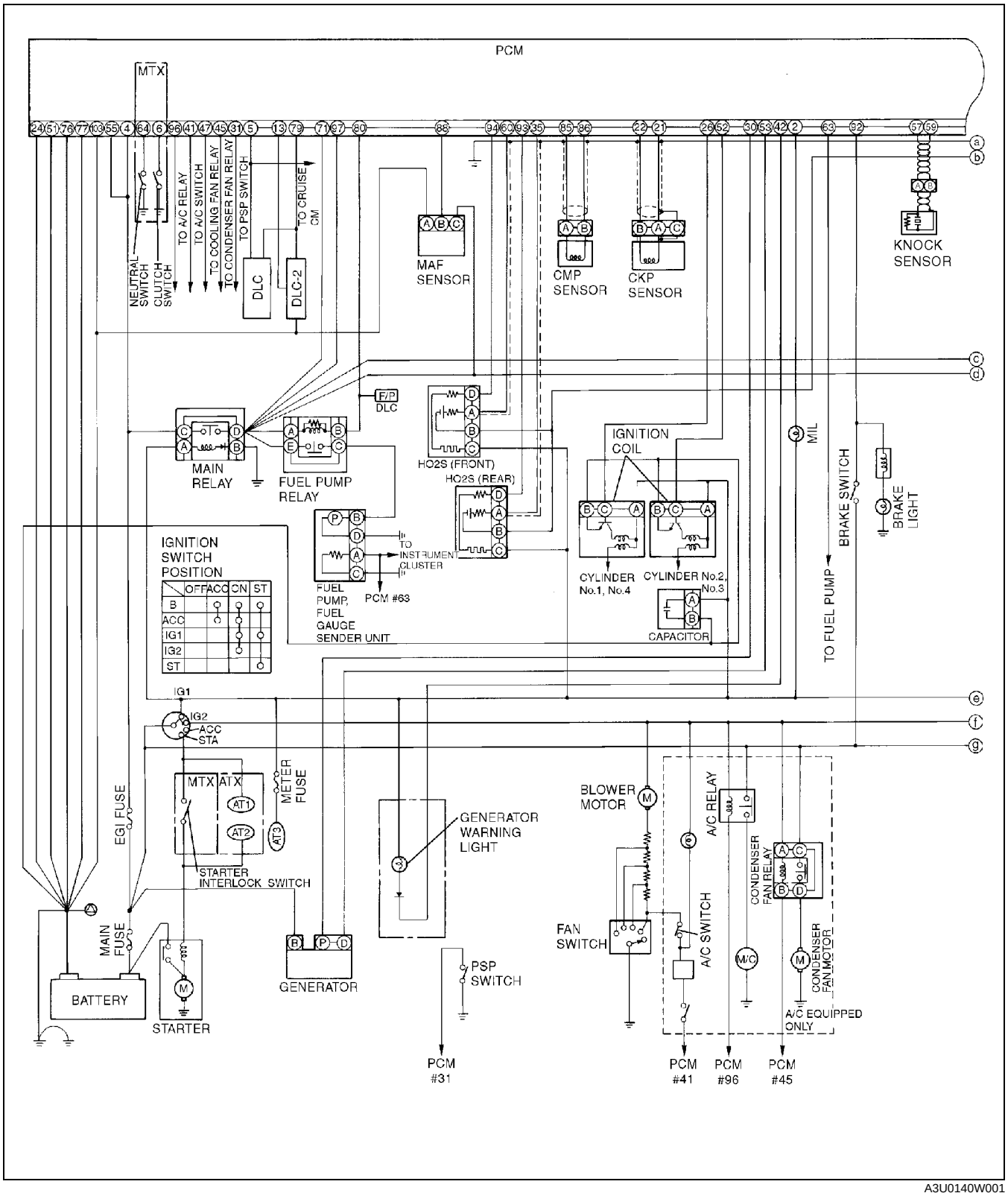
01–02B ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (FS)]

CONTROL SYSTEM WIRING DIAGRAM [FS]

A3U010218881W01



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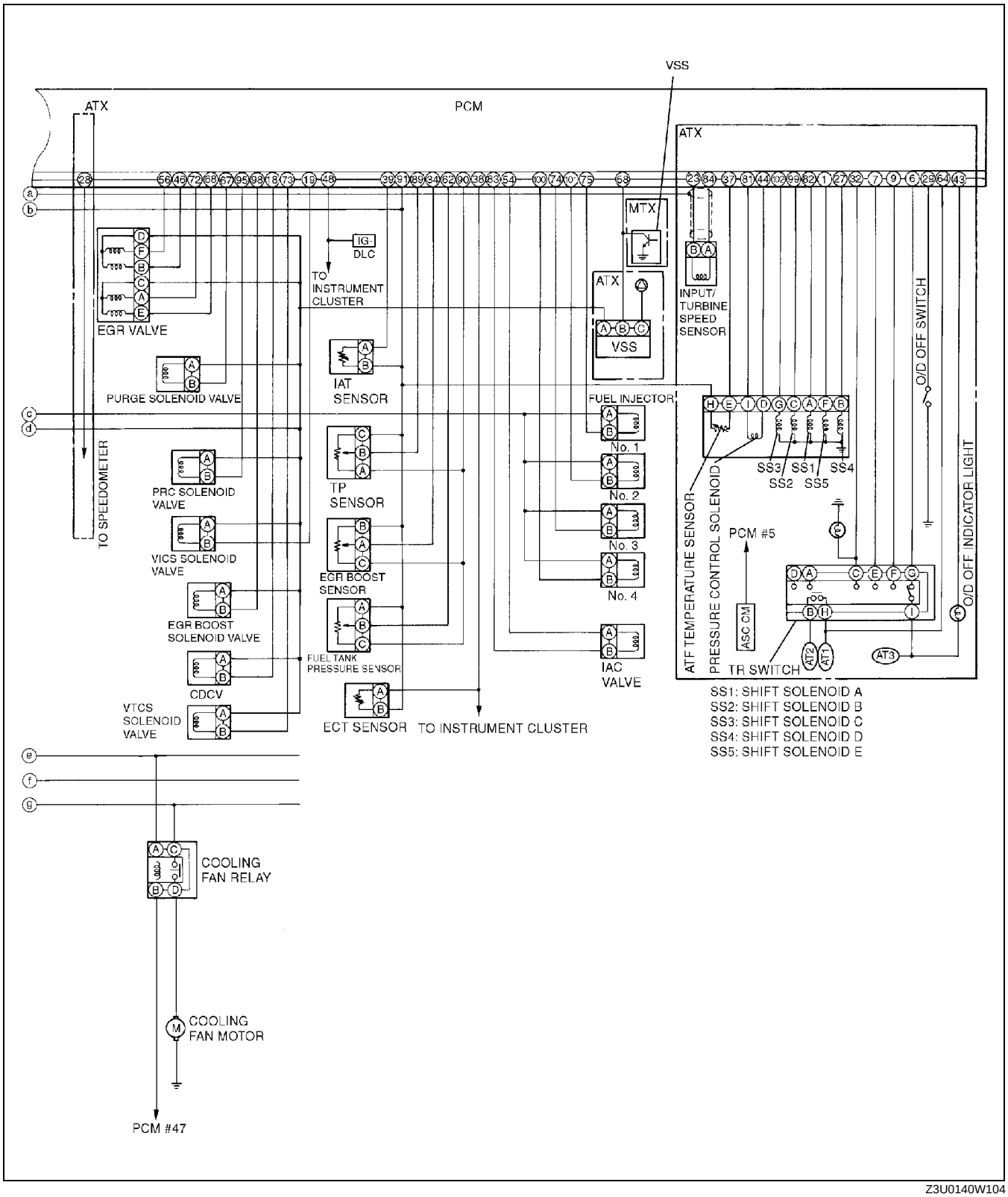


Z3U0140W104

CONTROL SYSTEM DEVICE AND CONTROL RELATIONSHIP CHART [FS]

A3U010218881W02

Engine Control System

Component	Idle air control (IAC)	Fuel injection control	Pressure regulator control (PRC)	Electronic spark advance(ESA) control	Fuel pump control	HO2S heater (front) control	HO2S heater (rear) control	Electric fan control	Purge control	EGR control	VICS	VTCS	A/C cut-out control	Generator control
Input														
Brake switch		x		x										
Refrigerant pressure switch, A/C switch, blower fan switch and A/C amplifier	x	x		x				x					x	
PSP switch	x	x		x									x	
DLC in engine compartment (TEN)	x	x	x	x				x						
Neutral switch (MTX)	x	x	x	x										
Clutch switch (MTX)	x	x	x	x										
TR switch (ATX)	x	x	x	x										
CKP sensor	x	x	x	x	x	x	x	x	x	x	x	x	x	x
CMP sensor	x	x		x										
VSS	x	x		x						x				x
MAF sensor	x	x		x		x	x		x	x				
ECT sensor	x	x	x	x		x	x	x	x	x		x	x	x
IAT sensor	x	x	x	x		x			x	x				x
TP sensor	x	x	x	x		x		x	x	x		x	x	x
EGR boost sensor	x	x							x				x	
Battery positive voltage		x		x		x			x					x
Generator	x			x										x
HO2S (front)		x							x					
HO2S (rear)														
Output														
IAC valve	x													
A/C relay													x	
Cooling fan relay								x						
Condenser fan relay								x						
Fuel pump relay					x									
PRC solenoid valve			x											
Purge solenoid valve									x					
VICS solenoid valve											x			
VTCS solenoid valve												x		
EGR valve										x				
HO2S heater						x	x							
Ignition coils				x										
Fuel injectors		x												
Generator (field coil)														x
Generator warning light														x

Monitoring System

× : Applied

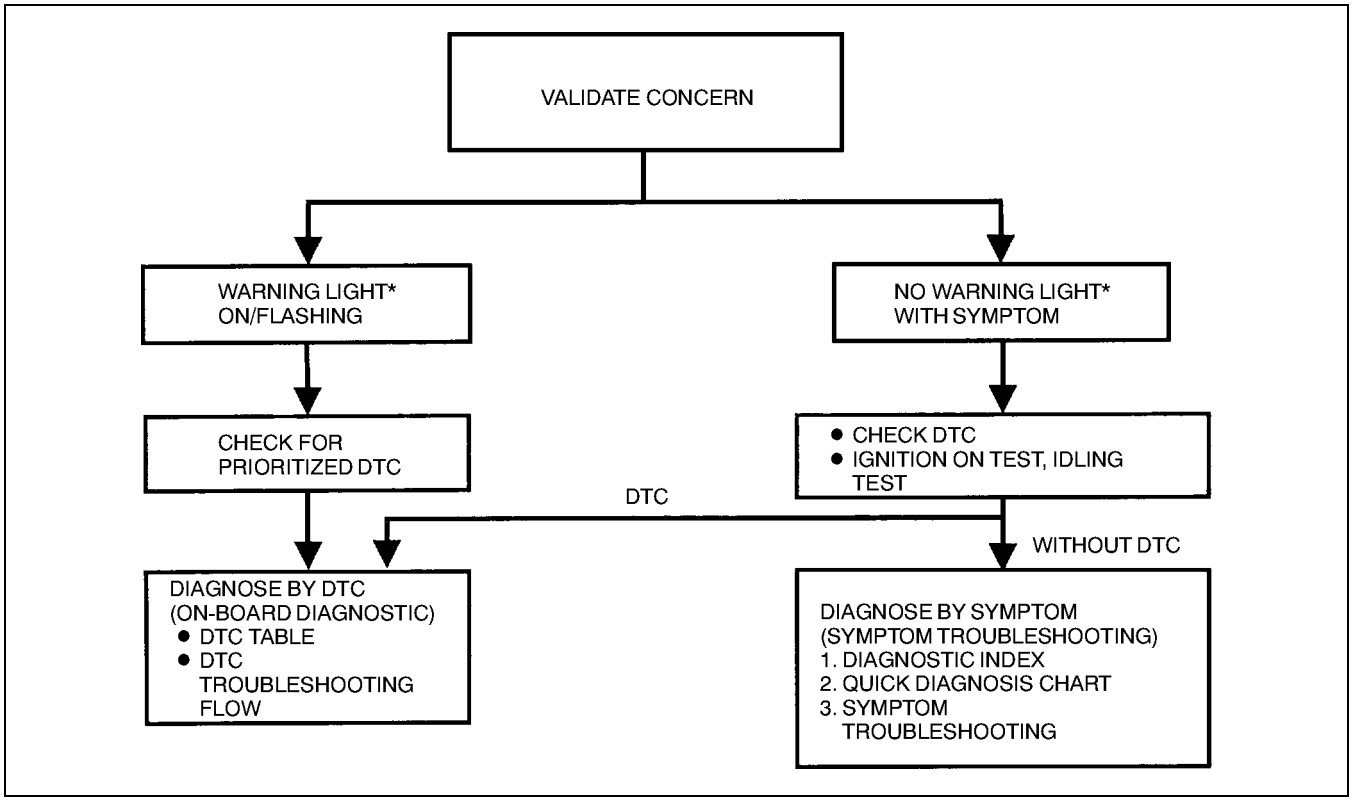
Component	Catalyst monitor	Misfire monitor	Evaporative system monitor	Fuel system monitor	Oxygen sensor monitor	Oxygen sensor heater monitor	EGR system monitor
Input							
Brake switch							
Refrigerant pressure switch, A/C switch, blower fan switch and A/C amplifier		×		×			×
PSP switch		×		×			×
CKP sensor	×	×	×	×	×	×	×
CMP sensor	×	×	×	×	×	×	×
VSS	×	×	×	×	×		×
MAF sensor	×	×	×	×	×	×	×
ECT sensor	×	×	×	×	×	×	×
IAT sensor	×	×	×	×	×		×
TP sensor	×	×	×	×	×		×
EGR boost sensor							×
Fuel level sensor			×				
Fuel gauge sender unit			×				
Rear HO2S	×				×	×	
Front HO2S	×			×	×	×	
Output							
DLC-2 in passenger compartment (Terminal KLN)	×	×	×	×	×	×	×
MIL	×	×	×	×	×	×	×
Purge solenoid valve			×	×	×		
EGR valve							×
EGR boost sensor solenoid valve							×
Canister drain cut valve			×				
Fuel injectors				×			

Y3U102WBC

FOREWORD [FS]

A3U010218881W03

- When the customer reports a vehicle malfunction, check the malfunction indicator light (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - — If the DTC exists, diagnose the applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
  - — If the DTC does not exist and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01–03B–7 SYMPTOM DIAGNOSTIC INDEX [FS].)



YMU102WBX

* : Malfunction Indicator Light (MIL), Generator Warning Light, Security Light

OBD-II PENDING TROUBLE CODES [FS]

A3U010218881W04

- The following functions are generic functions.
- These appear when a problem is detected in a monitored system. The MIL is illuminated when a problem is detected in two consecutive drive cycles. 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 the 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 the second drive cycle too, the PCM judges that the system has failed, deletes the pending code, illuminates the MIL and store the DTC.

OBD-II FREEZE FRAME DATA [FS]

A3U010218881W05

- This is the technical data which indicates the engine's 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 the Misfire or Fuel System DTCs. Once freeze frame data for the Misfire or Fuel System 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 [FS]

A3U010218881W06

- This shows OBD-II systems operating status. If any monitor function is incomplete, WDS or equivalent will identify which monitor function has not been completed. Misfires, Fuel System and Comprehensive Components (CCM) are continuous monitoring-type functions. The catalyst, EGR system, evaporation system and oxygen sensor 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 RESULTS [FS]

A3U010218881W07

- These results from the intermittent monitor system's technical data, which are used to determine whether the system is normal or not. They also display the system's thresholds and diagnostic results. The intermittent monitor system monitors the oxygen sensor, evaporative purge system, catalyst and the EGR system.

OBD-II READ/CLEAR DIAGNOSTIC TEST RESULTS [FS]

A3U010218881W08

- The following are generic functions.
- This retrieves all stored DTCs in the PCM and clears the DTC, Freeze Frame Data, On-Board Readiness Test Results, Diagnostic Monitoring Test Results and Pending Trouble Codes.

OBD-II PARAMETER IDENTIFICATION (PID) ACCESS [FS]

A3U010218881W09

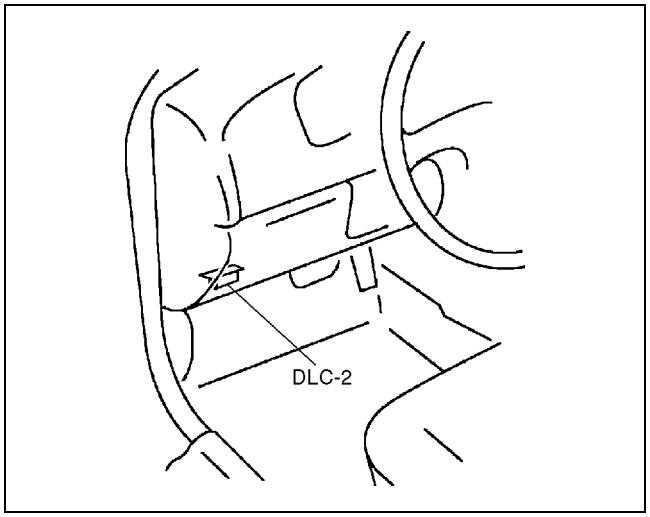
- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since PID values for output devices are PCM internal data values, inspect each device to identify which output devices are malfunctioning.

ON-BOARD DIAGNOSTIC TEST [FS]

A3U010218881W10

DTCs Retrieving Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
3. Retrieve DTC using WDS or equivalent.



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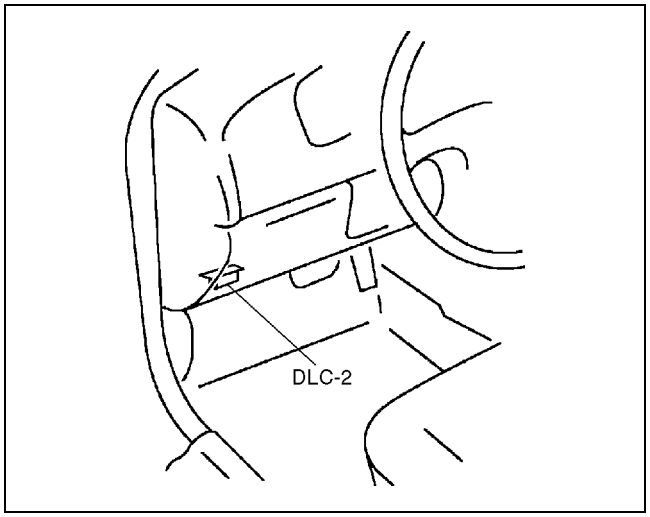
Pending Trouble Code Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
3. Retrieve pending trouble code using WDS or equivalent.



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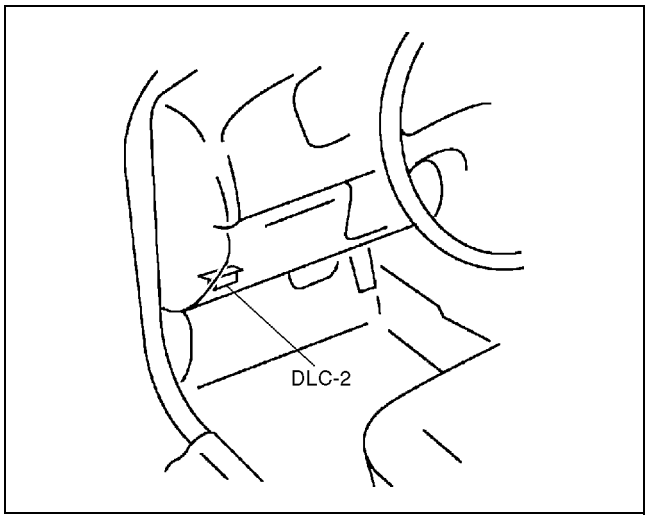
Freeze Frame PID Data Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
3. Retrieve FREEZE FRAME PID DATA using WDS or equivalent.



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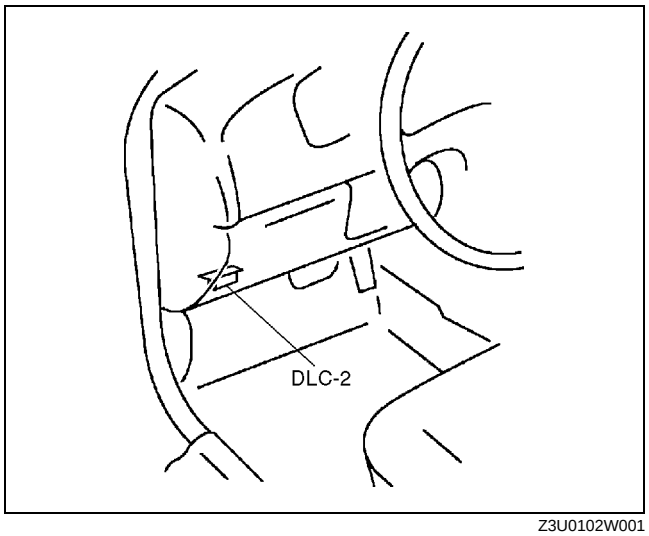
On-Board System Readiness Tests Access Procedure

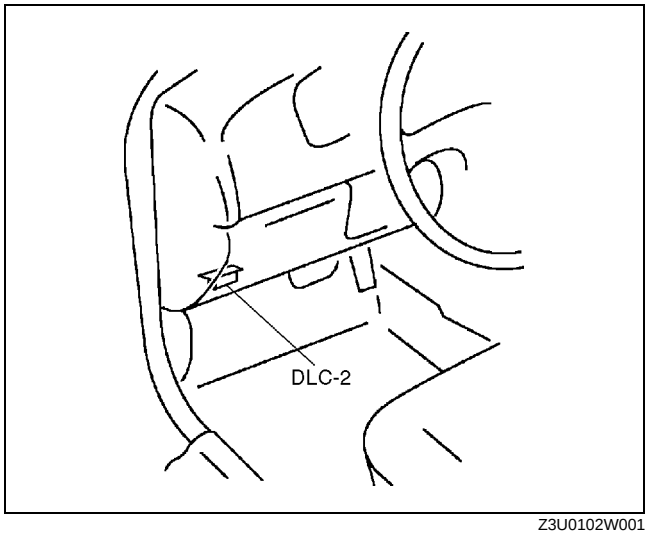
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
3. Monitor the OBD-II system operating status using WDS or equivalent.



Z3U0102W001

PID/DATA Monitor and Record Procedure

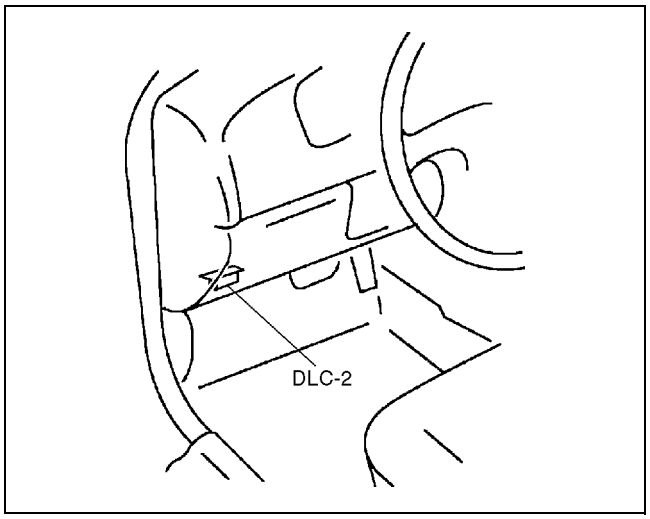
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
3. Access and monitor PIDs using WDS or equivalent.



Z3U0102W001

Diagnostic Monitoring Test Results Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
3. Access the DIAGNOSTIC MONITORING TEST RESULTS and read the test results using WDS or equivalent.

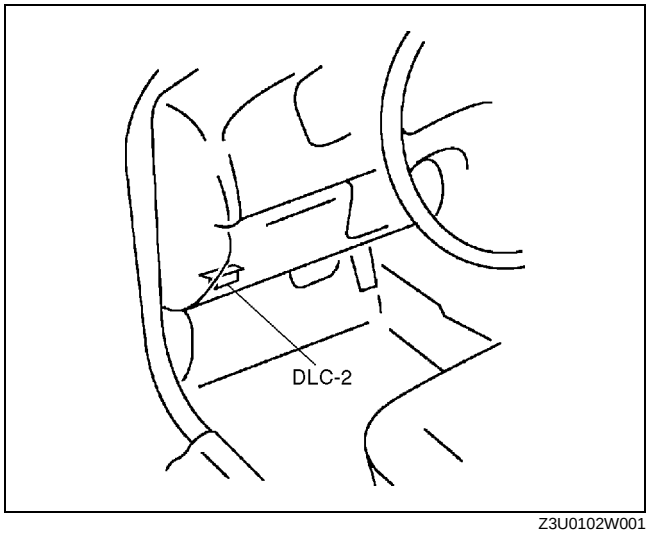


Z3U0102W001

AFTER REPAIR PROCEDURE [FS]

A3U010218881W11

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
2. Cycle the ignition key from OFF to ON.
3. Record DTC if retrieved.
4. Erase all diagnostic data by using WDS or equivalent.



Z3U0102W001

OBD-II DRIVE MODE [FS]

A3U010218881W12

- 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 Drive Mode, the following systems are inspected:
  - — EGR system
  - — Oxygen sensor (HO2S)
  - — Oxygen sensor heater
  - — Catalytic converter (TWC)
  - — Fuel, misfire and evaporative (EVAP) system

Caution

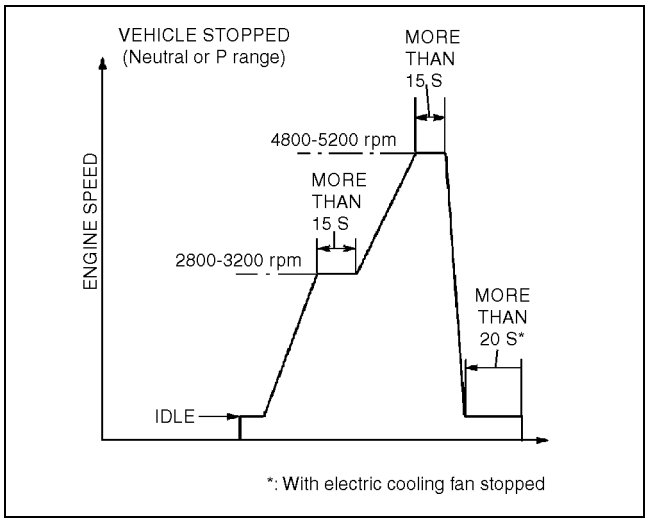
- **While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.**
- **When the WDS or equivalent is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the WDS or equivalent using the PID/DATA MONITOR AND 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:
  1. The OBD-II system detects the malfunction.
  2. The Drive Mode procedure is not completed correctly.
- Disconnecting the battery will reset the memory. Do not disconnect the battery during and after Drive Mode.

Mode 1 (PCM adaptive memory procedure drive mode)

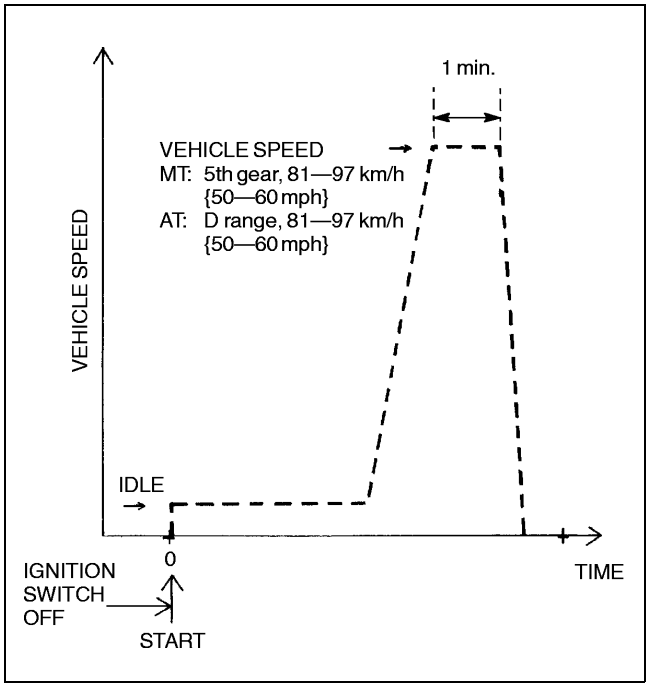
1. Start the engine and warm up completely.
2. Verify the following conditions and correct if necessary.
   - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
   - Initial ignition timing and idle speed are within specification.
   - TEN and GND of DLC are not connected.
3. Perform no load racing at the engine speed shown in the graph, then idle the engine for **more than 20 seconds** after the cooling fan stopped. If possible, monitor RPM PID for engine speed and cooling fan status during this procedure.



Z3U0102W002

Mode 2 (EGR system repair verification drive mode)

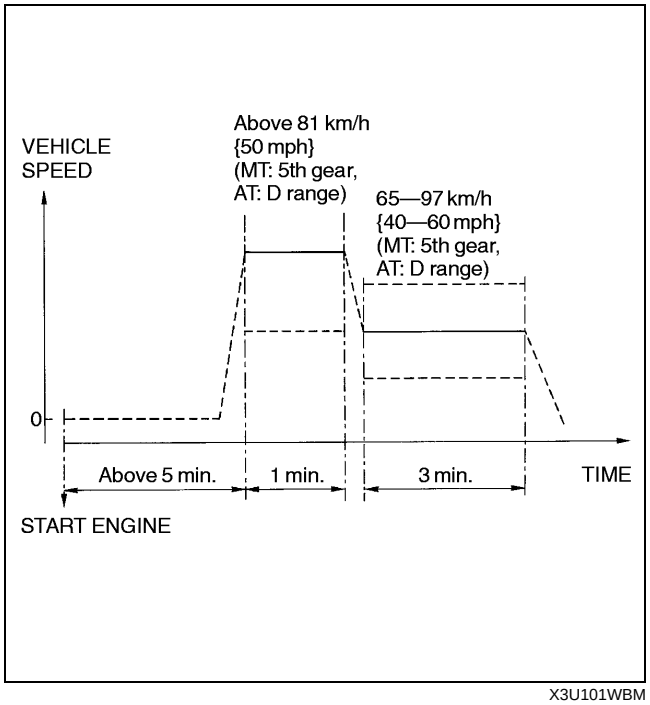
1. Perform Mode 1 first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph.
4. Stop vehicle and access to ON BOARD SYSTEM READINESS menu of GENERIC OBD II FUNCTION to inspect the Drive Mode completion status. If completed, RFC changes from NO to YES.
5. If not completed, turn the ignition key off then go back to Step 3.
6. Access to DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD II FUNCTIONS to inspect the monitor results. If MEAS are not within specification, repair has not completed.
7. Verify no DTCs are available.



X3U101WBL

Mode 3 (HO2S heater, HO2S, and TWC repair verification drive mode)

1. Perform Mode 1 first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph. Driving condition before the constant speed driving is not specified.
4. Stop vehicle and access to ON BOARD SYSTEM READINESS menu of GENERIC OBD II FUNCTION to inspect the Drive Mode completion status. If completed, RFC changes from NO to YES.
5. If not completed, turn the ignition key off then go back to Step 3.
6. Access to DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD II FUNCTIONS to inspect the monitor results. If MEAS are not within specification, repair has not completed.
7. Verify no DTCs are available.

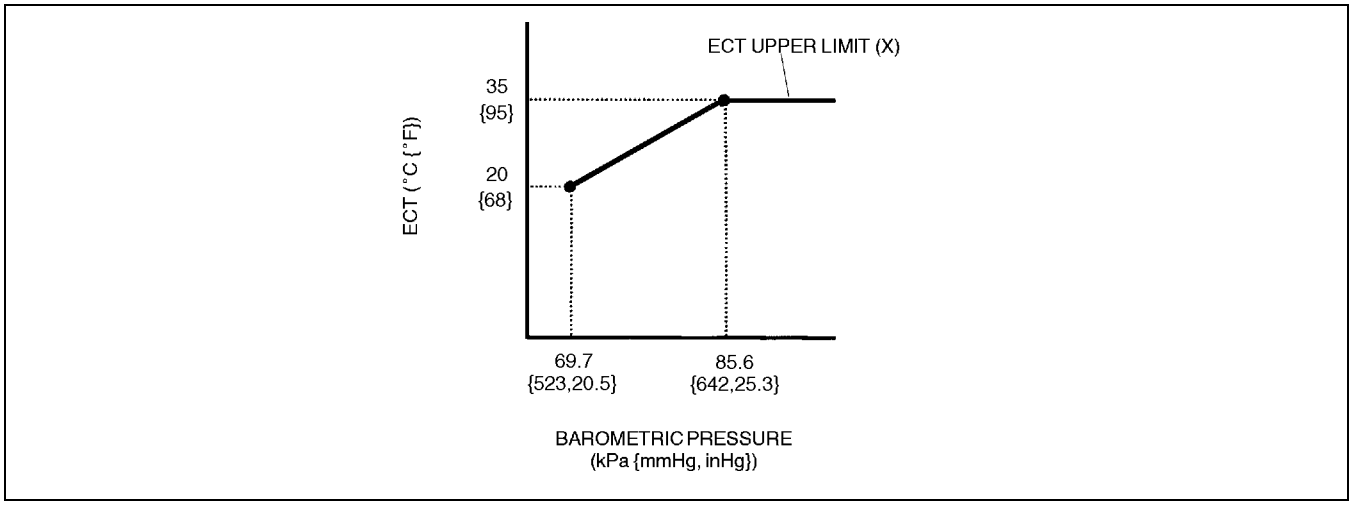


X3U101WBM

Mode 4 (EVAP system repair verification drive mode)

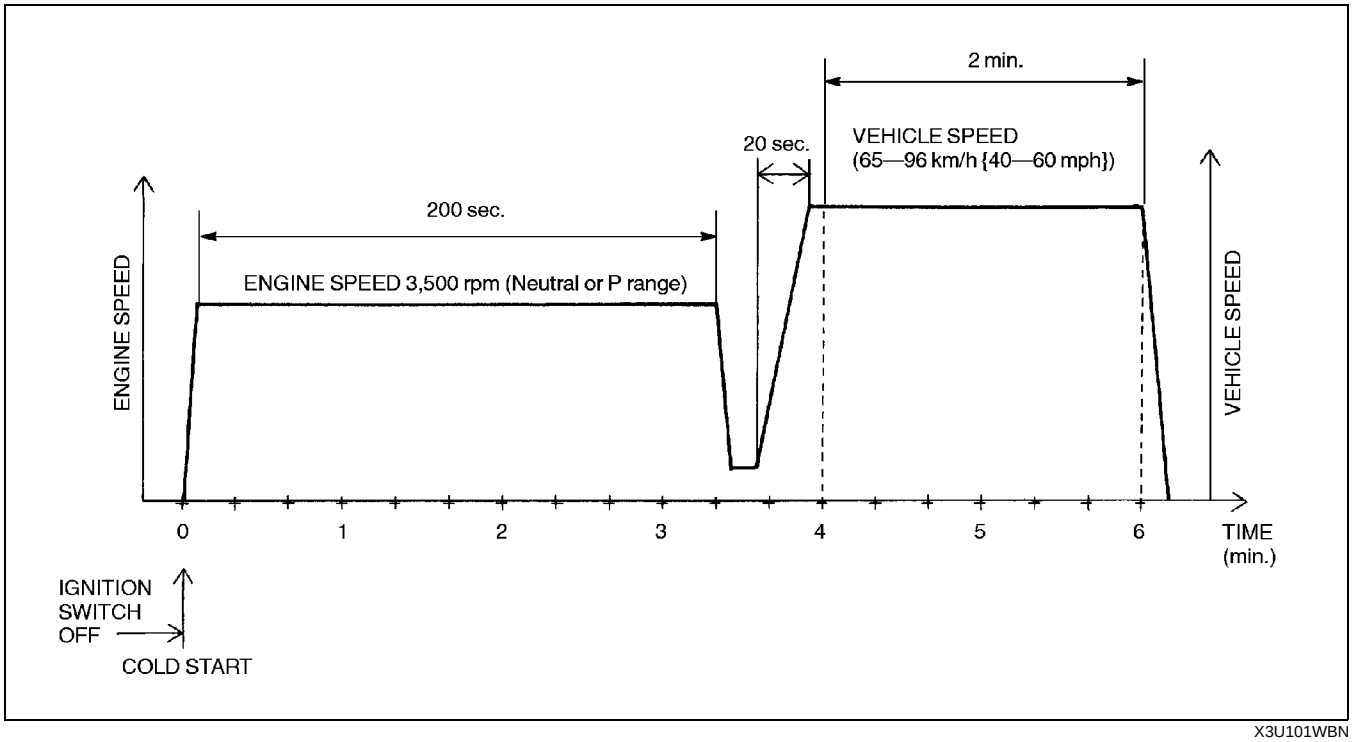
Note
- If Mode 4 can not be performed (you can not drive the vehicle under Mode 4 condition), perform evaporative system test procedure as an alternative. (See 01–03B–54 ENGINE CONTROL SYSTEM OPERATION INSPECTION [FS].)
- Mode 4 can be performed regardless of RFC FLAG condition.

1. Verify that the following conditions are met. All conditions must be within specifications before engine started to initiate the evaporative system test.
   - Barometric pressure: **69.7 kPa {523 mmHg, 20.5 inHg} or higher**
   - Intake air temperature: **–10—60 °C {14—131 °F}**
   - Fuel tank level: **1.3—3.75 V**
   - Engine coolant temperature: **–10 °C—X °C {14 °F—X °F}** (X, the Engine coolant temperature upper limit, is determined according to the barometric pressure as shown the graph below.)



A3U0102W001

2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Start the engine and race it at **3,500 rpm** to warm up completely.
4. Drive the vehicle as shown in the graph.



X3U101WBN

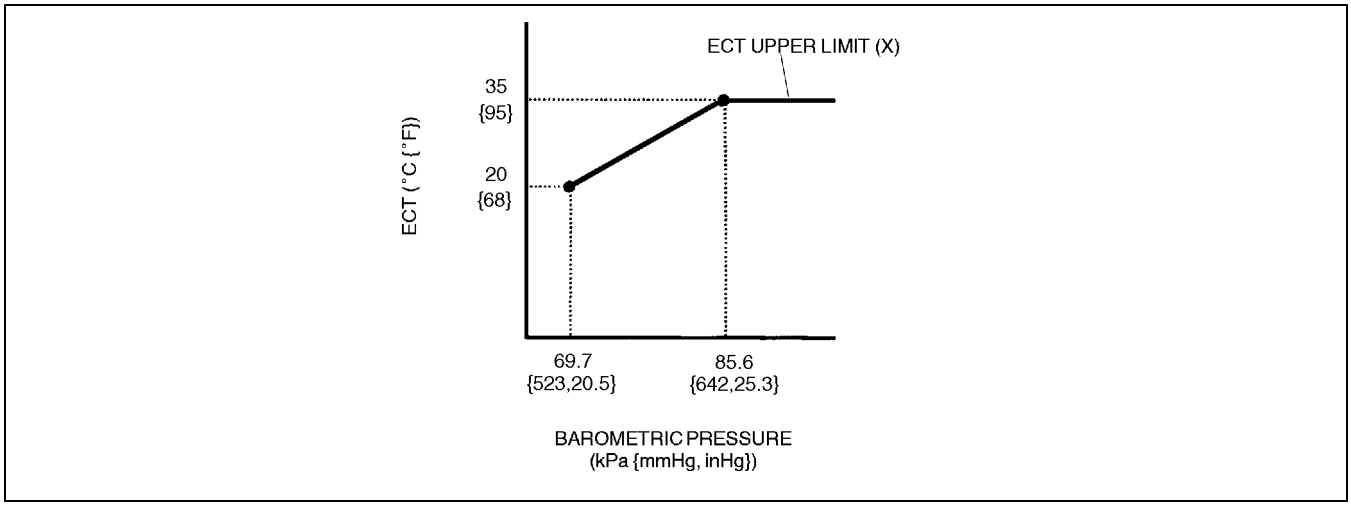
5. Stop vehicle and access to ON BOARD SYSTEM READINESS menu of GENERIC OBD II FUNCTION to inspect the Drive Mode completion status. If completed, RFC changes from NO to YES.
6. If not completed, turn the ignition key off then go back to Step 1.

7. Access to DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD II FUNCTION to inspect the monitor results. If MEAS are not within specification, repair has not completed.
8. Verify no DTCs are available.

Mode 5 (EVAP system very small leak repair verification drive mode)

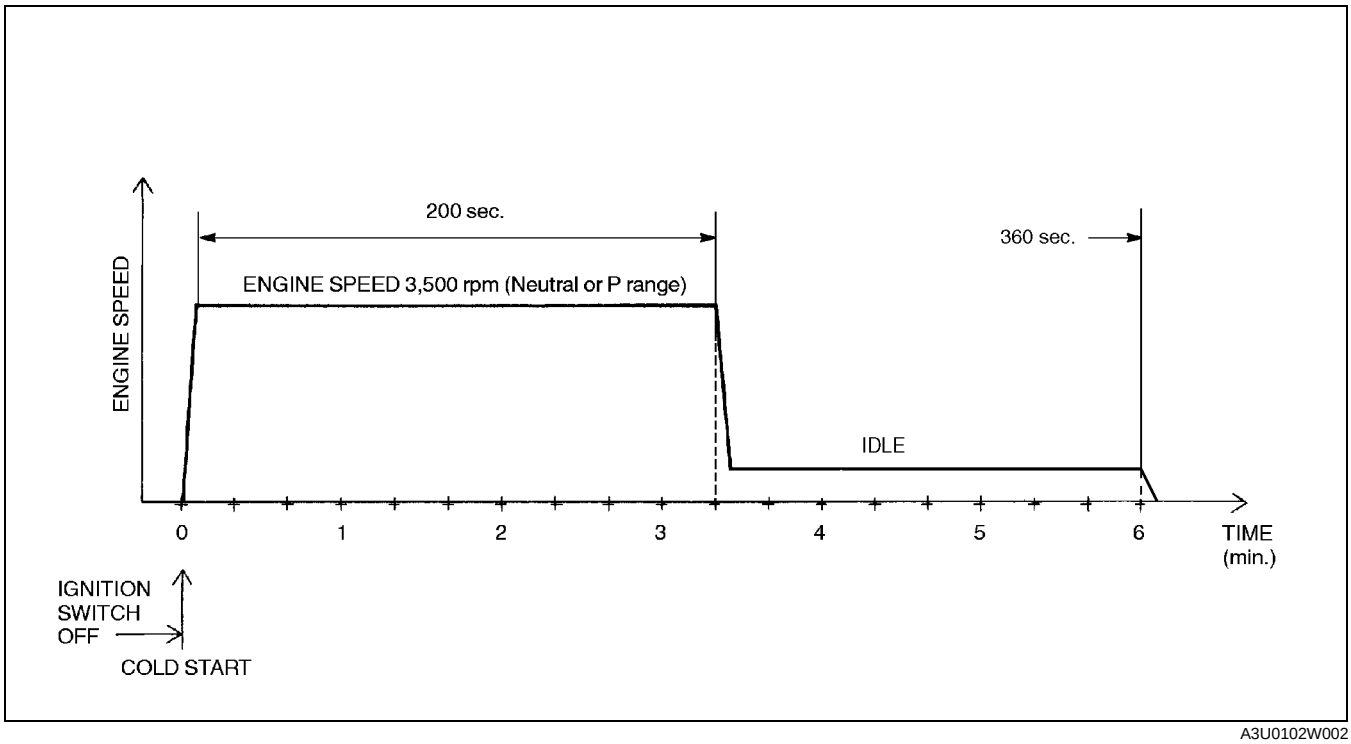
Note
- If Mode 5 can not be performed (you can not drive the vehicle under Mode 5 condition), perform evaporative system test procedure as an alternative. (See 01–03B–54 ENGINE CONTROL SYSTEM OPERATION INSPECTION [FS].)
- Mode 5 can be performed regardless of RFC FLAG condition.

1. Verify that the following conditions are met. All conditions must be within specifications before engine started to initiate the evaporative system test.
   - Barometric pressure: **69.7 kPa {523 mmHg, 20.5 inHg} or higher**
   - Intake air temperature: **–10—60 °C {14—131 °F}**
   - Fuel tank level: **1.3—3.75 V**
   - Engine coolant temperature: **–10 °C—X °C {14 °F—X °F}** (X, the Engine coolant temperature upper limit, is determined according to the barometric pressure as shown the graph below.)



A3U0102W001

2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Start the engine and race it at **3,500 rpm** to warm up completely, then idle the engine for **120 seconds**.



A3U0102W002

4. Stop vehicle and access to ON BOARD SYSTEM READINESS menu of GENERIC OBD II FUNCTION to inspect the Drive Mode completion status. If completed, RFC changes from NO to YES.
5. If not completed, turn the ignition key off then go back to Step 1.
6. Access to DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD II FUNCTION to inspect the monitor results. If MEAS are not within specification, repair has not completed.
7. Verify no DTCs are available.

DIAGNOSTIC MONITORING TEST RESULTS [FS]

A3U010218881W13

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

TEST ID	Description	Related system	Initial value (MEAS)
10:01:11	HO2S (Front) inversion cycles	HO2S	(0)
10:02:11	HO2S (Front) lean-to-rich response time		(0)
10:03:11	HO2S (Front) rich-to-lean response time		(0)
10:04:01	HO2S (Front) rich/lean inversion voltage		113
10:04:02	Middle/HO2S (Rear) rich/lean inversion voltage		113
10:05:01	HO2S (Front) lean threshold voltage		72
10:06:01	HO2S (Front) rich threshold voltage		113
10:11:11	Front and rear HO2S (RH) switching time ratio	TWC	(65535)
10:21:00	In-tank pressure evaporative purge system (small leak)	EVAP	(0)
10:22:00	In-tank pressure evaporative purge system (large leak)		(0)
10:23:00	In-tank pressure evaporative purge system (very small leak)		(0)
10:31:00	Heat radiation ratio	THERMOSTAT	(0)
10:32:00	ECT	THERMOSTAT	(65535)
10:41:00	EGR pressure variation	EGR	(32768)

DTC TABLE [FS]

A3U010218881W14

DTC No.	Condition	MIL	O/D off indicator light	DC	Monitor item	Memory function	Page
P0031	HO2S heater (front) circuit low	ON	—	2	O_2 sensor heater	×	(See 01–02B–19 DTC P0031 [FS])
P0032	HO2S heater (front) circuit high	ON	—	2	O_2 sensor heater	×	(See 01–02B–20 DTC P0032 [FS])
P0037	HO2S heater (rear) circuit low	ON	—	2	O_2 sensor heater	×	(See 01–02B–22 DTC P0037 [FS])
P0038	HO2S heater (rear) circuit high	ON	—	2	O_2 sensor heater	×	(See 01–02B–23 DTC P0038 [FS])
P0101	MAF circuit range/ performance problem	ON	—	2	CCM	×	(See 01–02B–25 DTC P0101 [FS])
P0102	MAF circuit low input	ON	—	1	CCM	×	(See 01–02B–27 DTC P0102 [FS])
P0103	MAF circuit high input	ON	—	1	CCM	×	(See 01–02B–29 DTC P0103 [FS])
P0106	BARO circuit performance problem	ON	—	2	CCM	×	(See 01–02B–30 DTC P0106 [FS])
P0107	BARO circuit low input	ON	—	1	CCM	×	(See 01–02B–31 DTC P0107 [FS])
P0108	BARO circuit high input	ON	—	1	CCM	×	(See 01–02B–34 DTC P0108 [FS])
P0111	IAT circuit performance problem	ON	—	2	CCM	×	(See 01–02B–35 DTC P0111 [FS])
P0112	IAT circuit low input	ON	—	1	CCM	×	(See 01–02B–36 DTC P0112 [FS])
P0113	IAT circuit high input	ON	—	1	CCM	×	(See 01–02B–38 DTC P0113 [FS])
P0117	ECT circuit low input	ON	—	1	CCM	×	(See 01–02B–40 DTC P0117 [FS])
P0118	ECT circuit high input	ON	—	1	CCM	×	(See 01–02B–42 DTC P0118 [FS])
P0121	TP circuit range/ performance problem	ON	—	2	CCM	×	(See 01–02B–43 DTC P0121 [FS])
P0122	TP circuit low input	ON	Flashing	1	CCM	×	(See 01–02B–46 DTC P0122 [FS])
P0123	TP circuit high input	ON	Flashing	1	CCM	×	(See 01–02B–47 DTC P0123 [FS])
P0125	Excessive time to enter closed loop fuel control	ON	—	2	CCM	×	(See 01–02B–49 DTC P0125 [FS])
P0126	Coolant thermostat stuck to open	ON	—	2	THERMOS TAT	×	(See 01–02B–50 DTC P0126, P0128 [FS])
P0128	Coolant thermostat stuck to open	ON	—	2	THERMOS TAT	×	(See 01–02B–50 DTC P0126, P0128 [FS])
P0131	HO2S (front) no inversion (low voltage stuck)	ON	—	2	CCM	×	(See 01–02B–52 DTC P0131 [FS])
P0132	HO2S (front) no inversion (high voltage stuck)	ON	—	2	CCM	×	(See 01–02B–55 DTC P0132 [FS])
P0133	HO2S (front) circuit slow response	ON	—	2	O_2 sensor	×	(See 01–02B–57 DTC P0133 [FS])
P0134	HO2S (front) circuit no activity detected	ON	—	2	CCM	×	(See 01–02B–61 DTC P0134 [FS])
P0138	HO2S (rear) circuit high input	ON	—	2	CCM	×	(See 01–02B–63 DTC P0138 [FS])
P0140	HO2S (rear) circuit no activity detected	ON	—	2	CCM	×	(See 01–02B–64 DTC P0140 [FS])
P0171	Fuel trim system too lean	ON	—	2	Fuel	×	(See 01–02B–67 DTC P0171 [FS])
P0172	Fuel trim system too rich	ON	—	2	Fuel	×	(See 01–02B–70 DTC P0172 [FS])

DTC No.	Condition	MIL	O/D off indicator light	DC	Monitor item	Memory function	Page
P0300	Random misfire detected	Flashing or ON	—	1 or 2	Misfire	×	(See 01–02B–71 DTC P0300 [FS])
P0301	Cylinder 1 misfire detected	Flashing or ON	—	1 or 2	Misfire	×	(See 01–02B–75 DTC P0301, P0302, P0303, P0304 [FS])
P0302	Cylinder 2 misfire detected	Flashing or ON	—	1 or 2	Misfire	×	(See 01–02B–75 DTC P0301, P0302, P0303, P0304 [FS])
P0303	Cylinder 3 misfire detected	Flashing or ON	—	1 or 2	Misfire	×	(See 01–02B–75 DTC P0301, P0302, P0303, P0304 [FS])
P0304	Cylinder 4 misfire detected	Flashing or ON	—	1 or 2	Misfire	×	(See 01–02B–75 DTC P0301, P0302, P0303, P0304 [FS])
P0325	Knock sensor circuit malfunction	ON	—	1	CCM	×	(See 01–02B–77 DTC P0325 [FS])
P0335	CKP sensor circuit malfunction	ON	—	1	CCM	×	(See 01–02B–79 DTC P0335 [FS])
P0340	CMP sensor circuit malfunction	ON	—	1	CCM	×	(See 01–02B–80 DTC P0340 [FS])
P0401	EGR flow insufficient detected	ON	—	2	EGR	×	(See 01–02B–82 DTC P0401 [FS])
P0402	EGR flow excessive detected	ON	—	2	EGR	×	(See 01–02B–83 DTC P0402 [FS])
P0421	Warm-up catalyst system efficiency below threshold	ON	—	2	Catalyst	×	(See 01–02B–84 DTC P0421 [FS])
P0442	Evaporative emission system leak detected (small leak)	ON	—	2	Evaporative	×	(See 01–02B–86 DTC P0442 [FS])
P0443	Evaporative emission control system purge solenoid valve circuit malfunction	OFF	—	—	Other	—	(See 01–02B–89 DTC P0443 [FS])
P0451	Fuel tank pressure sensor performance problem	ON	—	2	CCM	×	(See 01–02B–90 DTC P0451 [FS])
P0452	Fuel tank pressure sensor low input	ON	—	2	CCM	×	(See 01–02B–93 DTC P0452 [FS])
P0453	Fuel tank pressure sensor high input	ON	—	2	CCM	×	(See 01–02B–95 DTC P0453 [FS])
P0455	Evaporative emission control system leak detected (blockage or large leak)	ON	—	2	Evaporative	×	(See 01–02B–97 DTC P0455 [FS])
P0456	Evaporative emission control system leak detected (very small leak)	ON	—	2	Evaporative	×	(See 01–02B–102 DTC P0456 [FS])
P0461	Fuel gauge sender unit circuit range/performance	ON	—	2	CCM	×	(See 01–02B–104 DTC P0461 [FS])
P0462	Fuel gauge sender unit circuit low input	ON	—	2	CCM	×	(See 01–02B–105 DTC P0462 [FS])
P0463	Fuel gauge sender unit circuit high input	ON	—	2	CCM	×	(See 01–02B–107 DTC P0463 [FS])
P0464	Fuel gauge sender unit circuit performance (slosh check)	ON	—	2	CCM	×	(See 01–02B–108 DTC P0464 [FS])
P0480	Cooling fan relay malfunction	OFF	—	2	CCM	×	(See 01–02B–109 DTC P0480 [FS])
P0500	VSS circuit malfunction (MTX)	ON	—	2	CCM	×	(See 01–02B–111 DTC P0500 [FS])
	VSS circuit malfunction (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0505	IAC valve circuit malfunction	ON	—	1	CCM	×	(See 01–02B–113 DTC P0505 [FS])
P0506	Idle control system RPM lower than expected	ON	—	2	CCM	×	(See 01–02B–115 DTC P0506 [FS])

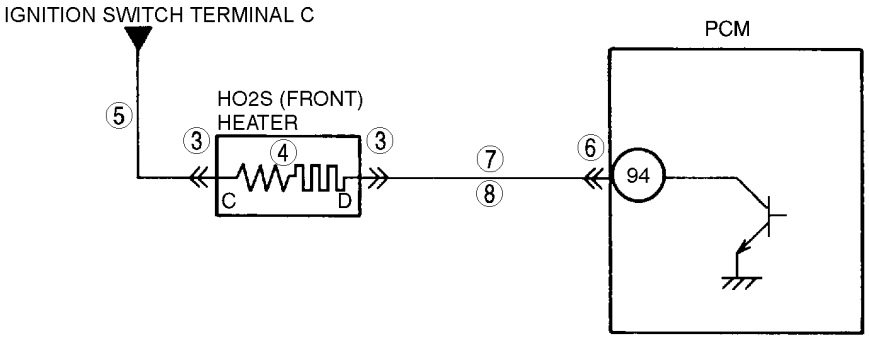
DTC No.	Condition	MIL	O/D off indicator light	DC	Monitor item	Memory function	Page
P0507	Idle control system RPM higher than expected	ON	—	2	CCM	×	(See 01–02B–117 DTC P0507 [FS])
P0550	PSP switch circuit malfunction	ON	—	2	CCM	×	(See 01–02B–118 DTC P0550 [FS])
P0660	VICS solenoid valve circuit malfunction	OFF	—	2	CCM	×	(See 01–02B–119 DTC P0660 [FS])
P0703	Brake switch input malfunction	ON	—	2	CCM	×	(See 01–02B–122 DTC P0703 [FS])
P0704	Clutch switch input circuit malfunction (MTX)	ON	—	2	CCM	×	(See 01–02B–123 DTC P0704 [FS])
P0705	Neutral switch input circuit malfunction (MTX)	ON	—	2	CCM	×	(See 01–02B–125 DTC P0705 [FS])
P0705	TR switch circuit malfunction (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0706	TR switch circuit malfunction (open circuit) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0710	Transaxle temperature sensor circuit malfunction (open or short) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0711	Transaxle temperature sensor circuit range/ performance (stuck) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0715	Input/turbine speed sensor circuit malfunction (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0731	Gear 1 incorrect (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0732	Gear 2 incorrect (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0733	Gear 3 incorrect (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0734	Gear 4 incorrect (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0741	TCC (stuck off) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0742	TCC (stuck on) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0745	Pressure control solenoid valve malfunction (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0751	Shift solenoid A malfunction (stuck off) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0752	Shift solenoid A malfunction (stuck on) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0753	Shift solenoid A malfunction (electrical) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0756	Shift solenoid B malfunction (stuck off) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0757	Shift solenoid B malfunction (stuck on) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0758	Shift solenoid B malfunction (electrical) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0761	Shift solenoid C malfunction (stuck off) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0762	Shift solenoid C malfunction (stuck on) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					

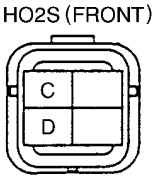
DTC No.	Condition	MIL	O/D off indicator light	DC	Monitor item	Memory function	Page
P0763	Shift solenoid C malfunction (electrical) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0766	Shift solenoid D malfunction (stuck off) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0767	Shift solenoid D malfunction (stuck on) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0768	Shift solenoid D malfunction (electrical) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0771	Shift solenoid E malfunction (stuck off) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0772	Shift solenoid E malfunction (stuck on) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P0773	Shift solenoid E malfunction (electrical) (ATX)	(See 05–02–6 AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION.)					
P1250	PRC solenoid valve circuit malfunction	OFF	—	2	CCM	×	(See 01–02B–127 DTC P1250 [FS])
P1449	CDCV circuit malfunction	OFF	—	—	Other	–	(See 01–02B–129 DTC P1449 [FS])
P1450	Evaporative emission control system malfunction (excessive vacuum)	ON	—	2	CCM	×	(See 01–02B–131 DTC P1450 [FS])
P1487	EGR boost sensor solenoid valve circuit malfunction	OFF	—	—	Other	–	(See 01–02B–133 DTC P1487 [FS])
P1496	EGR valve stepping motor coil 1 open or short	OFF	—	—	Other	–	(See 01–02B–135 DTC P1496 [FS])
P1497	EGR valve stepping motor coil 2 open or short	OFF	—	—	Other	–	(See 01–02B–137 DTC P1497 [FS])
P1498	EGR valve stepping motor coil 3 open or short	OFF	—	—	Other	–	(See 01–02B–139 DTC P1498 [FS])
P1499	EGR valve stepping motor coil 4 open or short	OFF	—	—	Other	–	(See 01–02B–141 DTC P1499 [FS])
P1512	VTCS shutter valve close stuck	ON	—	2	CCM	×	(See 01–02B–143 DTC P1512 [FS])
P1562	PCM +BB voltage low	ON	—	1	CCM	×	(See 01–02B–144 DTC P1562 [FS])
P1569	VTCS solenoid valve circuit low input	ON	—	2	CCM	×	(See 01–02B–146 DTC P1569 [FS])
P1570	VTCS solenoid valve circuit high input	ON	—	2	CCM	×	(See 01–02B–148 DTC P1570 [FS])
P1631	Generator output voltage signal no electricity	OFF	—	—	Other	×	(See 01–02B–150 DTC P1631 [FS])
P1632	Battery voltage monitor signal circuit malfunction	OFF	—	—	Other	×	(See 01–02B–152 DTC P1632 [FS])
P1633	Battery overcharge	OFF	—	—	Other	×	(See 01–02B–153 DTC P1633 [FS])
P1634	Generator terminal B circuit open	OFF	—	—	Other	×	(See 01–02B–154 DTC P1634 [FS])

DTC P0031 [FS]

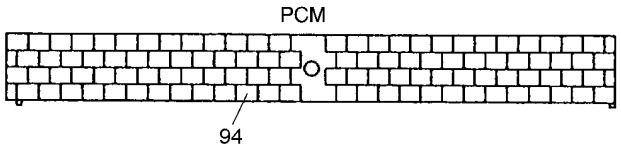
A3U010201084W01

DTC P0031	HO2S heater (front) circuit low
DETECTION CONDITION	• PCM monitors HO2S heater (front) control signal at PCM terminal 94. If PCM turns the HO2S heater (front) off but voltage at terminal 94 still remains low, PCM determines that HO2S heater (front) circuit has malfunction. **Note** • HO2S heater (front) is controlled by a duty signal. **Diagnostic support note** • This is an intermittent monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S (front) malfunction • Open circuit between ignition switch terminal C and HO2S (front) terminal C • Open circuit between HO2S (front) terminal D and PCM terminal 94 • Short to ground circuit between HO2S (front) terminal D and PCM terminal 94 • Poor connection at HO2S (front) or PCM connector • PCM malfunction





VEHICLE HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (FRONT) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (front) connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.

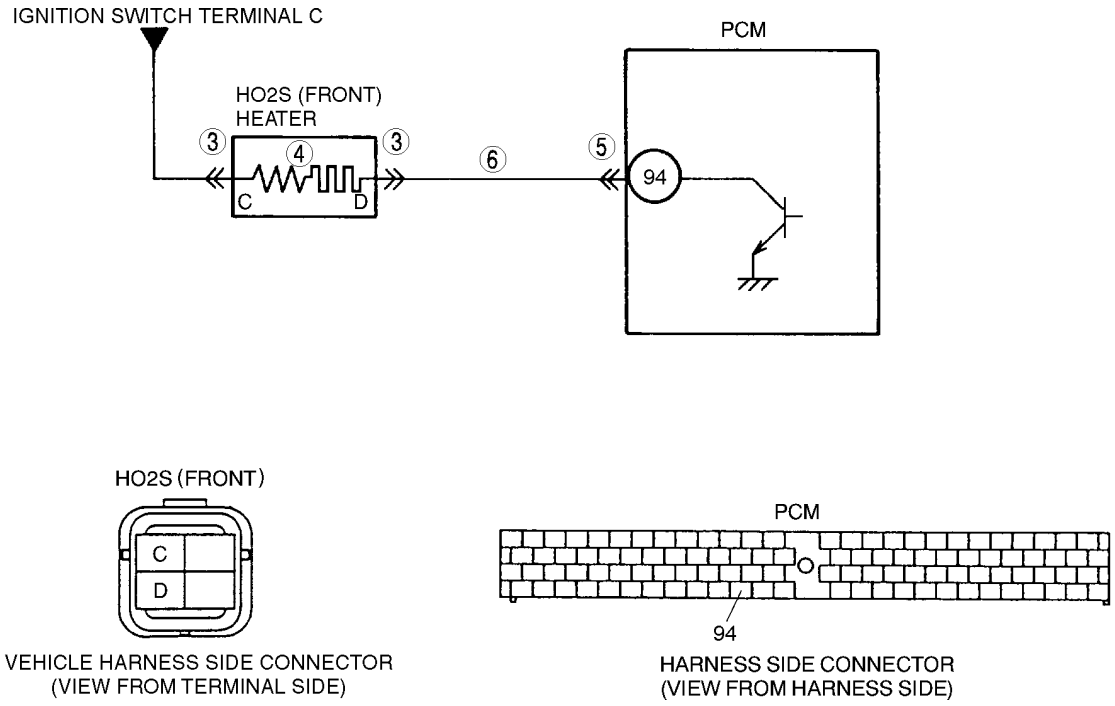
STEP	INSPECTION		ACTION
4	**INSPECT HO2S HEATER (FRONT)** • Measure resistance between HO2S (front) terminals C and D (part-side). • Is resistance **approx. 5.6 ohms**?	Yes	Go to next step.
		No	Replace the HO2S (front), then go to Step 9.
5	**INSPECT POWER CIRCUIT OF HO2S HEATER (FRONT) FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (front) terminal C (vehicle harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 94 (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT CONTROL CIRCUIT OF HO2S HEATER (FRONT) FOR SHORT TO GROUND** • Check for continuity between HO2S (front) terminal D (vehicle harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
8	**INSPECT CONTROL CIRCUIT OF HO2S HEATER (FRONT) FOR OPEN CIRCUIT** • Connect breakout box with PCM connector disconnected. • Check for continuity between HO2S (front) terminal D (vehicle harness-side) and breakout box terminal 94. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
9	**VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is same PENDING CODE of DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0032 [FS]

A3U010201084W02

DTC P0032	HO2S heater (front) circuit high
DETECTION CONDITION	• PCM monitors HO2S heater (front) control signal at PCM terminal 94. If PCM turns HO2S heater (front) on but voltage at terminal 94 still remains high, PCM determines that HO2S heater (front) circuit has malfunction. **Note** • HO2S heater (front) is controlled by a duty signal. **Diagnostic support note** • This is an intermittent monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Short to power circuit between HO2S (front) terminal D and PCM terminal 94 • Shorted HO2S (front) or PCM terminal • PCM malfunction

DTC P0032	HO2S heater (front) circuit high



Diagnostic procedure

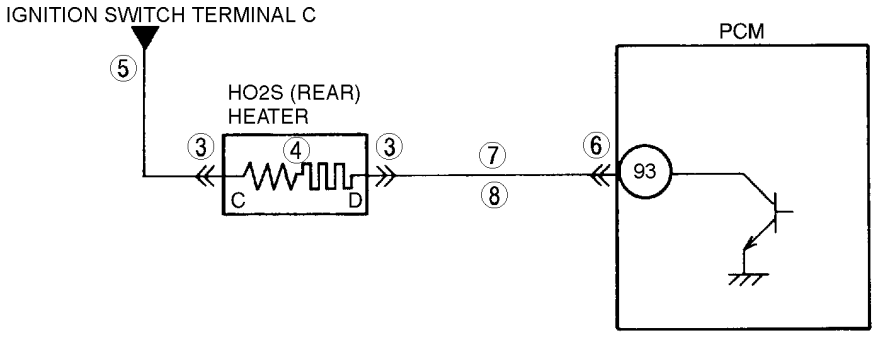
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (FRONT) TERMINALS** • Turn ignition key to OFF. • Disconnect HO2S (front) connector. • Check for bent terminals. • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT HO2S HEATER (FRONT)** • Measure resistance between HO2S (front) terminals C and D (part-side). • Is resistance **approx. 5.6 ohms**?	Yes	Go to next step.
		No	Replace the HO2S (front), then go to Step 7.
5	**INSPECT PCM TERMINAL** • Disconnect PCM connector. • Check for bent terminal at terminal 94. • Is there malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT HO2S (FRONT) HEATER CONTROL CIRCUIT FOR SHORT TO POWER CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (front) terminal D (vehicle harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power circuit, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.

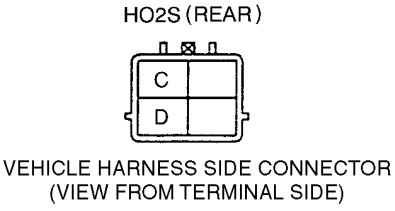
STEP	INSPECTION		ACTION
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

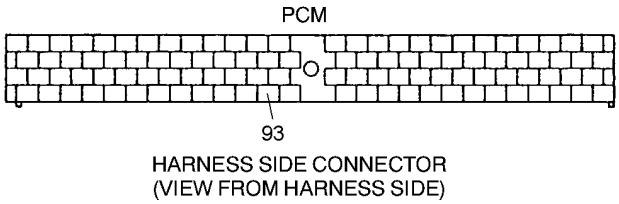
DTC P0037 [FS]

A3U010201084W03

DTC P0037	HO2S heater (rear) circuit low
DETECTION CONDITION	• PCM monitors HO2S heater (rear) control signal at PCM terminal 93. If PCM turns HO2S heater (rear) off but voltage at terminal 93 still remains low, PCM determines that HO2S heater (rear) circuit has malfunction. **Diagnostic support note** • This is an intermittent monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S (rear) malfunction • Open circuit between ignition switch terminal C and HO2S (rear) terminal C • Open circuit between HO2S (rear) terminal D and PCM terminal 93 • Short to ground circuit between HO2S (rear) terminal D and PCM terminal 93 • Poor connection at HO2S (rear) or PCM connector • PCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

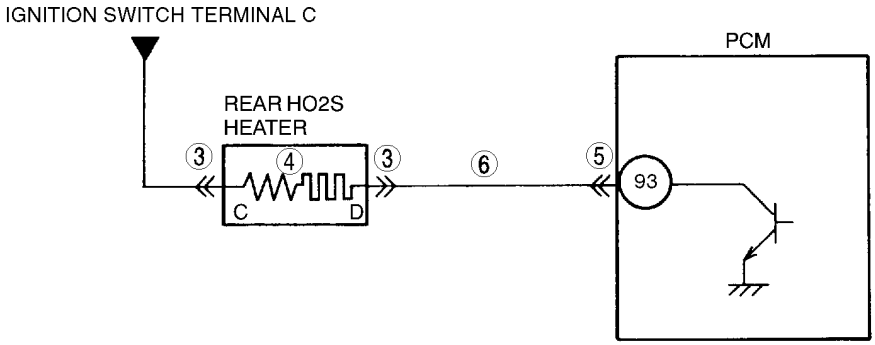
STEP	INSPECTION		ACTION
3	**INSPECT HO2S (REAR) CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect HO2S (rear) connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT HO2S HEATER (REAR)** • Measure resistance between HO2S (rear) terminals C and D (part-side). • Is resistance **approx. 15.7 ohms**?	Yes	Go to next step.
		No	Replace the HO2S (rear), then go to Step 9.
5	**INSPECT HO2S HEATER (REAR) POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (rear) terminal C (vehicle harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 93 (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT HO2S HEATER (REAR) CONTROL CIRCUIT FOR SHORT TO GROUND** • Check for continuity between HO2S (rear) terminal D (vehicle harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
8	**INSPECT HO2S HEATER (REAR) CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM connector disconnected. • Check for continuity between HO2S (rear) terminal D (vehicle harness-side) and breakout box terminal 93. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
9	**VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

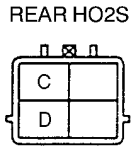
DTC P0038 [FS]

A3U010201084W04

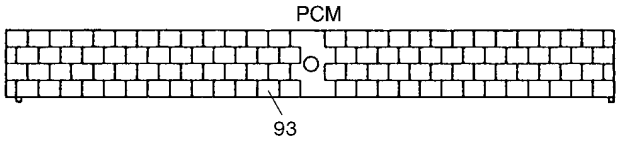
DTC P0038	HO2S heater (rear) circuit high
DETECTION CONDITION	• PCM monitors HO2S heater (rear) control signal at PCM terminal 93. If PCM turns HO2S heater (rear) on but voltage at terminal 93 still remains high, PCM determines that HO2S heater (rear) circuit has malfunction. **Diagnostic support note** • This is an intermittent monitor (O_2 sensor heater). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0038	HO2S heater (rear) circuit high
POSSIBLE CAUSE	• HO2S (rear) malfunction • Short to power circuit between HO2S (rear) terminal D (harness-side) and PCM terminal 93 (harness-side) • Shorted HO2S (rear) or PCM terminal • PCM malfunction





VEHICLE HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT HO2S (REAR) TERMINAL** • Turn ignition key to OFF. • Disconnect HO2S (rear) connector. • Check for bent terminals. • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**INSPECT HO2S HEATER (REAR)** • Measure resistance between HO2S (rear) terminals C and D (part-side). • Is resistance **approx. 15.7 ohms**	Yes	Go to next step.
		No	Replace the HO2S (rear), then go to Step 7.
5	**INSPECT PCM TERMINAL** • Disconnect PCM connector. • Check for bent terminal at terminal 93. • Is there malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
6	**INSPECT HO2S (REAR) HEATER CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (rear) terminal D (vehicle harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power circuit, then go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and warm it up completely. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0101 [FS]

A3U010201084W05

DTC P0101	MAF circuit range/performance problem
DETECTION CONDITION	• PCM compares actual input signal from MAF sensor with expected input signal from MAF sensor which PCM calculates by engine speed. If mass intake air flow amount is **above 83.5 g/s {11.05 lb/min}** for **5 seconds** and engine speed is **less than 2,000 rpm** with engine running, PCM determines that detected mass intake air flow amount is too high. • PCM compares actual input signal from MAF sensor with expected input signal from MAF sensor which PCM calculates by input voltage from TP sensor. If mass intake air flow amount is **below 5 g/s {0.66 lb/min}** for **5 seconds** and throttle opening angle is **above 50%** with engine running, PCM determines that detected mass intake air flow amount is too low. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • TP sensor malfunction • Electrical corrosion in MAF signal circuit • Electrical corrosion in MAF RETURN circuit • Voltage drops in MAF signal circuit • Voltage drops in ground circuit

Diagnostic procedure

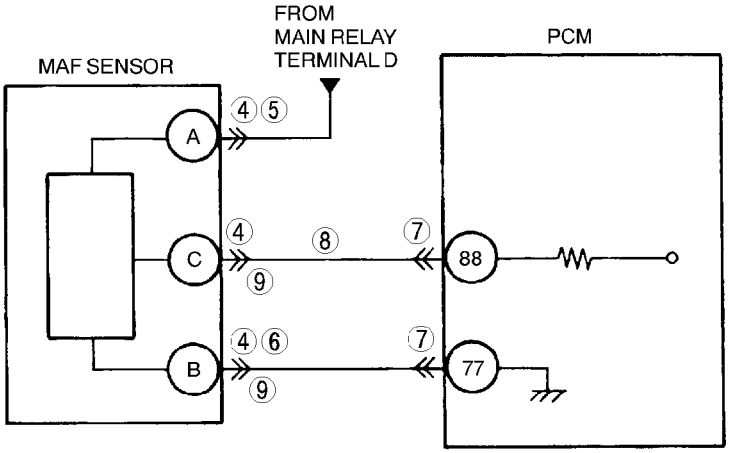
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start the engine. • Access ECT, RPM and MAF PIDs. • Warm up the engine until ECT PID is **above 70°C {158°F}**. • Read MAF PID while RPM PID is **below 2,000 rpm**. • Is MAF PID reading **above 83.5 g/s {11.05 lb/min}**?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)

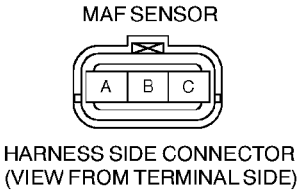
STEP	INSPECTION		ACTION
4	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start the engine. • Access ECT, TP and MAF PIDs. • Warm up the engine until ECT PID is **above 70°C {158°F}**. • Drive the vehicle. • Read MAF PID while TP PID is **above 50%**. • Is MAF PID reading **below 5 g/s {0.66 lb/min}**?	Yes	Make sure that TP sensor resistance changes smoothly while gradually opening throttle valve. • If not, replace TP sensor and go to step 7. • For others, go to next step .
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
5	**INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect MAF sensor connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace suspected terminal or MAF sensor, then go to Step 7.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to next step.
		No	Replace MAF sensor, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start the engine. • Access ECT, TP, RPM and MAF PIDs using WDS or equivalent. • Warm up the engine until ECT PID is reading **above 70°C {158°F}**. • Read MAF and RPM PIDs. **Note** • MAF PID should indicate **below 83.5 g/s {11.05 lb/min}** while RPM PID is **below 2,000 rpm**. • Drive the vehicle and read TP and MAF PIDs. **Note** • Verify PIDs reading are within specifications **more than 5 seconds**. — MAF PID: **above 5 g/s {0.66 lb/min}** — TP PID: **above 50%** • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

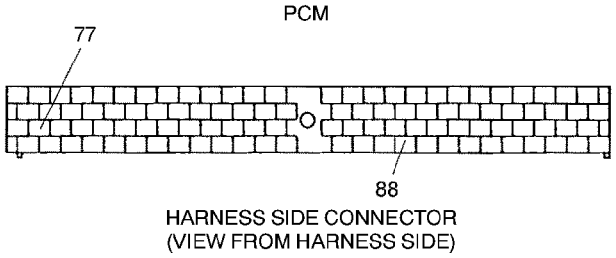
DTC P0102 [FS]

A3U010201084W06

DTC P0102	MAF circuit low input
DETECTION CONDITION	• PCM monitors input voltage from MAF sensor. If input voltage at PCM terminal 88 is **below 0.86 V**, PCM determines that MAF circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to ground in wiring between MAF sensor terminal C and PCM terminal 88 • Open circuit in wiring between MAF sensor terminal C and PCM terminal 88 • PCM malfunction • Open circuit in wiring between MAF sensor terminal B and PCM terminal 77 • Open circuit in wiring between main relay and MAF sensor terminal A







Diagnostic procedure

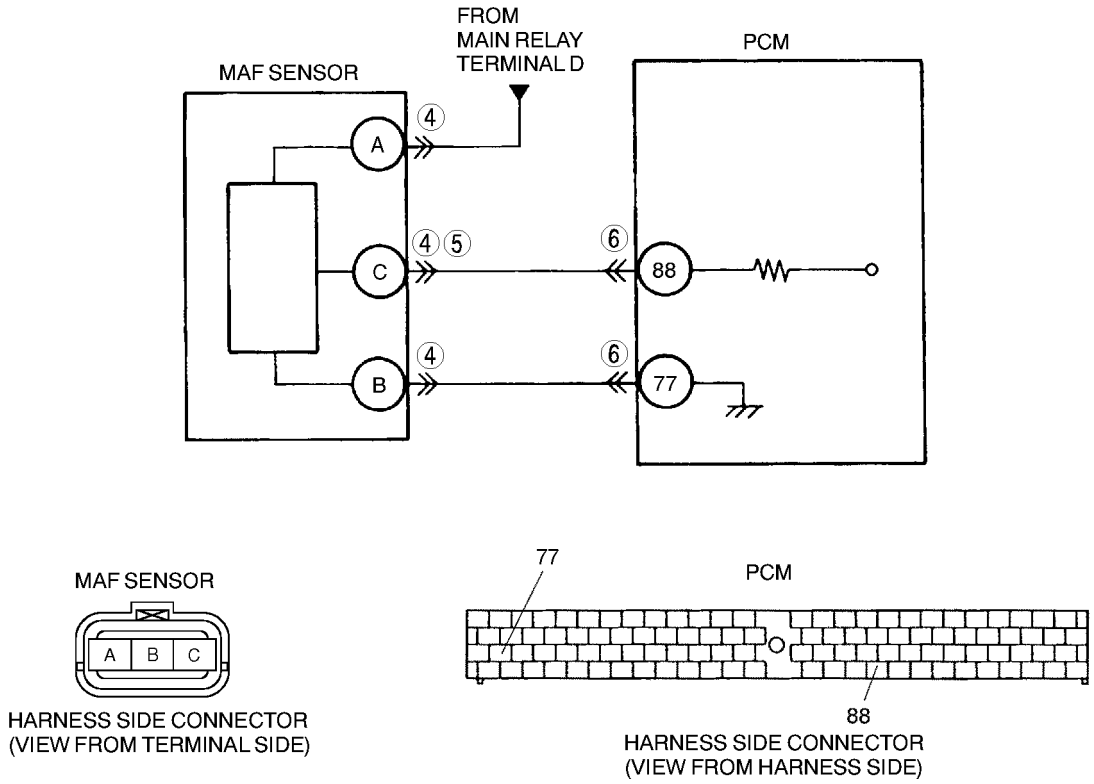
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start engine. • Access MAF PID. • Is MAF PID **above 0 g/s** and **217.8 g/s or below**?	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect MAF sensor connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 10.
		No	Go to next step.
5	**CHECK POWER SUPPLY CIRCUIT FOR OPEN CURCUIT** • Turn ignition key to ON (Engine OFF). • Check voltage at MAF sensor terminal A (harness-side). • Is voltage **B+**?	Yes	Go to next step.
		No	Inspect for open circuit in wiring harness between MAF sensor terminal A (harness-side) and main relay. Repair or replace harness, then go to Step 10.
6	**INSPECT MAF SENSOR GROUND CIRCUIT FOR OPEN** • Check for continuity between MAF sensor terminal B (harness-side) and body ground. • Is there continuity?	Yes	Go to next step.
		No	Check for open circuit between PCM terminal 36 (harness-side) and MAF sensor terminal B (harness-side). Repair or replace suspected harness, then go to Step 10.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
8	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Check for continuity between MAF sensor terminal C (harness-side) and breakout box terminal 88 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 10.
9	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORTS** • Check continuity between following circuits: — MAF sensor terminal C (harness-side) and body ground — MAF sensor connector terminal B (harness-side) and C (harness-side) • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from memory using WDS or equivalent. • Access MAF PID. **Note** • MAF PID should indicate **above 0 g/s** and **217.8 g/s or below**. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0103 [FS]

A3U010201084W07

DTC P0103	MAF circuit high input
DETECTION CONDITION	• PCM monitors input voltage from MAF sensor after ignition key is turned on. If input voltage at PCM terminal 88 is **above 4.90 V**, PCM determines that MAF circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to power circuit in wiring between MAF sensor terminal C and PCM terminal 88



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start engine. • Access MAF PID. • Is MAF PID **above 0 g/s** and **217.8 g/s or below**?	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
		No	Go to next step.
4	**INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect the MAF sensor connector. • Check for bent terminal. • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 7.
		No	Go to next step.

STEP	INSPECTION		ACTION
5	**INSPECT MAF SIGNAL CIRCUIT FOR SHORT TO POWER CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between MAF sensor terminal C (harness-side) and body ground. • Is voltage **0 V**?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 7.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for bent terminals. • Is there malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from memory using WDS or equivalent. • Access MAF PID. **Note** • MAF PID should indicate **above 0 g/s** and **217.8 g/s or below**. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0106 [FS]

A3U010201084W08

DTC P0106	BARO circuit performance problem
DETECTION CONDITION	• PCM monitors differences between intake manifold vacuum and atmospheric pressure at idle, which EGR boost sensor detects by switching EGR boost sensor solenoid. If difference is **below 6.43 kPa {48.2 mmHg, 1.90 inHg}**, PCM determines that there is EGR boost sensor performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EGR boost sensor malfunction or substandard performance • EGR boost sensor solenoid malfunction • Loose, damaged, misconnected, clogged or frozen moisture in vacuum hose from EGR boost sensor solenoid to EGR boost sensor • PCM malfunction • Loose, damaged, misconnected, clogged or frozen moisture in vacuum hose from EGR boost sensor solenoid to EGR valve

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY STORED DTC** • Turn ignition key to OFF then start engine. • Has DTC P1487 been stored?	Yes	Inspect and repair DTC P1487.
		No	Go to next step.

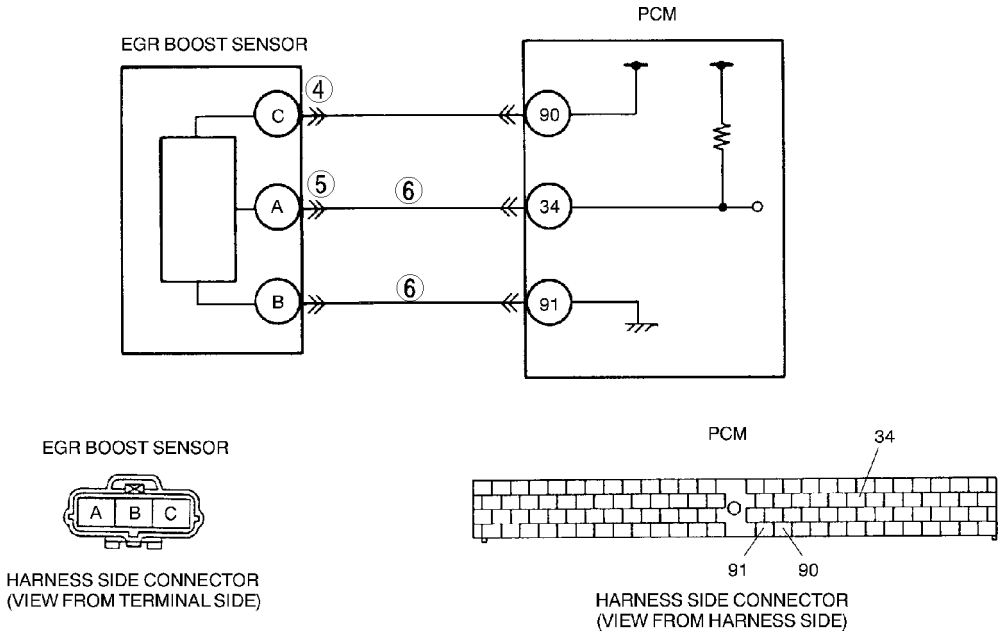
STEP	INSPECTION		ACTION
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0106 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT CONNECTION OF EGR BOOST SENSING RELATED VACUUM HOSES** • Inspect the following vacuum hoses for looseness, damage, improper connection and/or clogging. — From EGR boost sensor to EGR boost sensor solenoid — From EGR boost sensor solenoid to intake manifold • Are they okay?	Yes	Go to next step.
		No	Repair or replace vacuum hose, then go to Step 9.
6	**INSPECT EGR BOOST SENSOR SOLENOID AIR FILTER FOR CLOGGING** • Has EGR boost sensor solenoid air filter been clogged?	Yes	Repair air clogging, then go to Step 9.
		No	Go to next step.
7	**INSPECT EGR BOOST SENSOR SOLENOID VALVE FOR WHETHER STUCK OPEN OR CLOSED** • Inspect EGR boost sensor solenoid valve. (See 01–16–17 EGR BOOST SENSOR SOLENOID VALVE INSPECTION) • Is EGR boost sensor solenoid okay?	Yes	Go to next step.
		No	Replace EGR boost sensor solenoid, then go to Step 9.
8	**INSPECT EGR BOOST SENSOR FOR WHETHER STUCK OPEN OR CLOSED** • Inspect EGR boost sensor. (See 01–40B–39 EGR BOOST SENSOR INSPECTION [FS].) • Is EGR boost sensor okay?	Yes	Go to next step.
		No	Replace EGR boost sensor, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0106 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Run OBD-ll DRIVE MODE 1, 2 and 3. (See 01–02B–10 OBD-II DRIVE MODE [FS].) • Stop vehicle. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0107 [FS]

A3U010201084W09

DTC P0107	BARO circuit low input
DETECTION CONDITION	• PCM monitors input voltage from EGR boost sensor when monitoring conditions are met. If input voltage at PCM terminal 34 is **below 0.35 V**, PCM determines that EGR boost sensor circuit is malfunctioning. **MONITORING CONDITIONS** — Intake air temperature is **above 10 °C {50 °F}**. — EGR boost sensor solenoid is turned OFF. (Barometric pressure is applied to EGR boost sensor.) **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0107	BARO circuit low input
POSSIBLE CAUSE	• EGR boost sensor malfunction • Connector or terminal malfunction • Short to ground in wiring between EGR boost sensor terminal A and PCM terminal 34 • Open circuit in wiring between EGR boost sensor terminal C and PCM terminal 90 • PCM malfunction



Diagnostic procedure

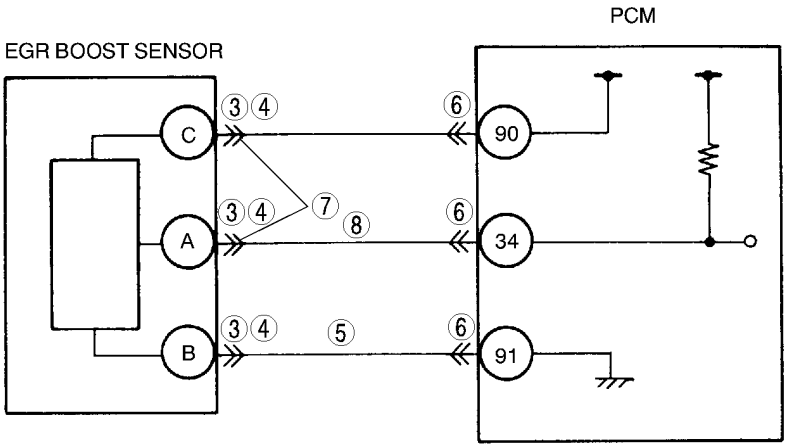
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**CHECK SIGNAL CIRCUIT VOLTAGE WHEN EGR BOOST SENSOR CONNECTOR IS DISCONNECTED** • Disconnect EGR boost sensor connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR boost sensor connector terminal A (harness-side) and body GND. • Is voltage **above 4.9 V**?	Yes	Go to next step.
		No	Go to Step 5.
4	**CHECK POWER SUPPLY CIRCUIT VOLTAGE AT EGR BOOST SENSOR CONNECTOR** **Note** • If DTCs P0122 and P0452 are also retrieved with P0107, go to REFERENCE VOLTAGE troubleshooting procedure. • Measure voltage between EGR boost sensor terminal C (harness-side) and body ground. • Is voltage **within 4.5—5.5 V?**	Yes	Check for poor connection of EGR boost sensor terminal C (harness-side). • Repair or replace terminal as necessary. • If okay, replace EGR boost sensor. Then go to Step 7.
		No	Check for open circuit between PCM terminal 90 (harness-side) and BARO terminal C (harness-side). Repair or replace suspected harness, then go to Step 7.

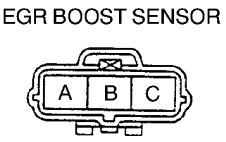
STEP	INSPECTION		ACTION
5	**INSPECT EGR BOOST SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for continuity between EGR boost sensor terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
6	**INSPECT EGR BOOST SENSOR SIGNAL AND GROUND CIRCUIT FOR INTERMEDIATE SHORT** • Check for continuity between EGR boost sensor terminals B and A (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then to go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0107 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0108 [FS]

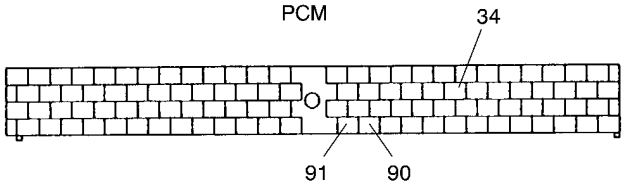
A3U010201084W10

DTC P0108	BARO circuit high input
DETECTION CONDITION	• PCM monitors input voltage from EGR boost sensor when monitoring conditions are met. If input voltage at PCM terminal 34 is **above 4.92 V**, PCM determines that EGR boost sensor circuit is malfunctioning. **MONITORING CONDITIONS** — Intake air temperature is **above 10 °C {50 °F}**. — EGR boost sensor solenoid is turned OFF. (Barometric pressure is applied to EGR boost sensor.) **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EGR boost sensor malfunction • Connector or terminal malfunction • Open circuit in wiring between EGR boost sensor terminal B and PCM terminal 91 • EGR boost sensor signal circuit is shorted to reference voltage (Vref) supply circuit. • PCM malfunction





HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT CONNECTION OF EGR BOOST SENSOR CONNECTOR** • Turn ignition key to OFF. • Verify that EGR boost sensor connector is connected securely. • Is connection okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 9.

STEP	INSPECTION		ACTION
4	**INSPECT EGR BOOST SENSOR CONNECTOR FOR POOR CONNECTION** • Disconnect the EGR boost sensor connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace suspected terminal, then go to Step 9.
		No	Go to next step.
5	**VERIFY EGR BOOST SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between EGR boost sensor terminal B (harness-side) and body ground. • Is there continuity?	Yes	Go to next step.
		No	Check for open circuit between PCM terminal 91 (harness-side) and EGR boost sensor terminal B (harness-side). Repair or replace suspected harness, then go to Step 9.
6	**CHECK PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection at terminal 91 (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**VERIFY EGR BOOST SENSOR SIGNAL CIRCUIT FOR SHORT TO REFERENCE VOLTAGE CIRCUIT** • Check for continuity between EGR boost sensor terminals A and C (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 9.
		No	Go to next step.
8	**VERIFY EGR BOOST SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between EGR boost sensor terminal A (harness-side) and PCM terminal 34 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0108 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0111 [FS]

A3U010201084W11

DTC P0111	IAT circuit performance problem
DETECTION CONDITION	• Intake air temperature is higher than engine coolant temperature by **40 °C {72 °F}** and ignition key is ON. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Poor connection at IAT sensor or PCM connector • PCM malfunction

Diagnostic procedure

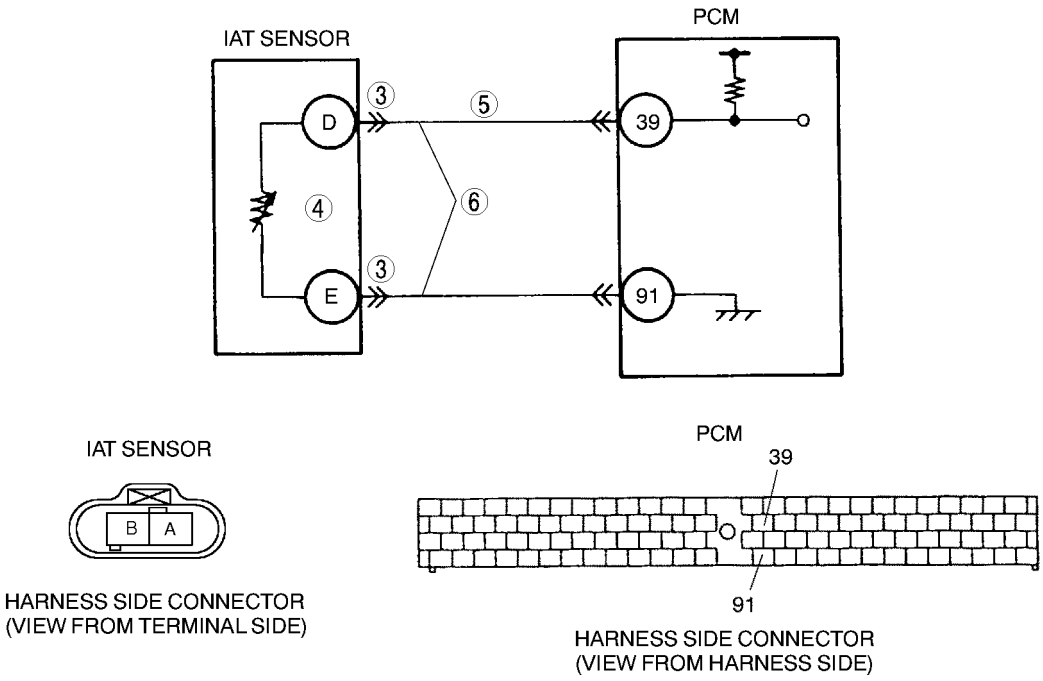
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect IAT sensor connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
4	**INSPECT IAT SENSOR** • Measure resistance between IAT sensor terminals A and B (part-side). • Is resistance **below 550 ohms**?	Yes	Replace IAT sensor, then go to Step 6.
		No	Go to next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminals 39 and 91 (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine and run engine under FREEZE FRAME DATA condition. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0112 [FS]

A3U010201084W12

DTC P0112	IAT circuit low input
DETECTION CONDITION	• PCM monitors IAT sensor signal at PCM terminal 39. If voltage at PCM terminal 39 is **below 0.16 V**, PCM determines that IAT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Short to ground circuit between IAT sensor terminal A and PCM terminal 39 • IAT signal and IAT ground circuits are shorted each other. • PCM malfunction

DTC P0112	IAT circuit low input



Diagnostic procedure

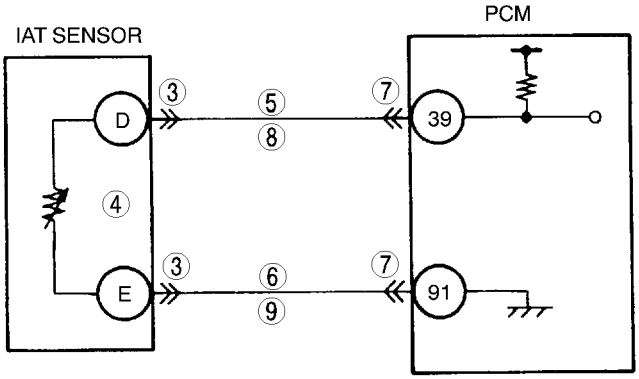
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**INSPECT IAT SENSOR TERMINALS** • Turn ignition key to OFF. • Disconnect IAT sensor connector. • Check for bent terminals of IAT sensor terminals A and B (part-side). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**CLASSIFY IAT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Disconnect IAT sensor connector. • Measure resistance between IAT sensor terminals A and B (part-side). • Is resistance **within 0.117—28.616 kilohms**?	Yes	Go to next step.
		No	Replace IAT sensor, then go to Step 7.
5	**INSPECT IAT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for continuity between IAT sensor terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 7.
		No	Go to next step.
6	**INSPECT IAT CIRCUITS FOR INTERMEDIATE SHORT** • Check for continuity between IAT sensor terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace harness for short, then go to Step 8.
		No	Go to next step.

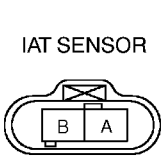
STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0113 [FS]

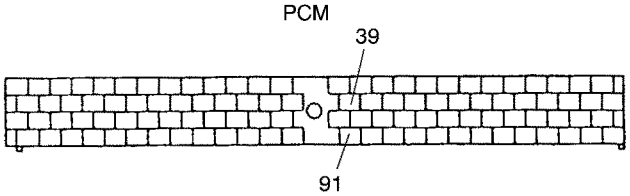
A3U010201084W13

DTC P0113	IAT circuit high input
DETECTION CONDITION	• The PCM monitors IAT sensor signal at PCM terminal 39. If voltage at PCM terminal 39 is **above 4.84 V**, PCM determines that IAT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is not stored in PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Open circuit between IAT sensor terminal A and PCM terminal 39 • Short to power circuit between IAT sensor terminal A and PCM terminal 39 • Open circuit between IAT sensor terminal B and PCM terminal 91 • Short to power circuit between IAT sensor terminal B and PCM terminal 91 • Poor connection at IAT sensor or PCM connector • PCM malfunction





HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

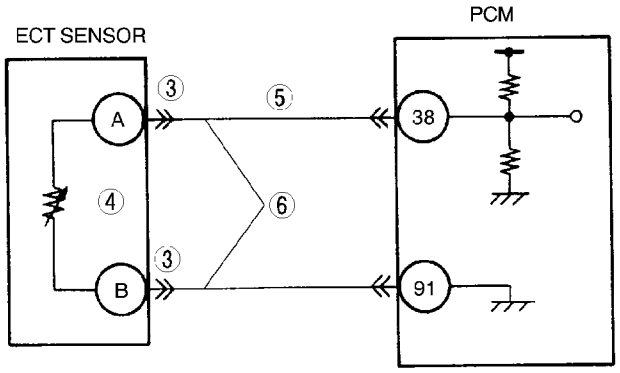
Diagnostic procedure

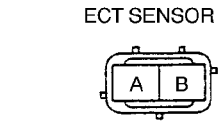
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect IAT sensor connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
4	**INSPECT IAT SENSOR** • Disconnect IAT sensor connector. • Measure resistance between IAT sensor terminals A and B (part-side). • Is resistance **within 0.117—28.616 kilohms**?	Yes	Replace IAT sensor, then go to Step 10.
		No	Go to next step.
5	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between IAT sensor terminal B (harness-side) and body ground. • Is there voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 10.
		No	Go to next step.
6	**INSPECT IAT SENSOR GROUND CIRCUIT FOR SHORT TO POWER** • Measure voltage between IAT sensor terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 10.
		No	Go to next step.
7	**INSPECT PCM CONNECTOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect PCM terminal 39 and 91 (harness-side) for tightness using feeler tool. • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
8	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Check for continuity between IAT sensor terminal A (harness-side) and breakout box terminal 39. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 10.
9	**INSPECT IAT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between IAT sensor terminal B (harness-side) and breakout box terminal 91. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0117 [FS]

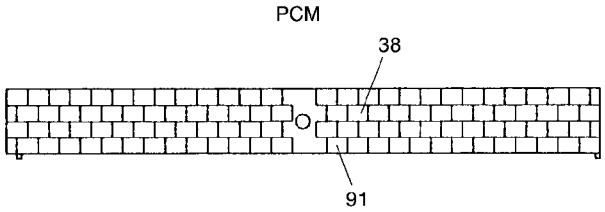
A3U010201084W14

DTC P0117	ECT circuit low input
DETECTION CONDITION	• PCM monitors ECT sensor signal at PCM terminal 38. If voltage at terminal 38 is **below 0.20 V**, PCM determines that ECT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Short to ground circuit between ECT sensor terminal A and PCM connector terminal 38 • ECT signal and ground circuits are shorted each other. • PCM malfunction





HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

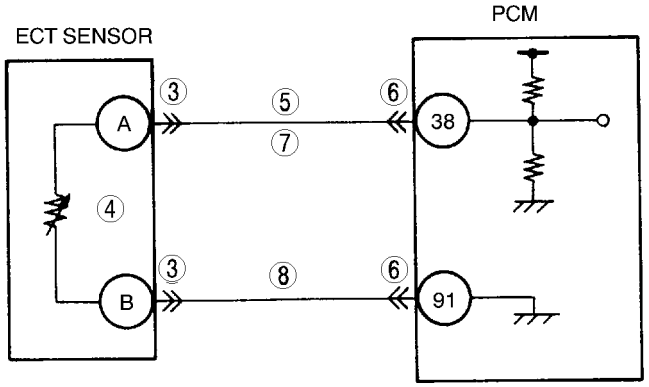
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT ECT SENSOR TERMINAL BENT** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Check for bent of ECT sensor terminals A and B (part-side). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	**CLASSIFY ECT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Measure resistance between ECT sensor teminals A and B (part-side). • Is resistance **within 0.111—25.403 kilohms**?	Yes	Go to next step.
		No	Replace ECT sensor, then go to Step 7.

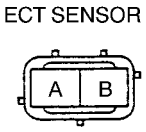
STEP	INSPECTION		ACTION
5	**INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for continuity between ECT sensor terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 7.
		No	Go to next step.
6	**INSPECT ECT CIRCUIT FOR SHORT** • Check for continuity between ECT sensor terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace harness for short, then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0118 [FS]

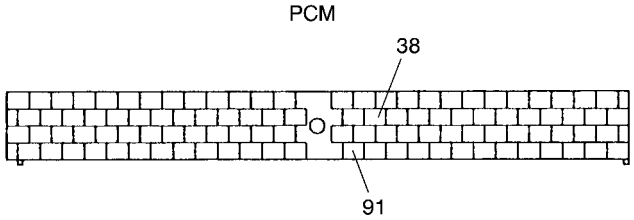
A3U010201084W15

DTC P0118	ECT circuit high input
DETECTION CONDITION	• PCM monitors ECT sensor signal at PCM terminal 38. If voltage at terminal 38 is **above 4.94 V**, PCM determines that ECT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Open circuit between ECT sensor terminal A and PCM terminal 38 • Short to power circuit between ECT sensor terminal A and PCM terminal 38 • Open circuit between ECT sensor terminal B and PCM terminal 91 • Poor connection of ECT sensor or PCM connectors • PCM malfunction





HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**CLASSIFY ECT SENSOR OR HARNESS MALFUNCTION** • Measure resistance between ECT sensor teminals A and B (part-side). • Is resistance **within 0.111—25.403 kilohms**?	Yes	Replace ECT sensor, then go to Step 9.
		No	Go to next step.
5	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between ECT sensor terminal A (harness-side) and body ground. • Is there voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminals 38 and 91 (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Check for continuity between ECT sensor terminal A (harness-side) and breakout box terminal 38. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
8	**INSPECT ECT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between ECT sensor terminal B (harness-side) and breakout box terminal 91. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0121 [FS]

A3U010201084W16

DTC P0121	TP circuit range/performance problem
DETECTION CONDITION	• If PCM detects that throttle valve opening angle is **below 12.5%** for **5 seconds** after following conditions are met, PCM determines that TP is stuck closed: **MONITORING CONDITIONS** — Engine coolant temperature is **above 70 °C {158 °F}**. — MAF sensor signal is **above 73.4 g/s {9.7 lb/min}**. • If PCM detects that throttle valve opening angle is **above 50%** for **5 seconds** after following conditions are met, PCM determines that TP is stuck open: **MONITORING CONDITIONS** — Engine speed is **above 500 rpm**. — MAF sensor signal is **below 5 g/s {0.66 lb/min}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0121	TP circuit range/performance problem
POSSIBLE CAUSE	• TP sensor malfunction • MAF sensor malfunction • Electrical corrosion in TP signal circuit • Voltage drops in reference voltage (vref) supply circuit • Voltage drops in ground circuit • PCM malfunction

Diagnostic procedure

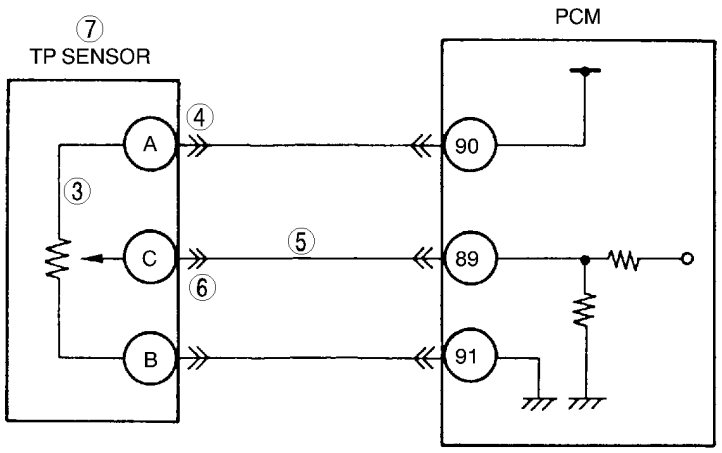
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn ignition key to ON (Engine OFF). • Retrieve pending or stored DTCs using WDS or equivalent. • Is DTC P0101 also retrieved?	Yes	Go to DTC P0101 troubleshooting procedure.
		No	Go to next step.
3	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT** • Start the engine. • Access ECT, TP and MAF PIDs using WDS or equivalent. • Warm up the engine until ECT PID is **above 70 °C {158 °F}**. • Drive the vehicle. • Read TP PID while MAF PID is **above 73.4 g/s {9.7 lb/min}**. • Is TP PID reading **above 12.5%**?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
5	**VERIFY TP PID** • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Access TP, MAF and RPM PIDs using WDS or equivalent. • Read TP PID while MAF PID is **below 4.8g/s {0.6 lb/min}** and RPM PID is **above 500 rpm**. • Is TP PID reading **above 50%**?	Yes	Go to Step 7.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT** • Drive the vehicle and read MAF PID. • Does MAF PID change in compliance with driving condition?	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
		No	Check MAF sensor and related circuits and terminals. (See 01–40B–28 MASS AIR FLOW (MAF) SENSOR INSPECTION [FS].) Repair or replace as necessary, then go to Step 11.
7	**CHECK TP SENSOR TERMINALS FOR ELECTRICAL CORROSION** • Turn ignition key to OFF. • Disconnect TP sensor connector. • Check for electrical corrosion on male and female TP sensor terminals. • Is any electrical corrosion found?	Yes	Repair or replace suspected terminal or TP sensor, then go to Step 11.
		No	Go to next step.
8	**CHECK GROUND CIRCUIT FOR VOLTAGE DROP** • Check resistance between TP sensor terminal B (harness-side) and body ground. • Does resistance read **approx. 0 ohm**?	Yes	Go to next step.
		No	Repair or replace rusted or corroded PCM terminal 91 (harness-side). Disconnect breakout box and go to Step 11.
9	**VERIFY TP SENSOR** • Does TP sensor resistance smoothly change while gradually opening throttle valve?	Yes	Go to next step.
		No	Replace TP sensor, then go to Step 11.

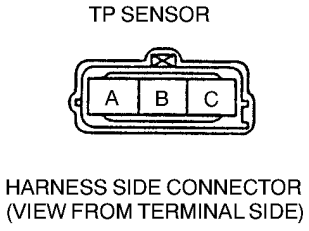
STEP	INSPECTION		ACTION
10	**CHECK PCM TERMINALS FOR ELECTRICAL CORROSION** • Disconnect PCM connector. • Check for electrical corrosion on PCM male and female terminals at 89, 90 and 91. • Is any electrical corrosion found?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0121 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear DTC from PCM memory using WDS or equivalent. • Access RPM, ECT, TP and MAF PIDs using WDS or equivalent. • Verify TP PID is reading **below 50%** while MAF PID is **below 5 g/s {0.66 lb/min}** and RPM PID is **above 500 rpm**. • Warm up the engine until ECT PID is reading **above 70 °C {158°F}**. • Drive the vehicle and read TP and MAF PIDs. • Verify PID readings are within specifications MAF PID: **above 73.4 g/s {9.7 lb/min}** TP PID: **above 12.5% more than 5 seconds** • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

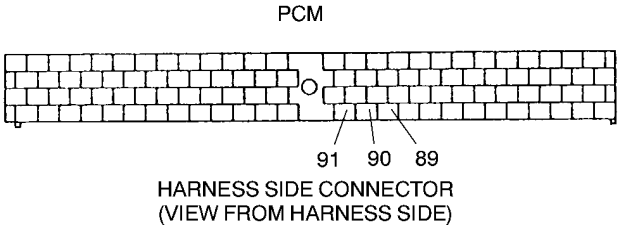
DTC P0122 [FS]

A3U010201084W17

DTC P0122	TP circuit low input
DETECTION CONDITION	• If PCM detects TP sensor voltage at PCM terminal 89 **below 0.10 V** after engine start, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between TP sensor terminal C and PCM terminal 89 • Short to ground circuit between TP sensor terminal C and PCM terminal 89 • Open circuit between TP sensor terminal A and PCM terminal 90 • Short to ground circuit between TP sensor terminal A and PCM terminal 90 • PCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CHECK TP SENSOR CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check for continuity between TP sensor terminals A and C (part-side). • Is there continuity?	Yes	Check TP sensor connector terminal A for poor connection. Repair or replace as necessary, then go to Step 8.
		No	Go to Step 8.

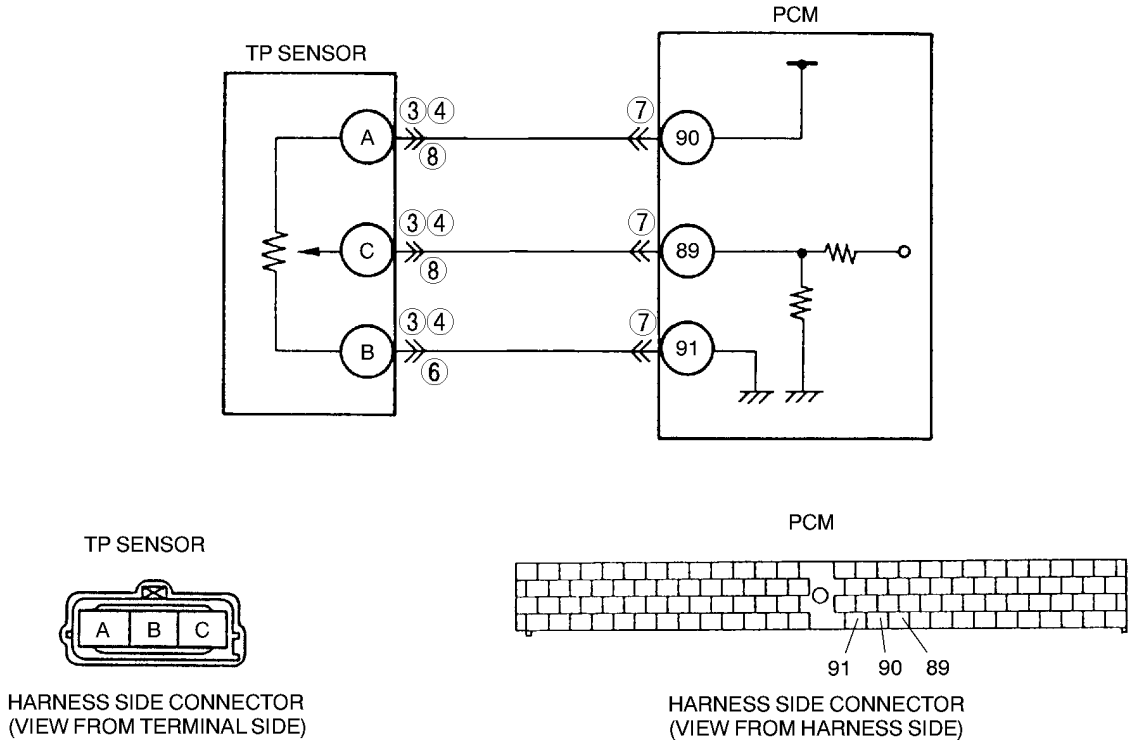
STEP	INSPECTION		ACTION
4	**CHECK POWER SUPPLY CIRCUIT VOLTAGE AT TP SENSOR CONNECTOR** **Note** • If DTC P0107 and P0452 are also retrieved with P0122, go to REFERENCE VOLTAGE troubleshooting procedure. (See 01–03B–49 NO.30 REFERENCE VOLTAGE [FS].) • Turn ignition key to ON (Engine OFF). • Check voltage at TP sensor terminal A (harness-side). • Is voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace open circuit in wiring harness between TP sensor terminal A (harness-side) and PCM terminal 90 (harness-side), then go to Step 8.
5	**VERIFY TP SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Disconnect PCM connector. • Connect breakout box with PCM disconnected. • Disconnect TP sensor connector. • Check for continuity between TP sensor terminal C (harness-side) and breakout box terminal 89. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 8.
6	**VERIFY TP SIGNAL CIRCUIT FOR SHORT TO GROUND** • Check for continuity between TP sensor connector terminal C and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 8.
		No	Go to next step.
7	**INSPECT TP SENSOR** • Perform TP sensor inspection. (See 01–40B–29 THROTTLE POSITION (TP) SENSOR INSPECTION [FS].) • Is TP sensor okay?	Yes	Go to next step.
		No	Replace TP sensor.
8	**VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Depress and release accelerator pedal several times. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0123 [FS]

A3U010201084W18

DTC P0123	TP circuit high input
DETECTION CONDITION	• If PCM detects TP sensor voltage at PCM terminal 89 is **above 4.90 V** after engine start, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between TP sensor terminal B and PCM terminal 91 • Short to constant voltage (Vref) supply circuit between TP sensor terminal C and PCM terminal 89 • PCM malfunction

DTC P0123	TP circuit high input



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CHECK TP SENSOR CONNECTOR** • Turn ignition key to OFF. • Verify that the TP sensor connector is connected securely. • Is connector okay?	Yes	Go to next step.
		No	Connect the connector securely, then go to Step 9.
4	**INSPECT TP SENSOR CONNECTOR FOR POOR CONNECTION** • Disconnect TP sensor connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 9.
		No	Go to next step.
5	**CHECK TP SENSOR RESISTANCE** • Check resistance between following TP sensor terminals (part-side): Terminals A and B: **Within 3.2—4.8 kilohms** Terminals B and C: **Within 0.2—1.2 kilohms** • Are both resistances within specifications?	Yes	Go to next step.
		No	Replace TP sensor, then go to Step 9.
6	**VERIFY TP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT AT TP SENSOR CONNECTOR** • Check for continuity between TP sensor terminal B (harness-side) and body ground. • Is there continuity?	Yes	Go to Step 8.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**CHECK PCM CONNECTOR** • Disconnect PCM connector. • Check for poor connection at terminals 89, 90 and 91 (damaged/pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Repair or replace open circuit in wiring harness between TP sensor terminal B and PCM connector terminal 91 (harness-side). Then, go to Step 9.
8	**VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Check for continuity between TP sensor terminals A and C. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equipment. • Depress and release accelerator pedal several times. • Does the same DTC appear?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0125 [FS]

A3U010201084W19

DTC P0125	Excessive time to enter closed loop fuel control
DETECTION CONDITION	• PCM monitors ECT sensor signal at PCM terminal 38 after engine is started engine is cold. If ECT voltage does not reach the expected temperature within specified period, PCM determines that it has taken an excessive amount of time for the engine coolant temperature to reach the temperature necessary to start closed-loop fuel control. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Poor connection of connectors • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Clear DTC using WDS or equivalent. • Start engine. • Warm up engine completely. • Access ECT PID using WDS or equivalent. • Is ECT PID **above 35.6 °C {96 °F}**?	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect ECT sensor connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
5	**INSPECT ECT SENSOR** • Measure resistance between ECT sensor terminals A and B (part-side). • Is resistance **approx. 2 kilohms**?	Yes	Go to next step.
		No	Replace ECT sensor, then go to Step 7.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminal 38 and 91 (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Access ECT PID using WDS or equivalent. • Wait until ECT PID is **below 20 °C {68 °F}**. • Start engine and warm it up completely. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0126, P0128 [FS]

A3U010201084W20

DTC P0126 DTC P0128	**Coolant thermostat stuck to open**
DETECTION CONDITION	**DTC P0126** • If ECT signal never exceeds **71°C {160°F}** after engine start for specified period, PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — IAT: **Above -10°C {14°F}** — Difference between ECT at engine start and minimum IAT: **Below 6°C {43°F}** — Vehicle speed **over 9.5 km/h {5.9 mph}** **DTC P0128** • PCM monitors MAF, IAT, VSS and ECT signals and calculate radiator's heat radiation ratio while following monitoring conditions are met. If calculated value exceeds threshold, PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — ECT at engine start: **Below 35°C {95°F}** — IAT: **Above -10°C {14°F}** — Difference between ECT at engine start and minimum IAT: **Below 6°C {43°F}** — Vehicle speed **above 25 km/h {15 mph} for ATX, 40 km/h {25 mph} for MTX** **Diagnostic support note** • This is a intermittent monitor (THERMOSTAT) • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Coolant thermostat malfunction • ECT 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 next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCs** • Have other DTCs been stored?	Yes	Repair circuit malfunction for applicable DTCs.
		No	Go to next step.
4	**VERIFY COOLANT THERMOSTAT OPERATION** • Turn off E/L and A/C. • Remove cooling fan relay No.1 located next to main relay box. • Warm up engine until ECT PID reads **99°C {210°F}**. • Short cooling fan relay No.1 terminal A and B (harness–side) using a jumper wire. • Monitor ECT PID. • Has ECT PID decreased continuously and stop at **80—84°C {176—183°F}** (thermostat closed)?	Yes	Go to step 6.
		No	Go to next step.
5	**INSPECT COOLANT THERMOSTAT FOR WHETHER STUCK OPEN** • Remove coolant thermostat and inspect for stuck open. (See 01–12–7 THERMOSTAT INSPECTION.) • Is thermostat okay?	Yes	Inspect ECT sensor. Replace ECT sensor if necessary, then go to next step.
		No	Replace coolant thermostat, then go to next step.
6	**VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION** • Make sure to reconnect all disconnected connectors. • Cool down engine. **Note** • If workshop inside and outside temperature difference is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to cool down engine out of workshop. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Access ECT, IAT PIDs and make sure that each value is within following conditions. — ECT: **below 31°C {88°F}** (for P0128 only) — IAT: **above –10°C {14°F}** — Difference between ECT and IAT: **below 6°C {43°F}** • Is there any PID that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step.
		No	Go to next step for DTC P0126 or go to step 8 for DTC P0128.

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0126 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSIS MONITORING TEST RESULTS using WDS or epuivalent and monitor TEST #10:32:00. • Drive vehicle from **40—100 km/h {25—62 mph}** until TEST value is changed. **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops during every **5 minuites** 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 engine start. (e.g. If ECT is **–10°C {14°F}**, monitoring period is **38 minuites** and if ECT is **30°C {86°F}**, monitoring period is **8 minuites**) • Verify TEST #10:32:00 value. • Is value above minimum value?	Yes	Go to step 9.
		No	Replace PCM, then go to step 9.
8	**VERIFY TROUBLESHOOTING OF DTC P0128 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSIS MONITORING TEST RESULTS using WDS or equivalent and monitor TEST #10:31:00 or #10:30:00. • Drive vehicle from **40—100 km/h {25—62 mph}** for approximately **5 minuites** until TEST value is changed. **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During 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 #10:31:00 or #10:30:00 value. • Is value below maximum value?	Yes	Go to next step.
		No	Replace PCM, then go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0131 [FS]

A3U010201084W21

DTC P0131	HO2S (front) no inversion (low voltage stuck)
DETECTION CONDITION	• PCM monitors input voltage from HO2S (front) when the following monitoring conditions are met. If input voltage from sensor remains **below 0.45 V** for **42.8 s**, PCM determines that there is no HO2S (front) inversion. **MONITORING CONDITIONS** — Engine speed is **above 1,500 rpm**. — Engine coolant temperature is **above 70 °C {158 °F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0131	HO2S (front) no inversion (low voltage stuck)
POSSIBLE CAUSE	• HO2S (front) malfunction • HO2S (front) heater malfunction • Fuel injector malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel delivery hose leakage • Fuel filter clogging • Fuel return hose leakage • Air suction or leakage • PCV valve malfunction • Purge solenoid valve malfunction • Purge solenoid hoses are hooked up incorrectly. • Ignition coil malfunction • Insufficient compression • Engine malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCs** • Turn ignition key to OFF, then start engine. • Verify pending and stored DTCs using WDS or equivalent. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0131 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Warm up engine. • Access O2S11 PID using WDS or equivalent. • Verify PID while racing engine (in PARK). • Is PID reading okay? — **More than 0.45 V** when suddenly depressing accelerator pedal (rich condition) — **Less than 0.45 V** just after release of accelerator pedal (lean condition)	Yes	Go to next step.
		No	Replace HO2S (front), then go to Step 18.
6	**INSPECT PURGE SOLENOID VALVE OPERATION** • Turn ignition key to OFF. • Inspect purge solenoid valve operation. • Is purge solenoid valve okay?	Yes	Go to Step 11.
		No	Replace purge solenoid valve. Then go to Step 18.
7	**INSPECT PCV VALVE OPERATION** • Inspect PCV valve operation. (See 01–16–18 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION.) • Is PCV valve okay?	Yes	Go to next step.
		No	Replace PCV, then go to Step 18.
8	**INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE)** • start engine. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL PRESSURE INSPECTION.) • Is fuel line pressure **within 210—250 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**?	Yes	Go to Step 11.
		No	Go to next step.

STEP	INSPECTION		ACTION
9	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PUMP** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 18.
		No	Inspect fuel filters for following: • Restriction or clogging at fuel filter (high-pressure) • Foreign material or stain inside fuel filter (low-pressure) — If restriction or clogging is found at fuel filter (high-pressure), replace fuel filter (high-pressure). — If foreign material or stain is found inside fuel filter (low-pressure), clean fuel tank and fuel filter (low-pressure). — If all items above are okay, go to next step.
10	**INSPECT FUEL PUMP MAXIMUM PRESSURE** • Stop engine. • Turn ignition key to ON (Engine OFF). • Perform fuel pump maximum pressure test. (See 01–14–17 Fuel Pump Maximum Pressure Inspection.) • Is fuel pump maximum pressure **within 450—630 kPa {4.5—6.5 kgf/cm^2, 64—92 psi}**?	Yes	Replace pressure regulator, then go to step 18.
		No	Inspect fuel pump circuit for open or poor connection. • Repair or replace suspected circuit. • If circuit is okay, replace fuel pump. Then go to Step 18.
11	**CHECK IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT** • Verify blinking condition on each cylinder using timing light at idle. • Do all cylinders show blinking condition?	Yes	Go to Step 15.
		No	Go to next step.
12	**CHECK HIGH-TENSION LEADS OF NON-BLINKING CYLINDER** • Turn ignition key to OFF. • Inspect high-tension leads for installation condition, corrosion on terminal, open lead and damaged cover. • Is condition of high-tension lead okay?	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 18.
13	**INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR** • Disconnect ignition coil connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between ignition coil connector terminal D (harness-side) and body ground. • Is voltage reading **B+**?	Yes	Go to next step.
		No	Check for open circuit between ignition coil connector and ignition switch. Repair or replace wiring harness, then go to Step 18.
14	**INSPECT IGNITION COIL RESISTANCE** • Check ignition coil resistance. (See 01–18–2 IGNITION COIL INSPECTION.) • Is coil resistance okay?	Yes	Go to next step.
		No	Replace ignition coil, then go to Step 18.
15	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–8 COMPRESSION INSPECTION [FS].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
16	**INSPECT FUEL INJECTOR OPERATION** • Turn ignition key to OFF. • Inspect injector. (See 01–14–24 FUEL INJECTOR INSPECTION.) • Is injector okay?	Yes	Go to next step.
		No	Replace injector, then go to Step 18.

STEP	INSPECTION		ACTION
17	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing to head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.
18	**VERIFY TROUBLESHOOTING OF DTC P0131 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Access ECT and RPM PIDs using WDS or equivalent. • Make sure that ECT PID is **above 70 °C {158 °F}**. • Increase and keep engine speed **above 1,500 rpm** for at **least 1 minute**. • Is pending code of same DTC present?	Yes	Replace or reprogram PCM. Then go to next step.
		No	Go to next step.
19	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0132 [FS]

A3U010201084W22

DTC P0132	HO2S (front) no inversion (high voltage stuck)
DETECTION CONDITION	• PCM monitors input voltage from HO2S (front) when the following monitoring conditions are met. If input voltage from sensor remains **above 0.45 V** for **42.8 s**, PCM determines that there is no HO2S (front) inversion. **MONITORING CONDITIONS** — Engine speed is **above 1,500 rpm**. — Engine coolant temperature is **above 70 °C {158 °F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S (front) malfunction • HO2S (front) heater malfunction • Fuel injector malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel return hose clogging • PCV valve malfunction • Purge solenoid valve malfunction • Purge solenoid hoses are hooked up incorrectly. • Engine malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCs** • Turn ignition key to OFF, then start engine. • Verify pending and stored DTCs using WDS or equivalent. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0132 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Warm up engine. • Access O2S11 PID using WDS or equivalent. • Verify PID while racing engine (in PARK). • Is PID reading okay? — **More than 0.45 V** when suddenly depressing accelerator pedal (rich condition) — **Less than 0.45 V** just after release of accelerator pedal (lean condition)	Yes	Go to next step.
		No	Replace HO2S (front), then go to Step 12.
6	**INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)** • Start engine. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL PRESSURE INSPECTION.) • Is fuel line pressure **within 210—250 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**?	Yes	Go to Step 9.
		No	Go to next step.
7	**VERIFY VACUUM IS LEADING TO PRESSURE REGULATOR** • Disconnect vacuum hose from pressure regulator. • Verify that vacuum is felt at opening port of disconnected vacuum hose. • Is vacuum felt?	Yes	Inspect following parts and repair or replace if necessary: • Fuel pump maximum pressure • Fuel return pipe for clogging — If all items above are okay, replace pressure regulator. Then, go to Step 12.
		No	Verify vacuum hoses are connected correctly. • If okay, replace PRC solenoid valve. Then go to Step 12. • If not, reconnect vacuum hoses to correct position. Then go to Step 12.
8	**INSPECT PURGE SOLENOID VALVE OPERATION** • Turn ignition key to OFF. • Inspect purge solenoid valve operation. • Is purge solenoid valve okay?	Yes	Go to Step 10.
		No	Replace purge solenoid valve. Then go to Step 12.
9	**INSPECT PCV VALVE OPERATION** • Inspect PCV valve operation. (See 01–16–18 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION.) • Is PCV valve okay?	Yes	Go to next step.
		No	Replace PCV, then go to Step 12.
10	**INSPECT FUEL INJECTOR OPERATION** • Turn ignition key to OFF. • Inspect injector. (See 01–14–24 FUEL INJECTOR INSPECTION.) • Is injector okay?	Yes	Go to next step.
		No	Replace injector, then go to Step 12.

STEP	INSPECTION		ACTION
11	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing to head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0132 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Access ECT and RPM PIDs using WDS or equivalent. • Make sure that ECT PID is **above 70 °C {158 °F}**. • Increase and keep engine speed **above 1,500 rpm** for at **least 1 minute**. • Is pending code of same DTC present?	Yes	Replace or reprogram PCM. Then go to next step.
		No	Go to next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0133 [FS]

A3U010201084W23

DTC P0133	HO2S (Front) circuit slow response
DETECTION CONDITION	• PCM monitors inversion cycle period, lean-to-rich response time and rich-to-lean response time of the sensor. PCM calculates the average of the inversion cycle period-specified inversion cycles, average response time from lean-to-rich, and from rich-to-lean when monitoring conditions are met. If any exceeds threshold, PCM determines that circuit has malfunction. **MONITORING CONDITIONS** — Drive mode 3 — Following conditions are met: • Calculation load is **20—59%** [at engine speed **2,000 rpm**] • Engine speed is **1,410—4,000 rpm** • Vehicle speed is **over 3.77 km/h {2.34 mph}**. • Engine coolant temperature is **above –10°C {14°F}**. **Diagnostic support note** • This is an intermittent monitor. (OXYGEN SENSOR) • MIL illuminates if PCM detects either of above malfunction conditions in two consecutive drive cycles. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0133	HO2S (Front) circuit slow response
POSSIBLE CAUSE	• Front HO2S deterioration • Front HO2S heater malfunction • PRC solenoid valve malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line from fuel distribution pipe and fuel pump • Fuel return hose clogged • Leakage from exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression • Engine malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition key to OFF, then start engine. • Verify pending and/or stored DTCs using WDS or equivalent. • Is the following DTC also present? — P0442, P0443, P0455, P0031, P0032 or P1450 with P0133	Yes	Go to appropriate DTC troubleshooting procedures, then go to Step 15. (See 01–02B–15 DTC TABLE [FS].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0133 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [FS].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S11 PID using WDS or equivalent. • Check PID under following accelerator pedal conditions (in PARK). — **More than 0.45 V** when suddenly depressing accelerator pedal (rich condition) — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is PID reading okay?	Yes	Go to Step 8.
		No	Go to next step.
6	**INSPECT INSTALLATION OF FRONT HO2S** • Check if HO2S (front) is loosely installed. • Is sensor installed securely?	Yes	Go to next step.
		No	Retighten sensor, then go to Step 15.
7	**INSPECT EXHAUST SYSTEM FOR GAS LEAKAGE** • Visually check if any gas leakage is found between exhaust manifold and HO2S (front). • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 15.
		No	Replace sensor, then go to Step 15.
8	**INSPECT LONG TERM FUEL TRIM** • Access LONGFT1 PIDs. • Compare it with FREEZE FRAME DATA (FFD) recorded at Step 1. • Is it below FFD value?	Yes	Engine is driven under rich condition. Go to next step.
		No	Engine is driven under lean condition. Go to Step 11.

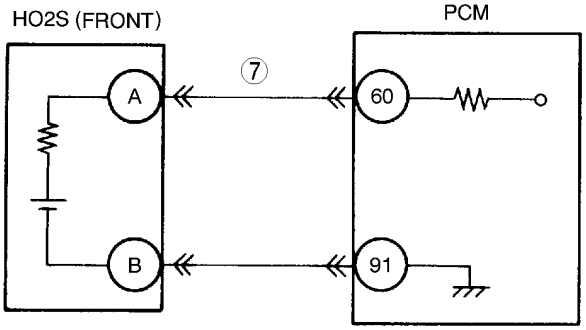
STEP	INSPECTION		ACTION
9	**INSPECT FUEL LINE PRESSURE (Excessive fuel line pressure)** • Start engine. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL PRESSURE INSPECTION.) • Is fuel line pressure **within 210—250 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**?	Yes	Go to Step 14.
		No	Go to next step.
10	**VERIFY VACUUM IS LEADING TO PRESSURE REGULATOR** • Disconnect vacuum hose from pressure regulator. • Verify that vacuum is felt at opening port of disconnected vacuum hose. • Is vacuum felt?	Yes	Inspect fuel pump maximum pressure and fuel return pipe for clogging. (See 01–14–15 FUEL PUMP UNIT INSPECTION.) • If any problem is found, repair or replace suspected parts. • If all items above are okay, replace pressure regulator. Then go to Step 15.
		No	Verify vacuum hoses are connected correctly. • If okay, replace PRC solenoid valve. • If not, reconnect vacuum hoses to correct position. Then go to Step 15.
11	**INSPECT FUEL LINE PRESSURE (Low fuel line pressure)** • Start engine. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL PRESSURE INSPECTION.) • Is fuel line pressure **within 210—250 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**?	Yes	Go to Step 14.
		No	Go to next step.
12	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 15.
		No	Inspect fuel filters for following: • Restriction or clogging at fuel filter (high-pressure) • Foreign material or stain inside fuel filter (low-pressure) Perform following actions as result. • If restriction or clogging is found at fuel filter (high-pressure), replace fuel filter (high-pressure). • If foreign material or stain is found inside fuel filter (low-pressure), clean fuel tank and fuel filter (low-pressure). • If all items above are okay, go to next step.
13	**INSPECT FUEL PUMP MAXIMUM PRESSURE** • Perform fuel pump maximum pressure test. (See 01–14–15 FUEL PUMP UNIT INSPECTION.) • Is fuel pump maximum pressure **within 450—630 kPa {4.5—6.5 kgf/cm^2, 64—92 psi}**?	Yes	Replace pressure regulator, then go to step 15.
		No	Inspect fuel pump circuit for open or poor connection. • Repair or replace suspected circuit. • If circuit is okay, replace fuel pump. Then go to Step 15.
14	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble, which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.

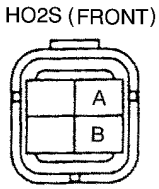
STEP	INSPECTION		ACTION
15	**VERIFY TROUBLESHOOTING OF DTC P0133 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Run OBD-ll DRIVE MODE 1 and 3. (See 01–02B–10 OBD-II DRIVE MODE [FS].) • Stop vehicle and access ON BOARD SYSTEM READINESS TEST to inspect DRIVE MODE completion status. • Verify RFC changes to YES for OXYGEN SENSOR. — If not, run DRIVE MODE again. • Access DIAGNOSTIC MONITORING TEST RESULTS. • Verify following TEST # values: — 10:01:11, 10:02:11 or 10:03:11 • Are they all below MAX value?	Yes	Go to next step.
		No	Replace PCM, then go to next step.
16	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0134 [FS]

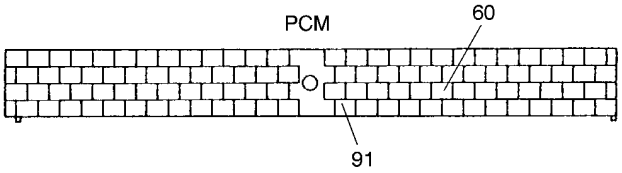
A3U010201084W24

DTC P0134	HO2S (Front) circuit no activity detected
DETECTION CONDITION	• PCM monitors input voltage from HO2S (front) when the following monitoring conditions are met. If input voltage from sensor never **exceed 0.55 V** for **120 seconds**, PCM determines that sensor circuit is not activated. **MONITORING CONDITIONS** — Drive mode 3 — Following conditions are met: • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S (front) deterioration • HO2S (front) heater malfunction • Leakage from exhaust system • Open or short to ground circuit between HO2S (front) terminal A and PCM terminal 60 • Insufficient compression • Engine malfunction





VEHICLE HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition key to OFF, then start engine. • Verify pending and stored DTCs using WDS or equivalent. • Is other DTC present except P0131 and P0132?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.

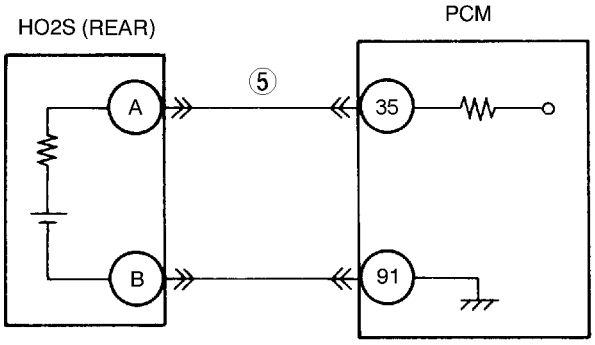
STEP	INSPECTION		ACTION
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0134 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [FS].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S11 PID using WDS or equivalent. • Check PID under following accelerator pedal condition (in PARK). — **More than 0.55 V** when suddenly depressing accelerator pedal (rich condition). — **Less than 0.55 V** just after release of accelerator pedal (lean condition) • Is PID reading okay?	Yes	Go to Step 8.
		No	Go to next step.
6	**INSPECT INSTALLATION OF HO2S** • Check if HO2S (front) is loosely installed. • Is sensor installed securely?	Yes	Go to next step.
		No	Install sensor securely, then go to Step 10.
7	**INSPECT EXHAUST SYSTEM FOR GAS LEAKAGE** • Visually check if any gas leakage is found between exhaust manifold and HO2S (front). • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 10.
		No	• Inspect the following harnesses for open or short to ground circuit. Repair or replace harness if necessary. — HO2S (front) terminal A (harness-side) to PCM terminal 60 (harness-side) • Repair or replace harness if necessary. • If all items above are okay, replace faulty sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 10.
		No	Go to next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–8 COMPRESSION INSPECTION [FS].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.

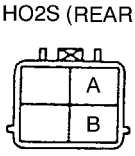
STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0134 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Access RPM and ECT PIDs using WDS or equivalent. • Verify that ECT PID is reading **above 70 °C {158 °F}**. • Increase engine speed **above 1,500 rpm** (RPM PID reading) for **more than 120 seconds**. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0138 [FS]

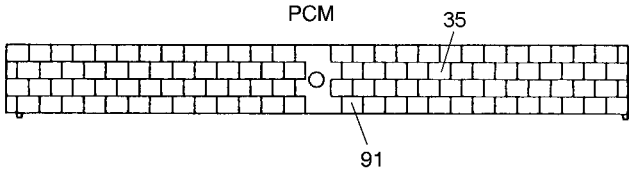
A3U010201084W25

DTC P0138	HO2S (rear) circuit high input
DETECTION CONDITION	• PCM monitors input voltage from HO2S (rear). If input voltage from sensor is **above 0.45 V** for **6 seconds** during deceleration fuel cut, PCM determines that the circuit input is high. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• HO2S (rear) malfunction • Short to power circuit in wiring between HO2S (rear) terminal A and PCM terminal 35





VEHICLE HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

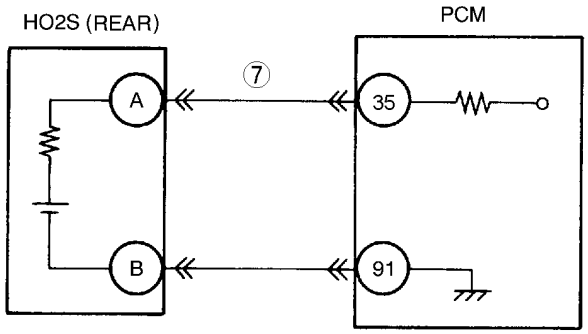
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition key to OFF, then Start engine. • Verify pending codes or stored DTCs using WDS or equivalent. • Is other DTC present?	Yes	Go to appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [FS].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0138 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [FS].)
5	**INSPECT HO2S (REAR) SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY CIRCUIT** • Turn ignition key to OFF. • Disconnect HO2S (rear) connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between HO2S (rear) terminal A (harness-side) and body ground. • Is any voltage reading?	Yes	Replace short to power supply circuit, then go to Step 7.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Start engine. • Access O2S12 PID using WDS or equivalent. • Verify PID while racing engine at least **10 times** (in neutral position). • Does PID reading stay **above 0.45 V**?	Yes	Replace HO2S (rear), then go to next step.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0138 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Run OBD-II DRIVE MODE 1 and 3. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

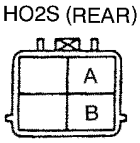
DTC P0140 [FS]

A3U010201084W26

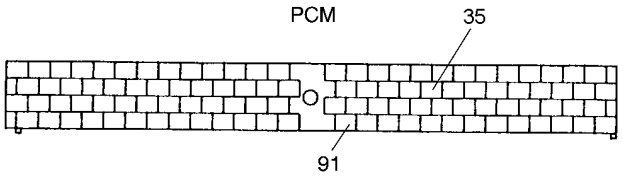
DTC P0140	HO2S (rear) circuit no activity detected
DETECTION CONDITION	• PCM monitors input voltage from HO2S (rear) when the following monitoring conditions are met. If input voltage from sensor never **exceed 0.55 V** for **30 seconds**, PCM determines that sensor circuit is not activated. **MONITORING CONDITIONS** — Drive mode 3 — Following conditions are met: • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0140	HO2S (rear) circuit no activity detected
POSSIBLE CAUSE	• HO2S (rear) deterioration • HO2S (rear) heater malfunction • Leakage from exhaust system • Open or short to ground circuit between HO2S (rear) terminal A and PCM terminal 35 • Insufficient compression • Engine malfunction





VEHICLE HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition key to OFF, then start engine. • Verify pending and stored DTCs using WDS or equivalent. • Is other DTC present except P0131 and P0132?	Yes	Go to appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [FS].)
		No	Go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0140 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02B–15 DTC TABLE [FS].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S12 PID using WDS or equivalent. • Verify PID while racing engine at least **10 times** (in neutral position). • Is PID reading okay? — **More than 0.55 V** at least once during engine racing.	Yes	Go to Step 8.
		No	Go to next step.
6	**INSPECT INSTALLATION OF HO2S (REAR)** • Check if HO2S (rear) is loosely installed. • Is sensor installed securely?	Yes	Go to next step.
		No	Install sensor securely, then go to Step 10.

STEP	INSPECTION		ACTION
7	**INSPECT EXHAUST SYSTEM FOR GAS LEAKAGE** • Visually check if any gas leakage is found between exhaust pipe and HO2S (rear). • Is there any gas leakage?	Yes	Repair or replace any faulty exhaust parts, then go to Step 10.
		No	• Inspect for open or short to ground circuit between HO2S (rear) terminal A (harness-side) and PCM terminal 35 (harness-side). — Repair or replace harness if necessary. • If all items above are okay, replace HO2S (rear). Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 10.
		No	Go to next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–8 COMPRESSION INSPECTION [FS].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0140 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Access RPM and ECT PIDs using WDS or equivalent. • Verify that ECT PID is reading **above 70 °C {158 °F}**. • Increase engine speed **above 1,500 rpm** (RPM PID reading) for **more than 30 seconds**. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0171 [FS]

A3U010201084W27

DTC P0171	Fuel trim system too lean
DETECTION CONDITION	• PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) values when DRIVE MODE 1 is run. If fuel trim exceeds preprogrammed criteria, PCM determines that the fuel system is too lean. **Diagnostic support note** • This is a continuous monitor. (FUEL SYSTEM) • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Misfire • HO2S (front) deterioration • HO2S (front) heater malfunction • PRC solenoid valve malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line from fuel delivery pipe and fuel pump • Fuel return hose clogged • Leakage from exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF, then start engine. • Verify 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 appropriate DTC troubleshooting procedures. (See 01–02B–15 DTC TABLE [FS].)
		No	If drivability concern is present, go to Step 8. If not, go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0171 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access ECT, MAF, TP and VS PIDs using WDS or equivalent. (See 01–40B–8 PID/DATA MONITOR table (Reference).) • Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 20.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any input signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, and repair or replace it. Then go to Step 20.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF HO2S FRONT** • Access O2S11 PID using WDS or equivalent. • Check PID under following accelerator pedal condition. (in PARK) — **More than 0.45 V** when suddenly depressing accelerator pedal (rich condition) — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is PID reading okay?	Yes	Inspect following for air suction due to cracks, damages and loose parts: • From air cleaner to throttle body • From throttle body to dynamic chamber • From dynamic chamber to intake manifold • Vacuum hoses **Note** • Engine speed may change when rust penetrating agent is sprayed on the air suction area. Repair or replace any faulty part, then go to Step 20.
		No	Visually inspect for any gas leakage between exhaust manifold and HO2S (front). • If there is no leakage, replace HO2S (front). Then go to Step 20.
8	**INSPECT MAF SIGNAL** • Start engine. • Access MAF PID using WDS or equivalent. • Verify that MAF PID changes quickly according to race engine RPM. • Is MAF PID response okay?	Yes	Go to next step.
		No	Replace MAF sensor, then go to Step 20.
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE-AIR SYSTEM** • Visually inspect for loose, cracked or damaged hoses on intake-air system. • Is there malfunction?	Yes	Repair or replace source of air suction, then go to Step 20.
		No	Go to next step.
10	**INSPECT FUEL LINE PRESSURE** • Turn ignition key to OFF. **Note** • If engine will not start, inspect fuel line pressure with ignition key ON. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL PRESSURE INSPECTION.) • Is fuel line pressure **within 210—250 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**?	Yes	Go to Step 14.
		No	If fuel line pressure is too high: Go to next step. If fuel line pressure is too low: Go to Step 12.
11	**VERIFY VACUUM IS LEADING TO PRESSURE REGULATOR** • Disconnect vacuum hose from pressure regulator. • Verify that vacuum is felt at opening port of disconnected vacuum hose. • Is vacuum felt?	Yes	Inspect fuel pump maximum pressure and fuel return hose for clogging. • If any problem is found, repair or replace suspected parts. • If all items above are okay, replace pressure regulator. Then go to Step 20.
		No	Verify vacuum hoses are connected correctly. • If okay, replace PRC solenoid valve, then go to Step 20. • If not, reconnect vacuum hoses to correct position, then go to Step 20.
12	**INSPECT FUEL PUMP MAXIMUM PRESSURE** • Perform fuel pump maximum pressure test. (See 01–14–15 FUEL PUMP UNIT INSPECTION.) • Is fuel pump maximum pressure **within 450—630 kPa {4.5—6.5 kgf/cm^2, 64—92 psi}**?	Yes	Go to next step.
		No	Inspect fuel pump circuit for open or poor connection. Repair or replace suspected circuit, then go to Step 20. • If circuit is okay, replace fuel pump. Then go to Step 20.

STEP	INSPECTION		ACTION
13	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 20.
		No	Inspect fuel filters for following: • Restriction or clogging at fuel filter (high-pressure). • Foreign materials or stain inside fuel filter (low-pressure) Perform following actions as result. • If restriction or clogging is found at fuel filter (high-pressure), replace fuel filter (high-pressure). • If foreign materials or stain is found inside fuel filter (low-pressure), clean of fuel tank and fuel filter (low-pressure). • If all items above are okay, replace pressure regulator. Then go to Step 20.
14	**CHECK IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT** • Verify blinking condition on each cylinders using timing light at idle. • Do all cylinders show blinking condition?	Yes	Go to Step 18.
		No	Go to next step.
15	**CHECK HIGH-TENSION LEADS OF NO BLINKING CYLINDER** • Turn ignition key to OFF. • Inspect high-tension leads for installation condition, corrosion on terminal, open lead and damaged cover. • Is condition of high-tension lead okay?	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 20.
16	**INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR** • Disconnect ignition coil connector. • Turn ignition key to ON (Engine OFF). • Check voltage at ignition coil connector terminal D (harness-side) and body ground. • Is voltage reading **B+**?	Yes	Go to next step.
		No	Check for open circuit between ignition coil connector and ignition switch. Repair or replace wiring harness, then go to Step 20.
17	**INSPECT IGNITION COIL RESISTANCE** • Check ignition coil resistance. (See 01–18–2 IGNITION COIL INSPECTION.) • Is coil resistance okay?	Yes	Go to next step.
		No	Replace ignition coil, then go to Step 20.
18	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–8 COMPRESSION INSPECTION [FS].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to Step 20.
19	**INSPECT FUEL INJECTOR OPERATION** • Remove fuel injector from suspected bank. (See 01–14–24 FUEL INJECTOR INSPECTION.) • Inspect injector operation. • Is fuel injector okay?	Yes	Go to next step.
		No	Replace injector, then go to Step 20.
20	**VERIFY TROUBLESHOOTING OF DTC P0171 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Run OBD-II DRIVE MODE 1, 2 and 3. • Is PENDING CODE P0171 present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
21	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0172 [FS]

A3U010201084W28

DTC P0172	Fuel trim system (RH) too rich
DETECTION CONDITION	• PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) values when DRIVE MODE 1 is run. If fuel trim exceeds pre programmed criteria, PCM determines that the fuel system is too rich. **Diagnostic support note** • This is a continuous monitor. (FUEL SYSTEM) • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Misfire • HO2S (front) deterioration • HO2S heater (front) malfunction • PRC solenoid valve malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel return hose clogged • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • PCV valve malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF, then start engine. • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	If drivability concern or rough idle is present, go to Step 10. If not, go to next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0172 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access ECT, MAF, TP and VS PIDs using WDS or equivalent. (See 01–40B–8 PID/DATA MONITOR table (Reference).) • Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 12.
		No	Go to next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as in Step 5 while simulating FREEZE FRAME DATA condition. • Is there any input signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, and repair or replace it. Then go to Step 12.
		No	Go to next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF HO2S (FRONT)** • Access O2S11 PID using WDS or equivalent. • Check PID under following accelerator pedal condition (in PARK or NEUTRAL). — **More than 0.45 V** when suddenly depressing accelerator pedal (rich condition) — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is PID reading okay?	Yes	Go to next step.
		No	Replace suspected HO2S (front). Then go to Step 12.

STEP	INSPECTION		ACTION
8	**INSPECT FUEL LINE PRESSURE** • Turn ignition key to OFF. • Inspect fuel line pressure while engine running. (See 01–14–6 FUEL PRESSURE INSPECTION.) • Is fuel line pressure **within 210—250 kPa {2.1—2.6 kgf/cm^2, 30—36 psi}**?	Yes	Go to Step 10.
		No	Go to next step.
9	**VERIFY VACUUM IS LEADING TO PRESSURE REGULATOR** • Start engine. • Disconnect vacuum hose from pressure regulator. • Verify that the vacuum is felt at opening port of disconnected vacuum hose. • Is vacuum felt?	Yes	Inspect fuel pump maximum pressure and fuel return hose for clogging. • If any problem found, repair or replace suspected parts. • If all items above are okay, replace pressure regulator. Then go to Step 12.
		No	Verify vacuum hoses are connected correctly. • If okay, replace PRC solenoid valve, then go to Step 12. • If not, reconnect vacuum hoses to correct position, then go to Step 12.
10	**INSPECT PURGE SOLENOID VALVE FOR WHETHER STUCK OPEN** • Turn ignition key to OFF. • Disconnect both hoses from purge solenoid valve. • Blow air through purge solenoid valve. • Does air blow through?	Yes	Replace purge solenoid valve. Then go to Step 12.
		No	Go to next step.
11	**INSPECT PCV VALVE OPERATION** • Inspect PCV valve operation. (See 01–03B–58 Pressure Regulator Control Inspection.) • Is PCV valve okay?	Yes	Go to next step.
		No	Replace PCV valve, then go to next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0172 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Run OBD-II DRIVE MODE 1, 2 and 3. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0300 [FS]

A3U010201085W01

DTC P0300	Random misfire detection
DETECTION CONDITION	• PCM monitors CKP sensor input signal interval time. PCM calculates the change of the interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, PCM detects a misfire in the corresponding cylinder. While the engine is running, PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, 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). • MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles. • PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle. • MIL flashes if PCM detects the misfire which can damage the catalytic converter during first drive cycle. Therefore, PENDING CODE is not available while MIL flashes. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0300	Random misfire detection
POSSIBLE CAUSE	• CKP sensor malfunction • CMP sensor malfunction • Ignition coil malfunction • High-tension lead malfunction • MAF sensor contamination • Excess air suction in intake-air system (between MAF sensor and dynamic chamber) • Fuel pump malfunction • Fuel pressure regulator malfunction • Fuel line clogged • Fuel filter clogged • Fuel leakage in fuel line • Purge control solenoid valve malfunction • PCV valve malfunction • EGR valve malfunction • Vacuum hoses damages or improper connection • Related connector and terminal malfunction • Related wiring harness malfunction • Poor fuel quality

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn ignition key to OFF then start engine. • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting. (See 01–02B–15 DTC TABLE [FS].)
		No	Go to next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access ECT, IAT, MAF, RPM, TP, and VS PIDs using WDS or equivalent. (See 01–40B–7 PCM Inspection Using the SST (WDS or equivalent).) • Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?	Yes	Inspect suspected circuit and/or part according to inspection results. (See 01–40B–7 PCM Inspection Using the SST (WDS or equivalent).) Then go to Step 23.
		No	Go to next step.
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit and/or part according to inspection results. (See 01–40B–7 PCM Inspection Using the SST (WDS or equivalent).) Then go to Step 23.
		No	Go to next step.
6	**INSPECT CMP SENSOR** • Inspect CMP sensor. (See 01–40B–35 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [FS].) • Is CMP sensor okay?	Yes	Go to next step.
		No	Inspect installation condition and damages on timing belt and gears, repair faulty parts. • If it is okay, replace CMP sensor. Then go to Step 23.
7	**VERIFY CKP SENSOR INSTALLATION CONDITION** • Check CKP sensor for looseness. • Is CKP sensor loose?	Yes	Retighten CKP sensor, then go to Step 23.
		No	Go to next step.
8	**CHECK IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT** • Verify blinking condition on each cylinders using timing light at idle. • Do all cylinders show blinking condition?	Yes	Go to Step 12.
		No	Go to next step.

STEP	INSPECTION		ACTION
9	**CHECK HIGH-TENSION LEADS OF NON-BLINKING CYLINDER** • Turn ignition key to OFF. • Inspect high-tension leads for installation condition, corrosion on terminal, open lead and damaged cover. • Is condition of high-tension lead okay?	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 23.
10	**INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR** • Disconnect ignition coil connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between ignition coil terminal A (harness-side) and body ground. • Is voltage reading **B+**?	Yes	Go to next step.
		No	Check for open circuit between ignition coil connector and ignition switch. Repair or replace wiring harness, then go to Step 23.
11	**INSPECT IGNITION COIL RESISTANCE** • Check ignition coil resistance. (See 01–18–2 IGNITION COIL INSPECTION.) • Is coil resistance okay?	Yes	Go to Step 23.
		No	Replace ignition coil, then go to Step 23.
12	**INSPECT MAF SIGNAL** • Start engine. • Access MAF PID using WDS or equivalent. • Verify that MAF PID changes quickly according to race engine RPM. • Is MAF PID response okay?	Yes	Go to next step.
		No	Replace MAF sensor, then go to Step 23.
13	**INSPECT EXCESSIVE AIR SUCTION IN INTAKE-AIR SYSTEM** • Inspect for air leakage at following: — Between MAF sensor and throttle body — Between throttle body and dynamic chamber • Is there malfunction?	Yes	Repair or replace suspected part, then go to Step 23.
		No	Go to next step.
14	**INSPECT FUEL LINE PRESSURE** • Inspect fuel line pressure. (See 01–14–6 FUEL PRESSURE INSPECTION.) • Is fuel line pressure okay?	Yes	Go to Step 18.
		No	If fuel line pressure is too high, go to next step. If fuel line pressure is too low, go to Step 16.
15	**VERIFY VACUUM LEADING TO PRESSURE REGULATOR** • Disconnect vacuum hose from pressure regulator. • Start engine. • Is vacuum felt at opening end of vacuum hose?	Yes	Check following: • Fuel pump maximum pressure (See 01–14–15 FUEL PUMP UNIT INSPECTION.) • Fuel return hose for clogging — If all above are okay, replace pressure regulator. Then go to Step 23.
		No	Verify vacuum hoses are connected correctly. • If okay, replace pressure regulator control solenoid valve. • If not, reconnect vacuum hose in proper position. Then go to Step 23.
16	**INSPECT FUEL PUMP MAXIMUM PRESSURE** • Inspect fuel pump maximum pressure. (See 01–14–15 FUEL PUMP UNIT INSPECTION.) • Is fuel pump maximum pressure **within 450—630 kPa {4.5—6.5 kgf/cm^2, 64—92 psi}**?	Yes	Go to next step.
		No	Inspect fuel pump circuit for open or poor connection. Repair or replace suspected circuit, then go to Step 23. • If okay, replace fuel pump, then go to Step 23.
17	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect for fuel leakage in fuel line for any leakage. • Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 23.
		No	Inspect fuel filters for following: • Restriction or clogging at fuel filter (high-pressure). • Foreign material or stain inside fuel filter (low-pressure) Perform following actions as result. • If restriction or clogging is found at fuel filter (high-pressure), replace fuel filter (high-pressure). • If foreign material or stain is found inside fuel filter (low-pressure), clean fuel tank and fuel filter (low-pressure). • If all items above are okay, replace pressure regulator. Then, go to Step 23.

STEP	INSPECTION		ACTION
18	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–8 COMPRESSION INSPECTION [FS].) • Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to Step 23.
19	**INSPECT OPERATION OF PURGE CONTROL SOLENOID VALVE** • Inspect purge solenoid valve. (See 01–16–12 PURGE SOLENOID VALVE INSPECTION.) • Is purge control solenoid valve operation okay?	Yes	Go to next step.
		No	Replace purge control solenoid valve, then go to Step 23.
20	**INSPECT PCV VALVE OPERATION** • Turn ignition key to OFF. • Remove PCV valve and check valve operation. (See 01–16–18 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION.) • Is PCV valve operation okay?	Yes	Replace PCV valve, then go to Step 23.
		No	Go to next step.
21	**INSPECT OPERATION OF EGR VALVE** • Remove EGR valve. • Visually check for stuck open condition. • Is EGR valve stuck open?	Yes	Repair or replace EGR valve, then go to Step 23.
		No	Go to next step.
22	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.
23	**VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and perform OBD-II DRIVE MODE 1. (See 01–02B–10 Mode 1 (PCM adaptive memory procedure drive mode).) • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
24	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0301, P0302, P0303, P0304 [FS]

A3U010201085W02

DTC P0301 **DTC P0302** **DTC P0303** **DTC P0304**	**Cylinder No.1 misfire detected** **Cylinder No.2 misfire detected** **Cylinder No.3 misfire detected** **Cylinder No.4 misfire detected**
DETECTION CONDITION	• PCM monitors CKP sensor input signal interval time. PCM calculates the change of the interval time for each cylinder. If the change of interval time exceeds the pre programmed criteria, PCM detects a misfire in the corresponding cylinder. While the engine is running, PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the pre programmed criteria, 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). • MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles. • PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle. • MIL flashes if PCM detects the misfire which can damage the catalytic converter during first drive cycle. Therefore, PENDING CODE is not available while MIL flashes. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Spark plug malfunction • High-tension lead malfunction • Fuel injector malfunction • Air suction in intake-air system (between dynamic chamber and cylinder head) • Inadequate engine compression due to engine internal malfunction • Related connector or terminal malfunction • Related wiring harness malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then start engine. • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting. (See 01–02B–15 DTC TABLE [FS].)
		No	Go to next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON /IDLE)** • Access ECT, IAT, MAF, RPM, TP and VS PIDs using WDS or equivalent. (See 01–40B–7 PCM Inspection Using the SST (WDS or equivalent).) • Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 12. (See 01–40B–7 PCM Inspection Using the SST (WDS or equivalent).)
		No	Go to next step.
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 13. (See 01–40B–7 PCM Inspection Using the SST (WDS or equivalent).)
		No	Go to next step.
6	**INSPECT SPARK PLUG CONDITION** • Turn ignition key to OFF. • Remove spark plug from suspected cylinder. • Check spark plug condition: — Cracks — Excessive wear — Gap — Wet • Is any problem found on spark plug?	Yes	• If spark plug is wet, fuel flooding is suspected. Go to Step 13. • If spark plug has cracks, excessive wear or improper gap, replace faulty spark plug. Then go to Step 13.
		No	Go to next step.

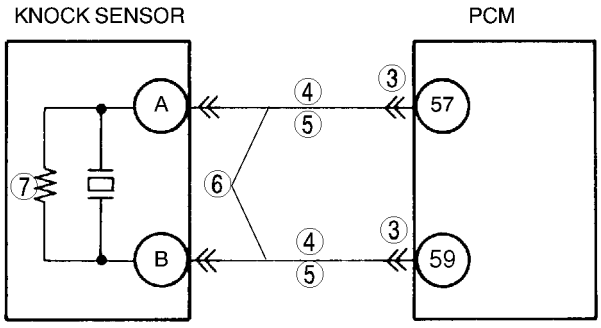
STEP	INSPECTION		ACTION
7	**VERIFY HIGH-TENSION LEAD CONDITION** • Remove high-tension lead. • Check high-tension lead condition and resistance. — Cracks — Spark shorts to cylinder head through high-tension lead insulator • Is high-tension lead okay?	Yes	Go to next step.
		No	Replace high-tension lead, then go to Step 13.
8	**INSPECT FOR AIR SUCTION AT INTAKE-AIR SYSTEM** • Inspect for air leakage at following: — Around connection of dynamic chamber and intake manifold — Around connection of intake manifold and cylinder head • Is air leakage found?	Yes	Repair or replace suspected part, then go to Step 13.
		No	Go to next step.
9	**INSPECT FUEL INJECTOR HARNESS** • Remove intake-air system parts. • Disconnect fuel injector connector on suspected cylinder. • Connect TEST LIGHT (LED) to fuel injector connector terminals. • Check dim of light during cranking. • Does TEST LIGHT (LED) illuminate?	Yes	Go to next step.
		No	Check for fuel injector harnesses. Repair or replace if necessary, then go to Step 13.
10	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing radiator cap when radiator is hot is dangerous, Scalding coolant and steam may shoot out and cause serious injury.** • **When removing radiator cap, wrap thick cloth around and turn it slowly.** • Remove radiator cap. • Implement procedure to bleed air from engine coolant, then run engine at idle. • Is there any small bubble which makes engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 13.
		No	Go to next step.
11	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–8 COMPRESSION INSPECTION [FS].) • Is engine compression okay?	Yes	Go to next step.
		No	Overhaul the engine, then go to next step.
12	**INSPECT FUEL INJECTOR OPERATION** • Remove fuel injector from suspected cylinder. • Swap injector with injector on other cylinder. • Start engine and run it at idle. • Does misfire DTC move to cylinder with suspected injector?	Yes	Replace injector, then go to Step 13.
		No	Go to next step.

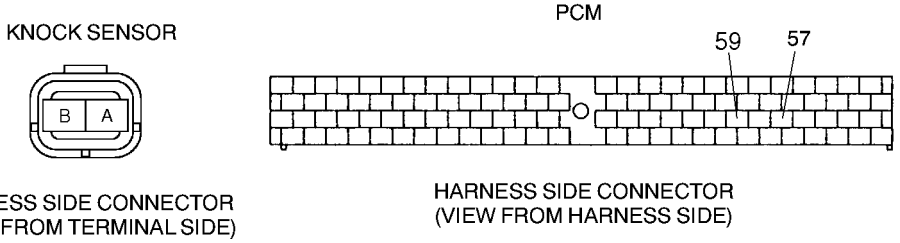
STEP	INSPECTION		ACTION
13	**VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Perform OBD-II DRIVE MODE 1. (See 01–02B–10 Mode 1 (PCM adaptive memory procedure drive mode).) • Is same PENDING CODE or stored code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0325 [FS]

A3U010201085W03

DTC P0325	Knock sensor circuit malfunction
DETECTION CONDITION	• PCM monitors input signal from knock sensor when the following monitoring conditions are met. If PCM does not receive input signal from knock sensor for **5 seconds**, PCM determines that knock sensor circuit is malfunctioning. **MONITORING CONDITIONS** — Engine load is **above 50%** — Engine coolant temperature is **above 60 °C {140 °F}**. — Engine speed is **within 1,500—5,000 rpm**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Knock sensor malfunction • Connector or terminal malfunction • Open or short to ground circuit between knock sensor connector terminal A and PCM terminal 57 • Open or short to ground circuit between knock sensor connector terminal B and PCM terminal 59 • Short between two wires of knock sensor





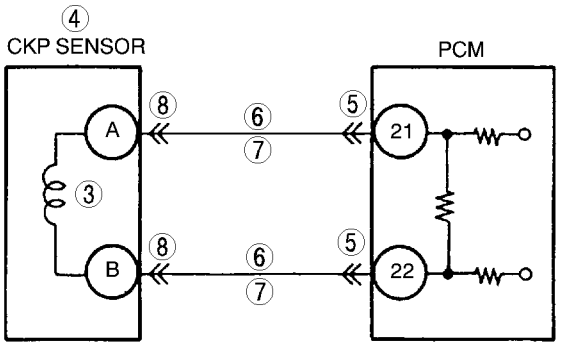
Diagnostic procedure

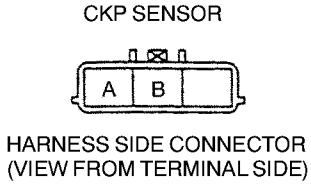
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT PCM CONNECTOR TERMINAL** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminals 57 and 66 (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
4	**INSPECT KNOCK SENSOR CIRCUITS FOR OPEN CIRCUIT** • Disconnect knock sensor connector. • Check continuity between the following circuits: — Knock sensor female terminal A (harness-side) and PCM terminal 57 (harness-side) — Knock sensor female terminal B (harness-side) and PCM terminal 59 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected wiring harness, then go to Step 8.
5	**INSPECT KNOCK SENSOR CIRCUITS FOR SHORT TO GROUND** • Check continuity between following circuits: — Knock sensor female terminal A (harness-side) and body ground — Knock sensor female terminal B (harness-side) and body ground • Is there continuitity?	Yes	Repair or replace suspected wiring harness, then go to Step 8.
		No	Go to next step.
6	**CHECK FOR SHORT CIRCUITS** • Check continuity between knock sensor female terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 8.
		No	Go to next step.
7	**CHECK KNOCK SENSOR RESISTANCE** • Measure resistance between knock sensor terminals (part-side). • Is resistance **approx. 560 kilohms**?	Yes	Go to next step.
		No	Replace knock sensor, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0325 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Access ECT, RPM and LOAD PIDs using WDS or equivalent. • Run vehicle **more than 5 seconds** in the following conditions: — ECT: **above 60 °C {140 °F}** — RPM: **1,500—5,000 rpm** — LOAD: **above 50%** • Is same DTC present?	Yes	Replace or reprogram PCM. Then go to next step.
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure” (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

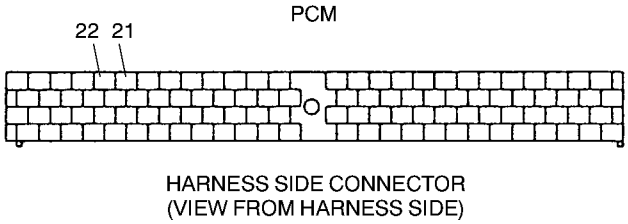
DTC P0335 [FS]

A3U010201085W04

DTC P0335	CKP sensor circuit malfunction
DETECTION CONDITION	• If PCM does not receive input signal from CKP sensor for **4.2 seconds** while MAF is **2.2 g/s {0.29 lb/min} or above**, PCM determines that CKP sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• CKP sensor malfunction • Connector or terminal malfunction • CKP sensor is dirty. • Short to ground between CKP sensor terminal A and PCM terminal 21 • Short to ground between CKP sensor terminal B and PCM terminal 22 • Open circuit between CKP sensor terminal A and PCM terminal 21 • Open circuit between CKP sensor terminal B and PCM terminal 22 • CKP sensor pulse wheel malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CKP SENSOR VOLTAGE** • Disconnect CKP sensor. • Connect voltmeter between CKP sensor terminals A and B (part-side). • Check voltage in AC range while cranking the engine. • Is any voltage present?	Yes	Go to Step 5.
		No	Go to next step.
4	**INSPECT CKP SENSOR RESISTANCE** • Inspect CKP sensor. (See 01–40B–32 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [FS].) • Is CKP sensor okay?	Yes	Check for poor connection (damaged/pulled-out terminals, corrosion, etc.), bent terminal of CKP sensor connector or plate. • Repair if necessary, then go to Step 9.
		No	Replace CKP sensor, then go to Step 9.

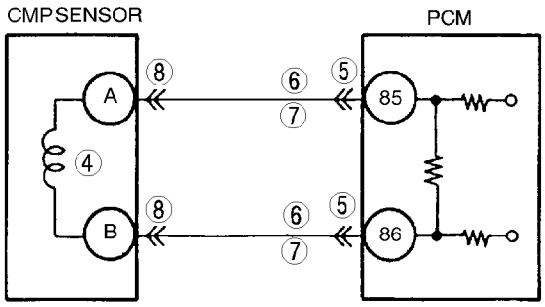
STEP	INSPECTION		ACTION
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminals 21 and 22 (damaged,/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
6	**INSPECT CKP CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between following circuits: — CKP sensor terminal A and PCM terminal 21 (harness-side) — CKP sensor terminal B and PCM terminal 22 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 9.
7	**INSPECT CKP CIRCUIT FOR SHORT TO GROUND** • Check for continuity between following terminal and body ground: — CKP sensor terminal A (harness-side) — CKP sensor terminal B (harness-side) • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 9.
		No	Go to next step.
8	**INSPECT CKP CIRCUITS FOR INTERMEDIATE SHORT** • Check for continuity between CKP sensor terminals A and B. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Access MAF PID using WDS or equivalent. **Note** • MAF PID should indicate **above 2.2 g/s {0.29 lb./min}** during this test. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

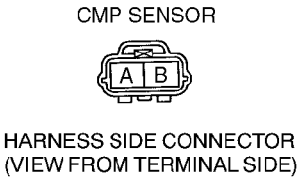
DTC P0340 [FS]

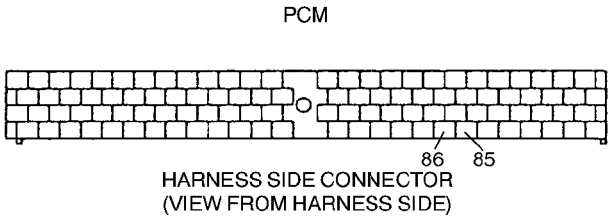
A3U010201085W05

DTC P0340	CMP sensor circuit malfunction
DETECTION CONDITION	• PCM monitors input voltage from CMP sensor while MAF is **above 2.2 g/s {0.29 ib/min}**. if PCM does not receive pulse signal the proper pulse signal timing basis on the CKP sensor signal, determines that CMP circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0340	CMP sensor circuit malfunction
POSSIBLE CAUSE	• CMP sensor malfunction • Connector or terminal malfunction • CMP sensor is dirty. • Short to ground between CMP sensor terminal A and PCM terminal 85 • Short to ground between CMP sensor terminal B and PCM terminal 86 • Open circuit between CMP sensor terminal A and PCM terminal 85 • Open circuit between CMP sensor terminal B and PCM terminal 86 • CKP sensor pulse wheel malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CMP SENSOR VOLTAGE** • Disconnect CMP sensor. • Connect voltmeter between CMP sensor terminals A and B (part-side). • Check voltage in AC range while cranking the engine. • Is any voltage reading?	Yes	Go to Step 5.
		No	Go to next step.
4	**CHECK CMP SENSOR RESISTANCE** • Check resistance between CMP sensor terminals A and B (part-side). • Is resistance **within 0.95—1.25 kilohms**?	Yes	Check for poor connection (damaged/pulled-out terminals, corrosion, etc.), bent terminal of CMP sensor connector or plate. • Repair if necessary, then go to Step 10.
		No	Replace CMP sensor, then go to Step 10.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminals 85 and 86 (damaged,/pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT CMP CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between following circuits: — CMP sensor terminal A and PCM terminal 85 (harness-side) — CMP sensor terminal B and PCM terminal 86 (harness-side) • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 10.
7	**INSPECT CMP CIRCUIT FOR SHORT TO GROUND** • Check for continuity between following terminal and body ground: — CMP sensor terminal A (harness-side) — CMP sensor terminal B (harness-side) • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 10.
		No	Go to next step.
8	**INSPECT CMP CIRCUITS FOR INTERMEDIATE SHORT** • Check for continuity between CMP sensor terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
9	**INSPECT CKP SENSOR** • Check CKP sensor. (See 01–40B–32 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [FS].) • Is CKP sensor okay?	Yes	Go to next step.
		No	Replace CKP sensor, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0340 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Access MAF PID using WDS or equivalent. **Note** • MAF PID should indicate **above 2.2 g/s {0.29 lb./min}** during this test. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0401 [FS]

A3U010201086W01

DTC P0401	EGR flow insufficient detected
DETECTION CONDITION	• Difference in intake manifold pressures when EGR is operated and when it is stopped is too small. **Diagnostic support note** • This is an intermittent monitor (EGR). • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles. • DIAGNOSTIC MONITORING TEST RESULTS and PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • EGR boost sensor malfunction • EGR boost sensor solenoid valve malfunction • EGR gasket 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 next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCS** • Turn ignition key to OFF then start engine. • Have other DTCs been stored?	Yes	Go to applicable DTC troubleshooting.
		No	Go to next step.
4	**INSPECT VACUUM HOSE CONDITION** • Inspect vacuum hoses for clogging, any damages, freeze, or vacuum leakage. • Is there malfunction?	Yes	Replace vacuum hoses, then go to Step 9.
		No	Go to next step.
5	**INSPECT EGR VALVE MALFUNCTION** • Inspect EGR valve. (See 01–16–15 EGR VALVE INSPECTION.) • Is EGR valve okay?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 9.
6	**INSPECT EGR BOOST SENSOR MALFUNCTION** • Inspect EGR boost sensor. (See 01–40B–39 EGR BOOST SENSOR INSPECTION [FS].) • Is EGR boost sensor okay?	Yes	Go to next step.
		No	Replace EGR boost sensor, then go to Step 9.
7	**INSPECT EGR BOOST SENSOR SOLENOID VALVE** • Inspect EGR boost sensor solenoid valve. (See 01–16–17 EGR BOOST SENSOR SOLENOID VALVE INSPECTION.) • Is EGR boost sensor solenoid valve okay?	Yes	Go to next step.
		No	Replace EGR boost sensor solenoid valve, then go to Step 9.
8	**INSPECT EGR VALVE PASSAGE** • Remove EGR valve. • Is gasket installation normal?	Yes	Go to next step.
		No	Install gasket correctly, then go to next step.
9	**MONITOR EGR SYSTEM BY DRIVE MODE** • Make sure to reconnect all disconnected connectors. • Run OBD-II Drive Mode 1 and 2. (See 01–02B–10 OBD-II DRIVE MODE [FS].) • Check EGR System Monitor completion status using On-Board Readiness Test function. • Has EGR system been monitored?	Yes	Go to next step.
		No	Retry this step.
10	**VERIFY TROUBLESHOOTING OF DTC P0401 COMPLETED** • Access DIAGNOSTIC MONITORING TEST RESULTS. • Verify TEST ID 10:41:00 value. • Is value within specification?	Yes	Go to next step.
		No	Replace PCM, then go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0402 [FS]

A3U010201086W02

DTC P0402	EGR flow excessive detected
DETECTION CONDITION	• Difference in intake manifold pressures when EGR is operated and when it is stopped is too large. **Diagnostic support note** • This is an intermittent monitor (EGR). • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0402	EGR flow excessive detected
POSSIBLE CAUSE	• EGR valve gasket is not installed. • EGR valve gasket has been damaged. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCS** • Turn ignition key to OFF then start engine. • Have other DTCs been stored?	Yes	Go to applicable DTC troubleshooting.
		No	Go to next step.
4	**INSPECT EGR VALVE GASKET** • Turn ignition key to OFF. • Remove EGR valve. • Is EGR valve gasket installed?	Yes	Go to next step.
		No	Install EGR valve gasket, then go to Step 6.
5	**INSPECT EGR VALVE GASKET MALFUNCTION** • Does EGR valve gasket have any crack and/or damage?	Yes	Replace EGR valve gasket, then go to Step 6.
		No	Go to next step.
6	**MONITOR EGR SYSTEM BY DRIVE MODE** • Make sure to reconnect all disconnected connectors. • Run OBD-II Drive Mode 1 and 2. (See 01–02B–10 OBD-II DRIVE MODE [FS].) • Check EGR System Monitor completion status using On-Board Readiness Test function. • Has EGR system been monitored?	Yes	Go to next step.
		No	Retry this step.
7	**VERIFY TROUBLESHOOTING OF DTC P0402 COMPLETED** • Access DIAGNOSTIC MONITORING TEST RESULTS. • Verify TEST ID 10:41:00 value. • Is value within specification?	Yes	Go to next step.
		No	Replace PCM, then go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0421 [FS]

A3U010201086W03

DTC P0421	Warm-up catalyst system efficiency below threshold
DETECTION CONDITION	• PCM compares the number of HO2S (front) and HO2S (rear) inversions for a predetermined time. PCM monitors the number of inversions the rear side performs while the front side inverts for a specified number of times when the following monitoring conditions are met. PCM detects the inversion ratio. If inversion ratio is below threshold, PCM determines that catalyst system has deteriorated. **MONITORING CONDITIONS** — Engine speed is **1,500—3,000 rpm**. — Calculated load is **15—48%**(*1). — Vehicle speed is **28—120 km/h {17.3—74.5 mph}**. *1: Maximum calculated load value varies depending on engine speed. **Diagnostic support note** • This is an intermittent monitor. (CATALYST) • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is stored if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0421	Warm-up catalyst system efficiency below threshold
POSSIBLE CAUSE	• WU-TWC deterioration or malfunction • Exhaust gas leakage • Looseness of HO2S (front) • Looseness of HO2S (rear) • HO2S (front) malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then start engine. • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting.
		No	Go to next step.
4	**INSPECT EXHAUST SYSTEM GAS LEAKAGE** • Visually inspect exhaust gas leakage in exhaust system. • Is there any gas leakage?	Yes	Repair or replace faulty exhaust parts, then go to Step 7.
		No	Go to next step.
5	**INSPECT INSTALLATION OF FRONT AND REAR OXYGEN SENSORS** • Inspect for looseness of front and rear oxygen sensors. • Is it okay?	Yes	Go to next step.
		No	Retighten sensor, then go to Step 7.
6	**INSPECT WU-TWC** • Clear DTC using WDS or equivalent. • Inspect WU-TWC. (See 01–16–19 WARM UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION.) • Is WU-TWC okay?	Yes	Replace suspected oxygen sensor, then go to next step.
		No	Replace WU-TWC, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0421 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine and perform OBD-II DRIVE MODE except for MODE 4. (See 01–02B–10 OBD-II DRIVE MODE [FS].) • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0442 [FS]

A3U010201086W04

DTC P0442	Evaporative emission control system leak detected (small leak)
DETECTION CONDITION	• PCM measures the fuel tank pressure (ftp2), which is the vacuum when a specified period has passed after EVAP system is sealed. PCM determines the pressure difference between ftp1 and ftp2. If pressure difference exceeds the threshold, PCM determines that the EVAP system has a small leak. This monitor can activate when the PCM determines that the CONSTANTLY LEAK DETECTED test results are passed. **THRESHOLD VALUE** — Fuel tank pressure (ftp2—ftp1): **1.17—3.91 kPa {8.78—29.30 mmHg, 0.34—1.15 inHg}** • Threshold valve varies depends on ECT at engine start BARO. **MONITORING CONDITIONS** — PCM monitors EVAP system when driving under following conditions: • Remaining fuel**: 35—85%** • ECT at engine start: **–10.0 °C—35 °C {14.0—95.0 °F}** • Atmospheric pressure: **above 69.7 kPa {523 mmHg, 20.5 inHg}** • Vehicle speed: **39.5—120.3 km/h {24.5—74.7 mph}** • Engine speed: **1,000—4,000 rpm** • Calculated load: **9—65%** • Throttle opening angle: **3.1—12.5%** • IAT during monitor: **–10—60 °C {14—140 °F}** **Diagnostic support note** • This is an intermittent monitor (Evaporative leak monitor). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • DIAGNOSTIC MONITORING TEST RESULTS and PENDING CODE are stored if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Canister drain cut valve (CDCV) malfunction • Pressure control valve malfunction • Loose or defective fuel filler cap • Charcoal canister malfunction • Catch tank malfunction • Rollover valve malfunction • Cracked fuel tank • Fuel tank component parts poorly installed • EVAP hose damaged or loose

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTCs. • Are DTCs P0443 and/or P1449 present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	**INSPECT FUEL-FILLER CAP** • Verify fuel-filler cap is not either loose or damaged. • Is it okay? **Note** • When fuel-filler caps other than OEM caps are attached, it is considered malfunction.	Yes	Go to next step.
		No	Retighten fuel-filler cap or replace it if it is damaged. Then go to Step 15.

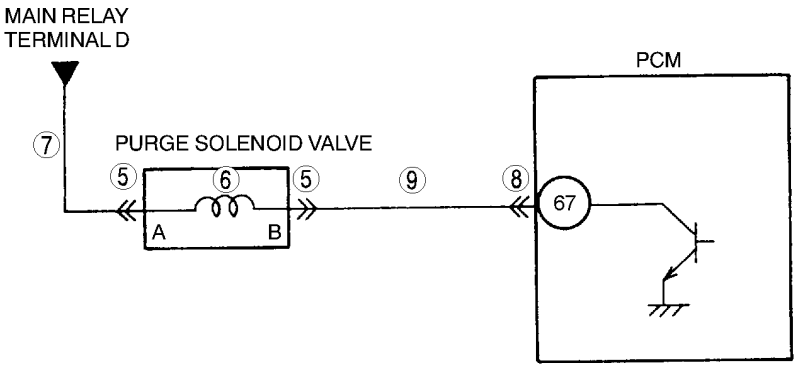
STEP	INSPECTION		ACTION
5	**INSPECT WHOLE EVAP CONTROL SYSTEM** • Implement "01-03B ENGINE CONTROL SYSTEM OPERATION INSPECTION [FS], Evaporative System Leak Inspection Using Vacuum Pump, Whole system inspection". (See 01–03B–55 Whole system inspection.) • Does voltage change under to specified readings and hold for **minimum of 2 minutes**?	Yes	No leaks were detected in EVAP control system at this time. Go to Step 15.
		No	If evaporative emission tester is available, go to Step 14. If not, go to next step.
6	**INSPECT LEAKAGE OF FROM CHARCOAL CANISTER TO FUEL TANK** • Implement "01-03B ENGINE CONTROL SYSTEM OPERATION INSPECTION [FS], Evaporative System Leak Inspection Using Vacuum Pump, Inspection from charcoal canister to fuel tank". (See 01–03B–55 Inspection from charcoal canister to fuel tank.) • Does voltage change under to specified readings and hold for a **minimum of 2 minutes**?	Yes	Go to Step 9.
		No	Go to next step.
7	**INSPECT ATTACHED ACCESSORIES ON FUEL TANK** • Remove fuel tank and visually inspect for damage, insufficient sealing or poorly attached accessories on fuel tank, such as fuel gauge. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to Step 15.
8	**INSPECT ROLLOVER VALVE** • Remove rollover valve and inspect for damage. • Is it okay?	Yes	Inspect for detached, incorrectly installed or cracked hoses on fuel tank and from charcoal canister to fuel tank. Repair or replace as necessary. Then go to step 15.
		No	Replace rollover valve, then go to Step 15.
9	**INSPECT LEAKAGE BETWEEN CHARCOAL CANISTER AND PURGE SOLENOID VALVE** • Implement "01-03B ENGINE CONTROL SYSTEM OPERATION INSPECTION [FS], Evaporative System Leak Inspection Using Vacuum Pump, Inspection from charcoal canister to purge solenoid valve". (See 01–03B–55 Inspection from charcoal canister to purge solenoid valve.) • Does voltage change under to specified readings and hold for **a minimum of 2 minutes**?	Yes	Go to Step 15.
		No	Go to next step.
10	**INSPECT CATCH TANK** • Remove catch tank and inspect for plugging, damages and pinhole using vacuum pump. • Is it okay?	Yes	Go to next step.
		No	Replace catch tank, then go to Step 15.
11	**INSPECT PURGE SOLENOID VALVE** • Remove purge solenoid valve and inspect for damage and air leakage. • Is it okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 15.
12	**INSPECT CHARCOAL CANISTER** • Remove charcoal canister and inspect for damage and pinhole. • Is it okay?	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 15.
13	**INSPECT CDCV** • Remove CDCV and inspect for damage and air leakage. • Is it okay?	Yes	Inspect and repair or replace detached, incorrectly installed or cracked hoses from charcoal canister to CDCV. Then go to Step 15.
		No	Replace CDCV, then go to Step 15.
14	**INSPECT LEAKAGE OF EVAPORATIVE CONTROL SYSTEM** • Inspect evaporative control system for leakage using evaporative emission tester. (See 01–16–13 FUEL-FILLER CAP INSPECTION.) • Is any leakage found?	Yes	Repair or replace faulty area, then go to next step.
		No	Go to next step.

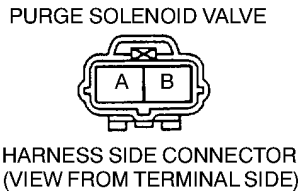
STEP	INSPECTION		ACTION
15	**VERIFY MONITORING CONDITION FOR EVAPORATIVE SYSTEM TEST** • Turn ignition key to ON (Engine OFF). • Verify that following conditions are met. — BARO: **69.7 kPa {523 mmHg, 20.5 inHg} or higher** — ECT: **–10.0—20.0 °C {14.0—68.0 °F} [at atmospheric pressure 69.7 kPa {523 mmHg, 20.5 inHg}]** — IAT: **–10—60 °C {14—140 °F}** — Fuel tank level: **35—85%** • Is there any PID that is out of specification?	Yes	Go to next step.
		No	Go to Step 18.
16	**VERIFY EVAP SYSTEM REPAIRED** • Carry out evaporative system test even if it is not test condition. (See 01–03B–54 Evaporative System Leak Inspection Using Leak Tester.) • Is system test result of small leak okay?	Yes	EVAP system repaired. Go to Step 22.
		No	Go to next step.
17	**VERIFY MONITORING CONDITION FOR EVAPORATIVE SYSTEM TEST OR DRIVE MODE 4** • Turn ignition key to ON (Engine OFF). • Verify that following conditions are met. — BARO: **69.7 kPa {523 mmHg, 20.5 inHg} or higher** — ECT: **–10.0—20.0 °C {14.0—68.0 °F} [at atmospheric pressure 69.7 kPa {523 mmHg, 20.5 inHg}]** — IAT: **–10—60 °C {14—140 °F}** — Fuel tank level: **35—85%** • Is there any PID that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step. **Note** • Readings need to be in the indicated ranges to perform Drive Mode.
		No	Then go to next step.
18	**DECIDE ON AFTER REPAIR PROCEDURE ACCORDING TO REPAIR SHOP CONDITION** • Clear DTC from memory using WDS or equivalent. • Is repair shop possible to perform Drive Mode 4?	Yes	Go to Step 20.
		No	Go to next step.
19	**VERIFY EVAP SYSTEM REPAIRED BY EVAPORATIVE SYSTEM TEST** • Carry out evaporative system test. (See 01–03B–54 Evaporative System Leak Inspection Using Leak Tester.) • Is system test result okay?	Yes	EVAP system repaired. Go to Step 22.
		No	Replace PCM, then go to Step 22.
20	**MONITOR EVAP SYSTEM BY DRIVE MODE 4** • Run Drive Mode 4. (See 01–02B–12 Mode 4 (EVAP system repair verification drive mode).) • Stop vehicle and access ON BOARD SYSTEM READINESS TESTS to inspect Drive Mode completion status. • Has EVAPORATIVE PURGE SYSTEM been monitored?	Yes	Go to next step.
		No	Go back to Step 17.
21	**VERIFY EVAP SYSTEM REPAIRED** • Access DIAGNOSTIC MONITORING TEST RESULTS. • Is it below MAX value?	Yes	Go to next step.
		No	Replace PCM, then go next step.
22	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

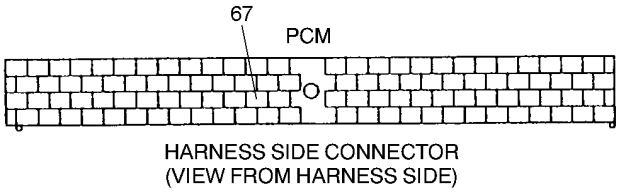
DTC P0443 [FS]

A3U010201086W05

DTC P0443	Evaporative emission solenoid system purge control valve circuit malfunction
DETECTION CONDITION	• PCM monitors input voltages from purge solenoid valve. If voltage at PCM terminal 67 remains low or high, PCM determines that purge solenoid valve circuit has malfunction. **Diagnostic support note** • This is a diagnostic support DTC (monitored one per key cycle). • MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTC is not stored in PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Connector or terminal malfunction • Short to ground in wiring between purge solenoid valve terminal B and PCM terminal 67 • Open circuit in wiring between main relay terminal D and purge solenoid valve terminal A • Open circuit in wiring between purge solenoid valve terminal B and PCM terminal 67 • Short to power circuit between purge solenoid valve terminal B and PCM terminal 67 • PCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then start engine. • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
3	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect purge solenoid valve tube that is connected to intake manifold. • Connect vacuum pump to purge solenoid valve. • Pump vacuum pump several times and stop. • Wait **a few seconds**. • Is vacuum maintained?	Yes	Go to Step 5.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect purge solenoid valve connector. • Pump vacuum pump several times and wait **a few seconds**. • Is vacuum maintained?	Yes	Repair or replace harness for short to ground, then go to Step 10.
		No	Replace purge solenoid valve, then go to Step 10.
5	**INSPECT PURGE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
6	**INSPECT PURGE SOLENOID VALVE** • Measure resistance between purge solenoid valve terminals (part-side). • Is resistance **within 22—26 ohms**?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
7	**INSPECT PURGE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between purge solenoid valve connector terminal A and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 10.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
9	**INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT** • Connect breakout box with PCM disconnected. • Turn ignition key to ON (Engine OFF). • Measure voltage between purge solenoid valve terminal B (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to next step.
		No	Check for continuity between purge solenoid valve terminal B (harness-side) and breakout box terminal 67. • If there is continuity, go to next step. • If there is no continuity, repair or replace harness for open, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0451 [FS]

A3U010201086W06

DTC P0451	Fuel tank pressure sensor performance problem
DETECTION CONDITION	• Difference in fuel tank pressure, which PCM monitors while operating evaporative leak monitor function or purge solenoid valve is intentionally closed, is too small or too large. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P0451	Fuel tank pressure sensor performance problem
POSSIBLE CAUSE	• Fuel tank pressure sensor malfunction • Purge solenoid valve malfunction • CDCV malfunction • Poor connection of CDCV, fuel tank pressure sensor and/or PCM • Short circuit in wiring at CDCV • Charcoal canister clogging

Diagnostic procedure

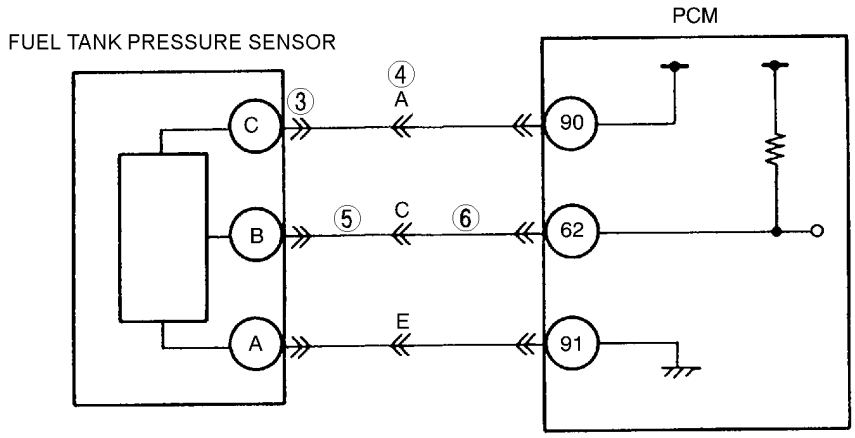
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FOR OTHER DTCS** • Turn ignition key to OFF then start engine. • Verify stored DTC. • Have DTCs P0443 and/or P1449 been stored?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	**INSPECT PURGE SOLENOID VALVE OPERATION** • Inspect purge solenoid valve. (See 01–16–12 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 8.
5	**INSPECT CDCV OPERATION** • Inspect CDCV. (See 01–16–10 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION.) • Is CDCV okay?	Yes	Go to next step.
		No	Replace CDCV, then go to Step 8.
6	**INSPECT CHARCOAL CANISTER FOR CLOGGING** • Remove charcoal canister and inspect for clogging. (See 01–16–9 CHARCOAL CANISTER INSPECTION.) • Is it okay?	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 8.
7	**INSPECT FUEL TANK PRESSURE SENSOR** • Inspect fuel tank pressure sensor. (See 01–40B–40 FUEL TANK PRESSURE SENSOR INSPECTION [FS].) • Is it okay?	Yes	Go to next step.
		No	Replace fuel tank pressure sensor, then go to Step 8.
8	**VERIFY MONITORING CONDITION FOR EVAPORATIVE SYSTEM TEST** • Turn ignition key to ON (Engine OFF). • Verify that following conditions are met. — ECT (at engine start): **–10—35 °C {14.0—95.0 °F}** — BARO: **Above 69.7kPa {523 mmHg, 20.5 inHg}** — VSS: **39.5—105.5 km/h {24.5—65.4 mph}** — Load: **9—65%** — TP: **0.15—0.85 %** — IAT: **–10—60 °C {14—140 °F}** • Is there any condition that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step. **Note** • Readings need to be in the indicated ranges to perform Drive Mode.
		No	Correct condition, then go to next step.

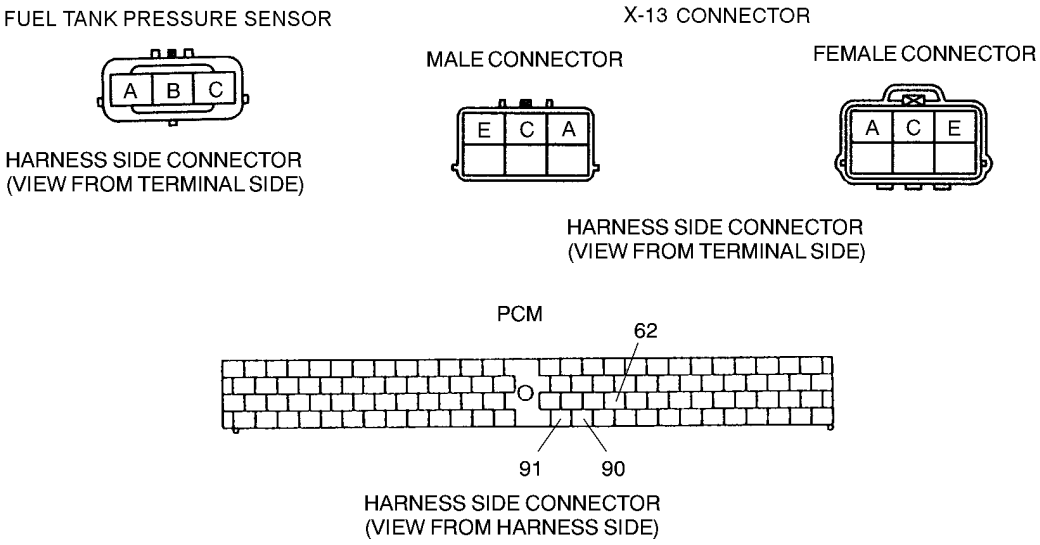
STEP	INSPECTION		ACTION
9	**MONITOR EVAP SYSTEM BY DRIVE MODE 4** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Run OBD-II Drive Mode 4. (See 01–02B–12 Mode 4 (EVAP system repair verification drive mode).) • Stop vehicle and access ON BOARD SYSTEM READINESS TESTS to inspect Drive Mode completion status. • Has EVAPORATIVE PURGE SYSTEM been monitored?	Yes	Go to next step.
		No	Go back to Step 8.
10	**VERIFY TROUBLESHOOTING OF DTC P0451 COMPLETED** • Turn ignition key to ON (Engine OFF). • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0452 [FS]

A3U010201086W07

DTC P0452	Fuel tank pressure sensor circuit low input
DETECTION CONDITION	• PCM monitors input voltage from fuel tank pressure sensor when monitoring condition is met. If PCM terminal 62 voltage is **below 0.20 V** after engine is started, PCM determines that fuel tank pressure sensor circuit is malfunctioning. **MONITORING CONDITION** — Engine coolant temperature is **below 80 °C {176 °F}**. **Diagnostic support note** • This is a continuous CCM monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Fuel tank pressure sensor malfunction • Connector or terminal malfunction • Short to ground in wiring harness between fuel tank pressure sensor terminal B and PCM terminal 62 • Open circuit in wiring harness between fuel tank pressure sensor terminal C and PCM terminal 90 • PCM malfunction





Diagnostic procedure

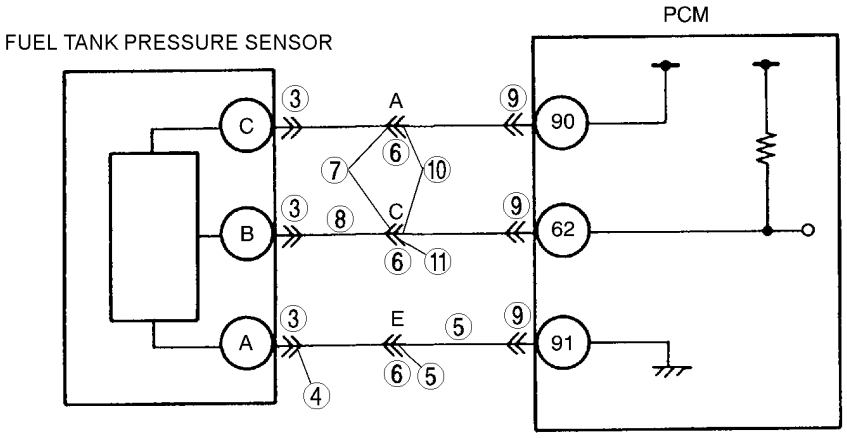
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

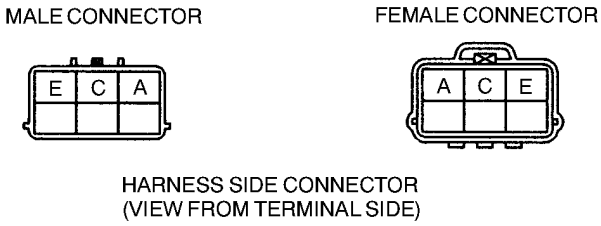
STEP	INSPECTION		ACTION
3	**CHECK POWER SUPPLY CIRCUIT VOLTAGE AT FUEL TANK PRESSURE SENSOR CONNECTOR** **Note** • If DTCs P0107 and P0122 are also retrieved with P0452, go to REFERENCE VOLTAGE troubleshooting procedure. (See 01–03B–49 NO.30 REFERENCE VOLTAGE [FS].) • Turn ignition key to ON (Engine OFF). • Check voltage between FTP sensor terminal C (harness-side) and body ground. • Is voltage **within 4.5—5.5 V**?	Yes	Go to Step 5.
		No	Go to next step.
4	**CHECK POWER SUPPLY CIRCUIT VOLTAGE AT FUEL TANK PRESSURE SENSOR INTERMEDIATE CONNECTOR** • Disconnect X-13 connector. • Measure voltage at X-13 male terminal A. • Is voltage **within 4.5—5.5 V**?	Yes	Check for open circuit between following terminals: • X-13 connector female terminal A and fuel tank pressure sensor terminal C (harness-side) — Repair or replace suspected harness, then go to Step 7.
		No	Check for open circuit between following terminals: • PCM terminal 90 (harness-side) and X-13 connector male terminal A. — Repair or replace suspected harness, then go to Step 7.
5	**INSPECT FTP SIGNAL CIRCUIT FOR SHORT TO GROUND (FUEL TANK PRESSURE SENSOR CONNECTOR AND X-13 INTERMEDIATE CONNECTOR)** • Turn ignition key to OFF. • Disconnect X-13 connector. • Check for continuity between X-13 female terminal C and ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 7.
		No	Go to next step.
6	**INSPECT FTP SIGNAL CIRCUIT FOR SHORT TO GROUND (PCM CONNECTOR AND X-13 INTERMEDIATE CONNECTOR)** • Disconnect PCM connector. • Check for continuity between X-13 male terminal C (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Check fuel tank pressure sensor signal circuit and fuel tank pressure sensor ground circuit for shorts. Repair or replace suspected harness, then go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0452 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

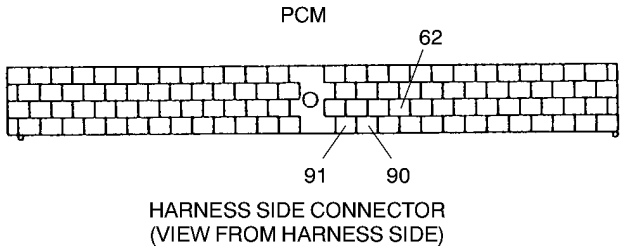
DTC P0453 [FS]

A3U010201086W08

DTC P0453	Fuel tank pressure sensor circuit high input
DETECTION CONDITION	• PCM monitors input voltage from FUEL TANK PRESSURE sensor when monitoring condition is met. If PCM terminal voltage is **above 4.79 V** after engine is started, PCM determines that FUEL TANK PRESSURE sensor circuit has malfunction. **MONITORING CONDITION** — Engine coolant temperature is **below 80 °C {176 °F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above detection condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• FUEL TANK PRESSURE sensor malfunction • Connector or terminal malfunction • Open circuit in wiring between fuel tank pressure sensor terminal B and PCM terminal 62 • Open circuit in wiring between from fuel tank pressure sensor terminal A and PCM terminal 91 • FUEL TANK PRESSURE sensor signal circuit is shorted to reference voltage (Vref) supply circuit.







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FUEL TANK PRESSURE SENSOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect FTP sensor connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace suspected terminal, then go to Step 12.
		No	Go to next step.
4	**INSPECT FUEL TANK PRESSURE SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT (AT FUEL TANK PRESSURE SENSOR CONNECTOR)** • Check for continuity between fuel tank pressure sensor terminal A (harness-side) and body ground. • Is there continuity?	Yes	Go to Step 6.
		No	Go to next step.
5	**INSPECT FUEL TANK PRESSURE SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT (AT X-13 CONNECTOR)** • Disconnect X-13 connector. • Check for continuity between X-13 male terminal E and body ground. • Is there continuity?	Yes	Check for open circuit between following terminals: • X-13 female terminal E and FTP sensor terminal A (harness-side) Repair or replace suspected harness, then go to Step 12.
		No	Check for open circuit between following terminals: • PCM terminal 91 (harness-side) and X-13 male terminal E Repair or replace suspected harness, then go to Step 12.
6	**CHECK 6-PIN INTERMEDIATE CONNECTOR** • Disconnect X-13 connector. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace suspected terminal, then go to Step 12.
		No	Go to next step.
7	**INSPECT FUEL TANK PRESSURE SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT (FUEL TANK PRESSURE SENSOR CONNECTOR AND X-13 CONNECTOR)** • Check for continuity between X-13 female terminals A and C. • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 12.
		No	Go to next step.
8	**INSPECT FUEL TANK PRESSURE SIGNAL CIRCUIT FOR OPEN CIRCUIT (FUEL TANK PRESSURE SENSOR CONNECTOR AND X-13 CONNECTOR)** • Check for continuity between fuel tank pressure sensor terminal B (harness-side) and X-13 female terminal C. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 12.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminals 62, 90 and 91 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 12.
		No	Go to next step.
10	**INSPECT FUEL TANK PRESSURE SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT (X-13 CONNECTOR AND PCM CONNECTOR)** • Check for continuity between X-13 terminals A and C (PCM-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 12.
		No	Go to next step.

STEP	INSPECTION		ACTION
11	**INSPECT FUEL TANK PRESSURE SIGNAL CIRCUIT FOR OPEN CIRCUIT (X-13 CONNECTOR AND PCM CONNECTOR)** • Connect breakout box with PCM disconnected. • Check for continuity between X-13 male terminal C (PCM-side) and breakout box terminal 62. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to next step.
12	**VERIFY TROUBLESHOOTING OF DTC P0453 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0455 [FS]

A3U010201086W09

DTC P0455	Evaporative emission control system leak detected (blockage or large leak)
DETECTION CONDITION	• PCM measures the fuel tank pressure (ftp1), which is the vacuum when a specified period has passed after the tank pressure has reached the preprogrammed target pressure and purge control valve has been closed when monitoring conditions are met. If fuel tank pressure is above threshold, PCM determines that the EVAP system is blocked or has a large leak. **THRESHOLD VALUE** — Fuel tank pressure (ftp1): **–1.3—1.95 kPa {–9.76—14.65 mmHg, –0.38—0.58 inHg}** • Threshold valve varies depends on ECT at engine start BARO. **MONITORING CONDITIONS** — Fuel tank pressure (ftp 1):**above –3.92 kPa {–29.42 mmHg, –1.16 inHg}** — PCM monitors EVAP system when driving under following conditions: • Remaining fuel: **35—85%** • ECT at engine start: **–10—35 °C {14.0—95.0 °F}** • Atmospheric pressure: **above 69.7 kPa {523 mmHg, 20.5 inHg}** • Vehicle speed: **39.5—120.3 km/h {24.5—74.7 mph}** • Engine speed: **1,000—4,000 rpm** • Calculated load: **9—65%** • Throttle opening angle: **3.1—12.5%** • IAT during monitor: **–10—60 °C {14—140 °F}** **Diagnostic support note** • This is an intermittent monitor (Evaporative leak monitor). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • DIAGNOSTIC MONITORING TEST RESULTS and PENDING CODE are available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Canister drain cut valve (CDCV) malfunction • Loose, missing or defective fuel filler cap • Charcoal canister malfunction • Catch tank malfunction • Check valve malfunction • Rollover valve malfunction • Cracked fuel tank • Fuel tank component parts poorly installed • EVAP hose damaged or loose • Fuel tank pressure sensor malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition key to OFF then ON (Engine OFF). • Verify related PENDING CODE or stored DTCs. • DTCs P0443 and/or P1449 present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	**INSPECT FUEL-FILLER CAP** • Verify fuel-filler cap is not either disconnected, loose or damaged. • Is it okay? **Note** • When fuel-filler caps other than OEM caps are attached, it is considered malfunction.	Yes	Go to next step.
		No	Retighten fuel-filler cap or replace it if it is damaged. Then go to Step 27.
5	**INSPECT PURGE SOLENOID VALVE STUCK** • Inspect purge solenoid valve (See 01–16–12 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 27.
6	**INSPECT CDCV STUCK** • Inspect CDCV. (See 01–16–10 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION.) • Is CDCV okay?	Yes	Go to next step.
		No	Replace CDCV, then go to Step 27.
7	**CLASSIFY EVAPORATIVE EMISSION CONTROL SYSTEM FOR LEAKAGE OR BLOCKAGE** **Note** • If evaporative emission tester is not available, go to next step. • Carry out evaporative emission control system inspection using evaporative emission tester. (See 01–03B–54 Evaporative System Leak Inspection Using Leak Tester.) • Does red “FAILED” light turn ON (leakage)?	Yes	Tester detects leakage. • Inspect evaporative control system for leakage using evaporative emission tester. (See 01–03B–54 Evaporative System Leak Inspection Using Leak Tester.) • Repair or replace faulty area, then go to Step 27.
		No	Go to next step.
8	**VERIFY REPAIR SHOP CONDITION** • Is repair shop possible to perform Drive Mode 4?	Yes	Go to next step.
		No	Go to Step 16.
9	**VERIFY MONITORING CONDITION FOR DRIVE MODE 4** • Turn ignition key to ON (Engine OFF). • Verify that following conditions are met. — Barometric pressure: **69.7 kPa {523 mmHg, 20.5 inHg} or higher** — Engine coolant temperature: **–10.0—20.0 °C {14.0—68.0 °F}** [at barometric pressure **69.7 kPa {523 mmHg, 20.5 inHg}**] — Intake air temperature: **–10—60 °C {50—140 °F}** — Fuel tank level: **35—85%** • Is there any conditions that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step. **Note** • Readings need to be in the indicated ranges to perform Drive Mode.
		No	Go to next step.

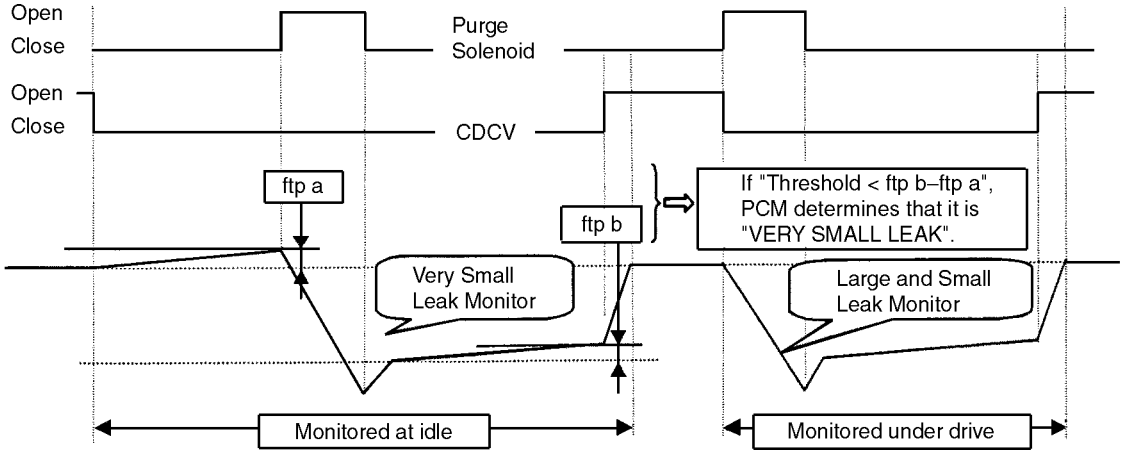
STEP	INSPECTION		ACTION
10	**MONITOR EVAP SYSTEM BY DRIVE MODE 4** • Clear DTC from memory using WDS or equivalent. • Run OBD-II Drive Mode 4 and verify that CDCV and FTP graphs. (See 01–02B–12 Mode 4 (EVAP system repair verification drive mode).) • Is there any problem detected?	Yes	FTP does not change: • EVAP monitoring system is inoperative. Go to next step. FTP changes, but does not reach **2.0 kPa {15 mmHg, 0.59 inHg}**: • There is a large leak in EVAP system. Go to Step 13. FTP reaches **2.0 kPa {15 mmHg, 0.59 inHg}**, but suddenly goes back: • Pressure in fuel tank cannot be reduced and only gas from EVAP line can be drawn. Inspect following and repair or replace suspected parts. • Rollover valve for large ventilation resistance. • Check valve for inoperative or blockage. • Air filter for clogging. Then go to Step 27.
		No	No leaks were detected in EVAP control system at this time. Go to Step 30.
11	**INSPECT PURGE SOLENOID VALVE OPERATION** • Inspect purge solenoid valve (See 01–16–12 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 27.
12	**INSPECT FUEL TANK PRESSURE SENSOR** • Inspect fuel tank pressure sensor. (See 01–40B–40 FUEL TANK PRESSURE SENSOR INSPECTION [FS].) • Is fuel tank pressure sensor okay?	Yes	Go to next step.
		No	Replace fuel tank pressure sensor, then go to Step 27.
13	**INSPECT CATCH TANK** • Remove catch tank and inspect for plugging, damages and pinhole using vacuum pump. • Is it okay?	Yes	Go to next step.
		No	Replace catch tank, then go to Step 27.
14	**INSPECT CHARCOAL CANISTER** • Remove charcoal canister and inspect for damage and pinhole. • Is it okay?	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 27.
15	**INSPECT CDCV OPERATION** • Inspect CDCV. (See 01–16–10 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION.) • Is CDCV okay?	Yes	Go to next step.
		No	Replace CDCV, then go to Step 27.
16	**INSPECT WHOLE SYSTEM OF EVAP CONTROL SYSTEM** • Implement “01-03B ENGINE CONTROL SYSTEM OPERATION INSPECTION [FS], Evaporative System Leak Inspection Using Vacuum Pump, Whole system inspection”. (See 01–03B–55 Whole system inspection.) • Does voltage change under to specified readings and hold for **minimum of 2 minutes**?	Yes	Intermittent concern exists. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].) Inspect purge solenoid valve and CDCV circuit.
		No	Go to next step.
17	**INSPECT FUEL TANK PRESSURE SENSOR** • Inspect fuel tank pressure sensor. (See 01–40B–40 FUEL TANK PRESSURE SENSOR INSPECTION [FS].) • Is fuel tank pressure sensor okay?	Yes	Go to next step.
		No	Replace fuel tank pressure sensor, then go to Step 27.
18	**INSPECT LEAKAGE FROM CHARCOAL CANISTER TO FUEL TANK** • Implement “01-03B ENGINE CONTROL OPERATION INSPECTION [FS], Evaporative System Leak Inspection Using Vacuum Pump, Inspection from charcoal canister to fuel tank”. (See 01–03B–55 Inspection from charcoal canister to fuel tank.) • Does voltage change under to specified readings and hold for **minimum of 2 minutes**?	Yes	Go to Step 22.
		No	Go to next step.

STEP	INSPECTION		ACTION
19	**INSPECT ATTACHED ACCESSORIES ON FUEL TANK** • Remove fuel tank and visually inspect for damage, insufficient sealing or poorly attached accessories on fuel tank, such as fuel gauge. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to Step 27.
20	**INSPECT FUEL SHUT-OFF VALVE** • Inspect fuel shut-off valve for ventilation. (See 01–14–13 FUEL TANK INSPECTION.) • Is it okay?	Yes	Go to next step.
		No	Replace fuel tank, then go to Step 27.
21	**INSPECT ROLLOVER VALVE** • Inspect rollover valve for ventilation. • Is it okay?	Yes	Inspect following and repair or replace for detached, incorrectly installed or cracked hoses: • Charcoal canister • Fuel tank (include fuel shut-off valve and rollover valve) • Fuel tank pressure sensor Then go to Step 27.
		No	Replace fuel tank, then go to Step 27.
22	**INSPECT LEAKAGE FROM CHARCOAL CANISTER TO PURGE SOLENOID VALVE** • Implement “01-03B ENGINE CONTROL SYSTEM OPERATION INSPECTION [FS], Evaporative Leak System Inspection Using Vacuum Pump, Inspection from charcoal canister to purge solenoid valve”. (See 01–03B–55 Inspection from charcoal canister to purge solenoid valve.) • Does voltage change under to specified readings and hold for a **minimum of 2 minutes**?	Yes	Go to Step 27.
		No	Go to next step.
23	**INSPECT CATCH TANK** • Remove catch tank and inspect for plugging, damages and pinhole using vacuum pump. • Is it okay?	Yes	Go to next step.
		No	Replace catch tank, then go to Step 27.
24	**INSPECT PURGE SOLENOID VALVE OPERATION** • Inspect purge solenoid valve (See 01–16–12 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 27.
25	**INSPECT CHARCOAL CANISTER** • Remove charcoal canister and inspect for plugging, damage and pinhole. • Is it okay?	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 27.
26	**INSPECT CDCV OPERATION** • Inspect CDCV. (See 01–16–10 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION.) • Is CDCV okay?	Yes	Go to next step.
		No	Replace CDCV, then go to next step.
27	**DECIDE ON AFTER REPAIR PROCEDURE ACCORDING TO REPAIR SHOP CONDITION** • Clear DTC from memory using WDS or equivalent. • Is repair shop possible to perform Drive Mode 4?	Yes	Go to next step.
		No	Go to step 31.

STEP	INSPECTION		ACTION
28	**VERIFY MONITORING CONDITION FOR EVAPORATIVE SYSTEM TEST OR DRIVE MODE 4** • Turn ignition key to ON (Engine OFF). • Verify that following conditions are met. — Barometric pressure: **69.7 kPa {523 mmHg, 20.5 inHg} or higher** — Engine coolant temperature: **–10.0—22.0 °C {14.0—71.6 °F}** [at barometric pressure **69.7 kPa {523 mmHg, 20.5 inHg}**] — Intake air temperature: **–10—60 °C {50—140 °F}** — Fuel tank level: **35—85%** • Is there any conditions that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step. **Note** • Readings need to be in the indicated ranges to perform Drive Mode.
		No	Go to next step.
29	**MONITOR EVAP SYSTEM BY DRIVE MODE 4** • Run OBD-II Drive Mode 4. (See 01–02B–12 Mode 4 (EVAP system repair verification drive mode).) • Stop vehicle and access ON BOARD SYSTEM READINESS TESTS to inspect Drive Mode completion status. • Has EVAPORATIVE PURGE SYSTEM been monitored?	Yes	Go to next step.
		No	Go back to Step 28.
30	**VERIFY EVAP SYSTEM REPAIRED** • Access DIAGNOSTIC MONITORING TEST RESULTS. • Verify TEST ID 10:22:00 value. (See 01–02B–9 Diagnostic Monitoring Test Results Access Procedure.) • Is it below maximum value?	Yes	Go to Step 32.
		No	Replace PCM, then go to Step 32.
31	**INSPECT WHOLE EVAP CONTROL SYSTEM** • Implement “01-03B ENGINE CONTROL SYSTEM OPERATION INSPECTION [FS], Evaporative System Leak Inspection Using Vacuum Pump, Whole system inspection”. (See 01–03B–55 Whole system inspection.) • Does voltage change under to specified readings and hold for **minimum of 2 minutes**?	Yes	Go to Step 32.
		No	Replace PCM, then go to Step 32.
32	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0456 [FS]

A3U010201086W10

DTC P0456	Evaporative emission control system leak detected (very small leak)
DETECTION CONDITION	• PCM measures the fuel tank pressure ftp a and ftp b when monitoring conditions are met. If the difference between ftp a and ftp b exceeds the threshold, PCM determines that EVAP system has a very small leak (**0.5 mm {0.02 in}** hole equivalent). **MONITORING CONDITION** — ECT at engine start **35 °C {95 °F} or below** — ECT **70—108 °C {158—226 °F}** — Atmospheric pressure: **above 69.7 kPa {523 mmHg, 20.5 inHg}** — Remaining fuel **35%—85%** — IAT **-10—60 °C {14—140 °F}** — Throttle opening angle closed — **16 minutes or less** after engine start  **Diagnostic support note** • This is an intermittent monitor (Evaporative leak monitor). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE are stored if PCM detects the above malfunction condition during first drive cycle. • DIAGNOSTIC MONITORING TEST RESULTS is available. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Canister drain cut valve (CDCV) malfunction • Charcoal canister malfunction • Catch tank malfunction • Fuel cap malfunction • Fuel tank malfunction • Fuel pump unit poor seal • EVAP hose damaged or loose • EVAP pipe damaged

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn ignition key to OFF then ON (Engine OFF). • Verify related pending code or stored DTC. • Is other DTC present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform evaporative system leak inspection. (See 01–03B–54 Evaporative System Leak Inspection Using Leak Tester.) • Is test result failed (red light turns on)?	Yes	Go to next step.
		No	Intermittent concern existing. Inspect purge solenoid valve and CDCV circuit for intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
5	**LOCATE LEAK POINT** • Check leakage for the following using Ultrasonic leak detector. — Charcoal canister — Catch tank — Fuel cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to next step.
6	**INSPECT PURGE SOLENOID VALVE** • Disconnect purge solenoid valve tube that is connected to intake manifold. • Connect vacuum pump to purge solenoid valve. • Apply vacuum and wait for **5 seconds**. • Is vacuum maintained?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
7	**INSPECT CDCV** • Connect all disconnected connectors and hoses. • Place clamp on CDCV hose between CDCV and air filter. • Perform evaporative system leak inspection. (See 01–03B–54 Evaporative System Leak Inspection Using Leak Tester.) • Is test result failed (red light turns on)?	Yes	Go to Step 10.
		No	Go to next step.
8	**CONFIRM CDCV LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01–03B–54 Evaporative System Leak Inspection Using Leak Tester.) • Is test result failed (red light turns on)?	Yes	Replace CDCV, then go to Step 11.
		No	Go to Step 11.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed fuel pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01–03B–54 Evaporative System Leak Inspection Using Leak Tester.) • Is test result failed (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step.
11	**VERIFY MONITORING CONDITION FOR EVAPORATIVE SYSTEM TEST OR DRIVE MODE 5** • Turn ignition key to ON (Engine OFF). • Access ECT and FTL V PIDs using NGS tester. — ECT: **35 °C {95 °F} or below** — FTL V: **1.3 V—3.75 V** (**35—85%** fuel tank level equivalent) — IAT: **-10—60 °C {14—140 °F}** **Note** • All PIDs must be within specification to start monitor. • Is there any PID that is out of specification?	Yes	Cool down engine with fan or adjust fuel level, then go to next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
12	**VERIFY TROUBLESHOOTING OF DTC P0456 COMPLETED** • Clear DTC using NGS tester generic OBD-II function. • Run engine at **3.500 rpm** for **3 minutes**, then run at idle for **6 minutes**. • Access DIAGNOSTIC MONITORING TEST RESULTS. • Verify TEST ID 10:23:00 value. • Does it indicate 0 or 65535.	Yes	Monitoring was not implemented. Repeat Step 10.
		No	Go to next step.
13	**VERIFY P0456 MONITOR RESULT** • Is below MAX value?	Yes	Go to next step.
		No	Replace PCM, then go to next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to appropriate DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0461 [FS]

A3U010201086W11

DTC P0461	Fuel gauge sender unit circuit range/performance
DETECTION CONDITION	• PCM monitors fuel gauge sender unit input voltage difference before and after PCM-calculated fuel consumption has reached **19.3 liters {20.4 US qt., 17.0 Imp qt.}**. If fuel gauge sender unit operation reflects **5% less** than PCM-calculated fuel consumption, PCM determines that fuel gauge sender unit range/performance is in error. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction or substandard performance

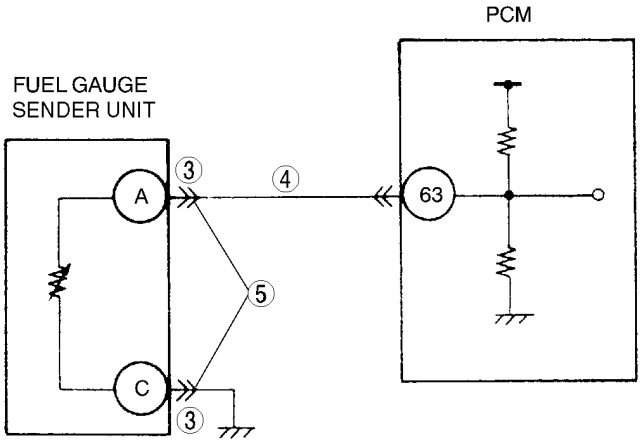
Diagnostic procedure

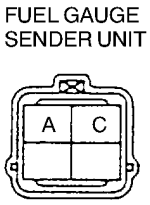
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FUEL GAUGE SENDER UNIT** • Turn ignition key to OFF. • Inspect fuel gauge sender unit. (See 09–22–13 FUEL GAUGE SENDER UNIT INSPECTION.) • Is fuel gauge sender unit okay?	Yes	Replace PCM, then go to next step.
		No	Repair or replace fuel gauge sender unit, then go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0462 [FS]

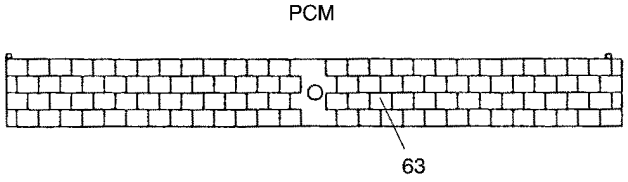
A3U010201086W12

DTC P0462	Fuel gauge sender unit circuit low input
DETECTION CONDITION	• PCM monitors the voltage of fuel gauge sender unit. If PCM detects PCM terminal 63 voltage **below 0.08 V** for **5 seconds**, PCM determines that fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Short to ground circuit between fuel gauge sender unit terminal A and PCM terminal 63 • Short circuit between fuel level signal circuit and fuel gauge sender unit ground circuit • PCM malfunction • Bent terminals of fuel gauge sender unit





HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)

Diagnostic procedure

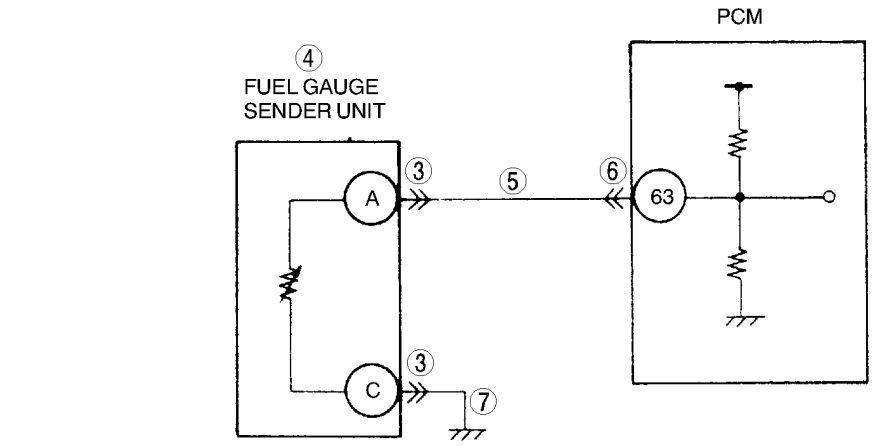
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT TERMINAL FOR BENT** • Turn ignition key to OFF. • Disconnect fuel gauge sender unit connector. • Check for bent terminal. • Is there malfunction?	Yes	Repair suspected terminal, then go to Step 6.
		No	Go to next step.

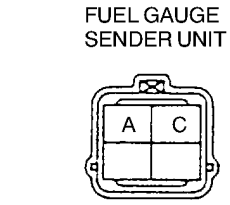
STEP	INSPECTION		ACTION
4	**INSPECT FUEL LEVEL SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for continuity between fuel gauge sender unit terminal A (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 6.
		No	Go to next step.
5	**INSPECT FUEL GAUGE SENDER UNIT CIRCUITS FOR SHORTS** • Check for continuity between fuel gauge sender unit terminals A and C (harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 6.
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0462 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0463 [FS]

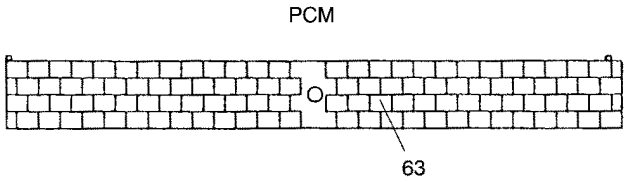
A3U010201086W13

DTC P0463	Fuel gauge sender unit circuit high input
DETECTION CONDITION	• PCM monitors the voltage of fuel gauge sender unit. If PCM detects PCM terminal 63 voltage **above 4.92 V** for **5 seconds**, PCM determines that fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Open circuit between fuel gauge sender unit terminal A and PCM terminal 63. • Open circuit between fuel gauge sender unit terminal C and body ground. • Poor connection of fuel gauge sender unit and/or PCM connector • PCM malfunction





HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT FUEL GAUGE SENDER UNIT CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect fuel gauge sender unit connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair suspected terminal, then go to Step 8.
		No	Go to next step.

STEP	INSPECTION		ACTION
4	**INSPECT FUEL GAUGE SENDER UNIT** • Inspect fuel gauge sender unit. (See 09–22–13 FUEL GAUGE SENDER UNIT INSPECTION.) • Is fuel gauge sender unit okay?	Yes	Connect fuel gauge sender unit connector, then go to next step.
		No	Replace fuel gauge sender unit, then go to Step 8.
5	**INSPECT FTL SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between fuel gauge sender unit terminal A (harness-side) and body ground. • Is voltage **above 4.5—5.5 V**?	Yes	Go to Step 8.
		No	Go to next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair suspected terminal, then go to Step 8.
		No	Repair or replace open circuit between fuel gauge sender unit terminal A (harness-side) and PCM terminal 63 (harness-side), then go to Step 8.
7	**INSPECT FUEL GAUGE SENDER UNIT GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check for continuity between fuel gauge sender unit terminal C (harness-side) and body ground. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0463 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Start engine. • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0464 [FS]

A3U010201086W14

DTC P0464	Fuel gauge sender unit circuit performance (slosh check)
DETECTION CONDITION	• PCM monitors fuel gauge sender unit input voltage at PCM terminal 63 while engine is running. If differences are high for **14 seconds** while vehicle is stopped, PCM determines that FTL signal is incorrect. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction or substandard performance

Diagnostic procedure

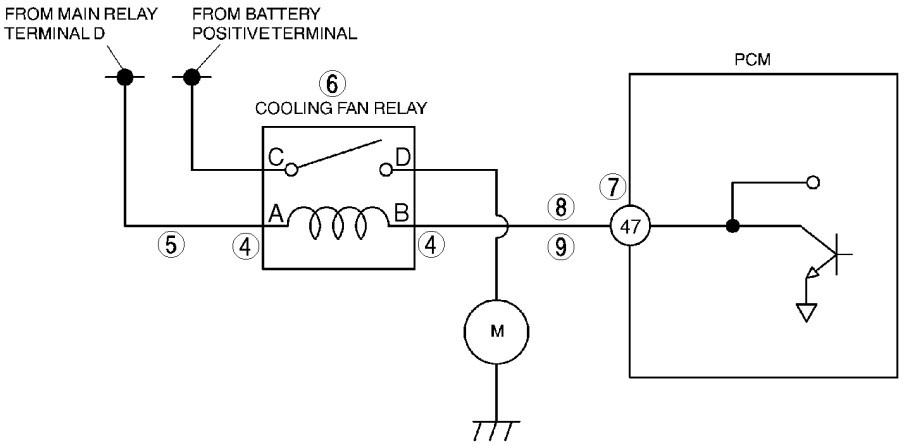
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, Go to next step.
		No	Go to next step.

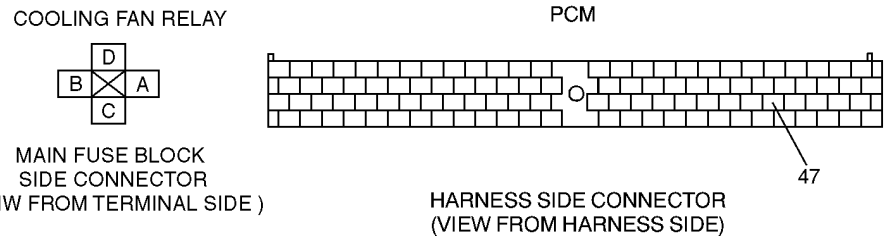
STEP	INSPECTION		ACTION
3	**INSPECT FUEL GAUGE SENDER UNIT** • Turn ignition key to OFF. • Inspect fuel gauge sender unit. (See 09–22–13 FUEL GAUGE SENDER UNIT INSPECTION.) • Is fuel gauge sender unit okay?	Yes	Replace PCM, then go to next step.
		No	Repair or replace fuel gauge sender unit, then go to next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0480 [FS]

A3U010201086W15

DTC P0480	Cooling fan relay circuit
DETECTION CONDITION	• PCM monitors control signal to cooling fan relay coil control circuit. If signal at PCM terminal 47 remains low or high, PCM determines that cooling fan relay circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM) • PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycles. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Cooling fan relay malfunction • Connector or terminal malfunction • Short to GND circuit in wiring between cooling fan relay terminal B and PCM terminal 47 • Open circuit in wiring between cooling fan relay terminal B and PCM terminal 47 • Open circuit in wiring between main relay terminal D and cooling fan relay terminal C • PCM malfunction





Diagnostic procedure

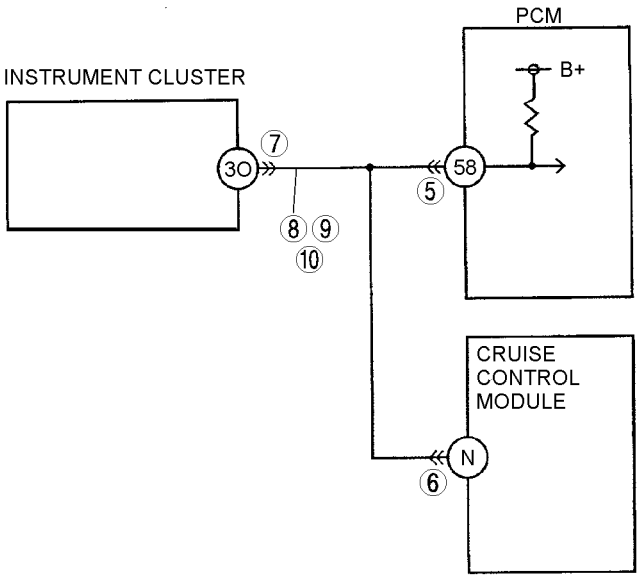
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.

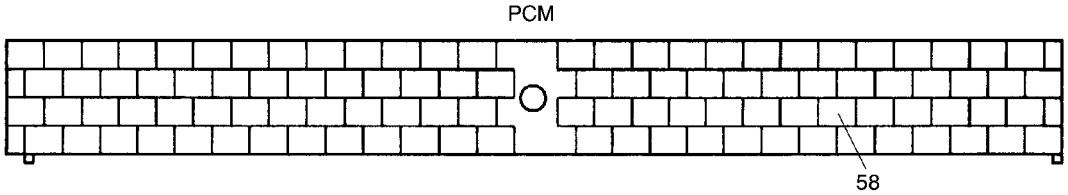
STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on - line repair information availability. • Is any Service Information available?	Yes	Perform repair or diagnosis according to available repair Information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Start engine. • Operate A/C to operate cooling fan relay. • Is same of DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
4	**INSPECT COOLING FAN RELAY FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect cooling fan relay connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, go to Step 10.
		No	Go to next step.
5	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between cooling fan relay terminal C (harness-side) and body GND. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness, go to Step 10.
6	**INSPECT COOLING FAN RELAY** • Inspect cooling fan relay. • Is cooling fan relay okay?	Yes	Go to next step.
		No	Replace cooling fan relay, go to Step 10.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminal 47 (damaged, pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, go to Step 10.
		No	Go to next step.
8	**INSPECT CONTROL CIRCUIT FOR SHORT** • Check for continuity between cooling fan relay terminal B (harness-side) and body GND. • Is there continuity?	Yes	Repair or replace harness for short to GND, go to Step 10.
		No	Turn ignition key to ON. Measure voltage between cooling fan relay terminal B and body GND. • If voltage is **B+**, repair or replace harness for short to power, go to next step. • If voltage is **approx. 0 V**, go to next step.
9	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Check for continuity between cooling fan relay terminal B (harness-side) and PCM terminal 47 (harness-side). • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Operate A/C for operate cooling fan relay. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0500 [FS]

A3U010201087W01

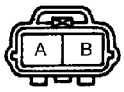
DTC P0500	Vehicle speed sensor (VSS) circuit malfunction (MTX)
DETECTION CONDITION	• Vehicle speed signal does not input after following conditions are met: — Gear is in position other than neutral. — Load is above **40%**. — Engine speed is **2,000 rpm or above**. **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PCM malfunction • Instrument cluster malfunction • ABS HU/CM malfunction • Open circuit between PCM terminal 58 and instrument cluster terminal 3O • Short to ground between PCM terminal 58 and instrument cluster terminal 3O • Vehicle speedometer sensor malfunction • Open circuit between vehicle speedometer sensor terminal A and instrument cluster terminal 3G • Short to ground between vehicle speedometer sensor terminal A and instrument cluster terminal 3G • Open circuit between vehicle speedometer sensor terminal B and instrument cluster terminal 3I • Short to ground between vehicle speedometer sensor terminal B and instrument cluster terminal 3I





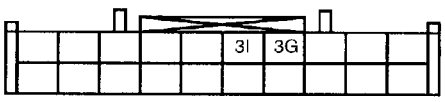
HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)

VEHICLE SPEEDOMETER



SENSOR HARNESS SIDE
(VIEW FROM TERMINAL SIDE)

INSTRUMENT CLUSTER



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

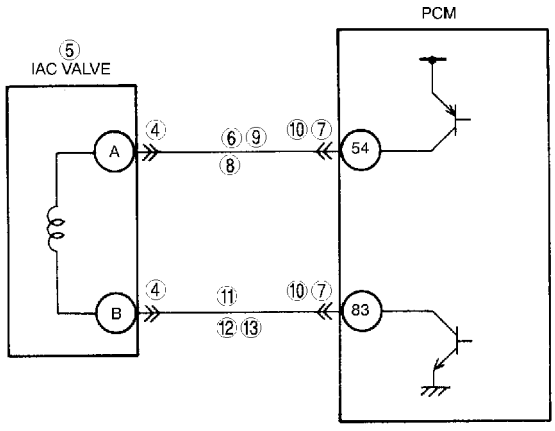
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect WDS or equivalent to DLC-2. • Start engine. • Access VS PID using WDS or equivalent. — Vehicle speed **20 km/h {12.4 mph}: 20km/h {12.4 mph}** — Vehicle speed **40 km/h {24.8 mph}: 40km/h {24.8 mph}** • Are PID readings within specification?	Yes	Go to intermittent concern troubleshooting procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
		No	Go to next step.
4	**CHECK INPUT/OUTPUT CHECK MODE** • Turn ignition key to ON (engine OFF). • Is instrument cluster DTCs 10 or 12 detected? (See 09–22–5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.).	Yes	DTC 10 and/or 12 displayed: Inspect instrument cluster. (See 09–22–5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.)
		No	Go to next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to next step.
		No	Repair or replace pin or connector, then go to Step 11.
6	**INSPECT CRUISE CONTROL MODULE CONNECTOR** • Disconnect cruise control module connector. • Inspect for bent terminals. • Are terminals okay?	Yes	Go to next step.
		No	Repair terminals, then go to Step 11.
7	**INSPECT INSTRUMENT CLUSTER CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect instrument cluster connector. • Check for poor connections (damaged/pulled-out terminals, corrosion, etc.). • Are terminals okay?	Yes	Go to next step.
		No	Repair or replace terminals, then go to Step 11.
8	**INSPECT VOLTAGE** • Connect PCM connector. • Turn ignition key to ON (engine OFF). • Measure voltage at instrument cluster terminal 3O (harness-side). • Is there **5 V** at instrument cluster terminal 3O (harness-side)?	Yes	Replace instrument cluster, then go to Step 11. (See 09–22–3 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
		No	Go to next step.
9	**INSPECT INSTRUMENT CLUSTER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Connect breakout box with PCM connector disconnected. • Turn ignition key to ON (engine OFF). • Check for continuity between instrument cluster terminal 3O (harness-side) and breakout box terminal 58. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
10	**INSPECT INSTRUMENT CLUSTER CIRCUIT FOR SHORT TO GROUND** • Check for continuity between instrument cluster terminal 3O (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness, then go to next step.
		No	Replace instrument cluster, then go to next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Warm up engine. • Drive vehicle under following conditions for 16 seconds. — Engine speed: **1,800 rpm or above** — Gear: not in neutral. — Load: **40% or above** • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step. (See 01–40B–7 PCM REMOVAL/INSTALLATION [FS].)
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

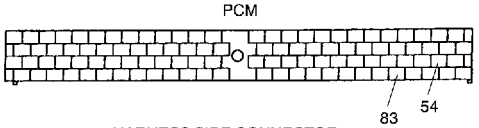
DTC P0505 [FS]

A3U010201087W02

DTC P0505	IAC valve circuit malfunction
DETECTION CONDITION	• PCM monitors IAC valve circuit current while IAC duty is within **18—70 %**. If PCM detects IAC valve circuit current **below 100 mA (25 °C {77 °F})** or **above 4.5 A (25 °C {77 °F})** for **1 second**, PCM determines that IAC valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IAC valve circuit malfunction • Short to ground between IAC valve terminal A and PCM terminal 54 • Open circuit between IAC valve terminal A and PCM terminal 54 • Short to ground between IAC valve terminal B and PCM terminal 83 • Short to power between IAC valve terminal B and PCM terminal 83 • Open circuit between IAC valve terminal B and PCM terminal 83 • Poor connection of IAC valve connector or PCM connector • PCM malfunction



HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC detected?	Yes	Go to next step.
		No	Go to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
4	**INSPECT IAC VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect IAC valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	**INSPECT IAC VALVE ELECTRICAL MALFUNCTION** • Measure resistance between IAC valve terminals A and B (part-side). • Is resistance **within 8.7— 10.5 ohms**?	Yes	Go to next step.
		No	Replace IAC valve, then go to Step 14.
6	**CLASSIFY MALFUNCTION AT POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between IAC valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Malfunction at control circuit. Go to Step 10.
		No	Malfunction at power supply circuit. Go to next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 54 (damaged/pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
8	**INSPECT POWER CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check for continuity between IAC valve terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 14.
		No	Go to next step.
9	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF • Connect breakout box with PCM disconnected. • Check for continuity between IAC valve terminal A (harness-side) and breakout box terminal 54. • Is there continuity?	Yes	Repair or replace harness for open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 83 (damaged/pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.

STEP	INSPECTION		ACTION
11	**INSPECT CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between IAC valve terminal B (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 14.
		No	Go to next step.
12	**INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn ignition key to OFF. • Check for continuity between IAC valve terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 14.
		No	Go to next step.
13	**INSPECT CONTROL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Check for continuity between IAC valve terminal B (harness-side) and breakout box terminal 83. • Is there continuity?	Yes	Repair or replace harness for open, then go to next step.
		No	Go to next step.
14	**VERIFY TROUBLESHOOTING OF DTC P0505 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0506 [FS]

A3U010201087W03

DTC P0506	Idle control system RPM lower than expected
DETECTION CONDITION	• Actual idle speed is lower than expected by **100 rpm** for **14.1 seconds** when brake pedal is depressed (brake switch is ON) and steering wheel is held straight ahead (power steering pressure switch is OFF). **Note** • If atmospheric pressure is **less than 72.0 kPa {540 mmHg, 21.3 inHg}** or intake air temperature is **below –10°C {14°F}**, PCM cancels diagnosis of P0506. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IAC valve malfunction • Air cleaner element clogged • Air intake passage clogged • A/C relay control circuit malfunction • Generator control circuit malfunction • Purge solenoid valve malfunction • Low engine compression (Over capacity of blow-by gas) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition key to OFF, then ON (Engine OFF). • Verify pending code or stored DTCs using WDS or equivalent. • Are other DTCs present?	Yes	Repair applicable DTCs. (See 01–02B–15 DTC TABLE [FS].)
		No	Go to next step.
4	**INSPECT IAC VALVE MALFUNCTION** • Perform IAC inspection. (See 01–13B–8 IDLE AIR CONTROL (IAC) VALVE INSPECTION [FS].) • Is IAC valve okay?	Yes	Go to next step.
		No	Replace IAC valve, then go to Step 11.
5	**INSPECT A/C MAGNETIC CLUTCH OPERATION** • Turn blower motor switch off. • Is magnetic clutch still ON?	Yes	Refer to “A/C is always on or A/C compressor runs continuously.” of ENGINE SYMPTOM TROUBLESHOOTING, then go to Step 11. (See 01–03B–45 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY [FS].)
		No	Go to next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT MALFUNCTION** • Turn ignition key to OFF. • Disconnect generator connector. • Turn ignition key to ON. • Measure voltage between generator connector terminal D (harness-side) and body GND. • Is voltage **0 V**?	Yes	Go to next step.
		No	Repair short to power circuit in generator control circuit, then go to Step 11.
7	**INSPECT PURGE SOLENOID VALVE CONTROL MALFUNCTION** • Perform purge solenoid valve. (See 01–16–12 PURGE SOLENOID VALVE INSPECTION.) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 11.
8	**INSPECT AIR CLEANER ELEMENT** • Remove air cleaner element with engine running. • Is engine speed increased?	Yes	Replace air cleaner element, then go to Step 11.
		No	Go to next step.
9	**INSPECT THROTTLE BODY PASSAGE** • Is throttle body passage clogged?	Yes	Clean or replace throttle body, then go to Step 11.
		No	Go to next step.
10	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01–10B–8 COMPRESSION INSPECTION [FS].) • Is engine compression okay?	Yes	Go to next step.
		No	Overhaul engine, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Depress brake pedal for **14.1 seconds or more**. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0507 [FS]

A3U010201087W04

DTC P0507	Idle control system RPM higher than expected
DETECTION CONDITION	• Actual idle speed is higher than expected by **200 rpm** for **14.1 seconds**, when brake pedal is depressed (brake switch is ON) and steering wheel is held straight ahead (power steering pressure switch is OFF). **Note** • If atmospheric pressure is **less than 72.0 kPa {540 mmHg, 21.3 inHg}** or intake air temperature is **below –10°C {14°F}**, PCM cancels diagnosis of P0507. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IAC valve malfunction • Accelerator cable misadjustment • Actuator cable misadjustment • Throttle valve malfunction • Vacuum hose misconnection • PCM malfunction

Diagnostic procedure

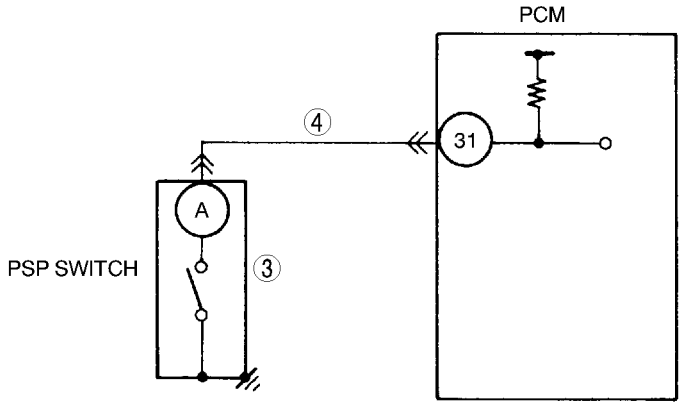
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition key to OFF, then start engine. • Verify pending code or stored DTCs using WDS or equivalent. • Are other DTCs present?	Yes	Repair applicable DTCs. (See 01–02B–15 DTC TABLE [FS].)
		No	Go to next step.
4	**INSPECT IAC VALVE MALFUNCTION** • Perform IAC inspection. (See 01–13B–8 IDLE AIR CONTROL (IAC) VALVE INSPECTION [FS].) • Is IAC valve okay?	Yes	Go to next step.
		No	Replace IAC valve, then go to Step 9.
5	**INSPECT ACCELERATOR CABLE FREE PLAY** • Turn ignition key to OFF. • Is accelerator cable free play okay? (See 01–13B–17 ACCELERATOR CABLE INSPECTION [FS].)	Yes	Go to next step.
		No	Adjust accelerator cable free play, then go to Step 9. (See 01–13B–17 ACCELERATOR CABLE ADJUSTMENT [FS].)
6	**INSPECT ACTUATOR CABLE FREE PLAY** • Is actuator cable adjustment okay?	Yes	Go to next step.
		No	Adjust actuator cable free play, then go to Step 9.
7	**INSPECT VACUUM HOSE CONNECTION** • Are vacuum hoses connected accurately? (See 01–13B–5 VACUUM HOSE ROUTING DIAGRAM [FS].)	Yes	Go to next step.
		No	Reconnect vacuum hose accurately, then go to Step 9.
8	**VISUAL INSPECT THROTTLE VALVE** • Remove throttle body. • Is throttle valve fully closed?	Yes	Go to next step.
		No	Clean or replace throttle body, then go to next step.

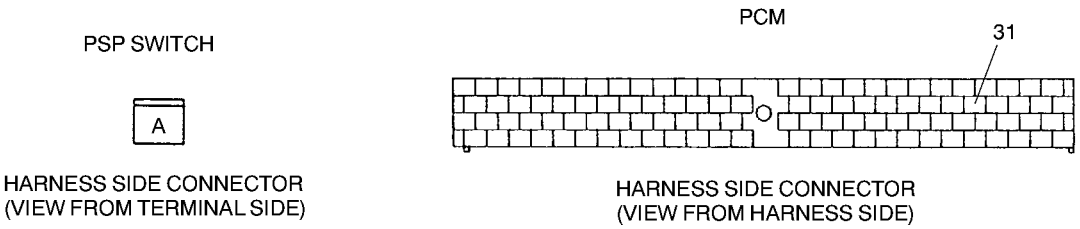
STEP	INSPECTION		ACTION
9	**VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Depress brake pedal for **14.1 seconds or more**. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0550 [FS]

A3U010201087W05

DTC P0550	PSP switch circuit malfunction
DETECTION CONDITION	• PCM monitors PSP switch signal at PCM terminal 31. If input voltage is low (switch stays on) for **1 minute** when the VSS is **above 60.2 km/h {37.4 mph}** and ECT is **above 60°C {140°F}**, PCM determines that PSP switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PSP switch malfunction • Short to ground between PSP switch terminal and PCM terminal 31 • PCM malfunction





Diagnostic procedure

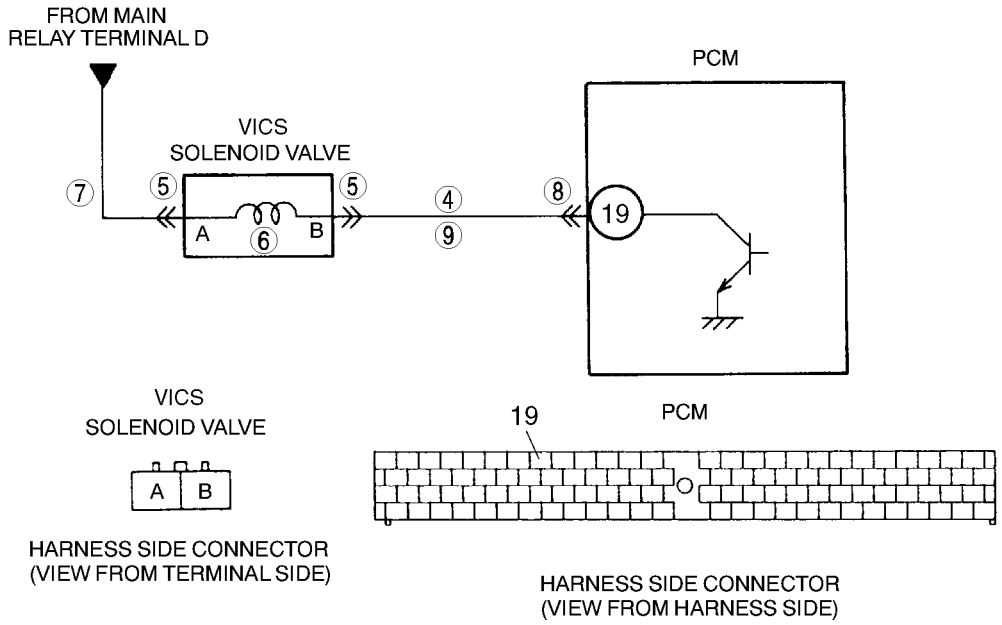
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT PSP SWITCH** • Perform PSP switch inspection (See 01–40B–44 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [FS].) • Is PSP switch okay?	Yes	Go to next step.
		No	Replace the PSP switch, then go to Step 5.
4	**INSPECT PSP SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Disconnect PCM connector. • Check for continuity between PSP switch terminal (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to next step.
		No	Go to next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0550 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle **above 60.2 km/h {37.4 mph}** for **1 minute**. • Verify that ECT PID is **above 60°C {140°F}** using WDS or equivalent. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0660 [FS]

A3U010201088W01

DTC P0660	VICS solenoid valve circuit malfunction
DETECTION CONDITION	• PCM monitors input voltages from VICS solenoid valve while engine running. If voltage at PCM terminal 19 remains low or high, PCM determines that VICS solenoid valve circuit has malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM) • PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• VICS solenoid valve malfunction • Connector or terminal malfunction • Short to ground in wiring between VICS solenoid valve terminal B and PCM terminal 19 • Open circuit in wiring between main relay terminal D and VICS solenoid valve terminal A • Open circuit in wiring between VICS solenoid valve terminal B and PCM terminal 19 • Short to power circuit between VICS solenoid valve terminal B and PCM terminal 19 • PCM malfunction

DTC P0660	VICS solenoid valve circuit malfunction



Diagnostic procedure

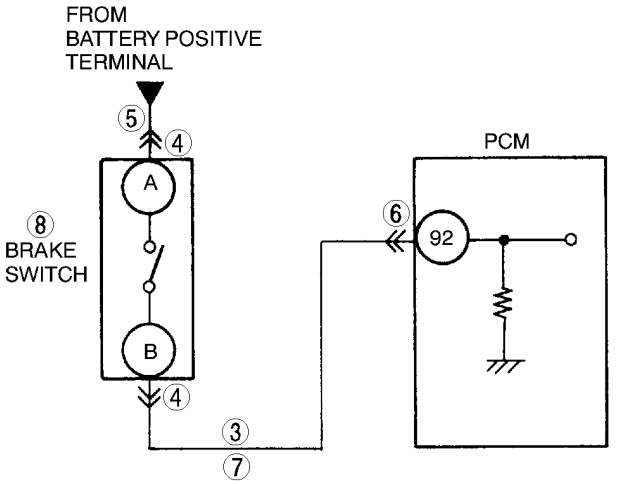
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Start engine. • Increase engine speed **above 4,750 rpm**. • Is PENDING CODE same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
3	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect VICS solenoid valve tube at solenoid side that connects to VICS solenoid valve. • Connect vacuum pump to VICS solenoid valve. • Apply vacuum. • Wait **for 5 seconds**. • Is vacuum maintained?	Yes	Go to Step 5.
		No	Go to next step.
4	**INSPECT PASSAGE CONTROL OF VICS SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect VICS solenoid valve connector. • Apply vacuum and wait **for 5 seconds**. • Is vacuum maintained?	Yes	Repair or replace harness between solenoid valve terminal B and PCM terminal 19 for short to ground, then go to Step 10.
		No	Replace VICS solenoid valve, then go to Step 10.
5	**INSPECT VICS SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
6	**INSPECT VICS SOLENOID VALVE** • Measure resistance between VICS solenoid valve terminals (part-side). • Is resistance **within 22—26 ohms**?	Yes	Go to next step.
		No	Replace VICS solenoid valve, then go to Step 10.

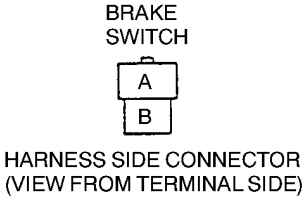
STEP	INSPECTION		ACTION
7	**INSPECT VICS SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between VICS solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 10.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 19. (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
9	**INSPECT VICS SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect VICS solenoid valve connector. • Connect breakout box with PCM disconnected. • Turn ignition key to ON (Engine OFF). • Measure voltage between breakout box terminal 19 and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0660 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Increase engine speed **above 4,750 rpm**. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

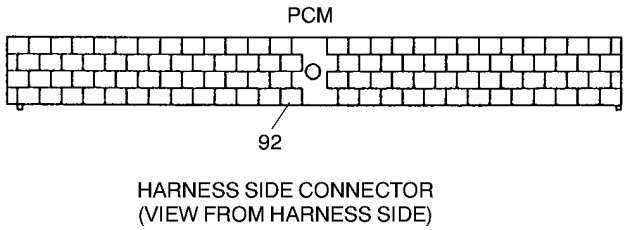
DTC P0703 [FS]

A3U010201089W01

DTC P0703	Brake switch input malfunction
DETECTION CONDITION	• PCM monitors changes in input voltage from brake switch. If PCM does not detect PCM terminal 92 voltage changes while accelerating and decelerating **10 times** repeatedly, it determines that brake switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Open harness between brake switch terminal B and PCM connector terminal 92 • PCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Measure voltage between brake switch connector terminal B and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to Next step.

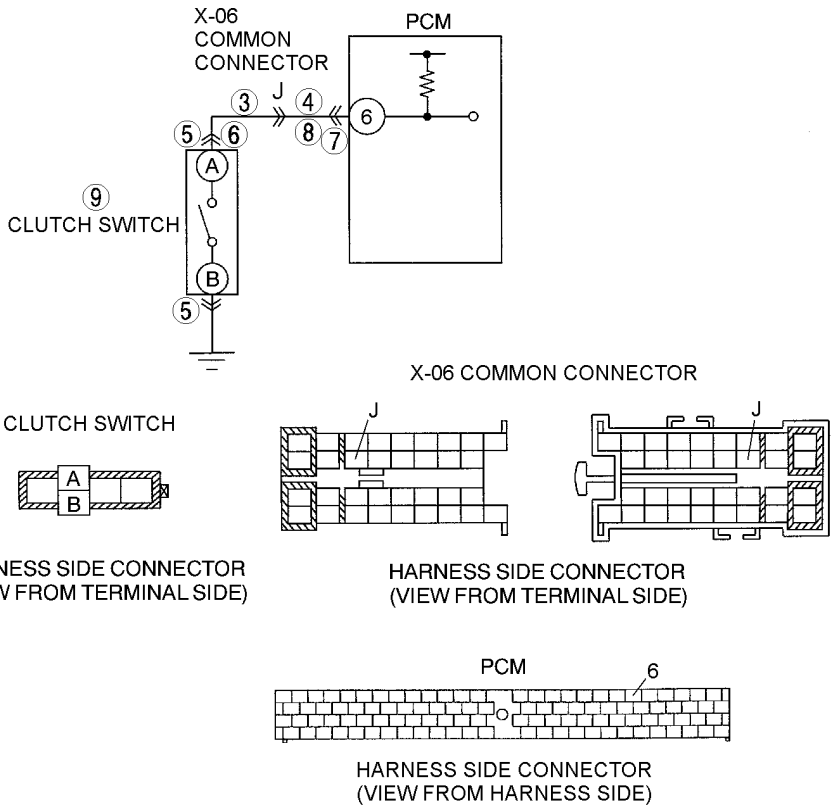
STEP	INSPECTION		ACTION
4	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect brake switch connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
5	**INSPECT BRAKE SWITCH POWER CIRCUIT FOR OPEN CIRCUIT** • Measure voltage between brake switch connector terminal A and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace brake switch power circuit for open, then Go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF. • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM connector disconnected. • Connect brake switch connector. • Turn ignition switch to ON (engine OFF). • Depress brake pedal and measure voltage between breakout box terminal 92 and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
8	**INSPECT BRAKE SWITCH** • Perform brake switch inspection. (See 04–11–5 BRAKE SWITCH INSPECTION.) • Is brake switch okay?	Yes	Go to next step.
		No	Replace brake switch, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Drive vehicle **30 km/h {18.6 mph} or more**. • Depress and release brake pedal **more than 10 times** while driving vehicle. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0704 [FS]

A3U010201089W02

DTC P0704	Clutch switch circuit malfunction
DETECTION CONDITION	• PCM monitors changes in input voltage from the clutch switch. If PCM does not detect PCM terminal 6 voltage changes while running vehicle with vehicle speed **above 30 km/h {19 mph}** and stopping vehicle **10 times** repeatedly, it determines that clutch switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• CLT switch malfunction • Open harness between clutch switch terminal A and PCM terminal 6 • PCM malfunction

DTC P0704	Clutch switch circuit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT X-06 COMMON CONNECTOR CIRCUIT FOR SHORT TO POWER** • Disconnect X-06 common connector. • Turn ignition key to ON (engine OFF). • Measure voltage between X-06 common connector male terminal J and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 10.
		No	Go to next step.
4	**INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key OFF. • Connect breakout box with PCM connector disconnected. • Turn ignition key to ON (engine OFF). • Measure voltage between breakout box terminal 6 and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 10.
		No	Go to next step.
5	**INSPECT CLUTCH SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect clutch switch connector. • Check for poor connection (damaged/pilled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go Step 10.
		No	Go to next step.

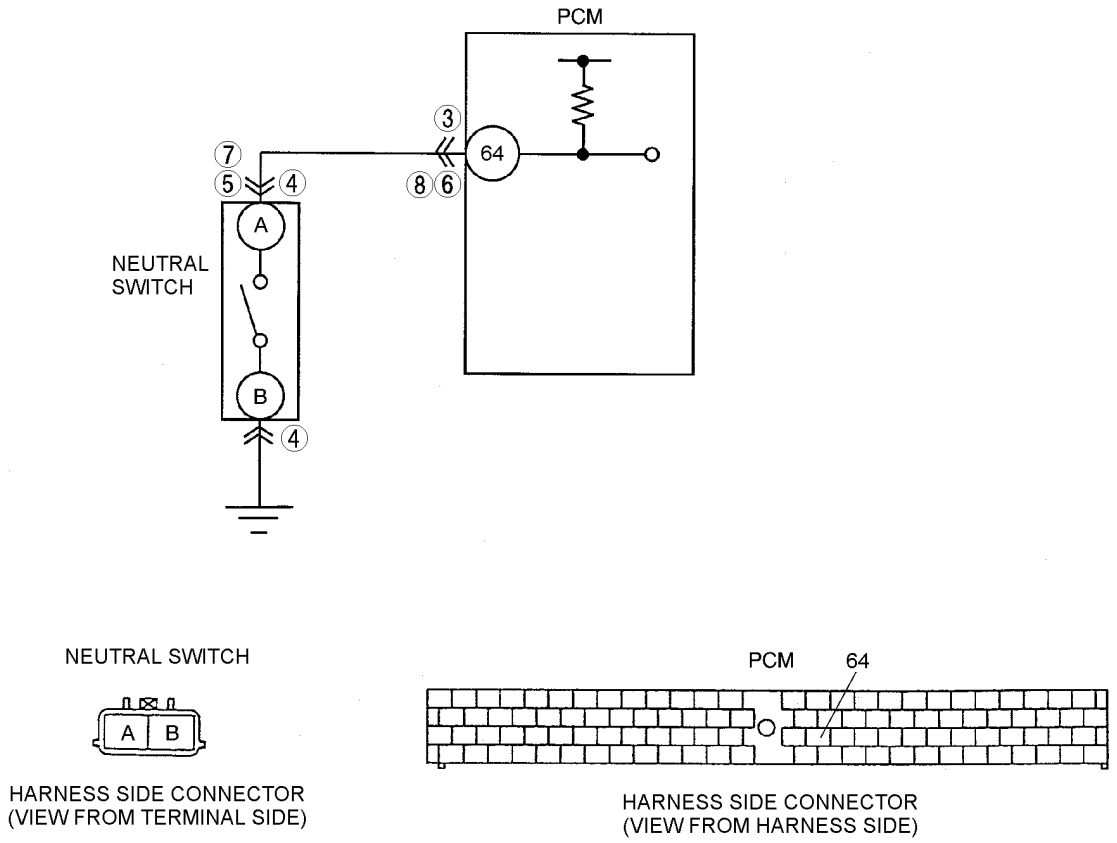
STEP	INSPECTION		ACTION
6	**INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (engine OFF). • Measure voltage between clutch switch terminal A and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace clutch switch signal circuit for open, then go to Step 10.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 6 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
8	**INSPECT X-06 COMMON CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect X-06 common connector. • Turn ignition key to ON (engine OFF). • Depress clutch pedal and measure voltage between X-06 common connector male terminal J and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 10.
9	**INSPECT CLUTCH SWITCH** • Perform clutch switch inspection. (See 01–40B–42 CLUTCH SWITCH INSPECTION [FS].) • Is clutch switch okay?	Yes	Go to next step.
		No	Replace clutch switch, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle **above 30 km/h {19 mph}** and stop vehicle. • Depress and release clutch pedal **more than 10 times** during drive cycle. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P0705 [FS]

A3U010201089W03

DTC P0705	Neutral switch circuit malfunction
DETECTION CONDITION	• PCM monitors changes in input voltage from neutral switch. If PCM does not detect PCM terminal 64 voltage changes when clutch pedal is depressed **10 times** while driving with vehicle speed **above 30 km/h {19 mph}** and vehicle stopped repeatedly, it determines that neutral switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Neutral switch malfunction • Open harness between neutral switch terminal A and PCM terminal 64 • PCM malfunction

DTC P0705	Neutral switch circuit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Connect breakout box with PCM connector disconnected. • Disconnect neutral switch connector. • Turn ignition key to ON (engine OFF). • Measure voltage between breakout box terminal 64 (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to next step.
4	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect neutral switch connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go Step 9.
		No	Go to next step.

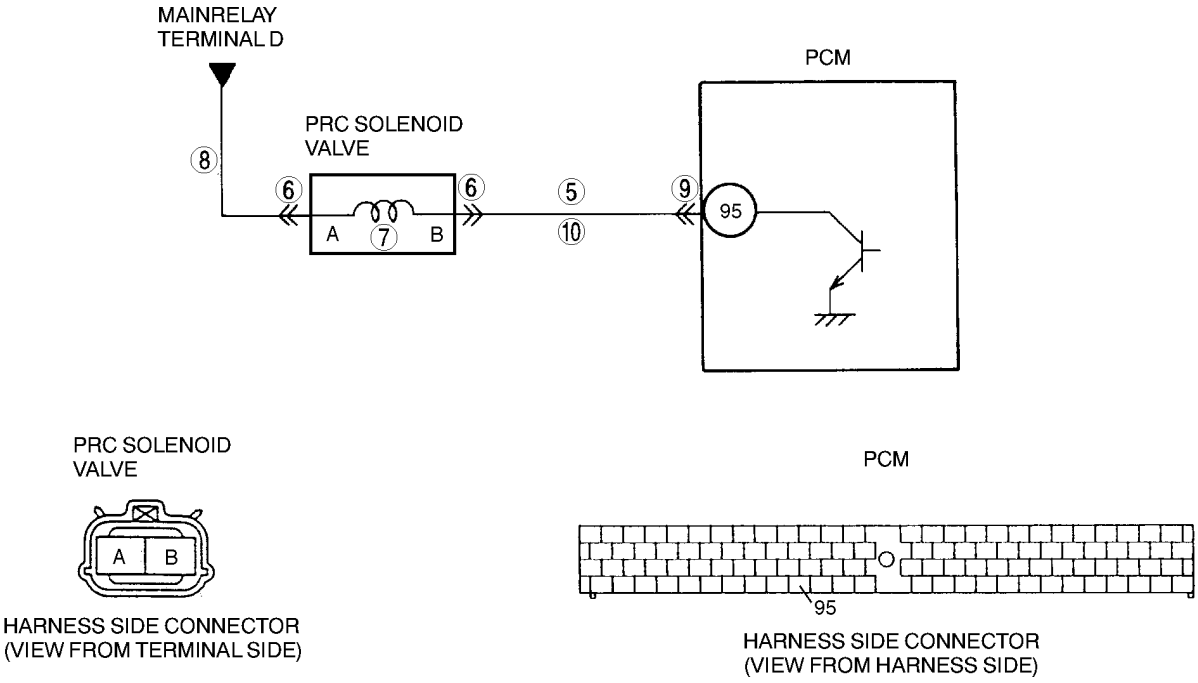
STEP	INSPECTION		ACTION
5	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (engine OFF). • Measure voltage between neutral switch terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace neutral switch signal circuit for open, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 64 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	**INSPECT NEUTRAL SWITCH CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect neutral switch connector. • Turn ignition key to ON (engine OFF). • Depress clutch pedal and measure voltage between neutral switch terminal A (harness-side) and body ground. • Is voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
8	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to OFF. • Connect breakout box with PCM connector disconnected. • Turn ignition key to ON (engine OFF). • Depress clutch pedal and measure voltage between breakout box terminal 64 and body ground. • Is voltage **below 1.0 V**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
9	**VERIFY TROUBLESHOOTING OF DTC P0705 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equivalent. • Drive vehicle **above 30 km/h {19 mph}** and stop vehicle. • Depress and release clutch pedal **more than 10 times** during drive cycle. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1250 [FS]

A3U010201083W01

DTC P1250	Pressure regulator control (PRC) valve circuit malfunction
DETECTION CONDITION	• PCM monitors input voltages from PRC solenoid valve. If voltage at PCM terminal 95 remains low or high, PCM determines that PRC solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is not stored in PCM memory.

DTC P1250	Pressure regulator control (PRC) valve circuit malfunction
POSSIBLE CAUSE	• PRC solenoid valve malfunction • Connector or terminal malfunction • Short to ground in wiring between PRC solenoid valve terminal B and PCM terminal 95 • Open circuit in wiring between main relay terminal D and PRC solenoid valve terminal A • Open circuit in wiring between PRC solenoid valve terminal B and PCM terminal 95 • Short to power circuit between PRC solenoid valve terminal B and PCM terminal 95 • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF then Start engine. • Is PENDING CODE of same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
4	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect PRC solenoid valve tube that connects to intake manifold. • Connect vacuum pump to PRC solenoid valve. • Apply vacuum and wait **5 seconds**. • Is vacuum maintained?	Yes	Go to Step 6.
		No	Go to next step.
5	**INSPECT PASSAGE CONTROL OF PRC SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect PRC solenoid valve connector. • Is vacuum maintained?	Yes	Repair or replace harness between PCM terminal 95 and PRC solenoid valve terminal B for short to ground, then go to Step 11.
		No	Replace PRC solenoid valve, then go to Step 11.

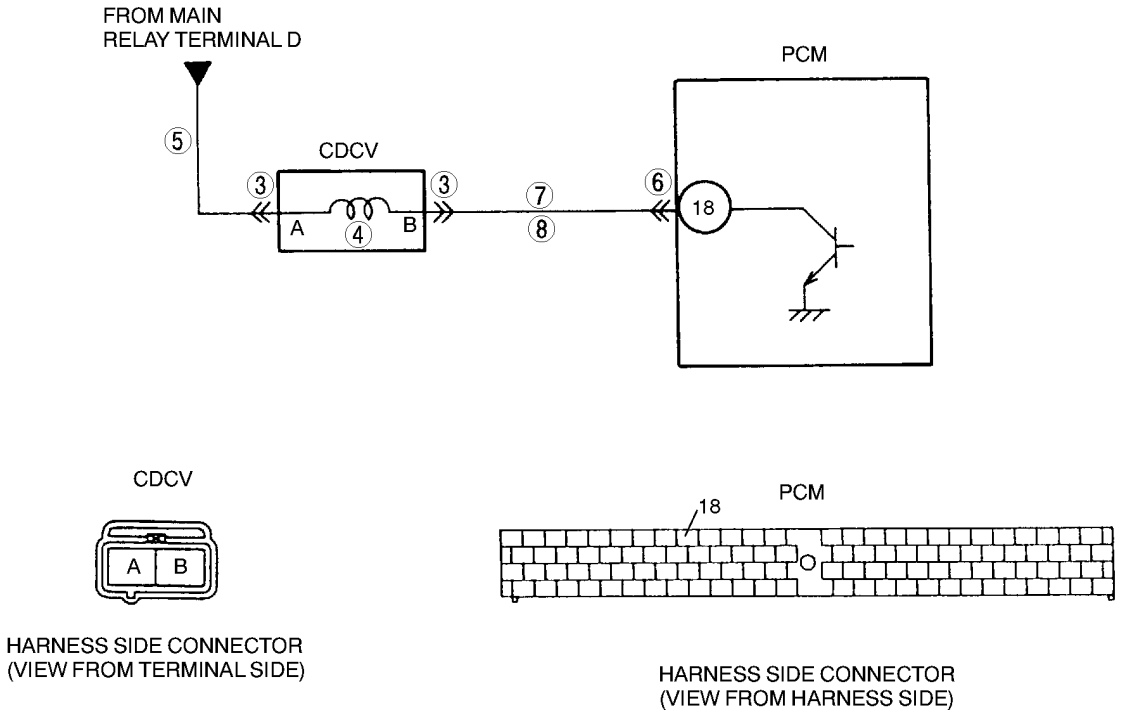
STEP	INSPECTION		ACTION
6	**INSPECT PRC SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 11.
		No	Go to next step.
7	**INSPECT PRC SOLENOID VALVE** • Measure resistance between PRC solenoid valve terminals (part-side). • Is resistance **within 22—26 ohms**?	Yes	Go to next step.
		No	Replace PRC solenoid valve, then go to Step 11.
8	**INSPECT PRC SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between PRC solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 11.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 95 (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
10	**INSPECT PRC SOLENOID VALVE CONTROL CIRCUIT** • Connect breakout box with PCM disconnected. • Turn ignition key to ON (Engine OFF). • Measure voltage between PRC solenoid valve terminal B (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to next step.
		No	Check for continuity between PRC solenoid valve terminal B (harness-side) and breakout box terminal 95. • If there is continuity, go to next step. • If there is no continuity, repair or replace harness for open, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1250 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF then start engine. • Is PENDING CODE of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1449 [FS]

A3U010201083W02

DTC P1449	Canister drain cut valve (CDCV) circuit malfunction
DETECTION CONDITION	• PCM monitors the input voltages from CDCV just after turning the ignition key to ON. If voltage at PCM terminal 18 remains low or high, PCM determines that CDCV circuit has malfunction. **Diagnostic support note** • This is a diagnostic support DTC (monitored one per key cycle). • MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTC is not stored in PCM memory.
POSSIBLE CAUSE	• CDCV malfunction • Connector or terminal malfunction • Short to ground in wiring between CDCV terminal B and PCM terminal 18 • Open circuit in wiring between main relay terminal D and CDCV terminal A • Open circuit in wiring between CDCV terminal B and PCM terminal 18 • Short to power circuit between CDCV terminal B and PCM terminal 18 • PCM malfunction

DTC P1449	Canister drain cut valve (CDCV) circuit malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
3	**INSPECT CDCV CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	**INSPECT CDCV** • Measure resistance between CDCV terminals (part-side). • Is resistance **within 17—21 ohms**?	Yes	Go to next step.
		No	Replace CDCV, then go to Step 9.
5	**INSPECT CDCV POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between CDCV terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 18. (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.

STEP	INSPECTION		ACTION
7	**INSPECT CDCV CONTROL CIRCUIT FOR SHORT TO GROUND** • Disconnect PCM connector. • Check for continuity between CDCV terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
8	**INSPECT CDCV CONTROL CIRCUIT FOR SHORT TO POWER** • Connect breakout box with PCM disconnected. • Turn ignition key to ON (Engine OFF). • Measure voltage between CDCV terminal B (harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace harness for short to power, then go to next step.
		No	Check for continuity between CDCV terminal B (harness-side) and breakout box terminal 18. • If there is continuity, go to next step. • If there is no continuity, repair or replace harness for open, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P1449 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1450 [FS]

A3U010201083W03

DTC P1450	Evaporative emission control system malfunction (excessive vacuum)
DETECTION CONDITION	• PCM monitors fuel tank pressure signal when monitoring conditions are met. If vacuum is **above –3.92 kPa {–29.4 mmHg, –1.16 inHg}** for **10 seconds**, PCM determines the excessive vacuum. **MONITORING CONDITIONS** — Intake air temperature is **above –10 °C {14 °F}**. — Engine coolant temperature is **100 °C {212 °F} or below**. — Vehicle speed is **99.8 km/h {61.9 mph} or below**. — Engine coolant temperature at engine start is **below 35 °C {95 °F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• CDCV malfunction • Air filter clogged • Charcoal canister malfunction • Evaporative drain passage clogged (including check valve) • Fuel tank pressure sensor malfunction • Purge solenoid valve malfunction

Diagnostic procedure

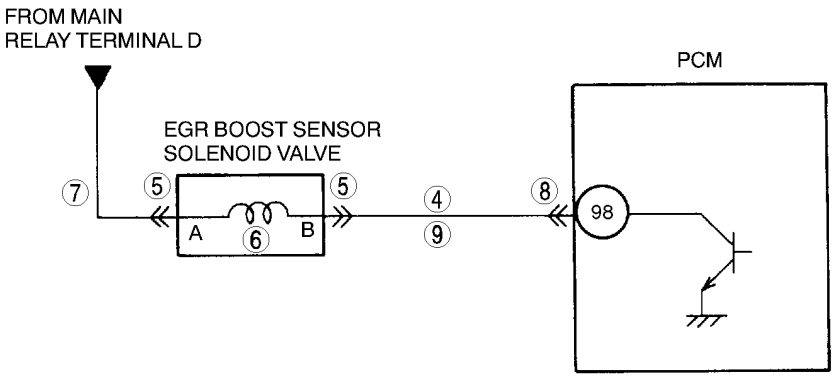
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED STORED DTCS** • Turn ignition key to OFF then start engine. • Verify stored DTC. • Are DTCs P0443 and/or P1449 present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step.

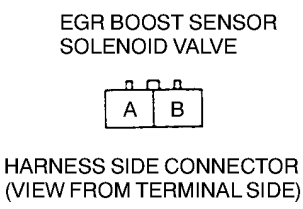
STEP	INSPECTION		ACTION
4	**INSPECT FOR OPERATION SOUND OF CDCV** • Perform CDCV inspection. (See 01–16–10 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION.) • Is CDCV okay?	Yes	Go to next step.
		No	Replace it if necessary, then go to Step 9.
5	**INSPECT PURGE SOLENOID VALVE** • Disconnect vacuum hose that connects to intake manifold from purge solenoid valve. • Connect vacuum pump to purge solenoid valve. • Pump vacuum several times and wait **a few seconds**. • Does vacuum hold?	Yes	Disconnect vacuum pump and connect vacuum hose to purge solenoid valve. Go to next step.
		No	Inspect purge solenoid valve and related harness. Replace it if necessary, then go to Step 9.
6	**INSPECT CHARCOAL CANISTER FOR CLOGGING** • Remove charcoal canister and inspect for clogging. (See 01–16–9 CHARCOAL CANISTER INSPECTION.) • Is it okay?	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 9.
7	**INSPECT FUEL TANK PRESSURE SENSOR** • Inspect fuel tank pressure sensor. (See 01–40B–40 FUEL TANK PRESSURE SENSOR INSPECTION [FS].) • Is it okay?	Yes	Go to next step.
		No	Replace fuel tank pressure sensor, then go to Step 9.
8	**INSPECT AIR FILTER FOR CLOGGING** • Remove and inspect air filter connected to CDCV for clogging. • Is it okay?	Yes	Inspect for clogging in following area: • From charcoal canister to CDCV • Drain passage including check valve — Repair or replace faulty area, then go to next step.
		No	Repair or replace air filter, then go to next step.
9	**VERIFY MONITORING CONDITION FOR EVAPORATIVE SYSTEM TEST** • Make sure to reconnect all disconnected connectors. • Turn ignition key to ON (Engine OFF). • Clear DTC from memory using WDS or equivalent. • Verify that following conditions are met. — BARO: **69.7 kPa {523 mmHg, 20.5 inHg} or higher** — ECT: **–10.0—20.0 °C {14.0—68.0 °F}** [at barometric pressure **69.7 kPa {523 mmHg, 20.5 inHg}]** — IAT: **–10—55 °C {50—131 °F}** — Fuel tank level: **15—85%** • Is there any condition out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step. **Note** • Readings need to be in the indicated ranges to perform Drive Mode 4.
		No	Go to next step.
10	**MONITOR EVAP SYSTEM BY DRIVE MODE 4** • Run Drive Mode 4. (See 01–02B–12 Mode 4 (EVAP system repair verification drive mode).) • Stop vehicle and access ON BOARD SYSTEM READINESS TESTS to inspect Drive Mode completion status. • Has EVAPORATIVE PURGE SYSTEM been monitored?	Yes	Go to next step.
		No	Go back to Step 9.
11	**VERIFY TROUBLESHOOTING OF DTC P1450 COMPLETED** • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

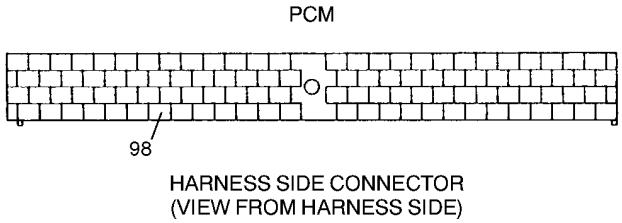
DTC P1487 [FS]

A3U010201083W04

DTC P1487	EGR boost sensor solenoid valve circuit malfunction
DETECTION CONDITION	• PCM monitors input voltages from EGR boost sensor solenoid valve just after turning the ignition key to ON. If voltage at PCM terminal 98 remains low or high, PCM determines that EGR boost sensor solenoid valve circuit has malfunction. **Diagnostic support note** • This is a diagnostic support DTC (monitored once per key cycle). • MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTC is not stored in PCM memory.
POSSIBLE CAUSE	• EGR boost sensor solenoid valve malfunction • Connector or terminal malfunction • Short to ground in wiring between EGR boost sensor solenoid valve terminal B and PCM terminal 98 • Open circuit in wiring between main relay terminal D and EGR boost sensor solenoid valve terminal A • Open circuit in wiring between EGR boost sensor solenoid valve terminal B and PCM terminal 98 • Short to power circuit between EGR boost sensor solenoid valve terminal B and PCM terminal 98 • PCM malfunction







Diagnostic procedure

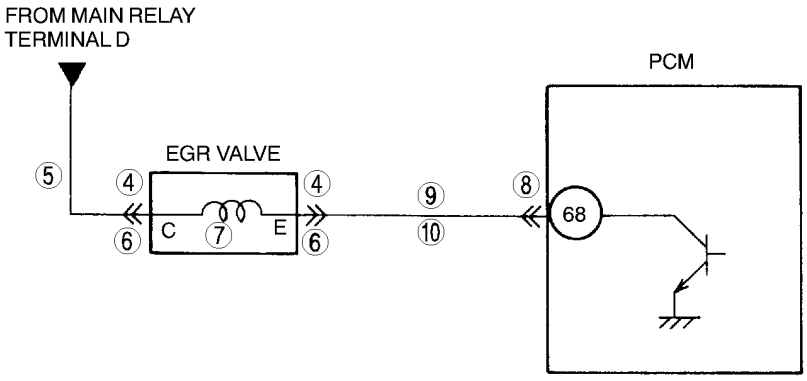
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
3	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect EGR boost sensor solenoid valve tube at solenoid side that connects to EGR valve. • Connect vacuum pump to EGR boost solenoid valve. • Apply vacuum. • Wait **for 5 seconds**. • Is vacuum maintained?	Yes	Go to Step 5.
		No	Go to next step.

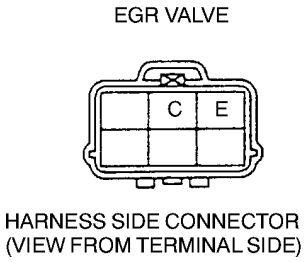
STEP	INSPECTION		ACTION
4	**INSPECT PASSAGE CONTROL OF EGR BOOST SENSOR SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect EGR boost sensor solenoid valve connector. • Apply vacuum and wait **for 5 seconds**. • Is vacuum maintained?	Yes	Repair or replace harness between solenoid valve terminal B and PCM terminal 98 for short to ground, then go to Step 10.
		No	Replace EGR boost sensor solenoid valve, then go to Step 10.
5	**INSPECT EGR BOOST SENSOR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
6	**INSPECT EGR BOOST SENSOR SOLENOID VALVE** • Measure resistance between EGR boost sensor solenoid valve terminals (part-side). • Is resistance **within 22—26 ohms**?	Yes	Go to next step.
		No	Replace EGR boost sensor solenoid valve, then go to Step 10.
7	**INSPECT EGR BOOST SENSOR SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR boost sensor solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 10.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at terminal 98. (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
9	**INSPECT EGR BOOST SENSOR SOLENOID VALVE CONTROL CIRCUIT** • Connect breakout box with PCM disconnected. • Turn ignition key to ON (Engine OFF). • Measure voltage between breakout box terminal B (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to next step.
		No	Check for continuity between EGR boost sensor solenoid valve terminal B (harness-side) and breakout box terminal 98. • If there is continuity, go to next step. • If there is no continuity, repair or replace harness for open, then go to next step.
10	**VERIFY TROUBLESHOOTING OF DTC P1487 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

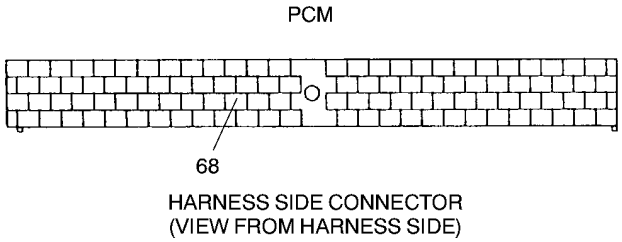
DTC P1496 [FS]

A3U010201083W05

DTC P1496	EGR valve stepping motor coil 1 open or short
DETECTION CONDITION	• PCM monitors input voltages from EGR valve coil control circuit just after turning ignition key to ON. If voltage at PCM terminal 68 remains low or high, PCM determines that EGR valve circuit has malfunction. **Diagnostic support note** • This is a diagnostic support DTC (monitored once per key cycle) • MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTC is not stored in PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to ground circuit in wiring between EGR valve terminal E and PCM terminal 68 • Open circuit in wiring between EGR valve terminal E and PCM terminal 68 • Short to power circuit in wiring between EGR valve terminal E and PCM terminal 68 • Open circuit in wiring between main relay terminal D and EGR valve terminal C • PCM malfunction







Diagnostic procedure

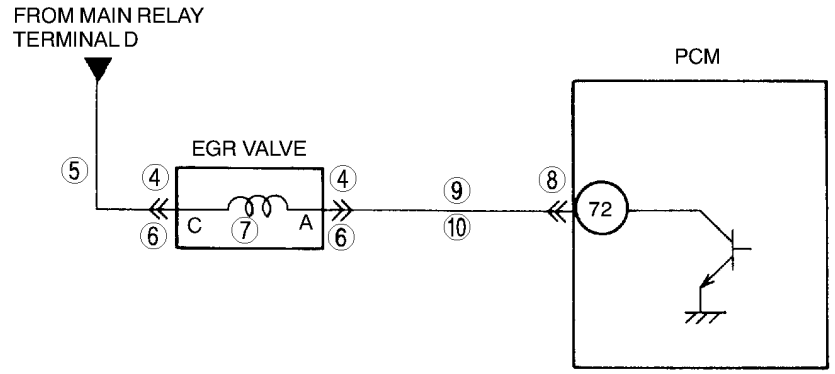
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Is same DTC and P1497 present?	Yes	Malfunction at EGR valve or power circuit. Go to next step.
		No	Malfunction at EGR valve or control circuit. Go to Step 6.

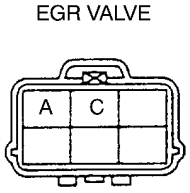
STEP	INSPECTION		ACTION
4	**INSPECT EGR VALVE FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
5	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR valve terminal C (harness-side) and body ground. • Is voltage **B+**?	Yes	Inspect EGR valve coils 1 and 2. (See 01–16–15 EGR VALVE INSPECTION.) • If there is a malfunction, replace EGR valve, and then go to Step 11. • If there is no malfunction, go to Step 11.
		No	Repair or replace harness, then go to Step 11.
6	**INSPECT EGR VALVE FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
7	**INSPECT EGR VALVE** • Measure resistance between EGR valve terminals C and E (part-side). • Is resistance **within 20—24 ohms**?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminal 68 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	**INSPECT CONTROL CIRCUIT FOR SHORT** • Check continuity between EGR valve terminal E (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 11.
		No	Measure voltage between EGR valve terminal E and body ground. • If voltage is **B+**, repair or replace harness for short to power, then go to next step. • If voltage is **approx. 0 V**, go to next step.
10	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Check for continuity between EGR valve terminal E (harness-side) and breakout box terminal 68. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1496 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1497 [FS]

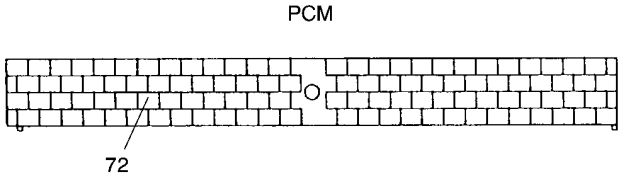
A3U010201083W06

DTC P1497	EGR valve stepping motor coil 2 open or short circuit
DETECTION CONDITION	• PCM monitors input voltages from EGR valve coil control circuit just after turning ignition key to ON. If voltage at PCM terminal 72 remains low or high, PCM determines that EGR valve circuit has malfunction. **Diagnostic support note** • This is a diagnostic support DTC (monitored once per key cycle). • MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTC is not stored in PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to ground circuit in wiring between EGR valve terminal A and PCM terminal 72 • Open circuit in wiring between EGR valve terminal A and PCM terminal 72 • Short to power circuit in wiring between EGR valve terminal A and PCM terminal 72 • Open circuit in wiring between main relay terminal D and EGR valve terminal C • PCM malfunction





HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Diagnostic procedure

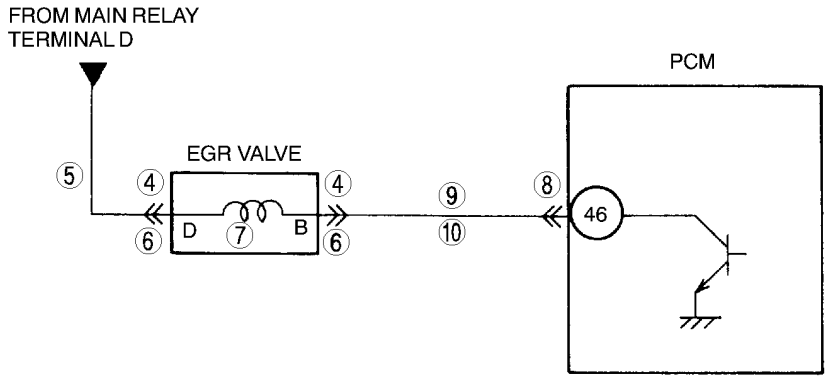
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Is same DTC and P1496 present?	Yes	Malfunction at EGR valve or power circuit. Go to next step.
		No	Malfunction at EGR valve or control circuit. Go to Step 6.

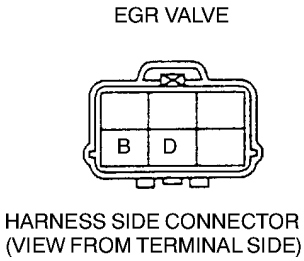
STEP	INSPECTION		ACTION
4	**INSPECT EGR VALVE FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
5	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR valve terminal C (harness-side) and body ground. • Is voltage **B+**?	Yes	Inspect EGR valve coils 1 and 2. (See 01–16–15 EGR VALVE INSPECTION.) • If there is a malfunction, replace EGR valve, and then go to Step 11. • If there is no malfunction, then go to Step 11.
		No	Repair or replace harness for open circuit, then go to Step 11.
6	**INSPECT EGR VALVE FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
7	**INSPECT EGR VALVE** • Measure resistance between EGR valve terminals C and A (part-side). • Is resistance **within 20—24 ohms**?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminal 72 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	**INSPECT CONTROL CIRCUIT FOR SHORT** • Check continuity between EGR valve terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 11.
		No	Measure voltage between EGR valve terminal A and body ground. • If voltage is **B+**, repair or replace harness for short to power, then go to next step. • If voltage is **approx. 0 V**, go to next step.
10	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Check for continuity between EGR valve terminal A (harness-side) and breakout box terminal 72. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1497 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF, then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

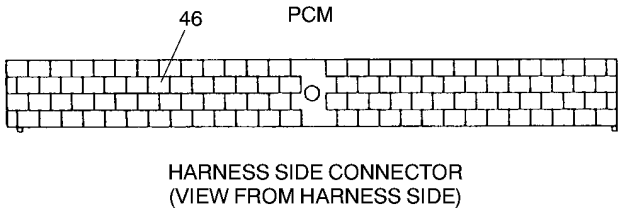
DTC P1498 [FS]

A3U010201083W07

DTC P1498	EGR valve stepping motor coil 3 open or short circuit
DETECTION CONDITION	• PCM monitors input voltages from EGR valve coil control circuit just after turning ignition key to ON. If voltage at PCM terminal 46 remains low or high, PCM determines that EGR valve circuit has malfunction. **Diagnostic support note** • This is a diagnostic support DTC (monitored once per key cycle). • MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTC is not stored in PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to ground circuit in wiring between EGR valve terminal B and PCM terminal 46 • Open circuit in wiring between EGR valve terminal B and PCM terminal 46 • Short to power circuit in wiring between EGR valve terminal B and PCM terminal 46 • Open circuit in wiring between main relay terminal D and EGR valve terminal D • PCM malfunction







Diagnostic procedure

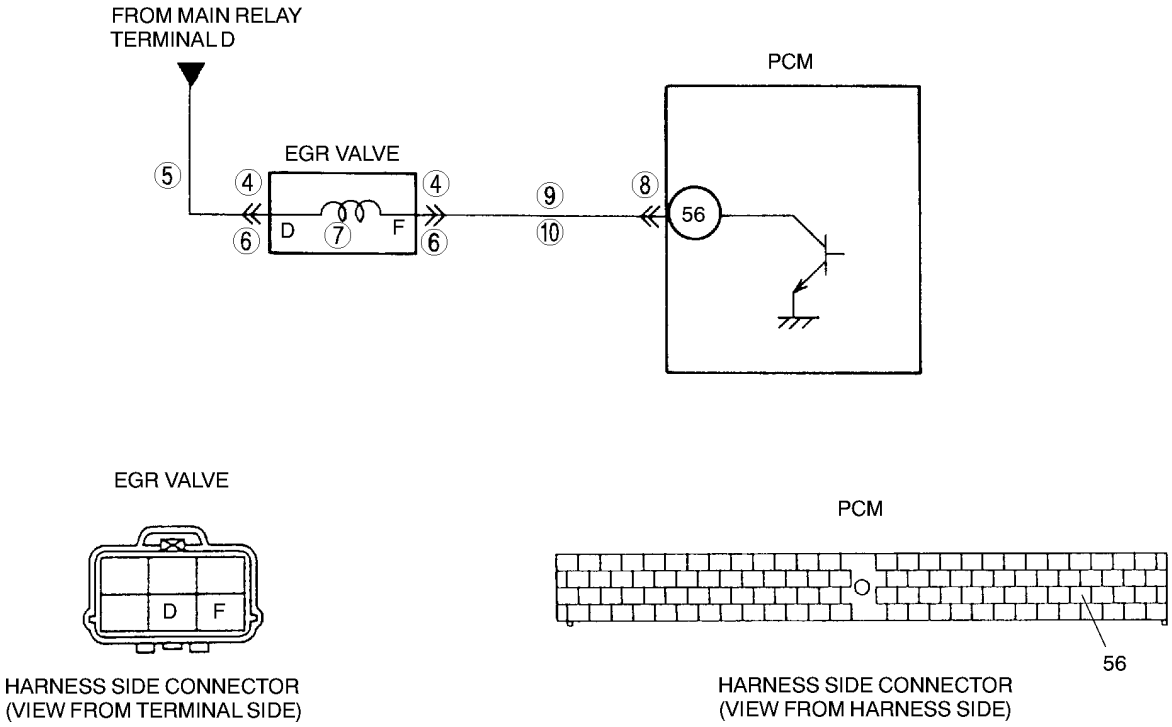
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Is same DTC and P1499 present?	Yes	Malfunction at EGR valve or power circuit. Go to next step.
		No	Malfunction at EGR valve or control circuit. Go to Step 6.

STEP	INSPECTION		ACTION
4	**INSPECT EGR VALVE FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
5	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR valve terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Inspect EGR valve coils 3 and 4. (See 01–16–15 EGR VALVE INSPECTION.) • If there is a malfunction, replace EGR valve, and then go to Step 11. • If there is no malfunction, go to Step 11.
		No	Repair or replace harness for open circuit, then go to Step 11.
6	**INSPECT EGR VALVE FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
7	**INSPECT EGR VALVE** • Measure resistance between EGR valve terminals D and B (part-side). • Is resistance **within 20—24 ohms**?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminal 46 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminals, then go to Step 11.
		No	Go to next step.
9	**INSPECT CONTROL CIRCUIT FOR SHORT** • Check continuity between EGR valve terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 11.
		No	Measure voltage between EGR valve terminal B and body ground. • If voltage is **B+**, repair or replace harness for short to power, then go to next step. • If voltage is **approx. 0 V**, go to next step.
10	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Check for continuity between EGR valve terminal B (harness-side) and breakout box terminal 46. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1498 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF, then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1499 [FS]

A3U010201083W08

DTC P1499	EGR valve stepping motor coil 4 open or short circuit
DETECTION CONDITION	• PCM monitors input voltages from EGR valve coil control circuit just after turning ignition key to ON. If voltage at PCM terminal 56 remains low or high, PCM determines that EGR valve circuit has malfunction. **Diagnostic support note** • This is a diagnostic support DTC (monitored once per key cycle). • MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTC is not stored in PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to ground circuit in wiring between EGR valve terminal F and PCM terminal 56 • Open circuit in wiring between EGR valve terminal F and PCM terminal 56 • Short to power circuit in wiring between EGR valve terminal F and PCM terminal 56 • Open circuit in wiring between main relay terminal D and EGR valve terminal D • PCM malfunction



Diagnostic procedure

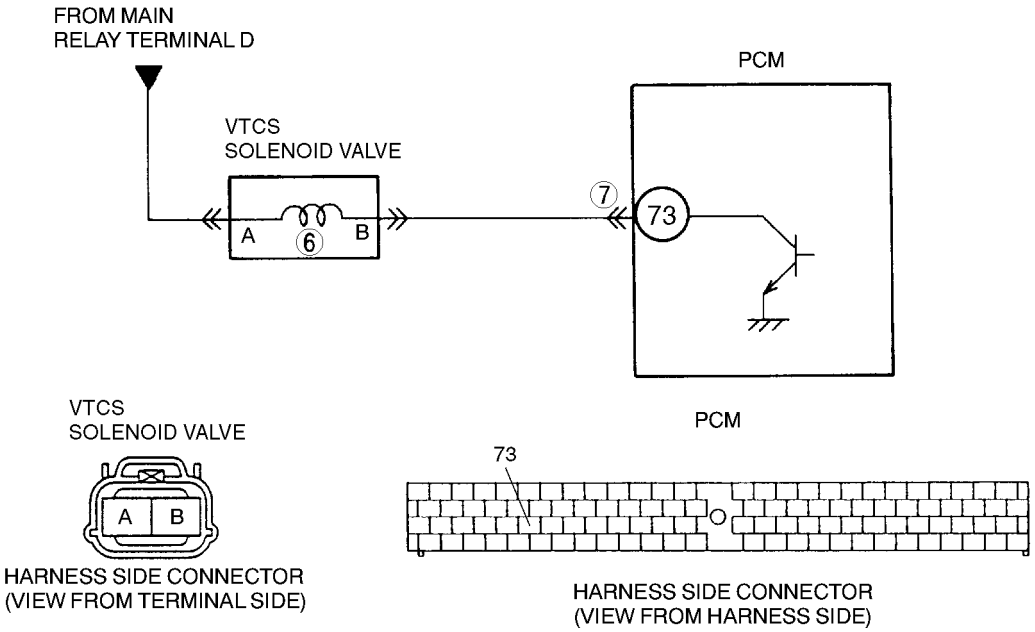
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Turn ignition key to OFF then ON (Engine OFF). • Is same DTC present?	Yes	Go to next step.
		No	Refer to intermittent concern. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
3	**CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION** • Are same DTC and P1498 present?	Yes	Malfunction at EGR valve or power circuit. Go to next step.
		No	Malfunction at EGR valve or control circuit. Go to Step 6.

STEP	INSPECTION		ACTION
4	**INSPECT EGR VALVE FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
5	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition key to ON (Engine OFF). • Measure voltage between EGR valve terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Inspect EGR valve coils 3 and 4. (See 01–16–15 EGR VALVE INSPECTION.) • If there is a malfunction, replace EGR valve, and then go to Step 11. • If there is no malfunction, go to Step 11.
		No	Repair or replace harness for open circuit, then go to Step 11.
6	**INSPECT EGR VALVE FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect EGR valve connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 11.
		No	Go to next step.
7	**INSPECT EGR VALVE** • Measure resistance between EGR valve terminal D and F (part-side). • Is resistance **within 20—24 ohms**?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminal 56 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	**INSPECT CONTROL CIRCUIT FOR SHORT** • Check for continuity between EGR valve terminal F (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 11.
		No	Measure voltage between EGR valve terminal F and body ground. • If voltage is **B+**, repair or replace harness for short to power, then go to next step. • If voltage is **approx. 0 V**, go to next step.
10	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Check for continuity between EGR valve terminal F (harness-side) and breakout box terminal 56. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1499 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition key to OFF, then ON (Engine OFF). • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1512 [FS]

A3U010201083W09

DTC P1512	Variable tumble control system (VTCS) shutter valve stuck closed
DETECTION CONDITION	• PCM monitors air flow amount is **above 45.2 g/s {6.0 lb/min}** when the following monitoring conditions are met. PCM determines that VTCS shutter valve has closed stuck malfunction. **MONITORING CONDITIONS** — Engine speed is **above 3,000 rpm**. — Engine coolant temperature is **above 70 °C {158 °F}**. — Throttle valve opening angle is **above 75%**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • MAF sensor malfunction • IAT sensor malfunction • EGR boost sensor malfunction • TP sensor malfunction • CKP sensor malfunction • VTCS solenoid valve malfunction • VTCS shutter valve malfunction (stuck closed) • VTCS shutter valve actuator malfunction (stuck closed). • Short to ground circuit between VTCS solenoid valve terminal B and PCM terminal 73 • Short to power circuit between VTCS solenoid valve terminal B and PCM terminal 73 • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**CHECK RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

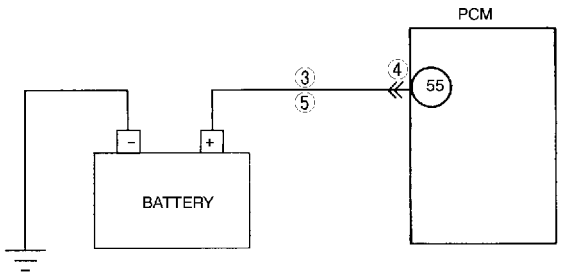
STEP	INSPECTION		ACTION
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC from PCM memory using WDS or equipment. • Verify that following conditions are met. — ECT: **at 20 °C {68 °F}** • Drive vehicle under following conditions: — Engine speed: **above 3,000 rpm** — MAF: **below 45.2 g/s {6.0 lb/min}** • Is pending code of same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
4	**VERIFY STORED OTHER DTCS** • Verify stored DTCs using WDS or equipment. • Is other DTC present except P1512?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
5	**INSPECT VTCS SHUTTER VALVE ACTUATOR** • Carry out “VTCS operation inspection” (See 01–03B–57 Variable Tumble Control System (VTCS) Inspection.) • Is VTCS shutter valve actuator okay?	Yes	Go to next step.
		No	Replace VTCS shutter valve actuator, then go to Step 8.
6	**INSPECT VTCS SOLENOID VALVE** • Carry out “VTCS solenoid valve airflow inspection” (See 01–13B–15 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION [FS].) • Is VTCS solenoid valve okay?	Yes	Go to next step.
		No	Replace VTCS solenoid valve, then go to Step 8.
7	**CHECK PCM POOR CONNECTION** • Check for poor connection at PCM terminal 73 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
8	**VERIFY TROUBLESHOOTING OF DTC P1512 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start engine. • Clear DTC from PCM memory using WDS or equipment. • Start engine. • Verify that following conditions are met. — ECT: **at 20 °C {68 °F}** • Drive vehicle under following conditions: — Engine speed: **above 3,000 rpm** — MAF: **below 45.2 g/s {6.0 lb/min}** • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

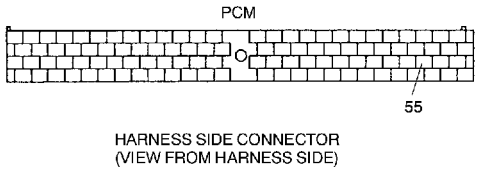
DTC P1562 [FS]

A3U010201083W10

DTC P1562	PCM +BB voltage low
DETECTION CONDITION	• PCM monitors voltage of backup battery positive terminal at PCM terminal 55 after engine is started. If the PCM detected battery positive terminal voltage **below 2.5 V** for **2 seconds**, PCM determines that backup voltage circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Open circuit or short to ground in wiring between battery positive terminal and PCM terminal 55 • Poor connection of PCM connector • PCM malfunction

DTC P1562	PCM +BB voltage low





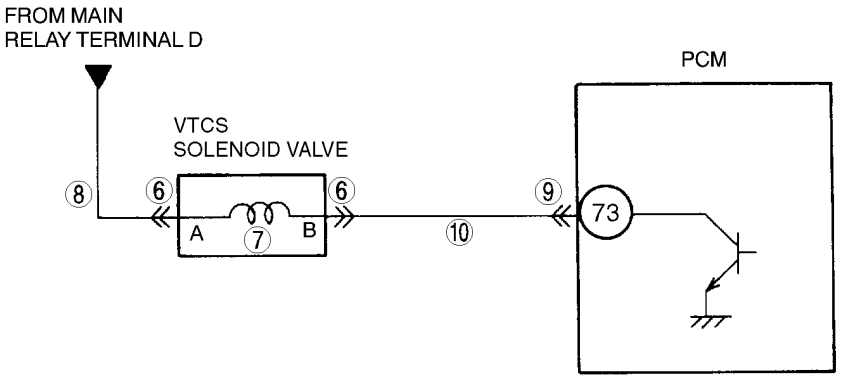
Diagnostic procedure

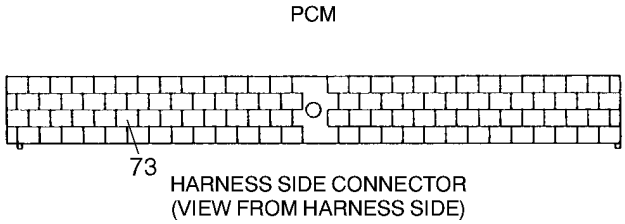
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**INSPECT MONITOR CIRCUIT FOR SHORT TO GROUND** • Disconnect both battery cables. • Measure resistance between battery positive cable and body ground. • Is resistance more than **500 ohms**?	Yes	Go to next step.
		No	Repair or replace harness between battery positive left terminal and PCM terminal 55 for short to ground, then go to Step 6.
4	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection at terminal 55 (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminals, then go to Step 6.
		No	Go to next step.
5	**INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect battery cables. • Connect breakout box with PCM disconnected. • Check for continuity between battery positive cable and breakout box terminal 55. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P1562 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1569 [FS]

A3U010201083W11

DTC P1569	Variable tamble control system (VTCS) solenoid valve circuit low input
DETECTION CONDITION	• PCM monitors input voltages from VTCS solenoid valve. If voltage at PCM terminal 73 is low when VTCS solenoid valve OFF, PCM determines that VTCS solenoid valve has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at PCM and/or VTCS solenoid valve • Short to ground in wiring between VTCS solenoid valve terminal B and PCM terminal 73 • Open circuit in wiring between main relay terminal D and VTCS solenoid valve terminal A • Open circuit in wiring between VTCS solenoid valve terminal B and PCM terminal 73 • VTCS solenoid valve malfunction • PCM malfunction





Diagnostic procedure

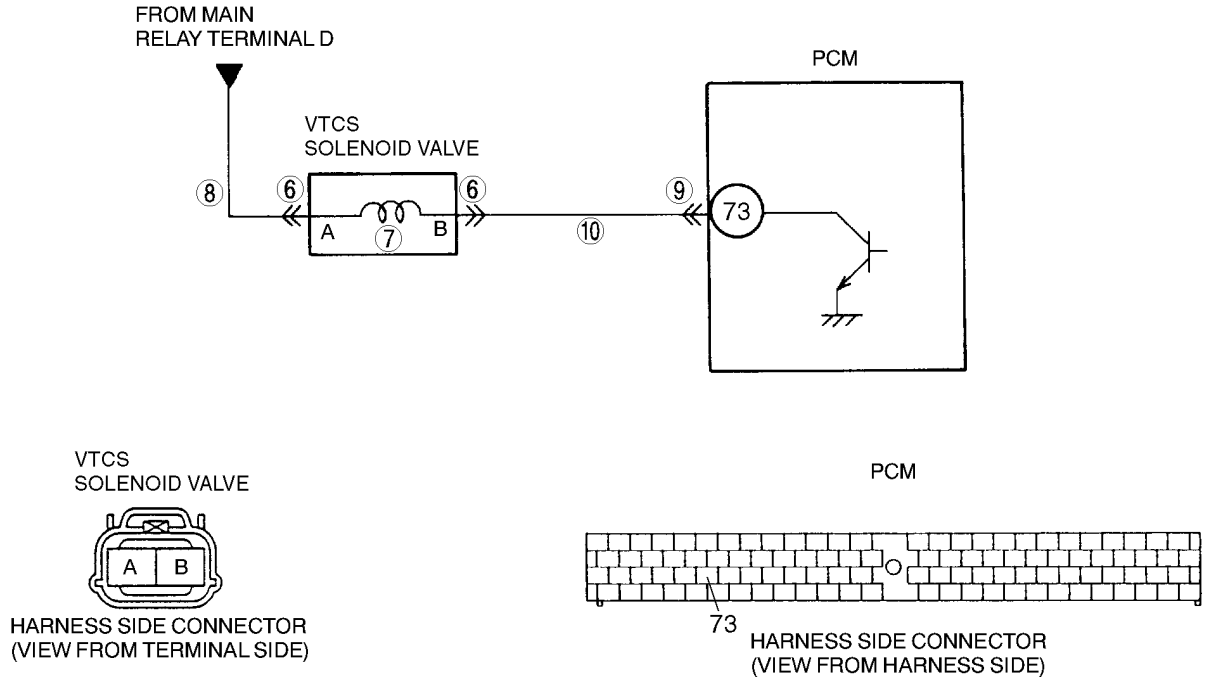
STEP	INSPECTION		ACTION
1	**CHECK FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC from PCM memory using WDS or equipment. • Start engine. • Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)

STEP	INSPECTION		ACTION
4	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect VTCS solenoid valve tube that connects to intake manifold. • Connect vacuum pump to VTCS solenoid valve. • Apply vacuum and wait **5 seconds**. • Is vacuum maintained?	Yes	Go to Step 6.
		No	Go to next step.
5	**INSPECT PASSAGE CONTROL OF VTCS SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect VTCS solenoid valve connector. • Is vacuum maintained?	Yes	Repair or replace harness between PCM terminal 73 and VTCS solenoid valve terminal B for short to ground, then go to Step 11.
		No	Replace VTCS solenoid valve, then go to Step 11.
6	**INSPECT VTCS SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 11.
		No	Go to next step.
7	**INSPECT VTCS SOLENOID VALVE** • Measure resistance between VTCS solenoid valve terminals (part-side). • Is resistance **within 22—26 ohms**?	Yes	Go to next step.
		No	Replace VTCS solenoid valve, then go to Step 11.
8	**INSPECT VTCS SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect VTCS solenoid valve connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between VTCS solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 11.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at PCM terminal 73. (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
10	**INSPECT VTCS SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect VTCS solenoid valve connector. • Connect breakout box with PCM disconnected. • Turn ignition key to ON (Engine OFF). • Measure voltage between breakout box terminal 73 and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open or short to ground circuit, then go to next step.
11	**VERIFY TROUBLESHOOTING OF DTC P1569 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Start engine. • Verify that following conditions are met. — ECT: **above 65 °C {149 °F}** — Engine speed: **below 3,250 rpm** • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1570 [FS]

A3U010201083W12

DTC P1570	Variable tumble control system (VTCS) solenoid valve circuit high input
DETECTION CONDITION	• PCM monitors input voltages from VTCS solenoid valve. If voltage at PCM 73 is high when the VTCS solenoid valve ON, PCM determines that VTCS solenoid valve malfunction. **MONITORING CONDITIONS** — Engine speed is **below 3,250 rpm**. — Engine coolant temperature is **below 65ºC {149 ºF}**. — Throttle valve opening angle is **below 14% for ATX, 12.50% for MTX [at engine speed 2,500 rpm]**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above the above malfunction condition in two consecutive drive cycles. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at PCM and/or VTCS solenoid valve • Short to power circuit in wiring between VTCS solenoid valve terminal B and PCM terminal 73 • Open circuit in wiring between main relay terminal D and VTCS solenoid valve terminal A • Open circuit in wiring between VTCS solenoid valve terminal B and PCM terminal 73 • VTCS solenoid valve malfunction • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.

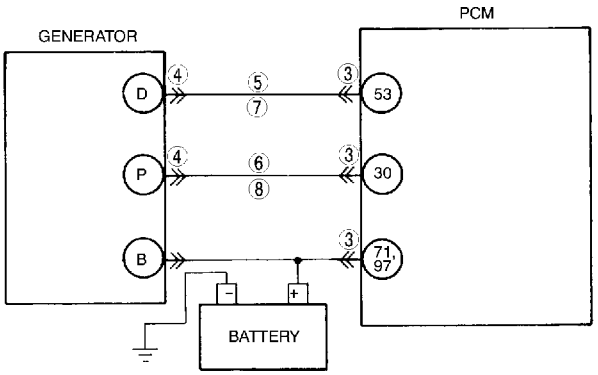
STEP	INSPECTION		ACTION
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear DTC from PCM memory using WDS or equipment. • Start engine. • Drive vehicle under following conditions: — Engine speed is **below 3,250 rpm**. — Engine coolant temperature is **below 65°C {149 °F}**. — Throttle valve opening angle is **below 14% for ATX, 12.50% for MTX [at engine speed 2,500 rpm]**. • Is pending code of same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01–03B–4 INTERMITTENT CONCERN TROUBLESHOOTING [FS].)
4	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect VTCS solenoid valve tube that connects to intake manifold. • Connect vacuum pump to VTCS solenoid valve. • Apply vacuum and wait **5 seconds**. • Is vacuum maintained?	Yes	Go to Step 6.
		No	Go to next step.
5	**INSPECT PASSAGE CONTROL OF VTCS SOLENOID VALVE** • Turn ignition key to OFF. • Disconnect VTCS solenoid valve connector. • Is vacuum maintained?	Yes	Repair or replace harness between PCM terminal 73 and VTCS solenoid valve terminal B for short to ground, then go to Step 11.
		No	Replace VTCS solenoid valve, then go to Step 11.
6	**INSPECT POOR CONNECTION OF VTCS SOLENOID VALVE CONNECTOR** • Turn ignition key to OFF. • Check for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 11.
		No	Go to next step.
7	**INSPECT VTCS SOLENOID VALVE** • Measure resistance between VTCS solenoid valve terminals (part-side). • Is resistance **within 22—26 ohms**?	Yes	Go to next step.
		No	Replace VTCS solenoid valve, then go to Step 11.
8	**INSPECT VTCS SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect VTCS solenoid valve connector. • Turn ignition key to ON (Engine OFF). • Measure voltage between VTCS solenoid valve terminal A (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 11.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection at PCM terminal 73. (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
10	**INSPECT VTCS SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER** • Disconnect VTCS solenoid valve connector. • Connect breakout box with PCM disconnected. • Turn ignition key to ON (Engine OFF). • Measure voltage between breakout box terminal 73 and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power circuit, then go to next step.
		No	Go to next step.

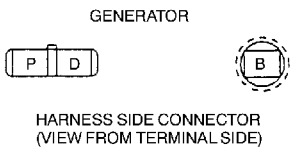
STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P1570 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equipment. • Start engine. • Drive vehicle under following conditions: — Engine speed is **above 3,250 rpm**. — Engine coolant temperature is **below 65°C {149 °F}**. — Throttle valve opening angle is **below 14% for ATX 12.50% for MTX [at engine speed 2,500 rpm]**. • Is pending code of same DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

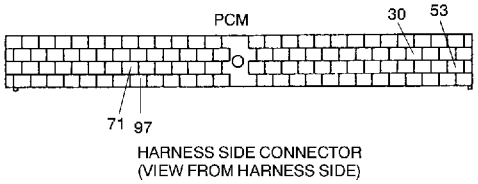
DTC P1631 [FS]

A3U010201083W13

DTC P1631	Generator output voltage signal no electricity
DETECTION CONDITION	• PCM monitors input voltage from generator. If PCM detect generator output voltage **below 8.5 V** or generated current **above 19.5 A** for **5 seconds** while engine running, PCM determines that charging system has malfunction.
POSSIBLE CAUSE	• Open or short to ground circuit between generator terminal P and PCM terminal 30 • Open or short to ground circuit between generator terminal D and PCM terminal 53 • Drive belt is cut off or has come off • Generator malfunction — Rectifier circuit malfunction — Brush abrasion • PCM malfunction







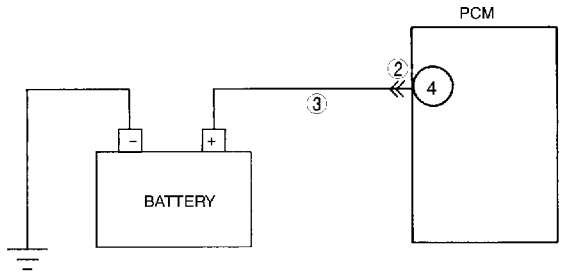
Diagnostic procedure

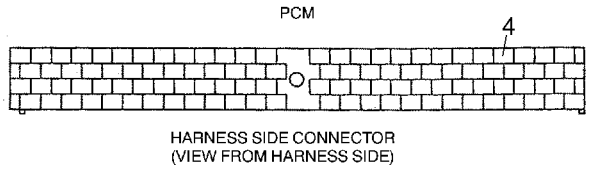
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**INSPECT DRIVE BELT CONDITION** • Verify that drive belt auto tensioner indicator mark in not exceeding limit. (See 01–10B–3 DRIVE BELT INSPECTION [FS].) • Is front drive belt okay?	Yes	Go to next step.
		No	Replace and/or adjust drive belt, then go to Step 9.
3	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair terminals, then go to Step 9.
		No	Go to next step.
4	**INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION** • Disconnect generator connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 9.
		No	Go to next step.
5	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO GROUND** • Check for continuity between generator terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
6	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR GROUND** • Check continuity between generator terminal P (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
7	**INSPECT GENERATOR CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect breakout box with PCM disconnected. • Measure resistance between generator terminal D (harness-side) and breakout box terminal 53. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
8	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR OPEN CIRCUIT** • Measure resistance between generator terminal P (harness-side) and breakout box terminal 30. • Is there continuity?	Yes	Repair or replace generator, then go to next step.
		No	Repair or replace harness for open, then go to next step.
9	**VERIFY TROUBLESHOOTING OF DTC P1631 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition switch to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1632 [FS]

A3U010201083W14

DTC P1632	Battery voltage monitor signal circuit malfunction
DETECTION CONDITION	• PCM monitors voltage of battery positive terminal at PCM terminal 4. If PCM detects battery positive terminal voltage **below 7.97 V** for **5 seconds**, PCM determines that battery positive voltage circuit has malfunction.
POSSIBLE CAUSE	• Open circuit in wiring between battery positive terminal and PCM terminal 4 • Poor connection of PCM connector • PCM malfunction





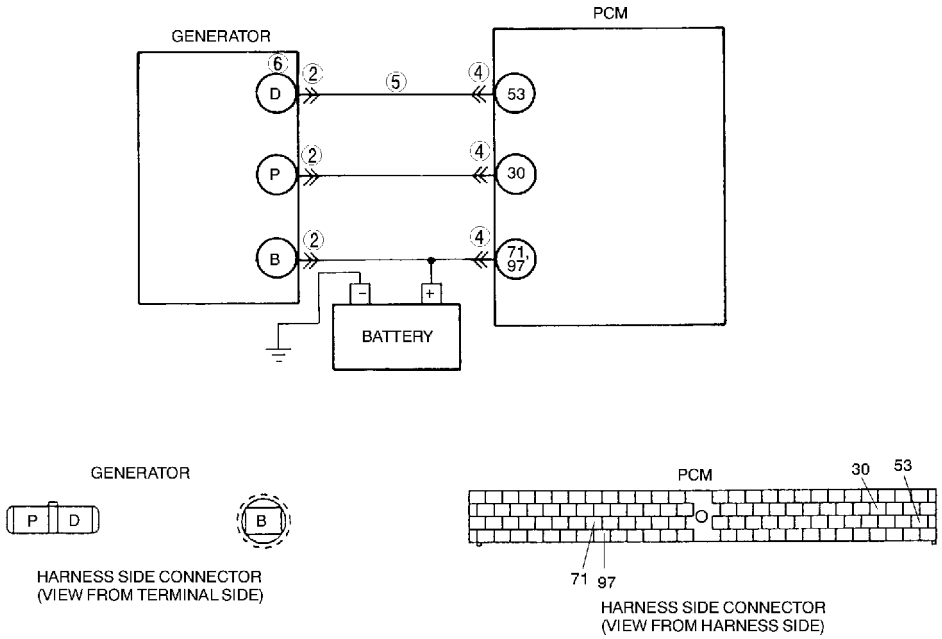
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair terminals, then go to Step 5.
		No	Go to next step.
3	**INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect battery cables. • Check for continuity between Battery positive terminal and PCM terminal 4. • Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
4	**VERIFY TROUBLESHOOTING OF DTC P1632 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

DTC P1633 [FS]

A3U010201083W15

DTC P1633	Battery overcharge
DETECTION CONDITION	• PCM monitors input voltage from generator and battery positive terminal. If PCM detects generator output voltage **above 18.47 V** or battery voltage **above 15.94 V** for **5 seconds** while engine running, PCM determines that charging system has malfunction.
POSSIBLE CAUSE	• Short to power circuit between generator connector terminal D and PCM connector terminal 53 • Generator malfunction • PCM malfunction



Diagnostic procedure

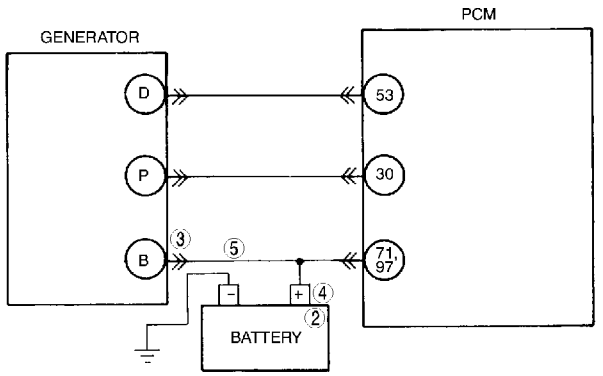
STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect generator connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminals, then go to Step 7.
		No	Go to next step.
3	**CLASSIFY GENERATOR MALFUNCTION OR OTHER MALFUNCTION** • Turn ignition key to ON (Engine OFF). • Measure voltage between generator terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Go to next step.
		No	Malfunction at generator. Go to Step 6.
4	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition key to OFF. • Disconnect PCM connector. • Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace pins, then go to Step 7.
		No	Go to next step.
5	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (Engine OFF). • Measure voltage between generator terminal D (harness-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace harness for short to power, then go to Step 7.
		No	Go to Step 7.

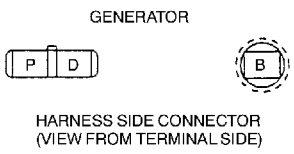
STEP	INSPECTION		ACTION
6	**INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER** • Measure resistance between generator terminal D (part-side) and body ground. • Is voltage **B+**?	Yes	Repair or replace generator, then go to Step 7.
		No	Go to next step.
7	**VERIFY TROUBLESHOOTING OF DTC P1633 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.

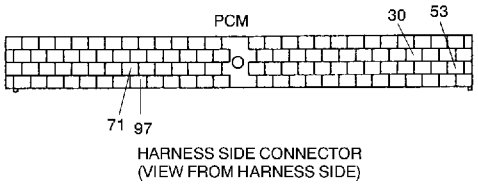
DTC P1634 [FS]

A3U010201083W16

DTC P1634	Generator terminal B circuit open
DETECTION CONDITION	• PCM monitors input voltage from generator and battery positive terminal. If PCM detects generator output voltage **above 16.97 V** and battery voltage **below 10.94 V** for **5 seconds** while engine running, PCM determines that charging system has malfunction.
POSSIBLE CAUSE	• Open circuit between generator terminal B and battery positive terminal • Battery malfunction • PCM malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
2	**INSPECT BATTERY** • Turn ignition key to OFF. • Inspect battery. (See 01–17–1 BATTERY INSPECTION.) • Is battery okay?	Yes	Replace battery, then go to Step 6.
		No	Go to next step.
3	**INSPECT GENERATOR TERMINAL FOR POOR INSTALLATION** • Turn ignition key to OFF. • Check for looseness of generator terminal B installation nut. • Is nut loose?	Yes	Tighten generator terminal B installation nut, then go to Step 6.
		No	Go to next step.
4	**INSPECT BATTERY POSITIVE TERMINAL FOR POOR INSTALLATION** • Check for looseness of battery positive terminal. • Is terminal loose?	Yes	Connect battery positive terminal correctly, then go to Step 6.
		No	Go to next step.
5	**INSPECT BATTERY CHARGING CIRCUIT** • Start engine. • Disconnect battery positive terminal. • Does engine stall?	Yes	Repair or replace harness between generator terminal B and battery positive terminal, then go to next step.
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P1634 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using WDS or equivalent. • Turn ignition key to OFF, then start engine. • Is same DTC present?	Yes	Replace PCM, then go to next step.
		No	No concern is detected. Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform “After Repair Procedure”. (See 01–02B–9 AFTER REPAIR PROCEDURE [FS].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01–02B–15 DTC TABLE [FS].)
		No	Troubleshooting completed.