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT CPP SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between CPP switch terminal B (wiring harness-side) and PCM terminal 4F (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Operate the clutch pedal when drive the vehicle **more than 30 km/h {19 mph} 10 times** alternately. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P08XX

DTC P0850

DTC P0850	Neutral switch input circuit problem
DETECTION CONDITION	• The PCM monitors the input signal from the neutral switch when the vehicle is running. If the input signal does not change while alternately running **more than 30 km/h {19 mph} 8 times** , the PCM determines that there is a neutral switch input circuit malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Neutral switch malfunction • Connector or terminal malfunction • Open circuit in wiring harness between neutral switch terminal 2A and PCM terminal 2O • Short to GND in wiring harness between neutral switch terminal 2A and PCM terminal 2O • Open circuit in wiring harness between neutral switch terminal 1A and GND • PCM malfunction


NEUTRAL SWITCH
PCM
4
3
6
1A
2A
3
5
8
7
2O
NEUTRAL SWITCH
WIRING HARNESS-SIDE
CONNECTOR
2A
1A
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the neutral switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT NEUTRAL SWITCH GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between neutral switch terminal 1A (wiring harness-side) and body GND. • Is there any continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 9.
5	INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between neutral switch terminal 2A (wiring harness-side) and body GND. • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
6	INSPECT NEUTRAL SWITCH	Yes	Replace the neutral switch, then go to Step 9. (See NEUTRAL SWITCH REMOVAL/INSTALLATION .)

	• Inspect the neutral switch. (See NEUTRAL SWITCH INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between neutral switch terminal 2A (wiring harness-side) and PCM terminal 2O (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P0850 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Operate the shift lever when drive the vehicle **more than 30 km/h {19 mph} 8 times** alternately. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P12XX

DTC P1260

DTC P1260	Immobilizer system problem
DETECTION CONDITION	• The keyless control module detects an immobilizer system malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is not stored in the PCM memory.
POSSIBLE CAUSE	• Immobilizer system malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY STORED DTC IN KEYLESS CONTROL MODULE • Turn the ignition switch to the ON position (Engine off). • Verify stored DTCs in keyless control module. (See DTC INSPECTION (IMMOBILIZER SYSTEM) .) • Are DTCs stored ?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE (IMMOBILIZER SYSTEM) .)
		No	Go to the next step.
4	VERIFY TROUBLESHOOTING OF DTC P1260 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

DTC P15XX

DTC P1574

DTC P1574	TP sensor output incongruent
DETECTION CONDITION	• The PCM compares the TP from TP sensor No.1 with the TP from TP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that the TP sensor outputs are incongruent. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • TP sensor No.2 malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	INSPECT TP SENSOR • Inspect the TP sensor. (See THROTTLE POSITION (TP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 6. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	VERIFY TROUBLESHOOTING OF DTC P1574 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P1577

DTC P1577	APP sensor output incongruent
DETECTION CONDITION	• The PCM compares the APP from APP sensor No.1 with the APP from APP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that the APP sensor outputs are incongruent. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • APP sensor No.2 malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	INSPECT APP SENSOR • Inspect the APP sensor. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the APP sensor, then go to Step 6. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.

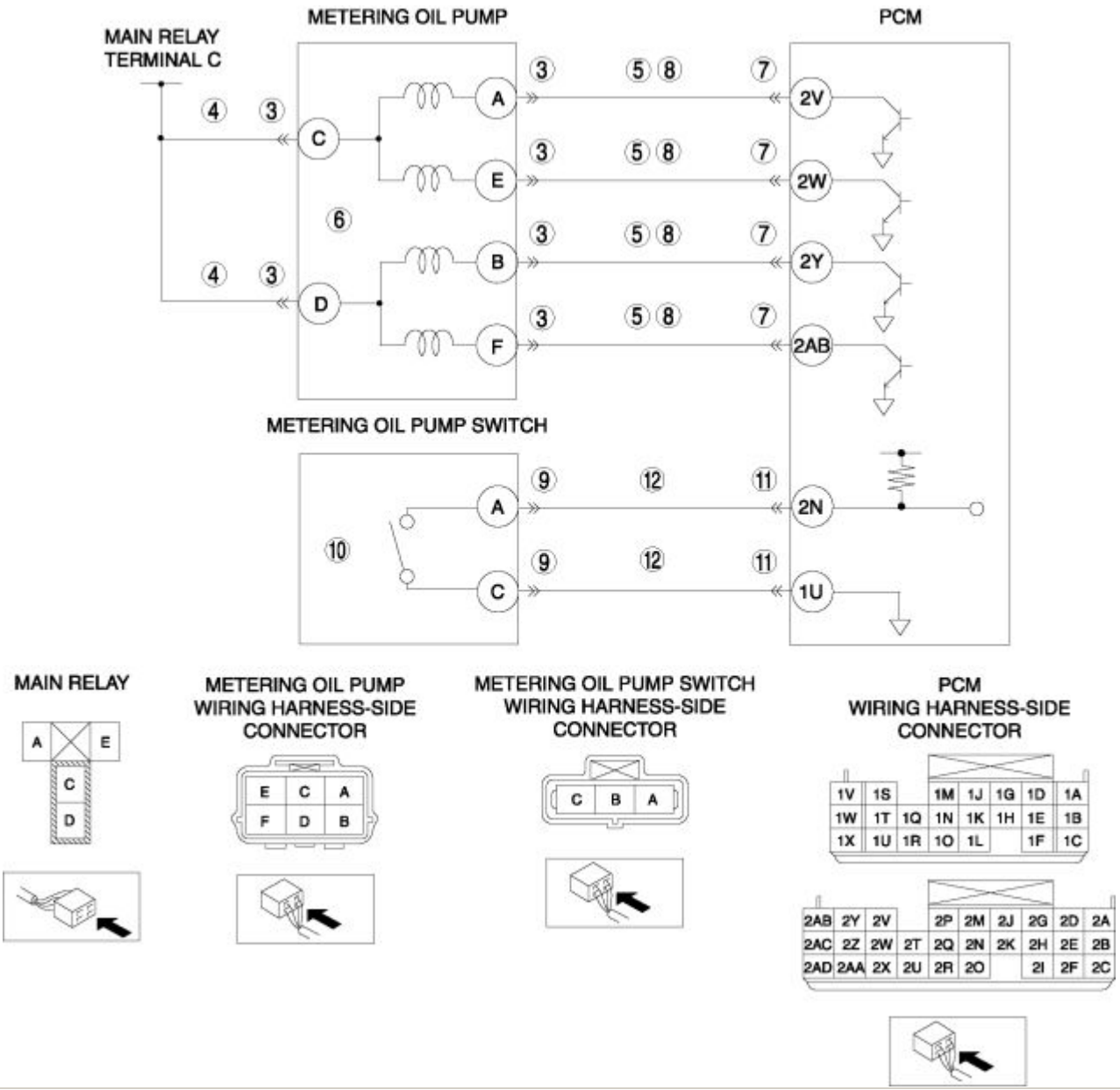
6	VERIFY TROUBLESHOOTING OF DTC P1577 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P16XX

DTC P1686

DTC P1686	Metering oil pump control circuit low flow side problem
DETECTION CONDITION	• The PCM monitors the input signal from the metering oil pump switch when the metering oil pump stepping motor is more than the standard step. If the input signal is off, the PCM determines that the metering oil pump control circuit has a problem on the low flow side. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Metering oil pump malfunction • Metering oil pump switch malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and metering oil pump terminal C • Short to GND in wiring harness between main relay terminal C and metering oil pump terminal C • Open circuit in wiring harness between main relay terminal C and metering oil pump terminal D • Short to GND in wiring harness between main relay terminal C and metering oil pump terminal D • Open circuit in wiring harness between metering oil pump terminal A and PCM terminal 2V • Short to GND in wiring harness between metering oil pump terminal A and PCM terminal 2V • Open circuit in wiring harness between metering oil pump terminal E and PCM terminal 2W • Short to GND in wiring harness between metering oil pump terminal E and PCM terminal 2W • Open circuit in wiring harness between metering oil pump terminal B and PCM terminal 2Y • Short to GND in wiring harness between metering oil pump terminal B and PCM terminal 2Y • Open circuit in wiring harness between metering oil pump terminal F and PCM terminal 2AB

	• Short to GND in wiring harness between metering oil pump terminal F and PCM terminal 2AB • Open circuit in wiring harness between metering oil pump switch terminal A and PCM terminal 2N • Open circuit in wiring harness between metering oil pump switch terminal C and PCM terminal 1U • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT METERING OIL PUMP CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the metering oil pump connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
4	INSPECT METERING OIL PUMP POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Metering oil pump terminal C (wiring harness-side) and body GND ▪ Metering oil pump terminal D (wiring harness-side) and body GND • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 13.
5	INSPECT METERING OIL PUMP CONTROL CIRCUIT FOR SHORT TO GND	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 13.

	• Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Metering oil pump terminal A (wiring harness-side) and body GND ▪ Metering oil pump terminal E (wiring harness-side) and body GND ▪ Metering oil pump terminal B (wiring harness-side) and body GND ▪ Metering oil pump terminal F (wiring harness-side) and body GND • Is there continuity?	No	Go to the next step.
6	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction ?	Yes	Replace the metering oil pump, then go to Step 13. (See METERING OIL PUMP REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
8		Yes	Go to the next step.

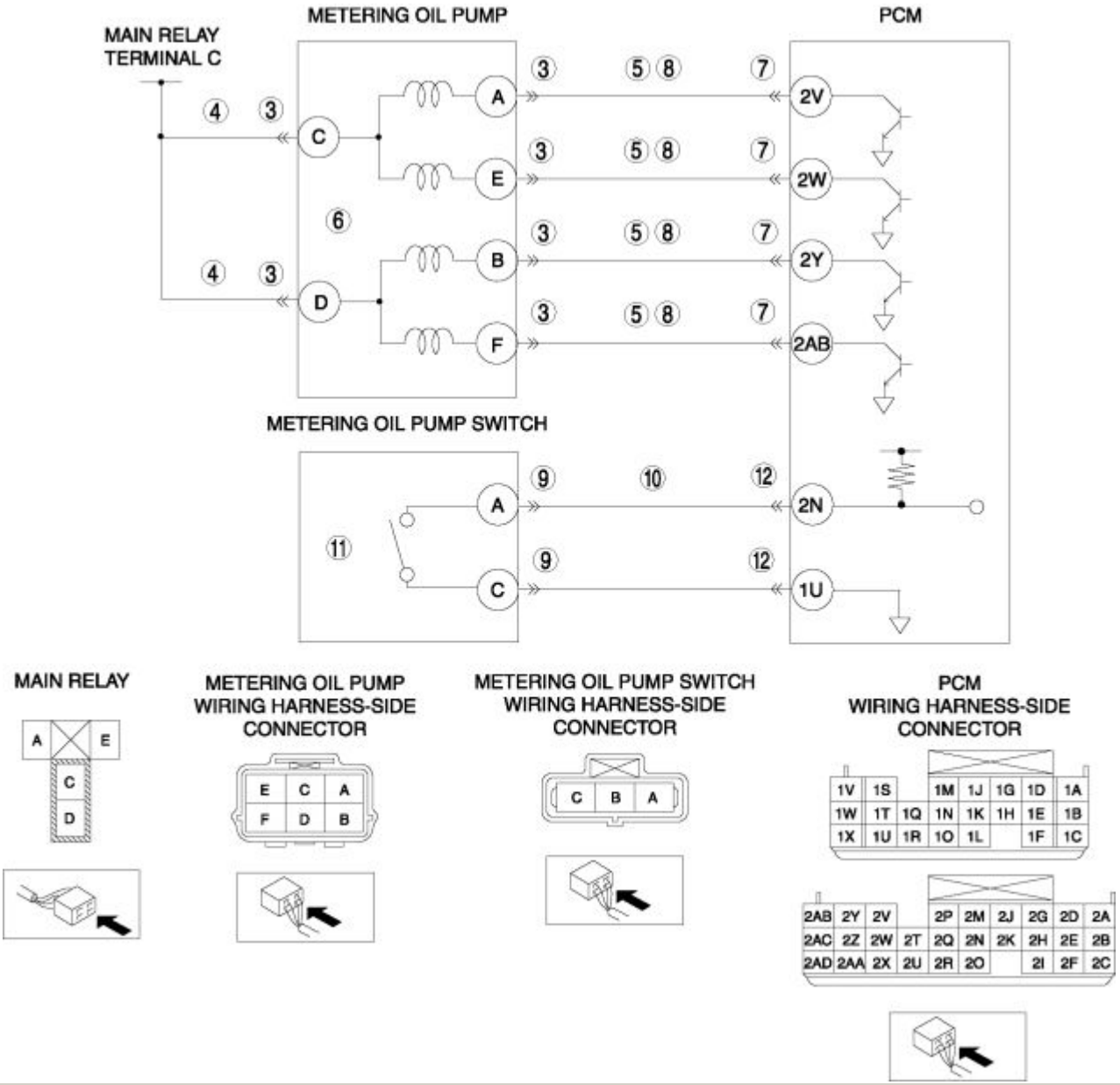
	INSPECT METERING OIL PUMP CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Metering oil pump terminal A (wiring harness-side) and PCM terminal 2V (wiring harness-side) ▪ Metering oil pump terminal E (wiring harness-side) and PCM terminal 2W (wiring harness-side) ▪ Metering oil pump terminal B (wiring harness-side) and PCM terminal 2Y (wiring harness-side) ▪ Metering oil pump terminal F (wiring harness-side) and PCM terminal 2AB (wiring harness-side) • Is there continuity?	No	Repair or replace the wiring harness for a possible open circuit, then go to Step 13.
9	INSPECT METERING OIL PUMP SWITCH CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the metering oil pump switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
10	INSPECT METERING OIL PUMP SWITCH • Inspect the metering oil pump switch. (See METERING OIL PUMP SWITCH INSPECTION .) • Is there any malfunction ?	Yes	Replace the metering oil pump, then go to Step 13. (See METERING OIL PUMP REMOVAL/INSTALLATION .)
		No	Go to the next step.
11	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.

12	INSPECT METERING OIL PUMP SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Metering oil pump switch terminal A (wiring harness-side) and PCM terminal 2N (wiring harness-side) ▪ Metering oil pump switch terminal C (wiring harness-side) and PCM terminal 1U (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
13	VERIFY TROUBLESHOOTING OF DTC P1686 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
14	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P1687

DTC P1687	Metering oil pump control circuit high flow side problem
DETECTION CONDITION	• The PCM monitors the input signal from the metering oil pump switch when the metering oil pump stepping motor is less than the standard step. If the input signal is on, the PCM determines that the metering oil pump control circuit has a problem on the high flow side. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Metering oil pump malfunction • Metering oil pump switch malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and metering oil pump terminal C • Short to GND in wiring harness between main relay terminal C and metering oil pump terminal C • Open circuit in wiring harness between main relay terminal C and metering oil pump terminal D • Short to GND in wiring harness between main relay terminal C and metering oil pump terminal D • Open circuit in wiring harness between metering oil pump terminal A and PCM terminal 2V • Short to GND in wiring harness between metering oil pump terminal A and PCM terminal 2V • Open circuit in wiring harness between metering oil pump terminal E and PCM terminal 2W • Short to GND in wiring harness between metering oil pump terminal E and PCM terminal 2W • Open circuit in wiring harness between metering oil pump terminal B and PCM terminal 2Y • Short to GND in wiring harness between metering oil pump terminal B and PCM terminal 2Y • Open circuit in wiring harness between metering oil pump terminal F and PCM terminal 2AB • Short to GND in wiring harness between metering oil pump terminal F and PCM terminal 2AB

	• Short to GND in wiring harness between metering oil pump switch terminal A and PCM terminal 2N • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT METERING OIL PUMP CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the metering oil pump connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
4	INSPECT METERING OIL PUMP POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Metering oil pump terminal C (wiring harness-side) and body GND ▪ Metering oil pump terminal D (wiring harness-side) and body GND • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 13.
5	INSPECT METERING OIL PUMP CONTROL CIRCUIT FOR SHORT TO GND	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 13.

	• Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Metering oil pump terminal A (wiring harness-side) and body GND ▪ Metering oil pump terminal E (wiring harness-side) and body GND ▪ Metering oil pump terminal B (wiring harness-side) and body GND ▪ Metering oil pump terminal F (wiring harness-side) and body GND • Is there continuity?	No	Go to the next step.
6	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction ?	Yes	Replace the metering oil pump, then go to Step 13. (See METERING OIL PUMP REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
8		Yes	Go to the next step.

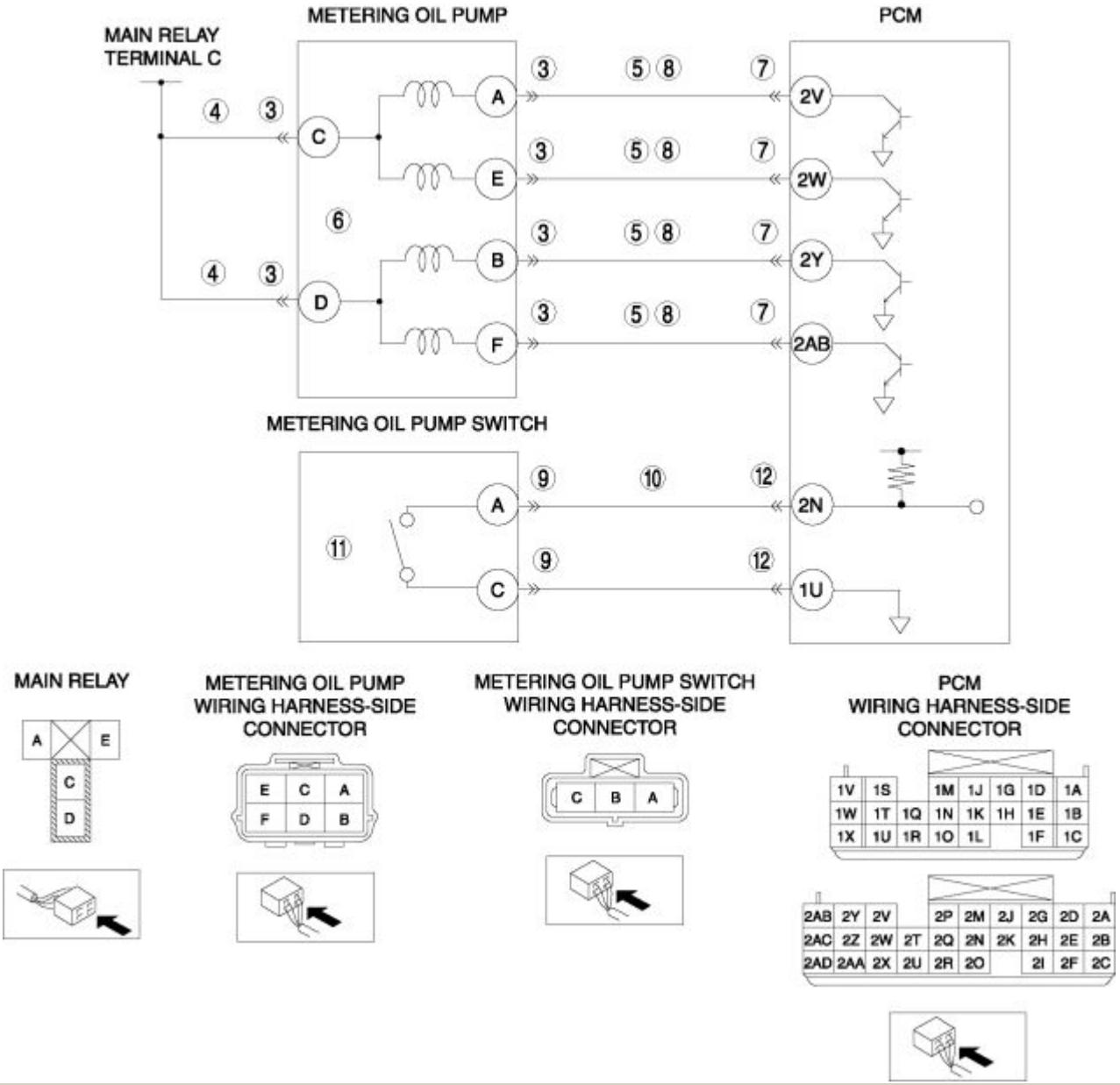
	INSPECT METERING OIL PUMP CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Metering oil pump terminal A (wiring harness-side) and PCM terminal 2V (wiring harness-side) ▪ Metering oil pump terminal E (wiring harness-side) and PCM terminal 2W (wiring harness-side) ▪ Metering oil pump terminal B (wiring harness-side) and PCM terminal 2Y (wiring harness-side) ▪ Metering oil pump terminal F (wiring harness-side) and PCM terminal 2AB (wiring harness-side) • Is there continuity?	No	Repair or replace the wiring harness for a possible open circuit, then go to Step 13.
9	INSPECT METERING OIL PUMP SWITCH CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the metering oil pump switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
10	INSPECT METERING OIL PUMP SWITCH SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between metering oil pump switch terminal A (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 13.
		No	Go to the next step.
11	INSPECT METERING OIL PUMP SWITCH • Inspect the metering oil pump switch.	Yes	Replace the metering oil pump, then go to Step 13. (See METERING OIL PUMP REMOVAL/INSTALLATION .)

	(See METERING OIL PUMP SWITCH INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
12	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
13	VERIFY TROUBLESHOOTING OF DTC P1687 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
14	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P1688

DTC P1688	Metering oil pump control circuit initial check problem
DETECTION CONDITION	• The PCM monitors the input signal from the metering oil pump switch when the metering oil pump stepping motor initial check is operating. If the input signal is on, the PCM determines that there is a metering oil pump control circuit initial check problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Metering oil pump malfunction • Metering oil pump switch malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and metering oil pump terminal C • Short to GND in wiring harness between main relay terminal C and metering oil pump terminal C • Open circuit in wiring harness between main relay terminal C and metering oil pump terminal D • Short to GND in wiring harness between main relay terminal C and metering oil pump terminal D • Open circuit in wiring harness between metering oil pump terminal A and PCM terminal 2V • Short to GND in wiring harness between metering oil pump terminal A and PCM terminal 2V • Open circuit in wiring harness between metering oil pump terminal E and PCM terminal 2W • Short to GND in wiring harness between metering oil pump terminal E and PCM terminal 2W • Open circuit in wiring harness between metering oil pump terminal B and PCM terminal 2Y • Short to GND in wiring harness between metering oil pump terminal B and PCM terminal 2Y • Open circuit in wiring harness between metering oil pump terminal F and PCM terminal 2AB • Short to GND in wiring harness between metering oil pump terminal F and PCM terminal 2AB

	• Short to GND in wiring harness between metering oil pump switch terminal A and PCM terminal 2N • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT METERING OIL PUMP CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the metering oil pump connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
4	INSPECT METERING OIL PUMP POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Metering oil pump terminal C (wiring harness-side) and body GND ▪ Metering oil pump terminal D (wiring harness-side) and body GND • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 13.
5	INSPECT METERING OIL PUMP CONTROL CIRCUIT FOR SHORT TO GND	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 13.

	• Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Metering oil pump terminal A (wiring harness-side) and body GND ▪ Metering oil pump terminal E (wiring harness-side) and body GND ▪ Metering oil pump terminal B (wiring harness-side) and body GND ▪ Metering oil pump terminal F (wiring harness-side) and body GND • Is there continuity?	No	Go to the next step.
6	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction ?	Yes	Replace the metering oil pump, then go to Step 13. (See METERING OIL PUMP REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
8		Yes	Go to the next step.

	INSPECT METERING OIL PUMP CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Metering oil pump terminal A (wiring harness-side) and PCM terminal 2V (wiring harness-side) ▪ Metering oil pump terminal E (wiring harness-side) and PCM terminal 2W (wiring harness-side) ▪ Metering oil pump terminal B (wiring harness-side) and PCM terminal 2Y (wiring harness-side) ▪ Metering oil pump terminal F (wiring harness-side) and PCM terminal 2AB (wiring harness-side) • Is there continuity?	No	Repair or replace the wiring harness for a possible open circuit, then go to Step 13.
9	INSPECT METERING OIL PUMP SWITCH CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the metering oil pump switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
10	INSPECT METERING OIL PUMP SWITCH SIGNAL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between metering oil pump switch terminal A (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 13.
		No	Go to the next step.
11	INSPECT METERING OIL PUMP SWITCH • Inspect the metering oil pump switch.	Yes	Replace the metering oil pump, then go to Step 13. (See METERING OIL PUMP REMOVAL/INSTALLATION .)

	(See METERING OIL PUMP SWITCH INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
12	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
13	VERIFY TROUBLESHOOTING OF DTC P1688 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
14	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2004

DTC P2004	APV stuck open
DETECTION CONDITION	• The PCM monitors the input voltage from the APV position sensor when the PCM turns the APV motor off. If the input voltage is **more than 1.4 V** , the PCM determines that the APV is stuck open. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APV stuck open • APV control malfunction • APV motor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APV CONTROL SYSTEM OPERATION • Perform the "APV Control Inspection". (See Auxiliary Port Valve (APV) Control Inspection .) • Is there any malfunction ?	Yes	Repair or replace the malfunctioning parts according to the inspection results. Then go to the Step 5.
		No	Go to the next step.
4	INSPECT APV MOTOR • Inspect the APV motor. (See AUXILIARY PORT VALVE (APV) MOTOR INSPECTION (13B-MSP (HIGH POWER)) .) • Is there any malfunction ?	Yes	Replace the APV motor, then go to the next step. (See INTAKE MANIFOLD DISASSEMBLY/ASSEMBLY .)
		No	Go to the next step.
5	VERIFY TROUBLESHOOTING OF DTC P2004 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2006

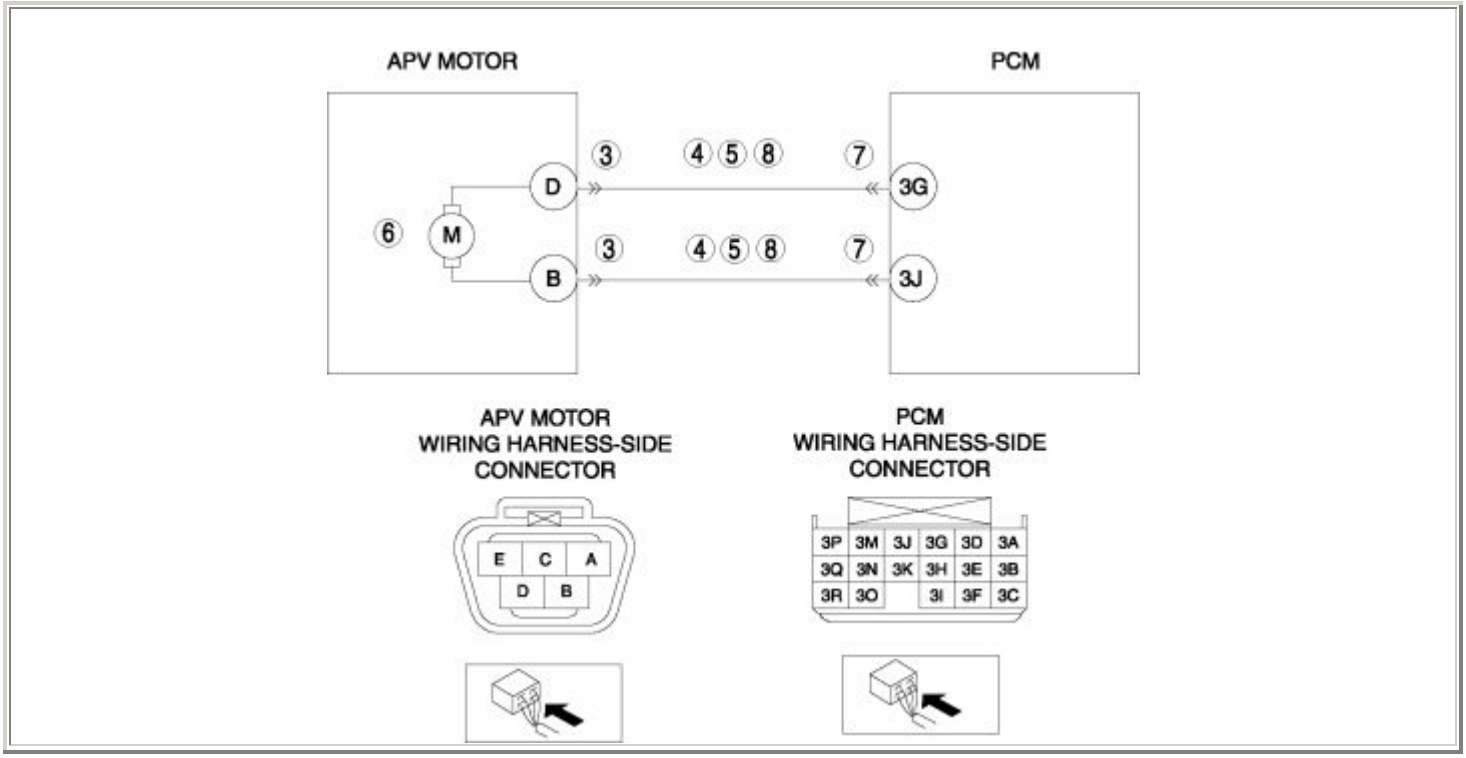
DTC P2006	APV motor control circuit IC problem
DETECTION CONDITION	• APV motor control IC error. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APV motor control IC malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY TROUBLESHOOTING OF P2006 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2008

DTC P2008	APV motor control circuit/open
DETECTION CONDITION	• The PCM monitors the APV motor control current when the engine is running. If the control current is **less than 0.1 A** or **more than 10 A** , the PCM determines that there is an APV motor control open circuit. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APV motor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between APV motor terminal D and PCM terminal 3G • Short to power supply in wiring harness between APV motor terminal D and PCM terminal 3G • Short to GND in wiring harness between APV motor terminal D and PCM terminal 3G • Open circuit in wiring harness between APV motor terminal B and PCM terminal 3J • Short to power supply in wiring harness between APV motor terminal B and PCM terminal 3J • Short to GND in wiring harness between APV motor terminal B and PCM terminal 3J • PCM malfunction


APV MOTOR
PCM
3
4 5 8
7
D
3G
6
M
3
4 5 8
7
B
3J
APV MOTOR
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR
E C A
D B
3P 3M 3J 3G 3D 3A
3Q 3N 3K 3H 3E 3B
3R 3O 3I 3F 3C

Diagnostic procedure

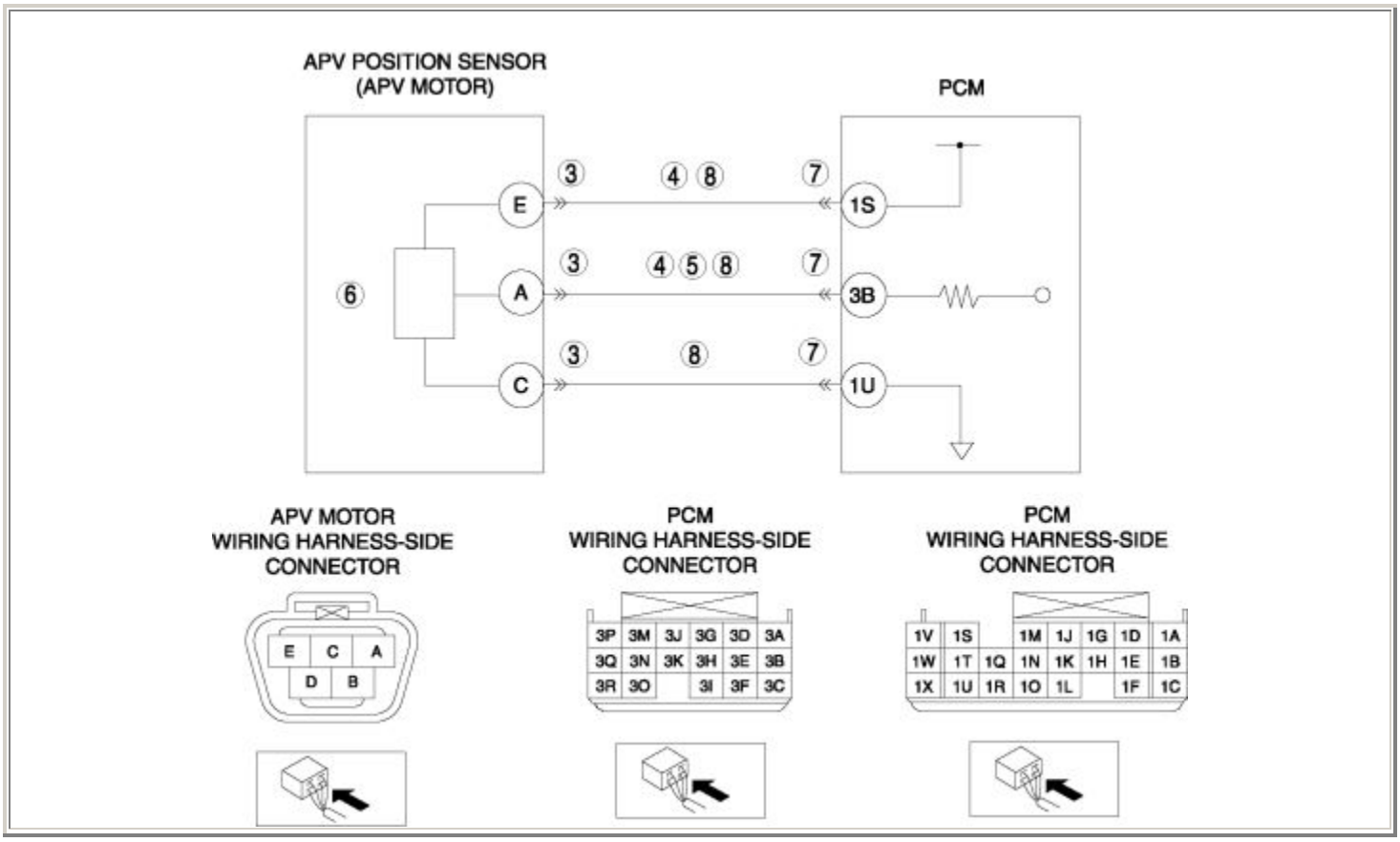
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APV MOTOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the APV motor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT APV MOTOR CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ APV motor terminal D (wiring harness-side) and body GND ▪ APV motor terminal B (wiring harness-side) and body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
5	INSPECT APV MOTOR CIRCUIT FOR SHORT TO POWER SUPPLY	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 9.

	• Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ APV motor terminal D (wiring harness-side) and body GND ▪ APV motor terminal B (wiring harness-side) and body GND • Is the voltage **B+** ?	No	Go to the next step.
6	INSPECT APV MOTOR • Inspect the APV motor. (See AUXILIARY PORT VALVE (APV) MOTOR INSPECTION (13B-MSP (HIGH POWER)) .) • Is there any malfunction ?	Yes	Replace the APV motor, then go to Step 9. (See INTAKE MANIFOLD DISASSEMBLY/ASSEMBLY .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT APV MOTOR CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ APV motor terminal D (wiring harness-side) and PCM terminal 3G (wiring harness-side) ▪ APV motor terminal B (wiring harness-side) and PCM terminal 3J (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P2008 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2017

DTC P2017	APV position sensor circuit problem
DETECTION CONDITION	• The PCM monitors the input voltage from the APV position sensor when the engine is running. If the input voltage is **less than 0.2 V** , the PCM determines that the APV position sensor circuit input voltage is low. • The PCM monitors the input voltage from the APV position sensor when the engine is running. If the input voltage is **more than 4.8 V** , the PCM determines that the APV position sensor circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APV position sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between APV motor terminal E and PCM terminal 1S • Short to GND in wiring harness between APV motor terminal E and PCM terminal 1S • Open circuit in wiring harness between APV motor terminal A and PCM terminal 3B • Short to power supply in wiring harness between APV motor terminal A and PCM terminal 3B • Short to GND in wiring harness between APV motor terminal A and PCM terminal 3B • Open circuit in wiring harness between APV motor terminal C and PCM terminal 1U • PCM malfunction


APV POSITION SENSOR
(APV MOTOR)
PCM
E
A
C
6
3
4
8
5
7
1S
3B
1U
APV MOTOR
WIRING HARNESS-SIDE
CONNECTOR
E C A
D B
PCM
WIRING HARNESS-SIDE
CONNECTOR
3P 3M 3J 3G 3D 3A
3Q 3N 3K 3H 3E 3B
3R 3O 3I 3F 3C
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APV MOTOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the APV motor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT APV POSITION SENSOR CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ APV motor terminal E (wiring harness-side) and body GND ▪ APV motor terminal A (wiring harness-side) and body GND • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
5	INSPECT APV POSITION SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 9.

	• Turn the ignition switch to the ON position (Engine off). • Measure the voltage between APV motor terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	No	Go to the next step.
6	INSPECT APV POSITION SENSOR • Inspect the APV position sensor. (See AUXILIARY PORT VALVE (APV) POSITION SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the APV motor, then go to Step 9. (See INTAKE MANIFOLD DISASSEMBLY/ASSEMBLY .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT APV POSITION SENSOR CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ APV motor terminal E (wiring harness-side) and PCM terminal 1S (wiring harness-side) ▪ APV motor terminal A (wiring harness-side) and PCM terminal 3B (wiring harness-side) ▪ APV motor terminal C (wiring harness-side) and PCM terminal 1U (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P2017 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2070

DTC P2070	SSV stuck open
DETECTION CONDITION	• The PCM monitors the input signal from the SSV switch when the PCM turns the SSV solenoid valve on. If the input signal is on, the PCM determines that the SSV is stuck open. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• SSV stuck open • SSV control malfunction • SSV actuator malfunction • SSV solenoid valve malfunction • SSV switch malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT SSV CONTROL SYSTEM OPERATION • Perform the "SSV Operation Inspection". (See Secondary Shutter Valve (SSV) Operation Inspection .) • Is there any malfunction ?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the Step 7.
		No	Go to the next step.
4	INSPECT SSV ACTUATOR • Inspect the SSV actuator. (See SECONDARY SHUTTER VALVE (SSV) ACTUATOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the intake manifold, then go to Step 7. (See INTAKE MANIFOLD REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT SSV SOLENOID VALVE • Inspect the SSV solenoid valve.	Yes	Replace the SSV solenoid valve, then go to Step 7. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)

	(See SECONDARY SHUTTER VALVE (SSV) SOLENOID VALVE INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT SSV SWITCH • Inspect the SSV switch. (See SECONDARY SHUTTER VALVE (SSV) SWITCH INSPECTION .) • Is there any malfunction ?	Yes	Replace the SSV switch, then go to the next step. (See SECONDARY SHUTTER VALVE (SSV) SWITCH REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P2070 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine and warm up it completely. • Run the engine at high engine speed and high load. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2096

DTC P2096	Target A/F feedback system too lean
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is more than the specification, the PCM determines that the target A/F feedback system is too lean. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.

POSSIBLE CAUSE	• Leakage exhaust gas
	• Rear HO2S malfunction
	• IAT sensor malfunction
	• ECT sensor malfunction
	• AIR system malfunction
	• Leakage intake-air
	• Front HO2S malfunction
	• MAF sensor malfunction
	• Fuel line pressure malfunction
	• Fuel pump unit malfunction
	• Leakage fuel
	• Ignition system malfunction
	  ▪ High-tension lead malfunction
	  ▪ Incorrect power supply to ignition coil
	  ▪ Ignition coil malfunction
	• Insufficient compression
	  ▪ Metering oil pump malfunction
	  ▪ Engine oil condition malfunction
	  ▪ Rised oil pressure
	  ▪ Oil passage malfunction
	  ▪ Engine malfunction
	• Fuel injector malfunction
	• PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0171 also present?	Yes	Go to the DTC P0171 inspection. (See DTC P0171 .)
		No	If misfire DTC is present or drivability concern exists, go to step 10. If misfire DTC is not present and drivability concern does not exist, go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P2096 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S12 PID. • Read the O2S12 PID under following accelerator pedal condition (in PARK or NEUTRAL). ▪ **More than 0.55 V** when accelerator pedal is suddenly depressed (rich condition). ▪ **Less than 0.55 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	No	Visually inspect for the the gas leakage between TWC and rear HO2S. • If there is no leakage, replace the rear HO2S. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .) Then go to Step 24.
6	VERIFY CURRENT INPUT SIGNAL STATUS • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 24.
7		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	No	Inspect the malfunctioning part according to the inspection results. Then go to Step 24.
8	INSPECT AIR SYSTEM OPERATION • Perform the "AIR System Inspection". (See Secondary Air Injection (AIR) System Inspection .) • Does AIR system operate properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to the inspection results. Then go to Step 24.
9	VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S11 PID. • Read the O2S11 PID under following accelerator pedal condition (in PARK or NEUTRAL). ▪ **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). ▪ **More than 1 mA** just after	Yes	Inspect for air suction at followings due to cracks, damages and loosening parts: • From air cleaner to throttle body • From throttle body to intake manifold • Vacuum hoses **NOTE:** • Engine speed may change when rust penetrating agent (cab cleaner etc.) is sprayed on the air suction area. Repair or replace the malfunctioning part, then go to Step 23.

	release of accelerator pedal (lean condition) • Is the PID normal?	No	Visually inspect for the gas leakage between exhaust manifold and front HO2S. • If there is no leakage, replace the front HO2S. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .) Then go to Step 24.
10	VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR • Connect the WDS or equivalent to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 24. (See MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION .)
11	INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION • Visually inspect for loosen, cracks or damages hoses in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 24.
		No	Go to the next step.
12	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	• If the fuel line pressure is too low, go to the next step. • If the fuel line pressure is too high, replace the fuel pump unit, then go to Step 24. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
		No	Go to Step 14.
13	INSPECT FUEL SYSTEM FOR FUEL LEAKAGE • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 24.
		No	Replace the fuel pump unit, then go to Step 24. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
14		Yes	Go to Step 18.

	INSPECT IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT • Inspect the blinking condition on each high-tension lead using timing light at idle. • Do all the high-tension leads show blinking condition?	No	Go to the next step.
15	INSPECT HIGH-TENSION LEAD OF NO BLINKING HIGH-TENSION LEAD • Inspect the high-tension leads. (See HIGH-TENSION LEAD INSPECTION .) • Is there any malfunction?	Yes	Replace the malfunctioning high-tension lead, then go to Step 23. (See HIGH-TENSION LEAD REMOVAL/INSTALLATION .)
		No	Go to the next step.
16	INSPECT IGNITION COIL POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between ignition coil terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 24.
17	INSPECT IGNITION COIL • Inspect the ignition coil. (See IGNITION COIL INSPECTION .) • Is there any malfunction?	Yes	Replace the ignition coil, then go to Step 24. (See IGNITION COIL REMOVAL/INSTALLATION .)
		No	Go to the next step.
18	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION .) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 23.

19	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 24.
		No	Go to the next step.
20	INSPECT ENGINE OIL CONDITION • Inspect the engine oil condition. • Is the engine oil condition normal?	Yes	Go to the next step.
		No	Replace the engine oil. Inspect the ECT sensor and related harnesses. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) Overhaul or replace the engine. Then go to Step 24.
21	INSPECT OIL PRESSURE • Inspect the oil pressure. (See OIL PRESSURE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 24.
		No	Go to the next step.
22	INSPECT OIL PASSAGE • Inspect the oil pipe between metering oil pump and metering oil nozzle. • Is there any malfunction?	Yes	Inspect and repair for leakage and/or clogged in oil passage at engine. Overhaul or replace the engine. Then go to Step 25.
		No	Overhaul or replace the engine. Then go to Step 24.
23	INSPECT FUEL INJECTOR • Inspect the fuel injector. (See FUEL INJECTOR INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel injector, then go to the next step. (See FUEL INJECTOR REMOVAL/INSTALLATION .)
		No	Go to the next step.

24	VERIFY TROUBLESHOOTING OF DTC P2096 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the "DRIVE MODE 1". (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
25	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2097

DTC P2097	Target A/F feedback system too rich
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is less than the specification, the PCM determines that the target A/F feedback system is too rich. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.

POSSIBLE CAUSE	• Leakage exhaust gas
	• Rear HO2S malfunction
	• IAT sensor malfunction
	• ECT sensor malfunction
	• Front HO2S malfunction
	• Fuel pump speed control malfunction
	• Fuel line pressure malfunction
	• Fuel pump unit malfunction
	• Purge solenoid valve malfunction
	• Insufficient compression
	  ▪ Metering oil pump malfunction
	  ▪ Engine oil condition malfunction
	  ▪ Rised oil pressure
	  ▪ Oil passage malfunction
	  ▪ Engine malfunction
	• PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0172 also present?	Yes	Go to the DTC P0172 inspection. (See DTC P0172 .)
		No	If misfire DTC is present or drivability concern exists, go to step 11. If misfire DTC is not present and drivability concern does not exist, go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P2097 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S12 PID. • Read the O2S12 PID under following accelerator pedal condition (in PARK or NEUTRAL). ▪ **More than 0.55 V** when accelerator pedal is suddenly depressed (rich condition). ▪ **Less than 0.55 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	No	Visually inspect for the the gas leakage between TWC and rear HO2S. • If there is no leakage, replace the rear HO2S. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .) Then go to Step 17.
6	VERIFY CURRENT INPUT SIGNAL STATUS • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 17.
7		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See PCM INSPECTION .) ▪ APP ▪ ECT ▪ MAF ▪ TP ▪ VSS • Are the PIDs normal?	No	Inspect the malfunctioning part according to the inspection results. Then go to Step 17.
8	VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S11 PID. • Read the O2S11 PID under following accelerator pedal condition (in PARK or NEUTRAL). ▪ **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). ▪ **More than 1 mA** just after release of accelerator pedal (lean condition) • Is the PID normal?	Yes	Go to the next step.
		No	Replace the front HO2S. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .) Then go to Step 17.
9	INSPECT FUEL PUMP SPEED CONTROL OPERATION • Perform the "Fuel Pump Speed Control Operation Inspection". (See Fuel Pump Speed Control Operation Inspection .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 17.
		No	Go to the next step.

10	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	• If the fuel line pressure is too low, go to the next step. • If the fuel line pressure is too high, replace the fuel pump unit, then go to Step 17. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
		No	Go to Step 13.
11	INSPECT LONG TERM FUEL TRIM • Connect the WDS or equivalent to the DLC-2. • Access the LONGFT1 PID. • Compare the LONGFT1 PID with recorded FREEZE FRAME DATA at Step 1. • Is the LONGFT1 PID above FREEZE FRAME DATA?	Yes	Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • If there is any malfunction, replace the purge solenoid valve. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .) Then go to Step 17.
		No	Go to the next step.
12	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION .) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 17.
13	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 17.
		No	Go to the next step.
14	INSPECT ENGINE OIL CONDITION	Yes	Go to the next step.

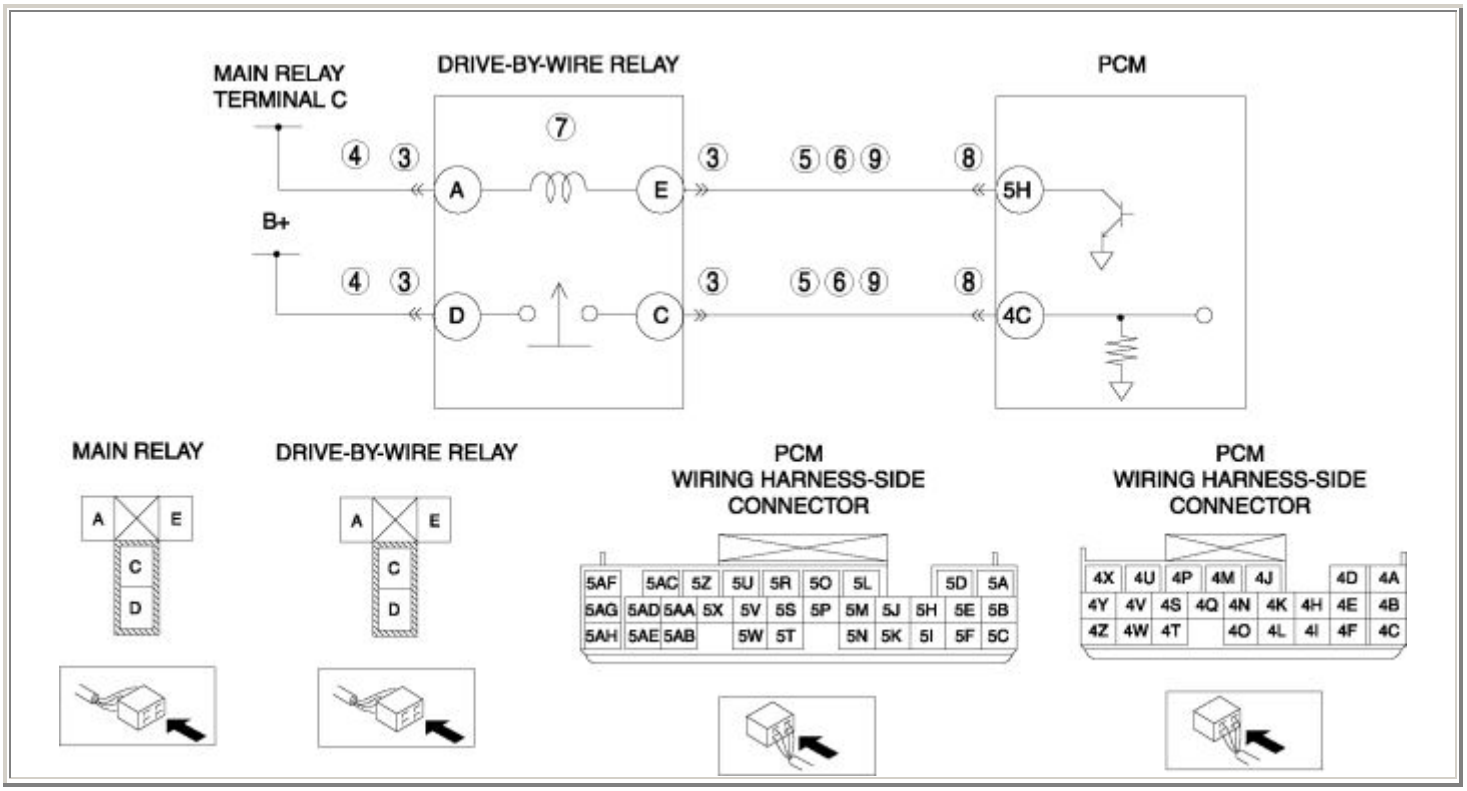
	• Inspect the engine oil condition. • Is the engine oil condition normal?	No	Replace the engine oil. Inspect the ECT sensor and related harnesses. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) Overhaul or replace the engine. Then go to Step 17.
15	INSPECT OIL PRESSURE • Inspect the oil pressure. (See OIL PRESSURE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 17.
		No	Go to the next step.
16	INSPECT OIL PASSAGE • Inspect the oil pipe between metering oil pump and metering oil nozzle. • Is there any malfunction?	Yes	Inspect and repair for leakage and/or clogged in oil passage at engine. Overhaul or replace the engine. Then go to the next step.
		No	Overhaul or replace the engine. Then go to the next step.
17	VERIFY TROUBLESHOOTING OF DTC P2097 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the "DRIVE MODE 1". (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
18	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

Notes:

DTC P2101

DTC P2101	Drive-by-wire relay control circuit problem
DETECTION CONDITION	• The PCM monitors the input voltage from the drive-by-wire relay when the PCM turns the drive-by-wire relay on. If the input voltage is **less than 5.0 V** , the PCM determines that the drive-by-wire relay control circuit voltage is low. • The PCM monitors the input voltage from the drive-by-wire relay when the PCM turns the drive-by-wire relay off. If the input voltage is **more than 5.0 V** , the PCM determines that the drive-by-wire relay control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Drive-by-wire relay malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and drive-by-wire relay terminal A • Short to GND in wiring harness between main relay terminal C and drive-by-wire relay terminal A • Open circuit in wiring harness between drive-by-wire relay terminal E and PCM terminal 5H • Short to GND in wiring harness between drive-by-wire relay terminal E and PCM terminal 5H • Open circuit in wiring harness between battery positive terminal and drive-by-wire relay terminal D • Short to GND in wiring harness between battery positive terminal and drive-by-wire relay terminal D • Open circuit in wiring harness between drive-by-wire relay terminal C and PCM terminal 4C • Short to power supply in wiring harness between drive-by-wire relay terminal C and PCM terminal 4C • Short to GND in wiring harness between drive-by-wire relay terminal C and PCM terminal 4C • PCM malfunction


MAIN RELAY
TERMINAL C
DRIVE-BY-WIRE RELAY
PCM
B+
A
E
D
C
5H
4C
MAIN RELAY
DRIVE-BY-WIRE RELAY
PCM
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR

Diagnostic procedure

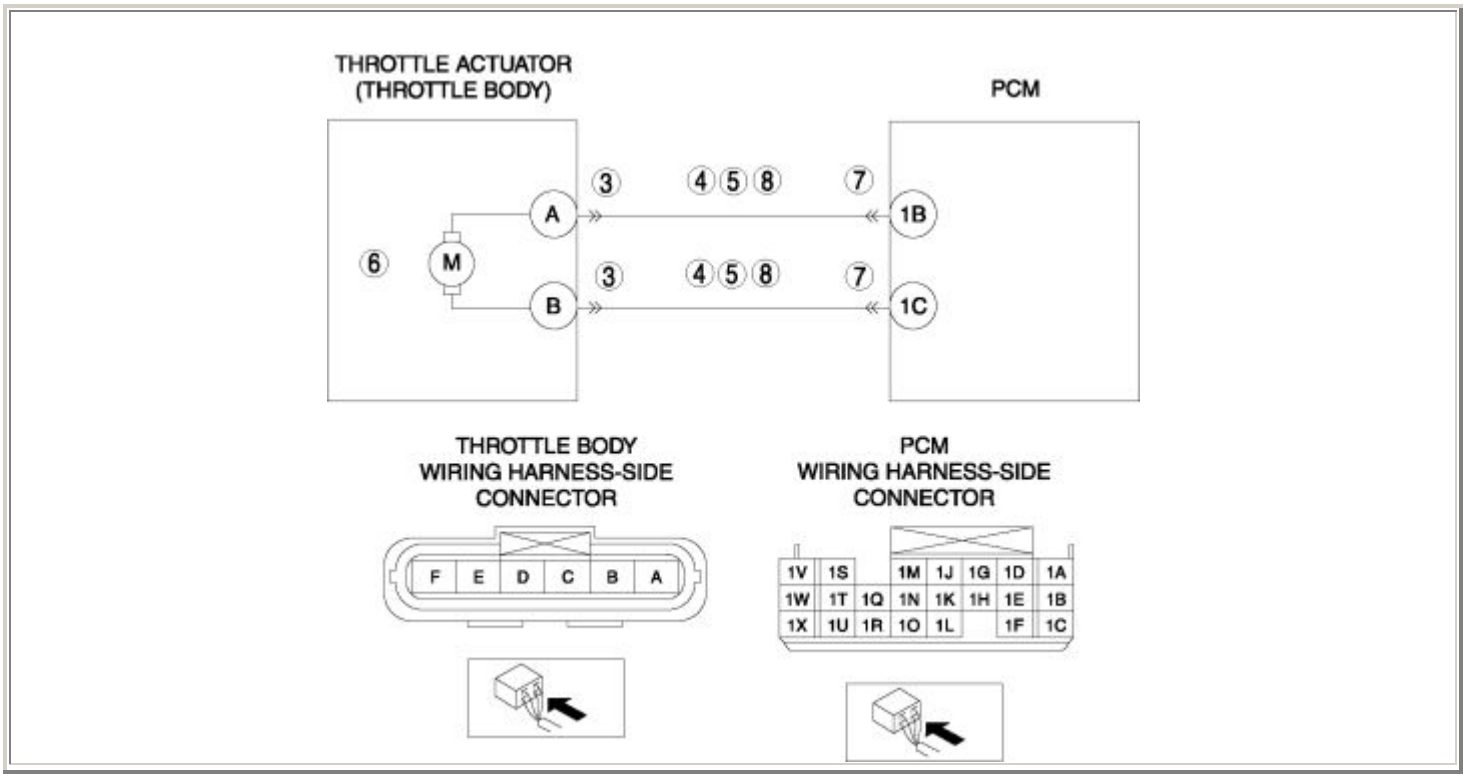
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT DRIVE-BY-WIRE RELAY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the drive-by-wire relay connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
4	INSPECT DRIVE-BY-WIRE RELAY POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Drive-by-wire relay terminal A (wiring harness-side) and body GND ▪ Drive-by-wire relay terminal D (wiring harness-side) and body GND • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 10.
5	INSPECT DRIVE-BY-WIRE RELAY CIRCUIT FOR SHORT TO GND	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 10.

	• Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Drive-by-wire relay terminal E (wiring harness-side) and body GND ▪ Drive-by-wire relay terminal C (wiring harness-side) and body GND • Is there continuity?	No	Go to the next step.
6	INSPECT DRIVE-BY-WIRE RELAY CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between drive-by-wire relay terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 10.
		No	Go to the next step.
7	INSPECT DRIVE-BY-WIRE RELAY • Inspect the drive-by-wire relay. (See RELAY INSPECTION .) • Is there any malfunction ?	Yes	Replace the drive-by-wire relay, then go to Step 10. (See RELAY LOCATION .)
		No	Go to the next step.
8	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9		Yes	Go to the next step.

	INSPECT DRIVE-BY-WIRE RELAY CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Drive-by-wire relay terminal E (wiring harness-side) and PCM terminal 5H (wiring harness-side) ▪ Drive-by-wire relay terminal C (wiring harness-side) and PCM terminal 4C (wiring harness-side) • Is there continuity?	No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P2101 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2106

DTC P2106	Throttle actuator control system-forced limited power
DETECTION CONDITION	• The PCM monitors the throttle actuator control current when the ignition switch is on. If the control current is **less than 8 A** or **more than 11 A** , the PCM determines that the throttle actuator control system is under forced limited power. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator malfunction • Connector or terminal malfunction • Open circuit in wiring harness between throttle body terminal A and PCM terminal 1B • Short to power supply in wiring harness between throttle body terminal A and PCM terminal 1B • Short to GND in wiring harness between throttle body terminal A and PCM terminal 1B • Open circuit in wiring harness between throttle body terminal B and PCM terminal 1C • Short to power supply in wiring harness between throttle body terminal B and PCM terminal 1C • Short to GND in wiring harness between throttle body terminal B and PCM terminal 1C • PCM malfunction


THROTTLE ACTUATOR
(THROTTLE BODY)
PCM
3
4 5 8
7
A
1B
6
M
3
4 5 8
7
B
1C
THROTTLE BODY
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT THROTTLE ACTUATOR CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Throttle body terminal A (wiring harness-side) and body GND ▪ Throttle body terminal B (wiring harness-side) and body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
5	INSPECT THROTTLE ACTUATOR CIRCUIT FOR SHORT TO POWER SUPPLY	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 9.

	• Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following circuits: ▪ Throttle body terminal A (wiring harness-side) and body GND ▪ Throttle body terminal B (wiring harness-side) and body GND • Is the voltage **B+** ?	No	Go to the next step.
6	INSPECT THROTTLE ACTUATOR • Inspect the throttle actuator. (See Resistance Inspection .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 9. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT THROTTLE ACTUATOR CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Throttle body terminal A (wiring harness-side) and PCM terminal 1B (wiring harness-side) ▪ Throttle body terminal B (wiring harness-side) and PCM terminal 1C (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P2106 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2107

DTC P2107	Throttle actuator control module processor error
DETECTION CONDITION	• Throttle actuator control module internal processor error. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator control module internal processor malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY TROUBLESHOOTING OF P2107 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2108

DTC P2108	Throttle actuator control module performance error
DETECTION CONDITION	• Throttle actuator control module internal communication error. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator control module malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY TROUBLESHOOTING OF P2108 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2109

DTC P2109	TP sensor minimum stop range/performance problem
DETECTION CONDITION	• The PCM monitors the minimum TP when the closed TP learning is completed. If the TP is **less than 11.5 %** or **more than 24.3 %** , the PCM determines that there is a TP sensor minimum stop range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Drive-by-wire control system malfunction • Throttle actuator malfunction • Throttle valve malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION • Perform the "Drive-by-wire Control System Inspection". (See Drive-by-wire Control System Inspection .) • Is there any malfunction ?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the Step 6.
		No	Go to the next step.
4	INSPECT THROTTLE ACTUATOR • Inspect the throttle actuator. (See Resistance Inspection .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 6. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT THROTTLE VALVE • Inspect the throttle valve. (See Throttle Valve Inspection .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to the next step. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	VERIFY TROUBLESHOOTING OF DTC P2109 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2112

DTC P2112	Throttle actuator control system range/performance problem
DETECTION CONDITION	• The PCM monitors the throttle actuator control duty ratio when the engine is running. If the duty ratio is **more than 95 %** , the PCM determines that there is a throttle actuator control system range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator control module malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY TROUBLESHOOTING OF P2112 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2119

DTC P2119	Throttle actuator control throttle body range/performance problem
DETECTION CONDITION	• The PCM compares the TP with default TP when the ignition switch is turned off. If the TP is higher than the default TP, the PCM determines that there is a throttle actuator control throttle body range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Drive-by-wire control system malfunction • Throttle actuator malfunction • Throttle valve malfunction • PCM malfunction

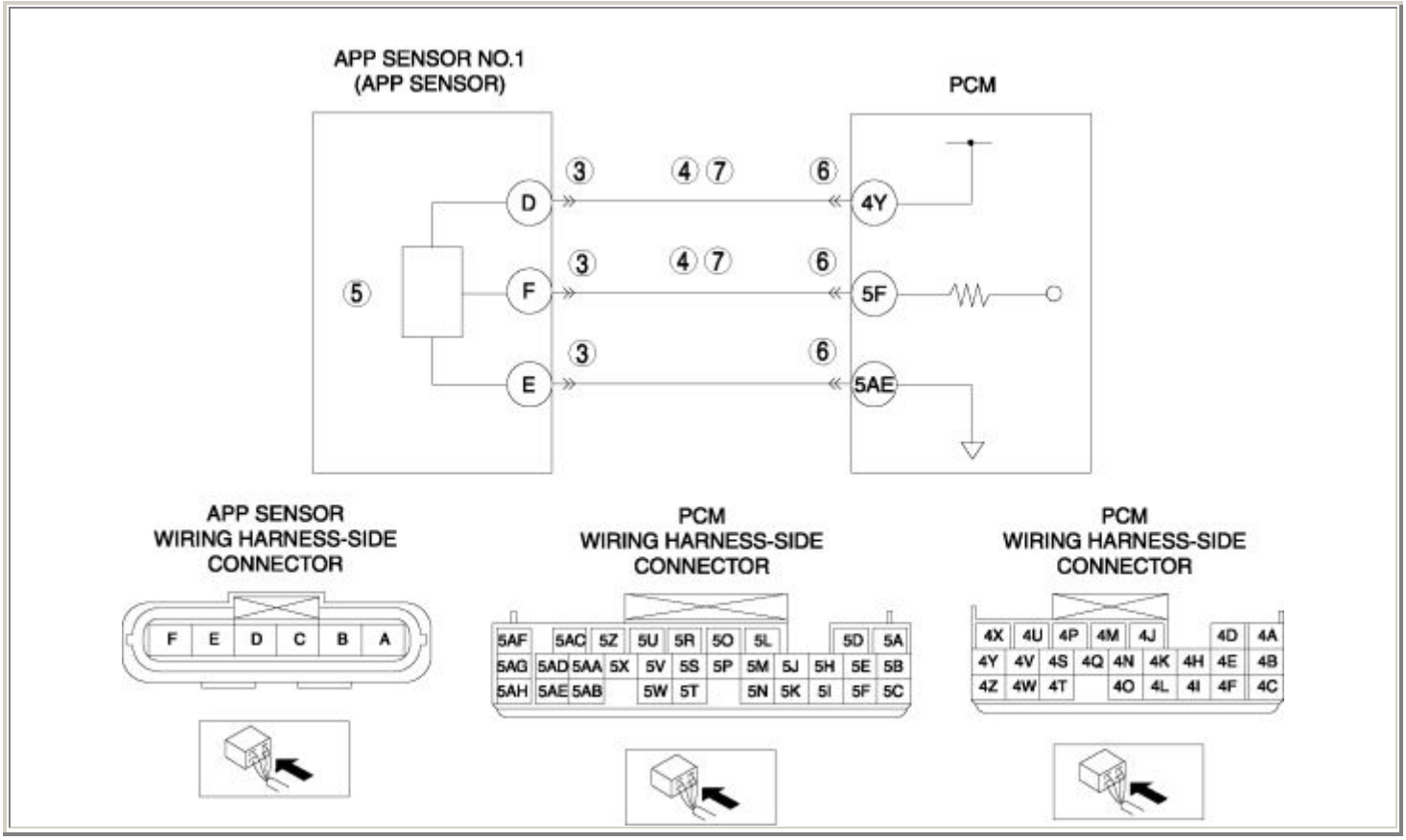
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION • Perform the "Drive-by-wire Control System Inspection". (See Drive-by-wire Control System Inspection .) • Is there any malfunction ?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the Step 6.
		No	Go to the next step.
4	INSPECT THROTTLE ACTUATOR • Inspect the throttle actuator. (See Resistance Inspection .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 6. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT THROTTLE VALVE • Inspect the throttle valve. (See Throttle Valve Inspection .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to the next step. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	VERIFY TROUBLESHOOTING OF DTC P2119 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Turn the ignition switch to the ON position (Engine off), then off. • Is the same DTC present?	No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2122

DTC P2122	APP sensor No.1 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the APP sensor No.1 when the engine is running. If the input voltage is **less than 0.3 V** , the PCM determines that the APP sensor No.1 circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between APP sensor terminal D and PCM terminal 4Y • Short to GND in wiring harness between APP sensor terminal D and PCM terminal 4Y • Open circuit in wiring harness between APP sensor terminal F and PCM terminal 5F • Short to GND in wiring harness between APP sensor terminal F and PCM terminal 5F • PCM malfunction


APP SENSOR NO.1
(APP SENSOR)
PCM
D
F
E
5
3
4 7
6
4Y
5F
5AE
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

Diagnostic procedure

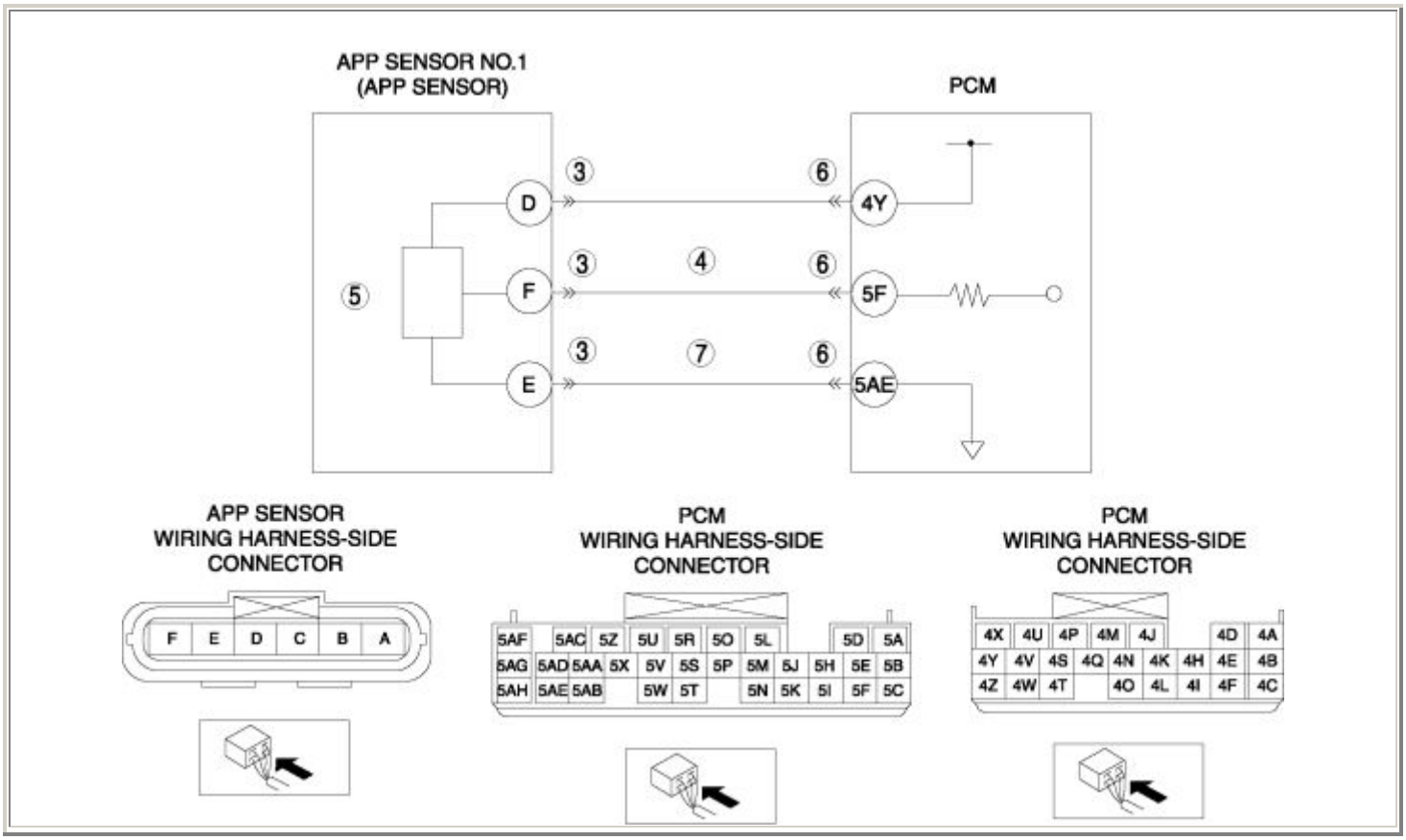
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT APP SENSOR NO.1 CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ APP sensor terminal D (wiring harness-side) and body GND ▪ APP sensor terminal F (wiring harness-side) and body GND • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	INSPECT APP SENSOR NO.1	Yes	Replace the APP sensor, then go to Step 8. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)

	• Inspect the APP sensor No.1. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	INSPECT APP SENSOR NO.1 CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ APP sensor terminal D (wiring harness-side) and PCM terminal 4Y (wiring harness-side) ▪ APP sensor terminal F (wiring harness-side) and PCM terminal 5F (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P2122 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

DTC P2123

DTC P2123	APP sensor No.1 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the APP sensor No.1 when the engine is running. If the input voltage is **more than 4.8 V** , the PCM determines that the APP sensor No.1 circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between APP sensor terminal F and PCM terminal 5F • Open circuit in wiring harness between APP sensor terminal E and PCM terminal 5AE • PCM malfunction


APP SENSOR NO.1
(APP SENSOR)
PCM
D
F
E
5
3
4
7
6
4Y
5F
5AE
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

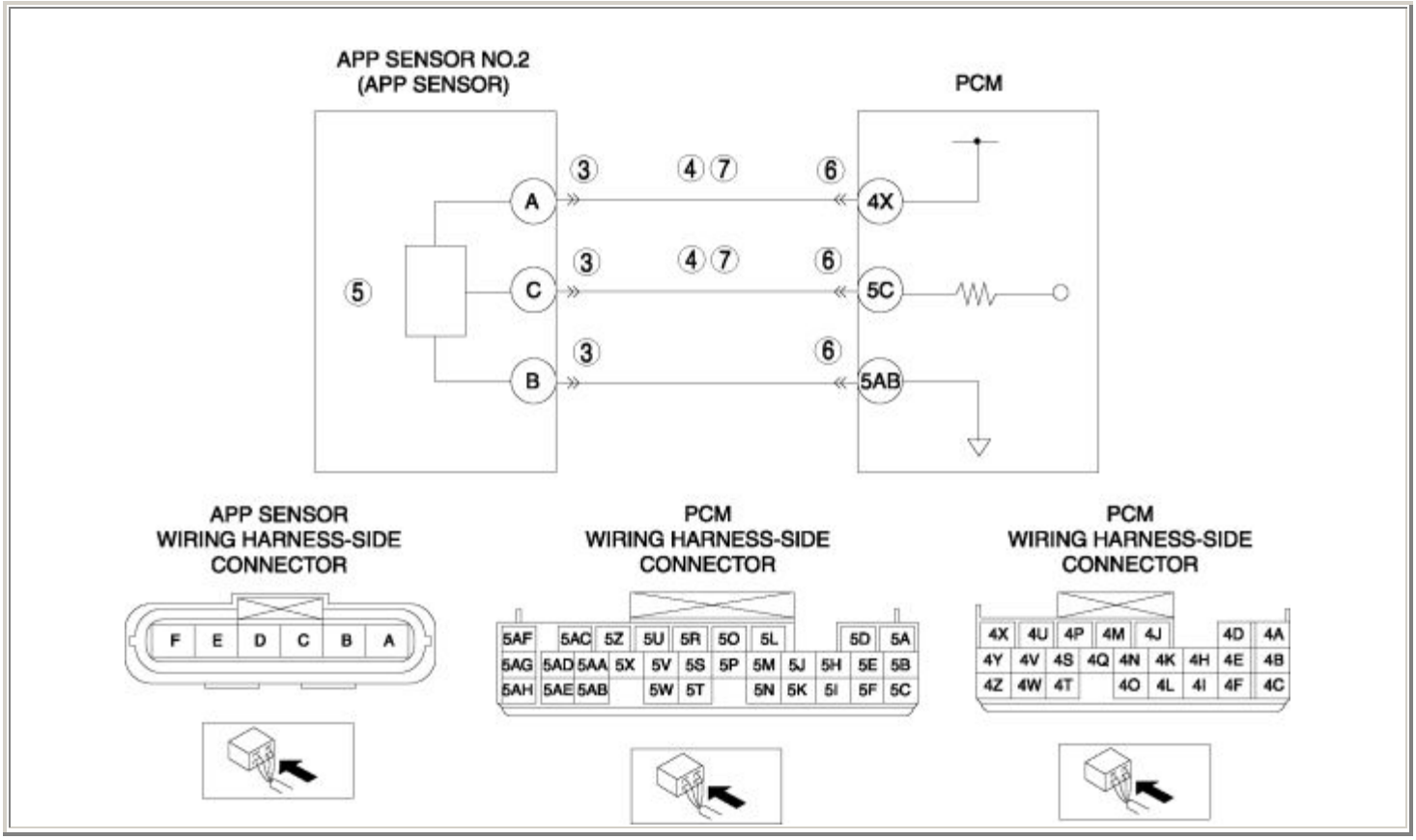
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT APP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between APP sensor terminal F (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	INSPECT APP SENSOR NO.1 • Inspect the APP sensor No.1. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the APP sensor, then go to Step 8. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to Step 8.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT APP SENSOR NO.1 GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between APP sensor terminal E (wiring harness-side) and PCM terminal 5AE (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P2123 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2127

DTC P2127	APP sensor No.2 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the APP sensor No.2 when the engine is running. If the input voltage is **less than 0.3 V** , the PCM determines that the APP sensor No.2 circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between APP sensor terminal A and PCM terminal 4X • Short to GND in wiring harness between APP sensor terminal A and PCM terminal 4X • Open circuit in wiring harness between APP sensor terminal C and PCM terminal 5C • Short to GND in wiring harness between APP sensor terminal C and PCM terminal 5C • PCM malfunction


APP SENSOR NO.2
(APP SENSOR)
PCM
A
C
B
5
3
4 7
6
4X
5C
5AB
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT APP SENSOR NO.2 CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ APP sensor terminal A (wiring harness-side) and body GND ▪ APP sensor terminal C (wiring harness-side) and body GND • Is there any continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	INSPECT APP SENSOR NO.2	Yes	Replace the APP sensor, then go to Step 8. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)

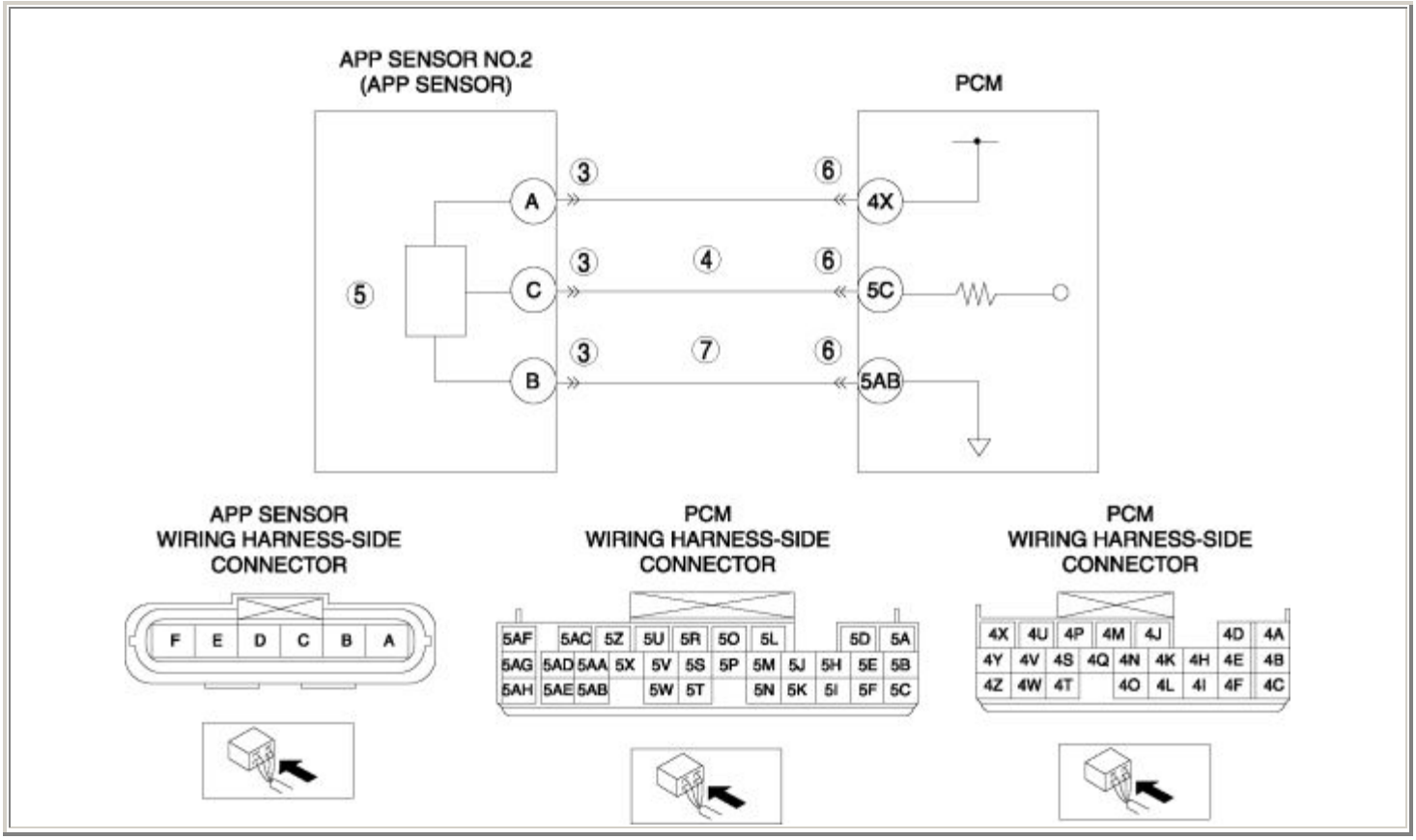
	• Inspect the APP sensor No.2. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	INSPECT APP SENSOR NO.2 CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ APP sensor terminal A (wiring harness-side) and PCM terminal 4X (wiring harness-side) ▪ APP sensor terminal C (wiring harness-side) and PCM terminal 5C (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P2127 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

Notes:

DTC P2128

DTC P2128	APP sensor No.2 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the APP sensor No.2 when the engine is running. If the input voltage is **more than 4.8 V** , the PCM determines that the APP sensor No.2 circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between APP sensor terminal C and PCM terminal 5C • Open circuit in wiring harness between APP sensor terminal B and PCM terminal 5AB • PCM malfunction


APP SENSOR NO.2
(APP SENSOR)
PCM
A
C
B
5
3
4
7
6
4X
5C
5AB
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR
F E D C B A
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT APP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between APP sensor terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	INSPECT APP SENSOR NO.2 • Inspect the APP sensor No.2. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the APP sensor, then go to Step 8. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to Step 8.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT APP SENSOR NO.2 GND CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between APP sensor terminal B (wiring harness-side) and PCM terminal 5AB (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P2128 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2135

DTC P2135	TP sensor No.1/No.2 voltage correlation problem
DETECTION CONDITION	• The PCM compares the input voltage from TP sensor No.1 with the input voltage from TP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that there is a TP sensor No.1/No.2 voltage correlation problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • TP sensor No.2 malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	INSPECT TP SENSOR • Inspect the TP sensor. (See THROTTLE POSITION (TP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the throttle body, then go to Step 6. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	VERIFY TROUBLESHOOTING OF DTC P2135 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2136

DTC P2136	TP sensor No.1/No.3 voltage correlation problem
DETECTION CONDITION	• The PCM compares the input voltage from TP sensor No.1 with the input voltage from TP sensor No.3 (calculation value in PCM) when the engine is running. If the difference is more than the specification, the PCM determines that there is a TP sensor No.1/No.3 voltage correlation problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY TROUBLESHOOTING OF P2136 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2138

DTC P2138	APP sensor No.1/No.2 voltage correlation problem
DETECTION CONDITION	• The PCM compares the input voltage from APP sensor No.1 with the input voltage from APP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that there is an APP sensor No.1/No.2 voltage correlation problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • APP sensor No.2 malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	INSPECT APP SENSOR • Inspect the APP sensor. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the APP sensor, then go to Step 6. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.

6	VERIFY TROUBLESHOOTING OF DTC P2138 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2195

DTC P2195	Front HO2S signal stuck lean
DETECTION CONDITION	• The PCM monitors the front HO2S output current when the following conditions are met. If the average output current is **more than 1.2 A** for **25 s** , the PCM determines that the front HO2S signal remains lean. **MONITORING CONDITION** ▪ ECT: more than **70 °C {158 °F}** ▪ Engine speed: **1,000—3,200 rpm** ▪ MAF amount: **6—80 g/s {0.80—10.58 lb/min}** ▪ Target A/F feedback system status: feedback control ▪ Input voltage from the rear HO2S: **more than 0.7 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Fuel line pressure malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P2195 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5	VERIFY CURRENT INPUT SIGNAL STATUS • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See PCM INSPECTION .) ▪ ECT ▪ MAF ▪ O2S12 ▪ RPM • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 10.

6	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See PCM INSPECTION .) ▪ ECT ▪ MAF ▪ O2S12 ▪ RPM • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 10.
7	INSPECT FRONT HO2S • Inspect the front HO2S. (See FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the front HO2S, then go to Step 10. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	INSPECT FUEL INJECTOR • Inspect the fuel injector. (See FUEL INJECTOR INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel injector, then go to Step 10. (See FUEL INJECTOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Inspect the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P2195 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as DTC present?	No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2196

DTC P2196	Front HO2S signal stuck rich
DETECTION CONDITION	• The PCM monitors the front HO2S output current when the following conditions are met. If the average output current is **less than 0.8 A** for **25 s** , the PCM determines that the front HO2S signal remains rich. **MONITORING CONDITION** ▪ ECT: **more than 70 °C {158 °F}** ▪ Engine speed: **1,000—3,200 rpm** ▪ MAF amount: **6—80 g/s {0.80—10.58 lb/min}** ▪ Target A/F feedback system status: feedback control ▪ Input voltage from the rear HO2S: **less than 0.2 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Fuel line pressure malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P2196 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5	VERIFY CURRENT INPUT SIGNAL STATUS • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs. (See PCM INSPECTION .) ▪ ECT ▪ MAF ▪ O2S12 ▪ RPM • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 10.

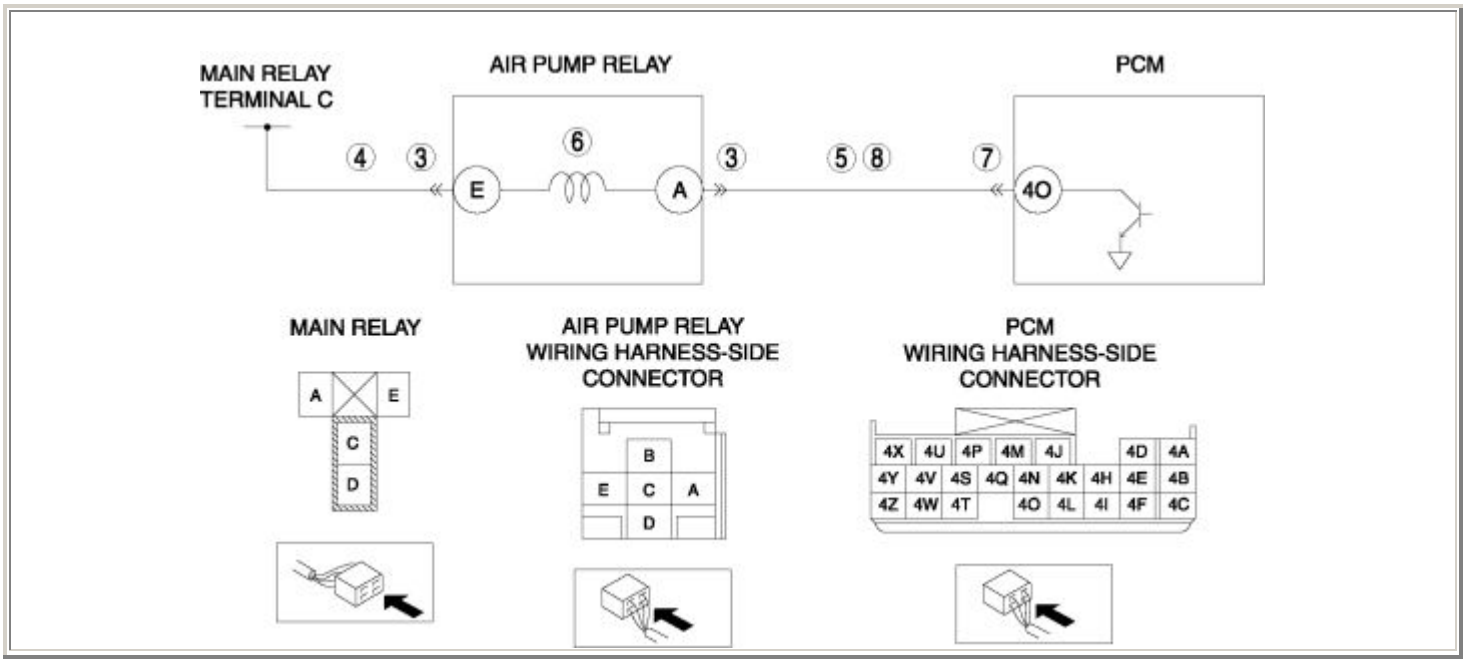
6	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION • Connect the WDS or equivalent to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See PCM INSPECTION .) ▪ ECT ▪ MAF ▪ O2S12 ▪ RPM • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 10.
7	INSPECT FRONT HO2S • Inspect the front HO2S. (See FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION .) • Is there any malfunction ?	Yes	Replace the front HO2S, then go to Step 10. (See FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	INSPECT FUEL INJECTOR • Inspect the fuel injector. (See FUEL INJECTOR INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel injector, then go to Step 10. (See FUEL INJECTOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Inspect the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P2196 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as DTC present?	No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P22XX

DTC P2257

DTC P2257	AIR pump relay control circuit low
DETECTION CONDITION	• The PCM monitors the AIR pump relay control voltage when the AIR pump is not operating. If the control voltage is **less than 5.8 V** , the PCM determines that the AIR pump relay control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• AIR pump relay malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and AIR pump relay terminal E • Short to GND in wiring harness between main relay terminal C and AIR pump relay terminal E • Open circuit in wiring harness between AIR pump relay terminal A and PCM terminal 4O • Short to GND in wiring harness between AIR pump relay terminal A and PCM terminal 4O • PCM malfunction


MAIN RELAY
TERMINAL C
AIR PUMP RELAY
PCM
4
3
E
6
A
3
5
8
7
4O
MAIN RELAY
A
E
C
D
AIR PUMP RELAY
WIRING HARNESS-SIDE
CONNECTOR
B
E
C
A
D
PCM
WIRING HARNESS-SIDE
CONNECTOR
4X
4U
4P
4M
4J
4D
4A
4Y
4V
4S
4Q
4N
4K
4H
4E
4B
4Z
4W
4T
4O
4L
4I
4F
4C

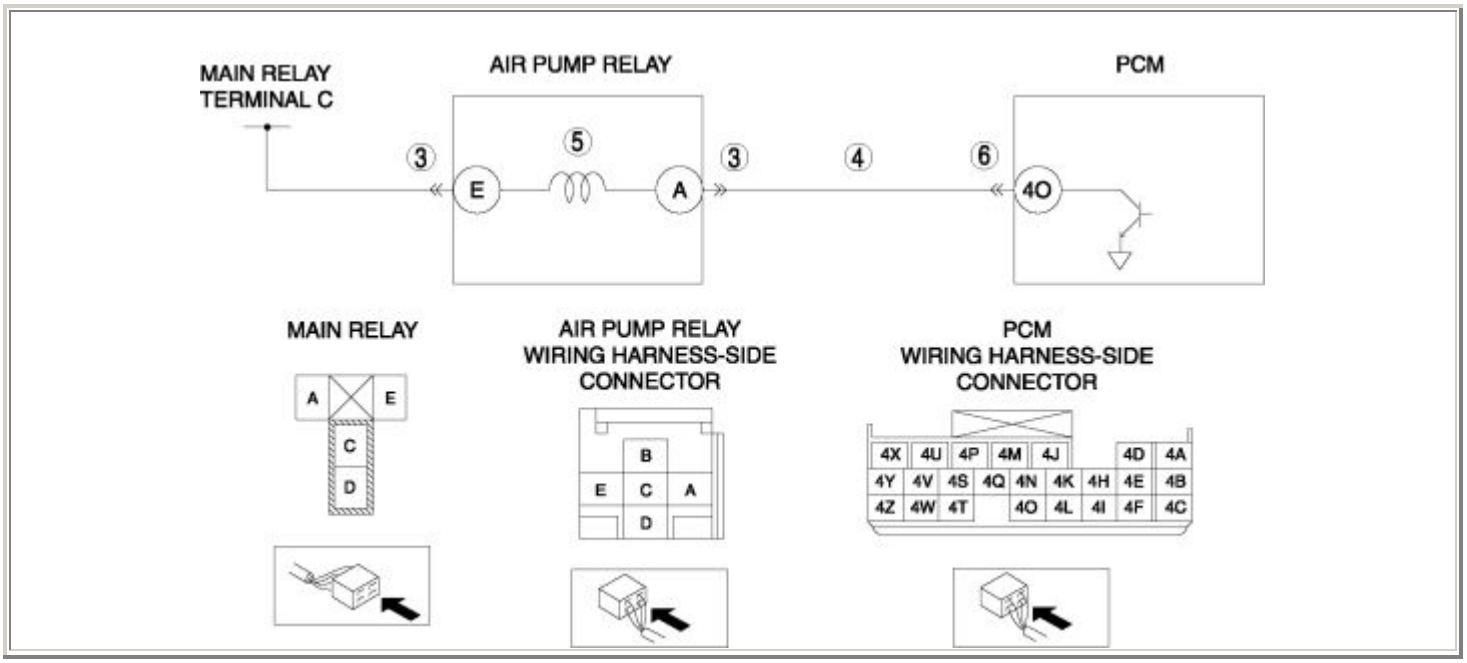
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT AIR PUMP RELAY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the AIR pump relay connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT AIR PUMP RELAY POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between AIR pump relay terminal E (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 9.
5	INSPECT AIR PUMP RELAY CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between AIR pump relay terminal A (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.

6	INSPECT AIR PUMP RELAY • Inspect the AIR pump relay. (See RELAY INSPECTION .) • Is there any malfunction ?	Yes	Replace the AIR pump relay , then go to Step 9. (See RELAY LOCATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT AIR PUMP RELAY CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between AIR pump relay terminal A (wiring harness-side) and PCM terminal 4O (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P2257 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2258

DTC P2258	AIR pump relay control circuit high
DETECTION CONDITION	• The PCM monitors the AIR pump relay control voltage when the AIR pump is operating. If the control voltage is **more than 11.5 V** , the PCM determines that the AIR pump relay control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• AIR pump relay malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between AIR pump relay terminal A and PCM terminal 4O • PCM malfunction


MAIN RELAY
TERMINAL C
AIR PUMP RELAY
PCM
3
5
3
4
6
E
A
4O
MAIN RELAY
AIR PUMP RELAY
WIRING HARNESS-SIDE
CONNECTOR
PCM
WIRING HARNESS-SIDE
CONNECTOR
A
E
C
D
B
E
C
A
D
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

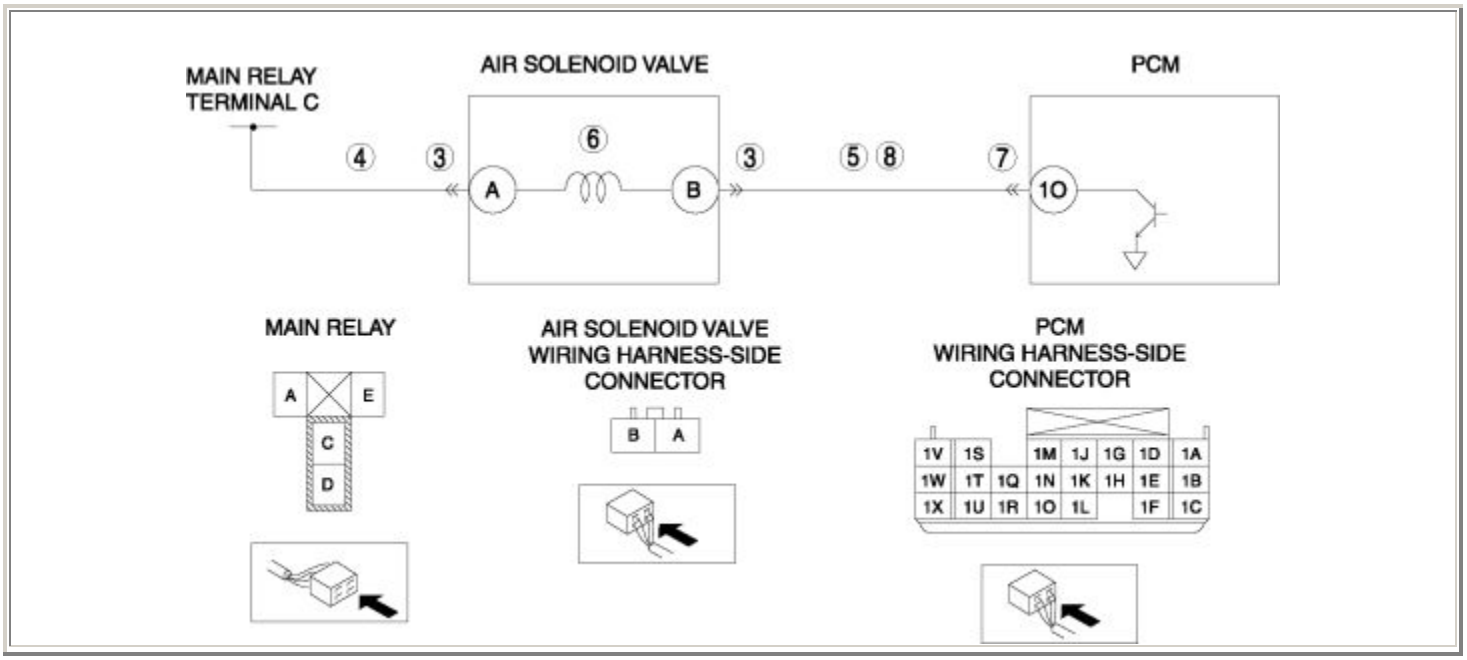
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT AIR PUMP RELAY CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the AIR pump relay connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT AIR PUMP RELAY CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between AIR pump relay terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT AIR PUMP RELAY • Inspect the AIR pump relay. (See RELAY INSPECTION .) • Is there any malfunction ?	Yes	Replace the AIR pump relay , then go to Step 7. (See RELAY LOCATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to the next step.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P2258 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Soak the vehicle in a place that is at a temperature of **approx. 25 °C {77 °F}** for **more than 6 hours** . • Start the engine. • Verify the SAIR_EVAL PID to Yes. ▪ If not, soak the vehicle again. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2259

DTC P2259	AIR solenoid valve control circuit low
DETECTION CONDITION	• The PCM monitors the AIR solenoid valve control voltage when the AIR pump is not operating. If the control voltage is **less than 5.8 V** , the PCM determines that the AIR solenoid valve control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• AIR solenoid valve malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and AIR solenoid valve terminal A • Short to GND in wiring harness between main relay terminal C and AIR solenoid valve terminal A • Open circuit in wiring harness between AIR solenoid valve terminal B and PCM terminal 1O • Short to GND in wiring harness between AIR solenoid valve terminal B and PCM terminal 1O • PCM malfunction


MAIN RELAY
TERMINAL C
AIR SOLENOID VALVE
PCM
4
3
6
A
B
3
5
8
7
1O
MAIN RELAY
A
E
C
D
AIR SOLENOID VALVE
WIRING HARNESS-SIDE
CONNECTOR
B
A
PCM
WIRING HARNESS-SIDE
CONNECTOR
1V 1S 1M 1J 1G 1D 1A
1W 1T 1Q 1N 1K 1H 1E 1B
1X 1U 1R 1O 1L 1F 1C

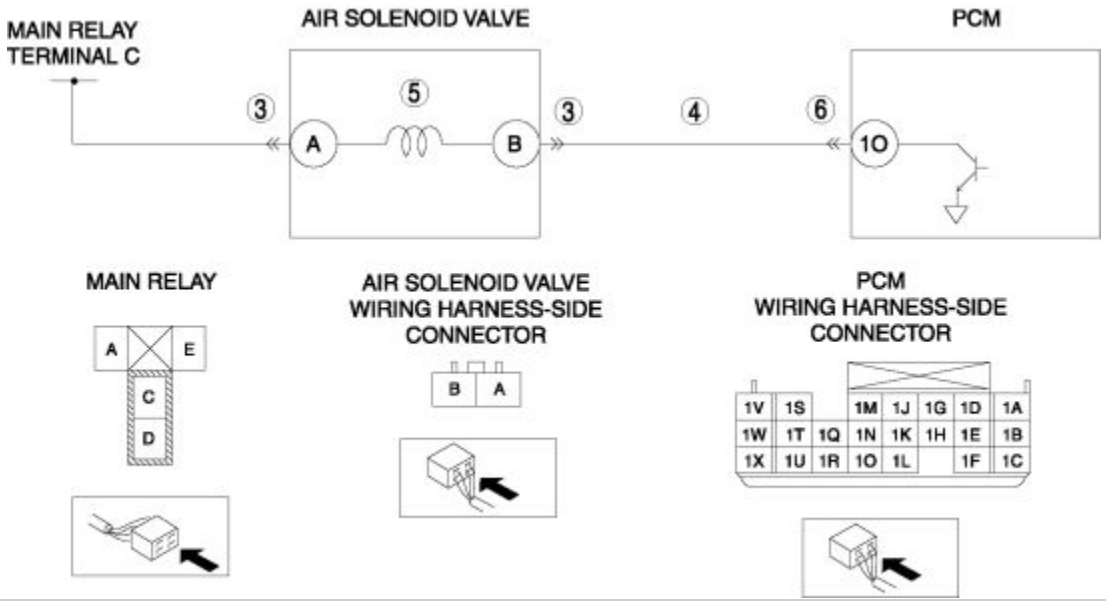
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT AIR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the AIR solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT AIR SOLENOID VALVE POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between AIR solenoid valve terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 9.
5	INSPECT AIR SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between AIR solenoid valve terminal B (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.

6	INSPECT AIR SOLENOID VALVE • Inspect the AIR solenoid valve. (See SECONDARY AIR INJECTION (AIR) SOLENOID VALVE INSPECTION .) • Is there any malfunction ?	Yes	Replace the AIR solenoid valve, then go to Step 9. (See SECONDARY AIR INJECTION (AIR) SOLENOID VALVE REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT AIR SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between AIR solenoid valve terminal B (wiring harness-side) and PCM terminal 1O (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P2259 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2260

DTC P2260	AIR solenoid valve control circuit high
DETECTION CONDITION	• The PCM monitors the AIR solenoid valve control voltage when the AIR pump is operating. If the control voltage is **more than 11.5 V** , the PCM determines that the AIR solenoid valve control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• AIR solenoid valve malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between AIR solenoid valve terminal B and PCM terminal 1O • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT AIR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the AIR solenoid valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT AIR SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between AIR solenoid valve terminal B (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT AIR SOLENOID VALVE • Inspect the AIR solenoid valve. (See SECONDARY AIR INJECTION (AIR) SOLENOID VALVE	Yes	Replace the AIR solenoid valve, then go to Step 7. (See SECONDARY AIR INJECTION (AIR) SOLENOID VALVE REMOVAL/INSTALLATION .)

	(AIR) SOLENOID VALVE INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P2260 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Soak the vehicle in a place that is at a temperature of **approx. 25 °C {77 °F}** for **more than 6 hours** . • Start the engine. • Verify the SAIR_EVAL PID to Yes. ▪ If not, soak the vehicle again. • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2270

DTC P2270	Rear HO2S signal stuck lean
DETECTION CONDITION	• The PCM monitors the input voltage from the rear HO2S when the following conditions are met. If the input voltage is **more than 0.9 V** for **40 s** , the PCM determines that the rear HO2S signal remains lean. **MONITORING CONDITION** ▪ ECT: **more than 70 °C {158 °F}** ▪ Engine speed: **more than 1,500 rpm** ▪ MAF amount: **more than 10 g/s {1.32 lb/min}** ▪ Short term fuel trim: **-20—20 %** ▪ Long term fuel trim: **-15—15 %** ▪ Target A/F feedback system status: feedback control **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage exhaust gas • Rear HO2S malfunction • Purge solenoid valve malfunction • Fuel injector malfunction • Leakage engine coolant • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P2270 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S12 PID. • Read the O2S12 PID under following accelerator pedal conditions (in PARK or NEUTRAL). ▪ **More than 0.55 V** when suddenly depress accelerator pedal (rich condition). ▪ **Less than 0.55 V** just after release of accelerator pedal (lean condition). • Is the PID normal?	No	Visually inspect for the the exhaust gas leakage between TWC and rear HO2S. • If there is no leakage, replace the rear HO2S. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .) Then go to Step 10.
6	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Go to the next step.
		No	Go to Step 10.
7	INSPECT PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 10. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
8	INSPECT FUEL INJECTOR • Inspect the fuel injector. (See FUEL INJECTOR INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel injector, then go to Step 10. (See FUEL INJECTOR REMOVAL/INSTALLATION .)
		No	Go to the next step.

9	INSPECT ENGINE COOLANT PASSAGE FOR ENGINE COOLANT LEAKAGE • Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See ENGINE COOLANT LEAKAGE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
10	VERIFY TROUBLESHOOTING OF DTC P2270 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
11	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2271

DTC P2271	Rear HO2S signal stuck rich
DETECTION CONDITION	• The PCM monitors the input voltage from the rear HO2S when the following conditions are met. If the input voltage is **less than 0.4 V** for **40 s** , the PCM determines that the rear HO2S signal remains rich. **MONITORING CONDITION** ▪ ECT: **more than 70 °C {158 °F}** ▪ Engine speed: **more than 1,500 rpm** ▪ MAF amount: **more than 10 g/s {1.32 lb/min}** ▪ Short term fuel trim: **-20—20 %** ▪ Long term fuel trim: **-15—15 %** ▪ Target A/F feedback system status: feedback control **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Rear HO2S malfunction • Front HO2S heater malfunction • Rear HO2S heater malfunction • Fuel pump control malfunction • Fuel pressure malfunction • Fuel injector malfunction • Leakage exhaust gas • Purge solenoid valve malfunction • Purge solenoid valve hoses improper connection • AIR system malfunction • Insufficient compression ▪ Engine oil malfunction ▪ Rised oil pressure ▪ Metering oil pump malfunction ▪ Metering oil pump control malfunction ▪ Engine malfunction

	• PCM malfunction

Notes:

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTC • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE .)
		No	Go to the next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P2271 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See DTC TABLE .)
5		Yes	Go to the next step.

	VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S • Connect the WDS or equivalent to the DLC-2. • Start the engine and warm it up completely. • Access the O2S12 PID. • Read the O2S12 PID under following accelerator pedal condition (in PARK or NEUTRAL). ▪ **More than 0.55 V** when accelerator pedal is suddenly depressed (rich condition). ▪ **Less than 0.55 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	No	Visually inspect for the the gas leakage between TWC and rear HO2S. • If there is no leakage, replace the rear HO2S. (See REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION .) Then go to Step 21.
6	INSPECT PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION .) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 21. (See INTAKE-AIR SYSTEM HOSE ROUTING DIAGRAM .)
		No	Go to the next step.
7	INSPECT AIR SYSTEM OPERATION • Perform the "AIR System Inspection". (See Secondary Air Injection (AIR) System Inspection .) • Does AIR system operate properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to the inspection results. Then go to Step 21
8	INSPECT FUEL LINE PRESSURE • Perform the "FUEL LINE PRESSURE INSPECTION". (See FUEL LINE PRESSURE INSPECTION .) • Is there any malfunction ?	Yes	Go to the next step.
		No	Go to Step 10.
9	INSPECT FUEL SYSTEM FOR FUEL LEAKAGE	Yes	Repair or replace the malfunctioning part, then go to Step 21.

	• Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	No	Replace the fuel pump unit, then go to Step 21. (See FUEL PUMP UNIT REMOVAL/INSTALLATION .)
10	INSPECT IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT • Inspect the blinking condition on each high-tension lead using timing light at idle. • Do all the high-tension leads show blinking condition?	Yes	Go to Step 14.
		No	Go to the next step.
11	INSPECT HIGH-TENSION LEAD OF NO BLINKING HIGH-TENSION LEAD • Inspect the high-tension leads. (See HIGH-TENSION LEAD INSPECTION .) • Is there any malfunction?	Yes	Replace the malfunctioning high-tension lead, then go to Step 24. (See HIGH-TENSION LEAD REMOVAL/INSTALLATION .)
		No	Go to the next step.
12	INSPECT IGNITION COIL POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between ignition coil terminal C (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 21.
13	INSPECT IGNITION COIL • Inspect the ignition coil. (See IGNITION COIL INSPECTION .) • Is there any malfunction?	Yes	Replace the ignition coil, then go to Step 21. (See IGNITION COIL REMOVAL/INSTALLATION .)
		No	Go to the next step.
14	INSPECT ENGINE COMPRESSION	Yes	Go to the next step.

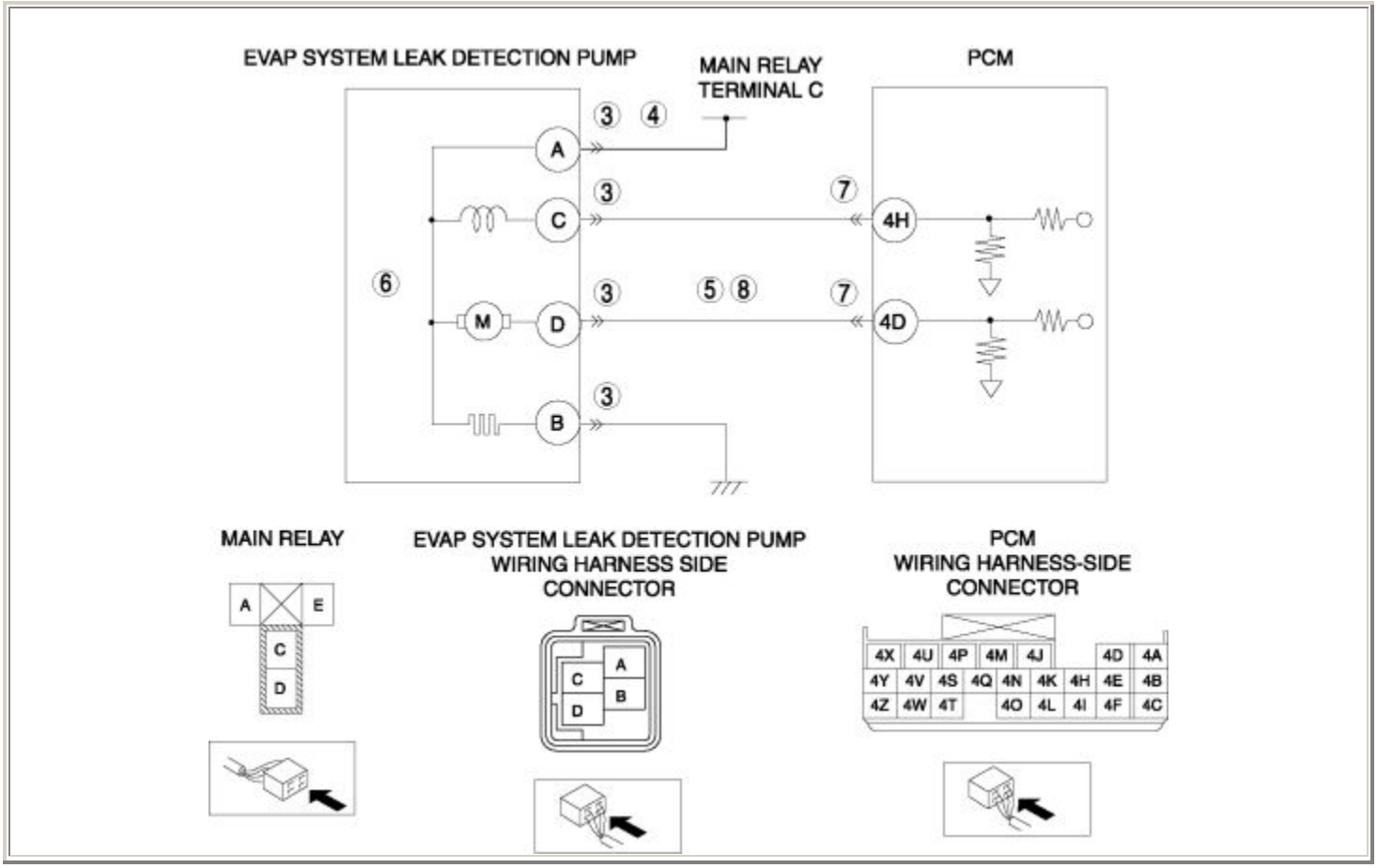
	• Inspect the engine compression. (See COMPRESSION INSPECTION .) • Is there any malfunction?	No	Go to Step 19.
15	INSPECT METERING OIL PUMP • Inspect the metering oil pump. (See METERING OIL PUMP INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 21.
		No	Go to the next step.
16	INSPECT ENGINE OIL CONDITION • Inspect the engine oil condition. • Is the engine oil condition normal?	Yes	Go to the next step.
		No	Replace the engine oil. Inspect the ECT sensor and related harnesses. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION .) Overhaul or replace the engine. Then go to Step 21.
17	INSPECT OIL PRESSURE • Inspect the oil pressure. (See OIL PRESSURE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Overhaul or replace the engine. Then go to Step 21.
		No	Go to the next step.
18	INSPECT OIL PASSAGE • Inspect the oil pipe between metering oil pump and metering oil nozzle. • Is there any malfunction?	Yes	Inspect and repair for leakage and/or clogged in oil passage at engine. Overhaul or replace the engine. Then go to Step 21.
		No	Overhaul or replace the engine. Then go to Step 21.

19	INSPECT FUEL INJECTOR • Inspect the fuel injector. (See FUEL INJECTOR INSPECTION .) • Is there any malfunction?	Yes	Replace the fuel injector, then go to Step 21. (See FUEL INJECTOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
20	INSPECT ENGINE COOLANT PASSAGE FOR ENGINE COOLANT LEAKAGE • Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See ENGINE COOLANT LEAKAGE INSPECTION .) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
21	VERIFY TROUBLESHOOTING OF DTC P2271 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 3. (See OBD-II DRIVE MODE .) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
22	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P24XX

DTC P2401

DTC P2401	EVAP system leak detection pump control circuit low
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the pump load current is less than the specification, the PCM determines that the EVAP system leak detection pump control circuit voltage is low. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay terminal C and EVAP system leak detection pump terminal A • Short to GND in wiring harness between main relay terminal C and EVAP system leak detection pump terminal A • Open circuit in wiring harness between EVAP system leak detection pump terminal D and PCM terminal 4D • Short to GND in wiring harness between EVAP system leak detection pump terminal D and PCM terminal 4D • PCM malfunction


EVAP SYSTEM LEAK DETECTION PUMP
MAIN RELAY TERMINAL C
PCM
A
C
M
D
B
4H
4D
MAIN RELAY
EVAP SYSTEM LEAK DETECTION PUMP WIRING HARNESS SIDE CONNECTOR
PCM WIRING HARNESS-SIDE CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

Diagnostic procedure

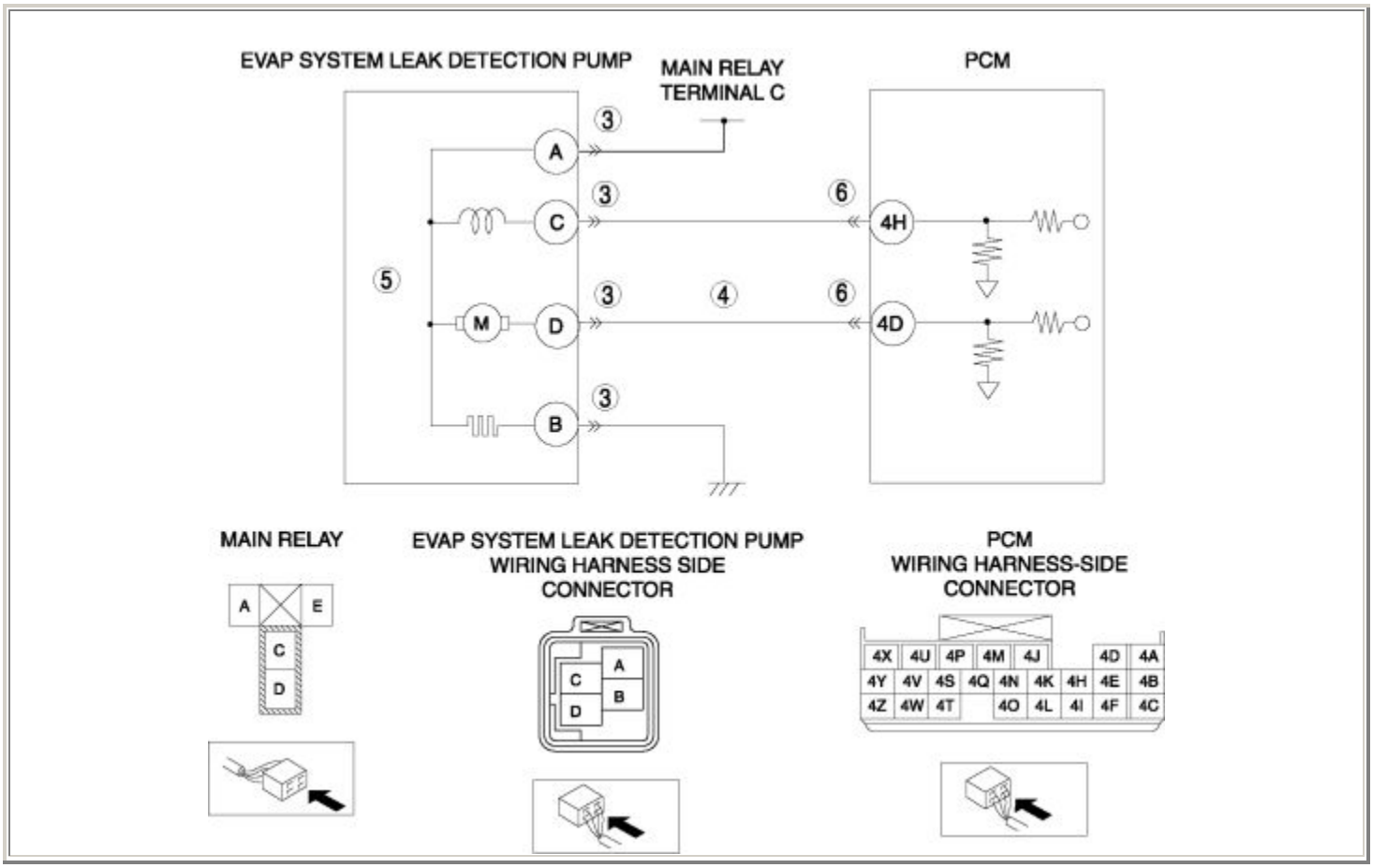
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the EVAP system leak detection pump connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	INSPECT EVAP SYSTEM LEAK DETECTION PUMP POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GND • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between EVAP system leak detection pump terminal A (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to GND, then go to Step 9.
5	INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT FOR SHORT TO	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.

	PUMP CONTROL CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between EVAP system leak detection pump terminal D (wiring harness-side) and body GND. • Is there continuity?	No	Go to the next step.
6	INSPECT EVAP SYSTEM LEAK DETECTION PUMP • Inspect the EVAP system leak detection pump. (See EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION .) • Is there any malfunction ?	Yes	Replace the EVAP system leak detection pump, then go to Step 9. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between EVAP system leak detection pump terminal D (wiring harness-side) and PCM terminal 4D (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
		No	Go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P2401 COMPLETED	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)

	• Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as DTC present?	No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2402

DTC P2402	EVAP system leak detection pump control circuit high
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the pump load current is more than the specification, the PCM determines that the EVAP system leak detection pump control circuit voltage is high. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between EVAP system leak detection pump terminal D and PCM terminal 4D • PCM malfunction


EVAP SYSTEM LEAK DETECTION PUMP
MAIN RELAY TERMINAL C
PCM
A
C
M
D
B
4H
4D
3
4
5
6
MAIN RELAY
A
E
C
D
EVAP SYSTEM LEAK DETECTION PUMP WIRING HARNESS SIDE CONNECTOR
A
B
C
D
PCM WIRING HARNESS-SIDE CONNECTOR
4X 4U 4P 4M 4J 4D 4A
4Y 4V 4S 4Q 4N 4K 4H 4E 4B
4Z 4W 4T 4O 4L 4I 4F 4C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the EVAP system leak detection pump connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between EVAP system leak detection pump terminal D (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT EVAP SYSTEM LEAK DETECTION PUMP • Inspect the EVAP system leak detection pump.	Yes	Replace the EVAP system leak detection pump, then go to Step 7. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)

	pump. (See EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION .) • Is there any malfunction ?	No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P2402 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2404

DTC P2404	EVAP system leak detection pump sense circuit range/performance problem
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the time in which the pump load current reaches the reference current value is not within the specification after the PCM obtains the reference current value, the PCM determines that there is an EVAP system leak detection pump sense circuit range/performance problem. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP hose bending • Air filter clogging • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT EVAP HOSE FOR BENDING • Inspect the EVAP hose for bending. • Is there any malfunction?	Yes	Repair or replace the malfunctioning EVAP hose, then go to Step 5.
		No	Go to the next step.
4	INSPECT AIR FILTER FOR CLOGGING • Inspect the air filter for clogging. (See AIR FILTER INSPECTION .) • Is there any malfunction?	Yes	Replace the air filter, then go to the next step. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	VERIFY TROUBLESHOOTING OF DTC P2404 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.

6	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2405

DTC P2405	EVAP system leak detection pump sense circuit low
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the pump load current is less than the specification while the PCM obtains the reference current value, the PCM determines that the EVAP system leak detection pump sense circuit voltage is low. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction ▪ Orifice fallen off ▪ Pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT EVAP SYSTEM LEAK DETECTION PUMP • Inspect the EVAP system leak detection pump. (See EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION .) • Is there any malfunction ?	Yes	Replace the EVAP system leak detection pump, then go to the next step. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY TROUBLESHOOTING OF DTC P2405 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

DTC P2406

DTC P2406	EVAP system leak detection pump sense circuit high
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the pump load current is more than the specification while the PCM obtains the reference current value, the PCM determines that the EVAP system leak detection pump sense circuit voltage is high. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction ▪ Orifice clogging ▪ Pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT EVAP SYSTEM LEAK DETECTION PUMP • Inspect the EVAP system leak detection pump. (See EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION .) • Is there any malfunction ?	Yes	Replace the EVAP system leak detection pump, then go to the next step. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY TROUBLESHOOTING OF DTC P2406 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

Notes:

DTC P2407

DTC P2407	EVAP system leak detection pump sense circuit intermittent/erratic problem
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the change in pump load current is more than the specification while the PCM obtains the reference current value **28 times** , the PCM determines that there is an EVAP system leak detection pump sense circuit intermittent/erratic problem. • The PCM monitors the pump load current (EVAP line pressure) when the evaporative leak monitor is operating. If the pump load current is kept less than the maximum pump load current after the PCM obtains the reference current value **28 times** , the PCM determines that there is an EVAP system leak detection pump sense circuit intermittent/erratic problem. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction ▪ Heater malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT EVAP SYSTEM LEAK DETECTION PUMP • Inspect the EVAP system leak detection pump. (See EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION .) • Is there any malfunction ?	Yes	Replace the EVAP system leak detection pump, then go to the next step. (See EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM REMOVAL/INSTALLATION .)
		No	Go to the next step.
4	VERIFY TROUBLESHOOTING OF DTC P2407 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Perform the DRIVE MODE 1 and 6. (See OBD-II DRIVE MODE) • Is the PENDING CODE same as DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	VERIFY AFTER REPAIR PROCEDURE	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)

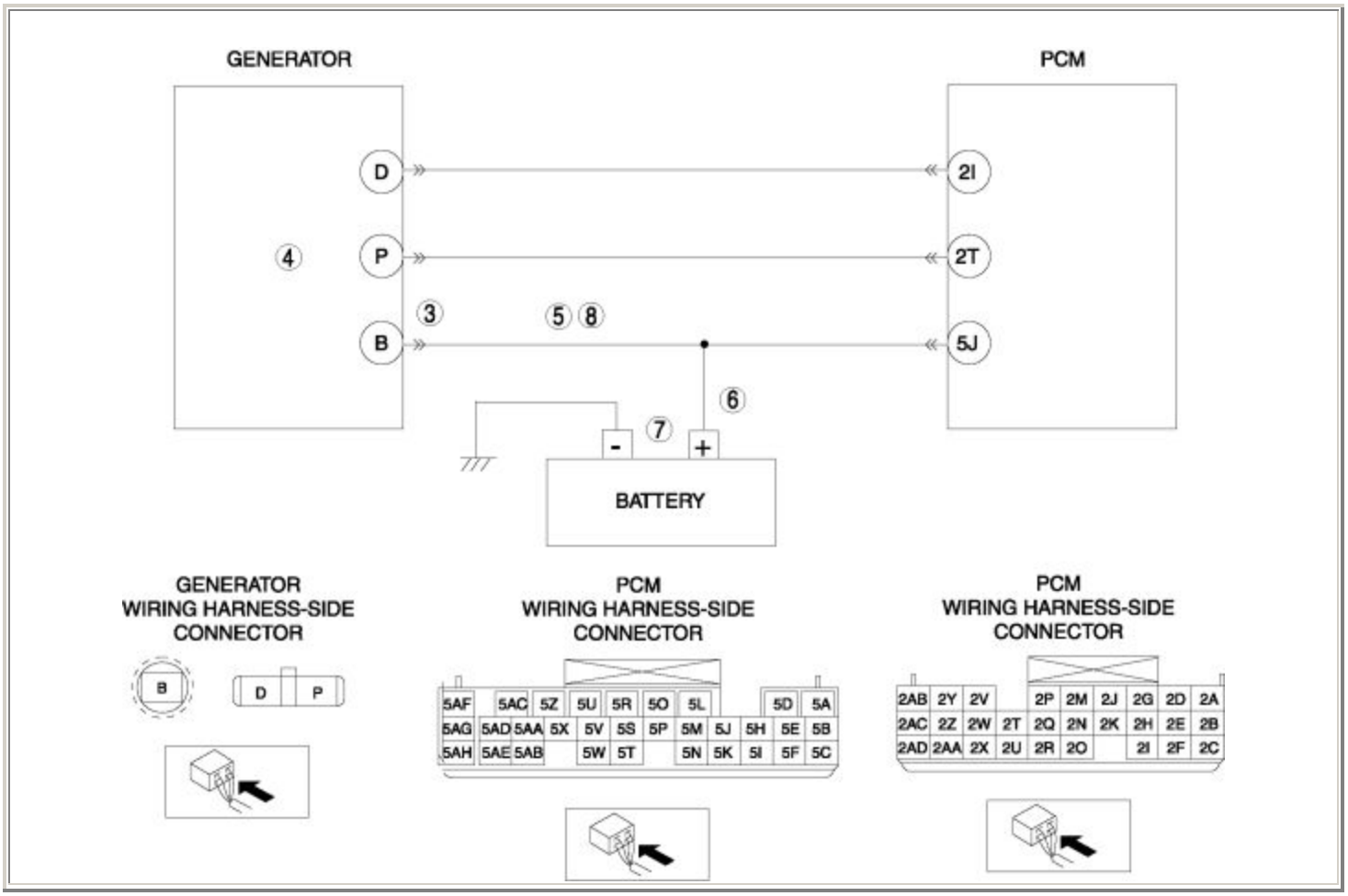
	• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	No	DTC troubleshooting completed.

Notes:

DTC P25XX

DTC P2502

DTC P2502	Charging system voltage problem
DETECTION CONDITION	• The PCM monitors the generator output voltage and the battery voltage when the engine is running. If the generator output voltage is **more than 16.9 V** and the battery voltage is **less than 10.9 V** , the PCM determines that there is a charging system voltage malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Generator malfunction • Battery malfunction • Connector or terminal malfunction • Open circuit in wiring harness between battery positive terminal and generator terminal B • Short to GND in wiring harness between battery positive terminal and generator terminal B • PCM malfunction


GENERATOR
PCM
D
P
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4
3
5 8
2I
2T
5J
6
7
-
+
BATTERY
GENERATOR
WIRING HARNESS-SIDE
CONNECTOR
B
D
P
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

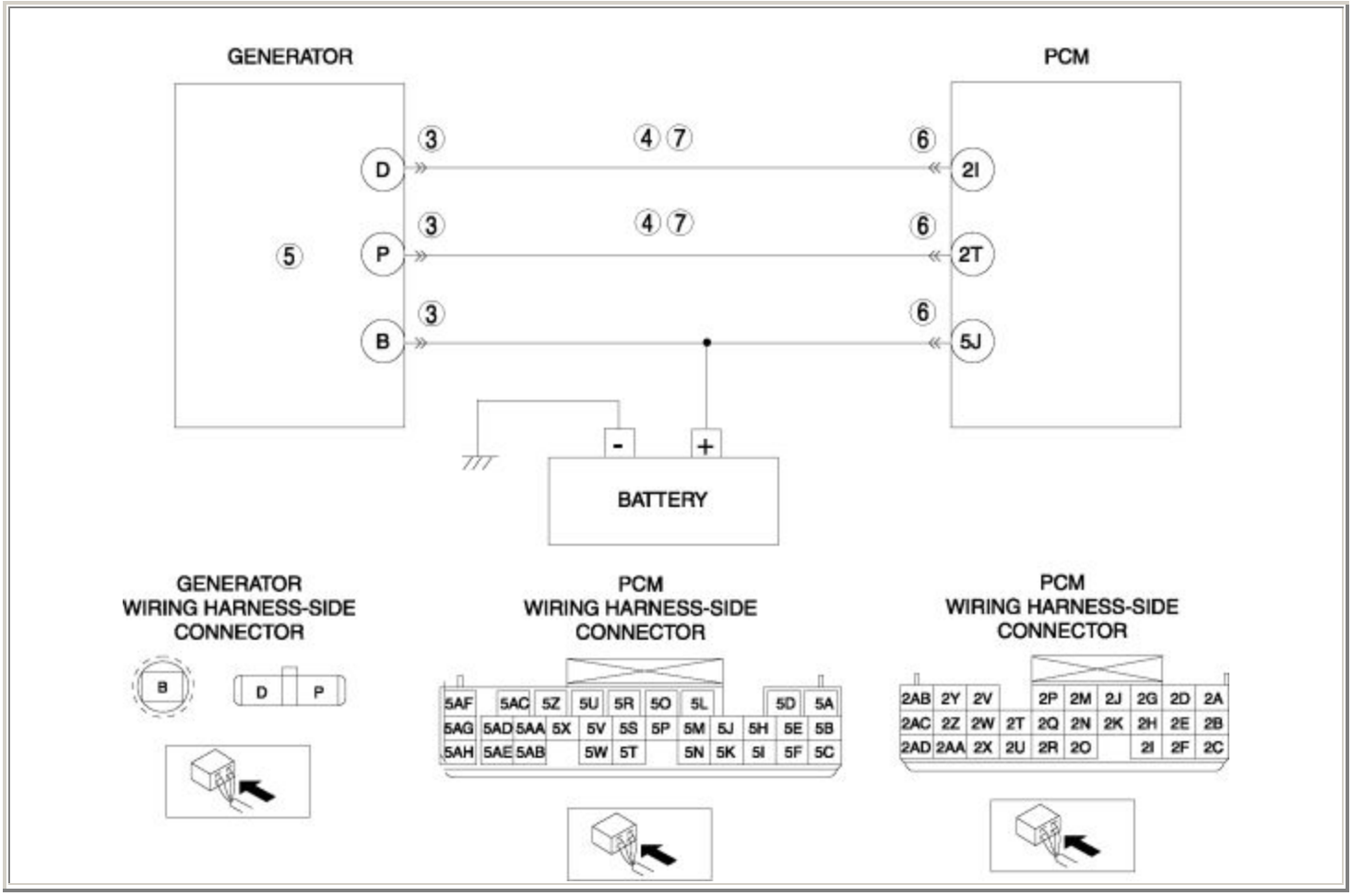
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT GENERATOR TERMINAL FOR POOR INSTALLATION • Turn the ignition switch off. • Inspect for looseness of the generator terminal B. • Is there any malfunction?	Yes	Connect the generator terminal B correctly, then go to Step 9.
		No	Go to the next step.
4	INSPECT GENERATOR • Inspect the generator. (See GENERATOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the generator, then go to Step 9. (See GENERATOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
5	INSPECT CHARGING CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between generator terminal B (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 9.
		No	Go to the next step.
6	INSPECT BATTERY POSITIVE TERMINAL FOR POOR INSTALLATION	Yes	Connect the battery positive terminal correctly, then go to Step 9.

	• Turn the ignition switch off. • Inspect for looseness of the battery positive terminal. • Is there any malfunction?	No	Go to the next step.
7	INSPECT BATTERY • Inspect the battery. (See BATTERY INSPECTION .) • Is there any malfunction?	Yes	Replace the battery, then go to Step 9. (See BATTERY REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	INSPECT CHARGING CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between generator terminal B (wiring harness-side) and battery positive terminal (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
		No	Go to the next step.
9	VERIFY TROUBLESHOOTING OF DTC P2502 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
10	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2503

DTC P2503	Charging system voltage low
DETECTION CONDITION	• The PCM monitors the generator output voltage when the engine is running. If the generator output voltage is **less than 8.5 V** while the PCM needs **more than 19.5 A** from the generator, the PCM determines that the charging system voltage is low. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Generator malfunction • Connector or terminal malfunction • Open circuit in wiring harness between generator terminal D and PCM terminal 2I • Short to GND in wiring harness between generator terminal D and PCM terminal 2I • Open circuit in wiring harness between generator terminal P and PCM terminal 2T • Short to GND in wiring harness between generator terminal P and PCM terminal 2T • PCM malfunction


GENERATOR
PCM
D
P
B
5
3
4 7
6
2I
2T
5J
-
+
BATTERY
GENERATOR
WIRING HARNESS-SIDE
CONNECTOR
B
D
P
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

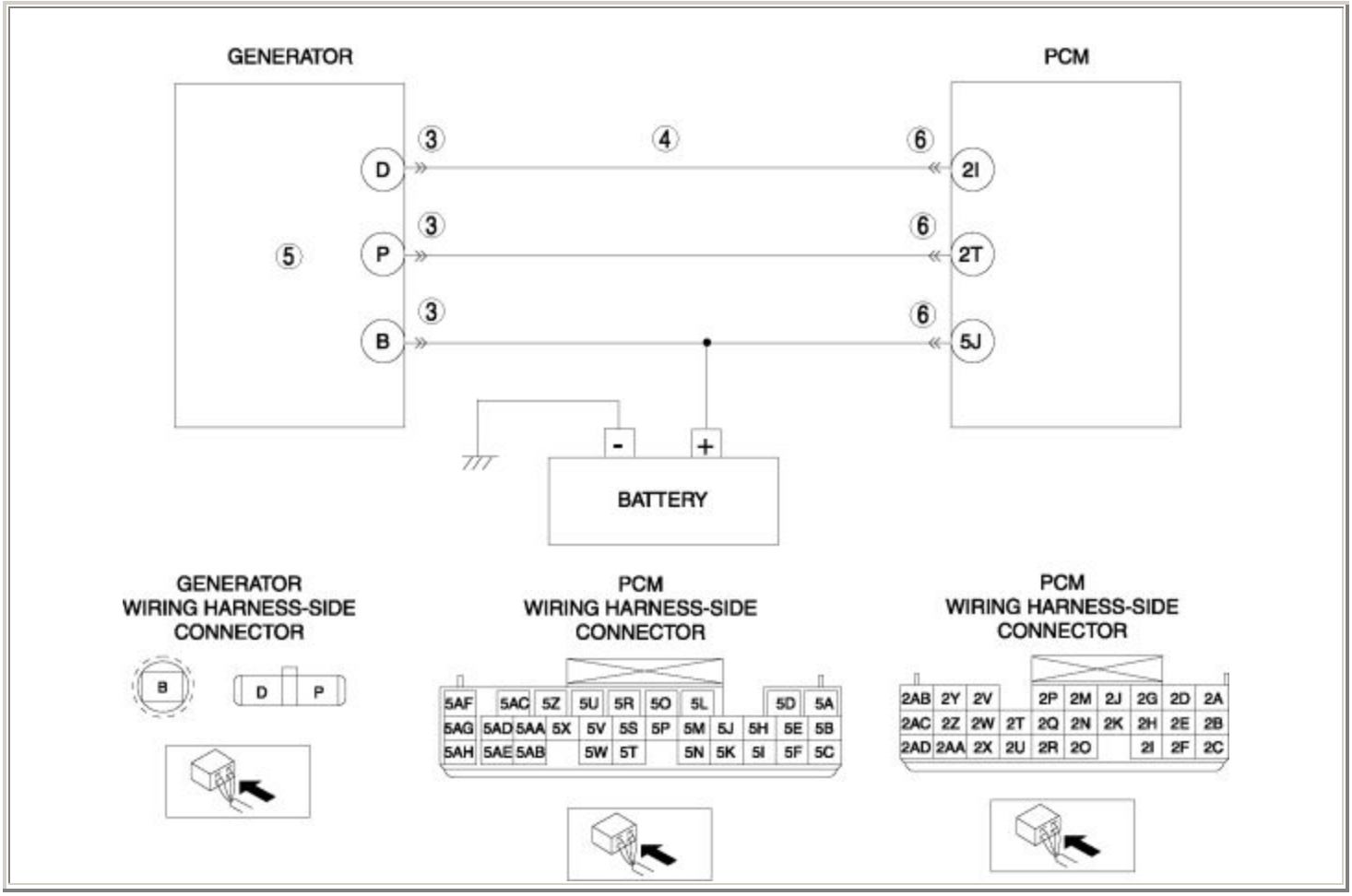
Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the generator connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	INSPECT GENERATOR CIRCUIT FOR SHORT TO GND • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Generator terminal D (wiring harness-side) and body GND ▪ Generator terminal P (wiring harness-side) and body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	INSPECT GENERATOR • Inspect the generator. (See GENERATOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the generator, then go to Step 8. (See GENERATOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
6		Yes	Repair or replace the terminal, then go to Step 8.

	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	INSPECT GENERATOR CIRCUIT FOR OPEN CIRCUIT • Turn the ignition switch off. • Inspect for continuity between the following circuits: ▪ Generator terminal D (wiring harness-side) and PCM terminal 2I (wiring harness-side) ▪ Generator terminal P (wiring harness-side) and PCM terminal 2T (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	VERIFY TROUBLESHOOTING OF DTC P2503 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

DTC P2504

DTC P2504	Charging system voltage high
DETECTION CONDITION	• The PCM monitors the generator output voltage and the battery voltage when the engine is running. If the generator output voltage is **more than 18.4 V** or the battery voltage is **more than 15.9 V** , the PCM determines that the charging system voltage is high. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Generator malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between generator terminal D and PCM terminal 2I • PCM malfunction


GENERATOR
PCM
3
4
6
D
2I
5
3
6
P
2T
3
6
B
5J
-
+
BATTERY
GENERATOR
WIRING HARNESS-SIDE
CONNECTOR
B
D
P
PCM
WIRING HARNESS-SIDE
CONNECTOR
5AF 5AC 5Z 5U 5R 5O 5L 5D 5A
5AG 5AD 5AA 5X 5V 5S 5P 5M 5J 5H 5E 5B
5AH 5AE 5AB 5W 5T 5N 5K 5I 5F 5C
PCM
WIRING HARNESS-SIDE
CONNECTOR
2AB 2Y 2V 2P 2M 2J 2G 2D 2A
2AC 2Z 2W 2T 2Q 2N 2K 2H 2E 2B
2AD 2AA 2X 2U 2R 2O 2I 2F 2C

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION • Turn the ignition switch off. • Disconnect the generator connector. • Inspect for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between generator terminal D (wiring harness-side) and body GND. • Is the voltage **B+** ?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	INSPECT GENERATOR • Inspect the generator. (See GENERATOR INSPECTION .) • Is there any malfunction ?	Yes	Replace the generator, then go to Step 7. (See GENERATOR REMOVAL/INSTALLATION .)
		No	Go to the next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION	Yes	Repair or replace the terminal, then go to the next step.

	• Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
7	VERIFY TROUBLESHOOTING OF DTC P2504 COMPLETED • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the WDS or equivalent. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION .)
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE .) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE .)
		No	DTC troubleshooting completed.

Notes: