

# ENGINE

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## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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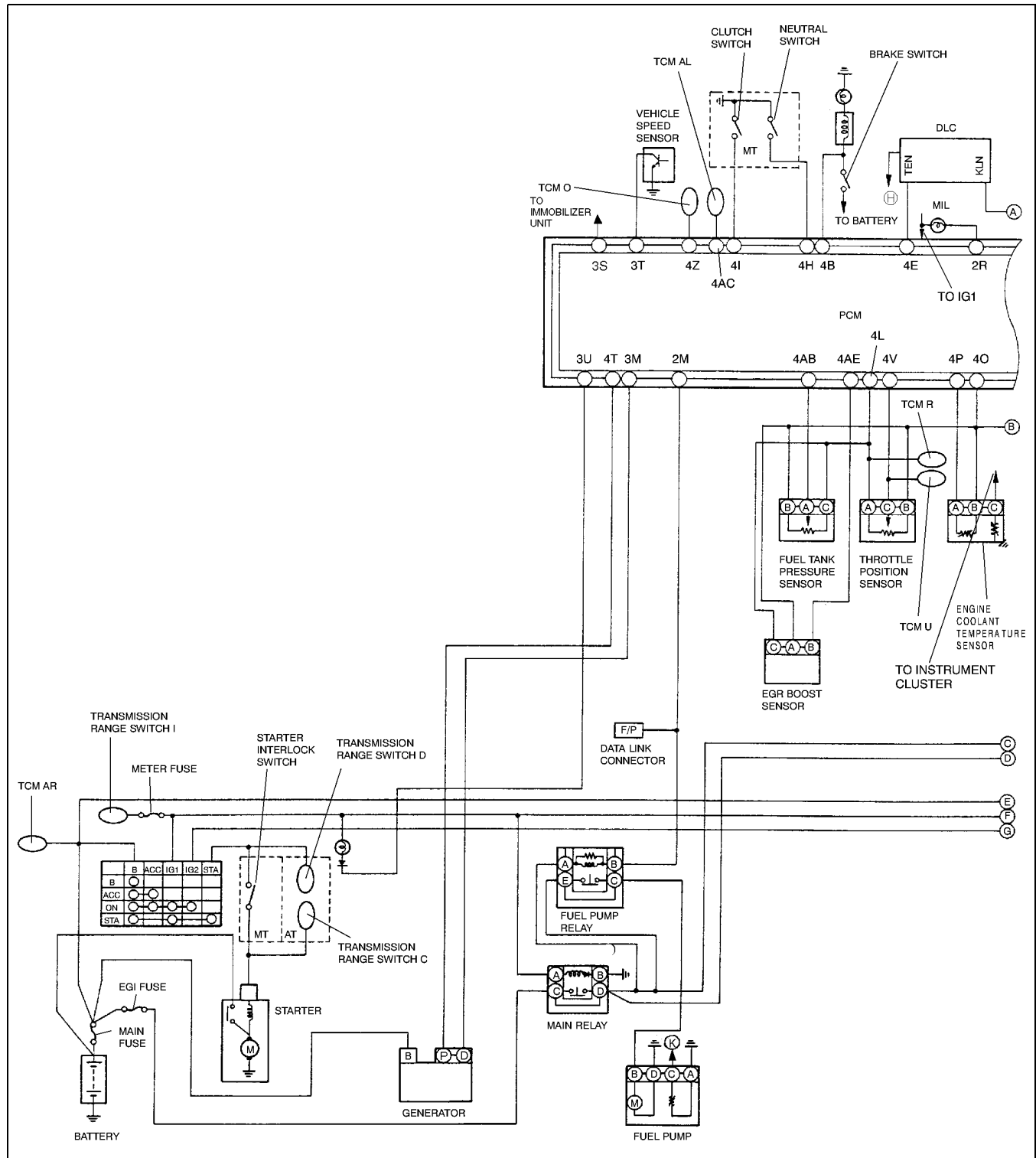
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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## CONTROL SYSTEM WIRING DIAGRAM

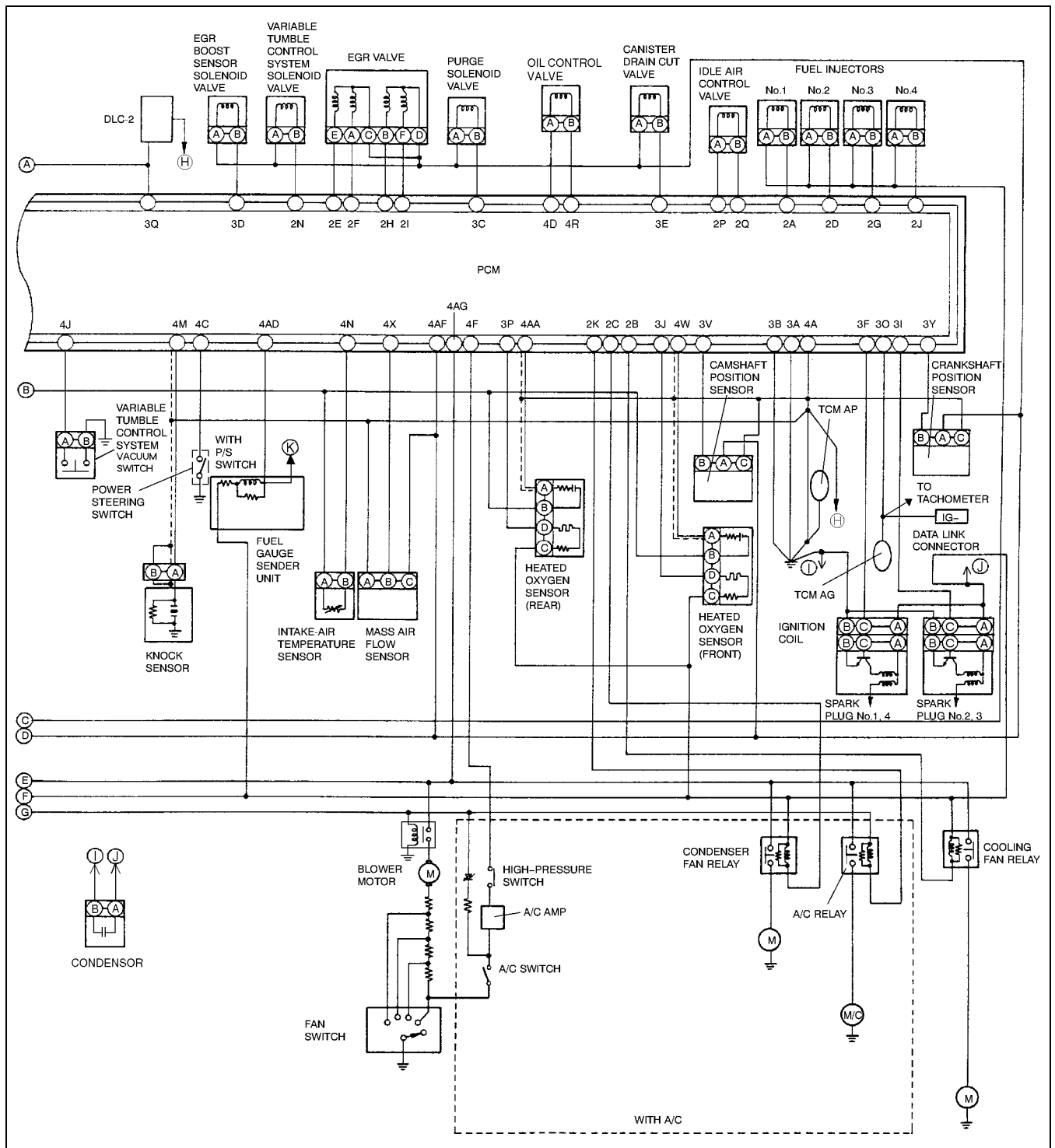
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A5U0102W001

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



A5U0102W002

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## CONTROL SYSTEM DEVICE AND CONTROL RELATIONSHIP CHART

A5U010218881W02

### Engine Control System

×:Applicable

Component		Idle air control (IAC)	Fuel Injection control	Electronic spark advance (ESA) control	Fuel pump control	Heated oxygen sensor (HO2S) heater control	Electrical fan control	Purge control	EGR control	Variable tumble control system (VTCS)	A/C cut-off control	Generator control	Immobilizer system
Input device	Brake switch	×	×	×									
	Refrigerant pressure switch(A/C equipped only)	×	×	×			×				×		
	PSP switch	×	×	×							×		
	DLC (TEN terminal)	×		×			×						
	Neutral switch (MT only)	×	×	×									
	Clutch switch (MT only)	×	×	×									
	TCM (Reduce torque signal) (AT only)		×	×									
	CKP sensor (NE signal)	×	×	×	×	×	×	×	×	×	×	×	
	CMP sensor (SGC signal)		×	×									
	VSS	×						×					
	Knock sensor			×									
	MAF sensor	×	×	×		×		×	×				
	ECT sensor	×	×	×		×	×	×	×	×	×		
	IAT sensor	×	×	×			×	×				×	
	TP sensor	×	×	×			×	×	×	×	×		
	HO2S (Rear)		×										
	EGR boost sensor	×	×				×				×		
	B+		×				×					×	
	Generator (Output voltage)											×	
	HO2S (Front)		×				×						
	Immobilizer unit												×
Output device	IAC valve	×											
	Fuel injector		×										×
	Ignition coil			×									×
	FP relay				×								
	HO2S heater (Front,Rear)					×							
	Cooling fan relay						×						
	Condenser fan relay						×						
	Purge solenoid valve							×					
	EGR valve								×				
	VTCS solenoid valve									×			
	A/C relay										×		
	Generator (Field coil)											×	
	Generator warning light											×	
	TCM (Torque reduce signal)		×	×									

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Monitoring System

× :Applicable

Component		Monitoring items						
		Catalyst monitor	Misfire monitor	Evaporative system monitor	Fuel system monitor	HO2S monitor	O2S heater monitor	EGR system monitor
Input device	Brake switch		×					
	Refrigerant pressure switch (A/C equipped only)		×		×			×
	PSP switch		×		×			×
	CKP sensor (NE signal)	×	×	×	×	×	×	×
	CMP sensor (SGC signal)	×	×	×	×	×	×	×
	VSS	×	×	×	×	×		×
	MAF sensor	×	×	×	×	×	×	×
	ECT sensor	×	×	×	×	×	×	×
	IAT sensor	×	×	×		×		×
	TP sensor	×	×	×	×	×		×
	HO2S (Front)				×	×		
	EGR boost sensor							×
	FTP sensor			×				
	Fuel gauge sender unit			×				
	HO2S (Rear)	×					×	
Output device	DLC-2 (Terminal KLN)	×	×	×	×	×	×	×
	MIL	×	×	×	×	×	×	×
	Purge solenoid valve			×	×	×		
	EGR valve							×
	EGR boost sensor solenoid valve							×
	Canister drain cut valve (CDCV)			×				
	Fuel injectors				×			

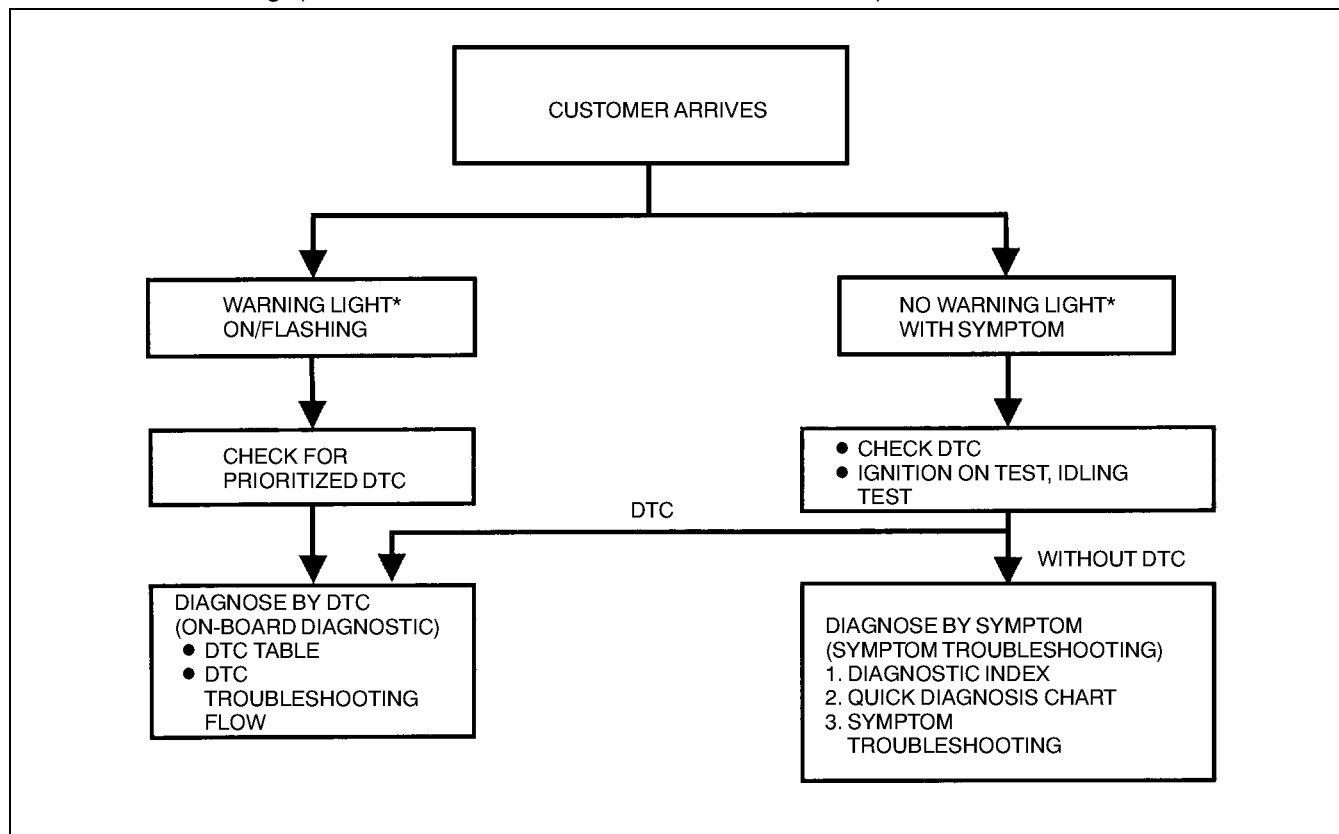
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## FOREWORD

A5U010218881W03

- 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 a DTC exists, and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01-03-6 SYMPTOM DIAGNOSTIC INDEX.)
  - If no DTC exists and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01-03-6 SYMPTOM DIAGNOSTIC INDEX.)

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Y5U102WA4

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

## OBD-II PENDING TROUBLE CODES

A5U010218881W04

- The following 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 also found in the second drive cycle, the PCM judges that the system has failed, deletes the pending code, illuminates the MIL and stores the DTC.

## OBD-II FREEZE FRAME DATA

A5U010218881W05

- 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

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- 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.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## OBD-II DIAGNOSTIC MONITORING TEST RESULTS

A5U010218881W07

- 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

A5U010218881W08

- 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

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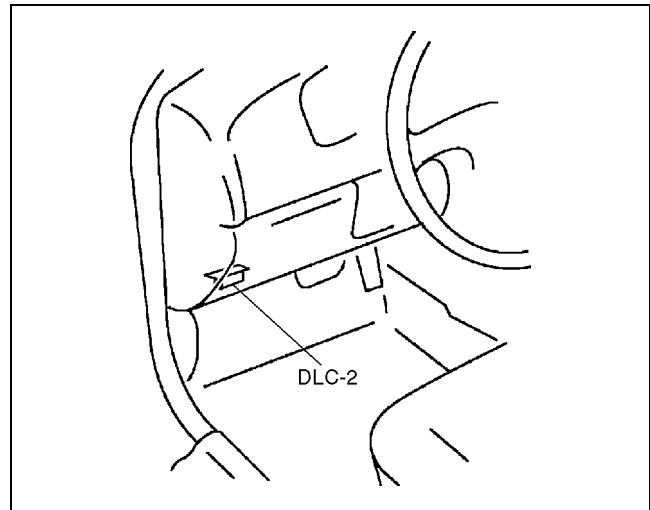
- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since PID values for output devices are PCM internal data values, inspect each device to identify which output devices are malfunctioning.

## ON-BOARD DIAGNOSTIC TEST

A5U010218881W10

### DTCs Reading Procedure

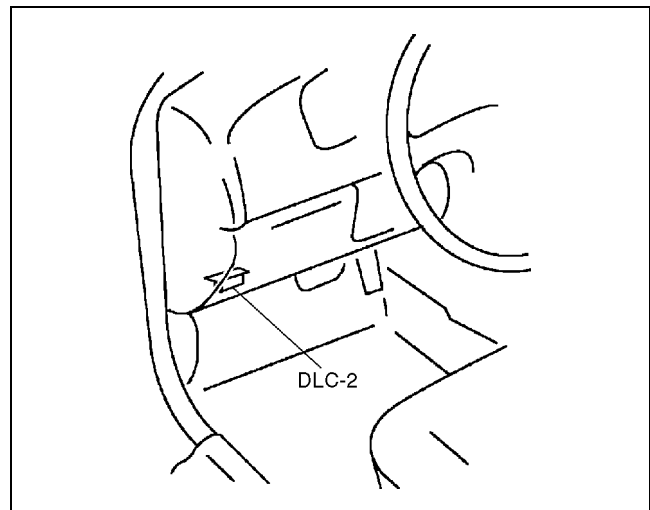
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located the left side of the center console.
3. Retrieve DTCs by WDS or equivalent.



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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 the left side of the center console.
3. Retrieve **PENDING trouble codes** by WDS or equivalent.

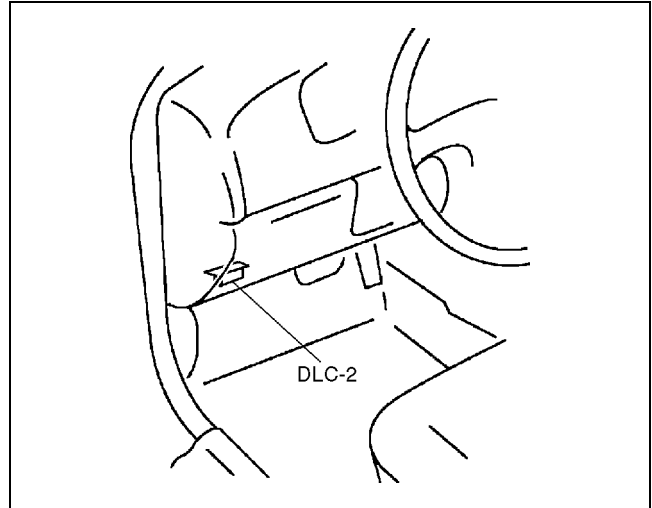


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### Freeze Frame PID Data Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located the left side of the center console.
3. Record the FREEZE FRAME PID DATA by WDS or equivalent.

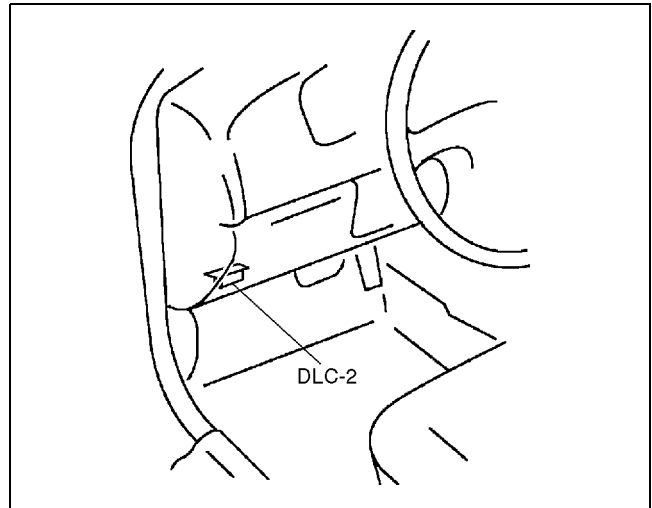


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### On-Board System Readiness Tests Access Procedure

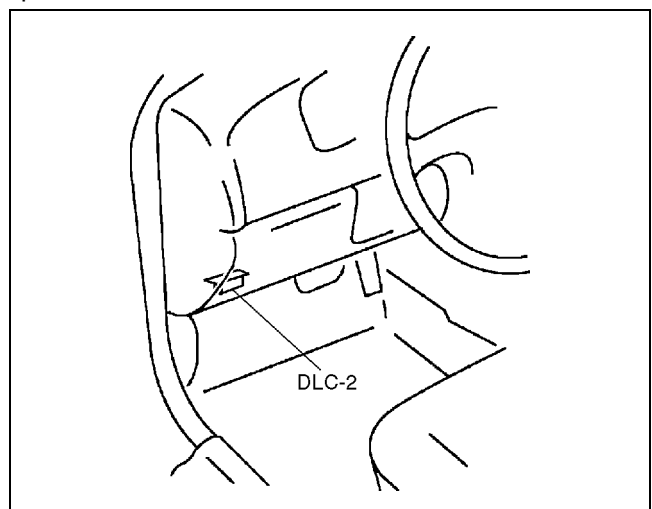
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located the left side of the center console.
3. Monitor the OBD-II systems operating status by WDS or equivalent.



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### 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 the left side of the center console.
3. Access and monitor PIDs by WDS or equivalent.

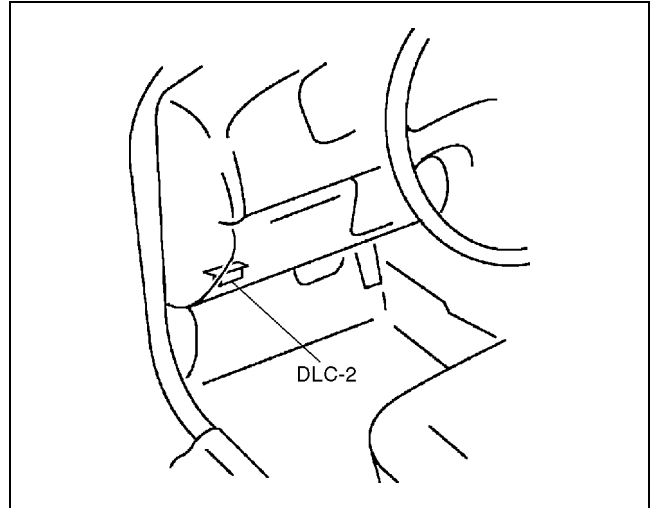


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## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

### 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 the left side of the center console.
3. Access to the DIAGNOSTIC MONITORING TEST RESULTS and read the test results by WDS or equivalent.

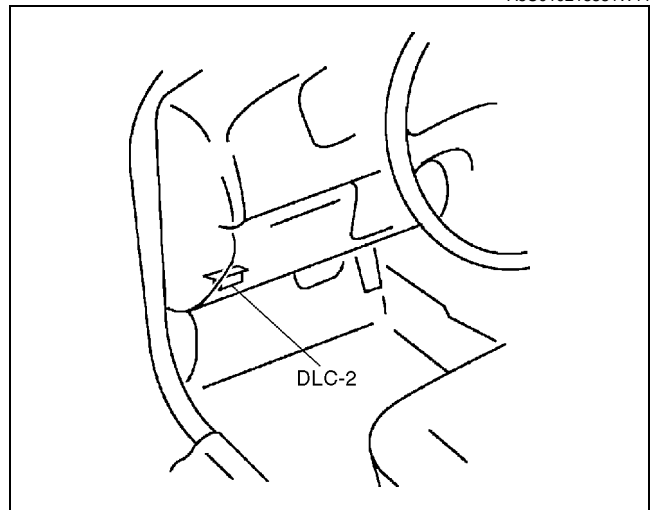


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### AFTER REPAIR PROCEDURE

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

A5U010218881W11



Z3U0102W001

### OBD-II DRIVE MODE

A5U010218881W12

- 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

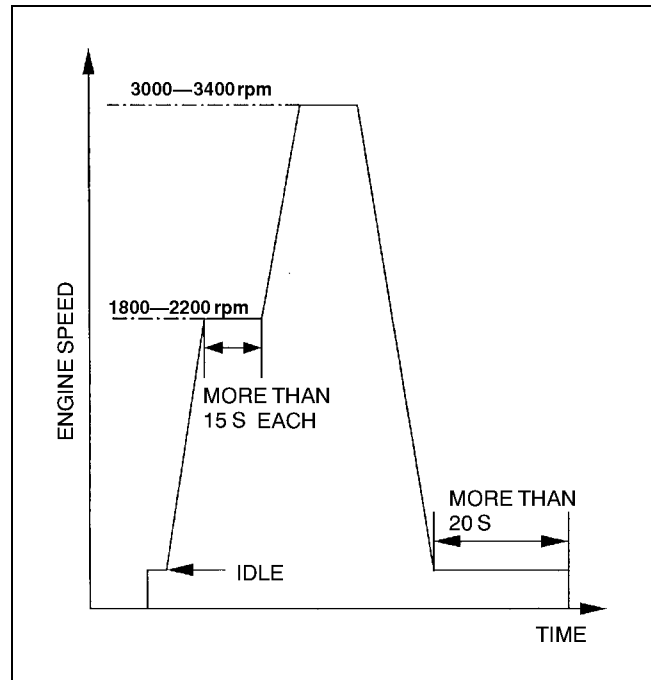
- While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.
- When the WDS or equivalent is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the WDS or equivalent using the PID/DATA MONITOR AND RECORD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

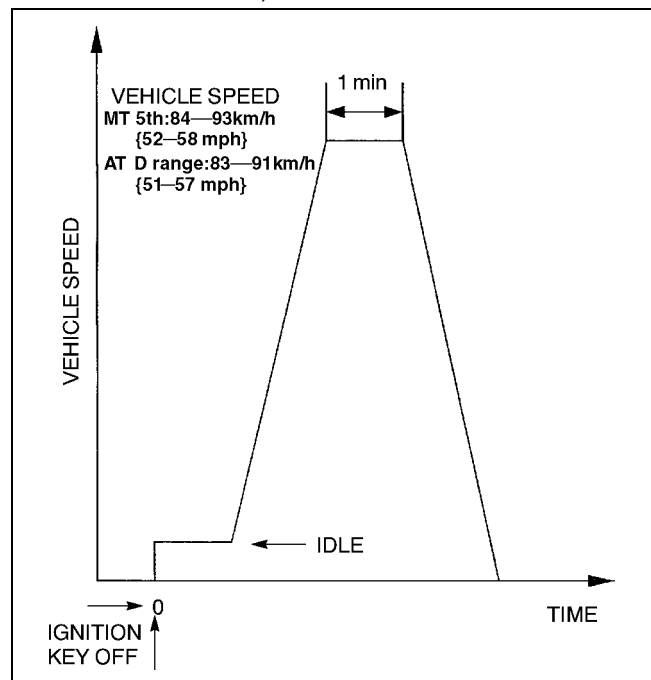
1. Start the engine and warm it up completely.
2. Verify the following conditions and correct if necessary:
  - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
  - Initial ignition timing and idle speed are within the specification.
  - TEN and GND of DLC are not connected.
3. Perform no load racing at the engine speed shown in the graph, then idle the engine for more than **20 s** after the cooling fan stopped. If possible, monitor RPM PID for engine speed and FAN2 PID (with A/C), FAN1 PID (without A/C) for cooling fan status during this procedure.



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## 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 the vehicle and access 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.
  - If not completed, turn the ignition key off then repeat from Step 3.
5. Access 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.
6. Verify no DTCs are available.



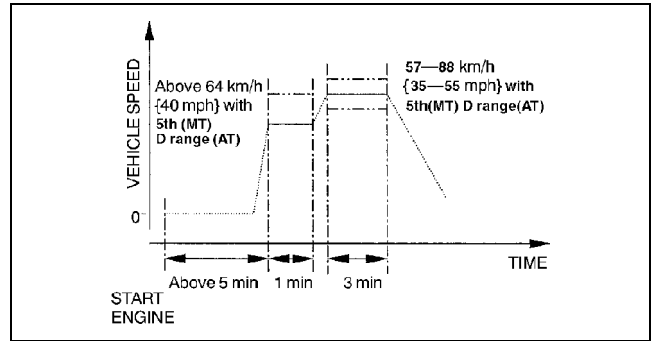
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## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

### 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 the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to inspect the completion status.
  - If completed, RFC changes from NO to YES.
  - If not completed, turn the ignition key off then repeat from Step 3.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to inspect the monitor results.
  - If MEAS are not within the specification, repair has not been completed.
6. Verify no DTCs are available.



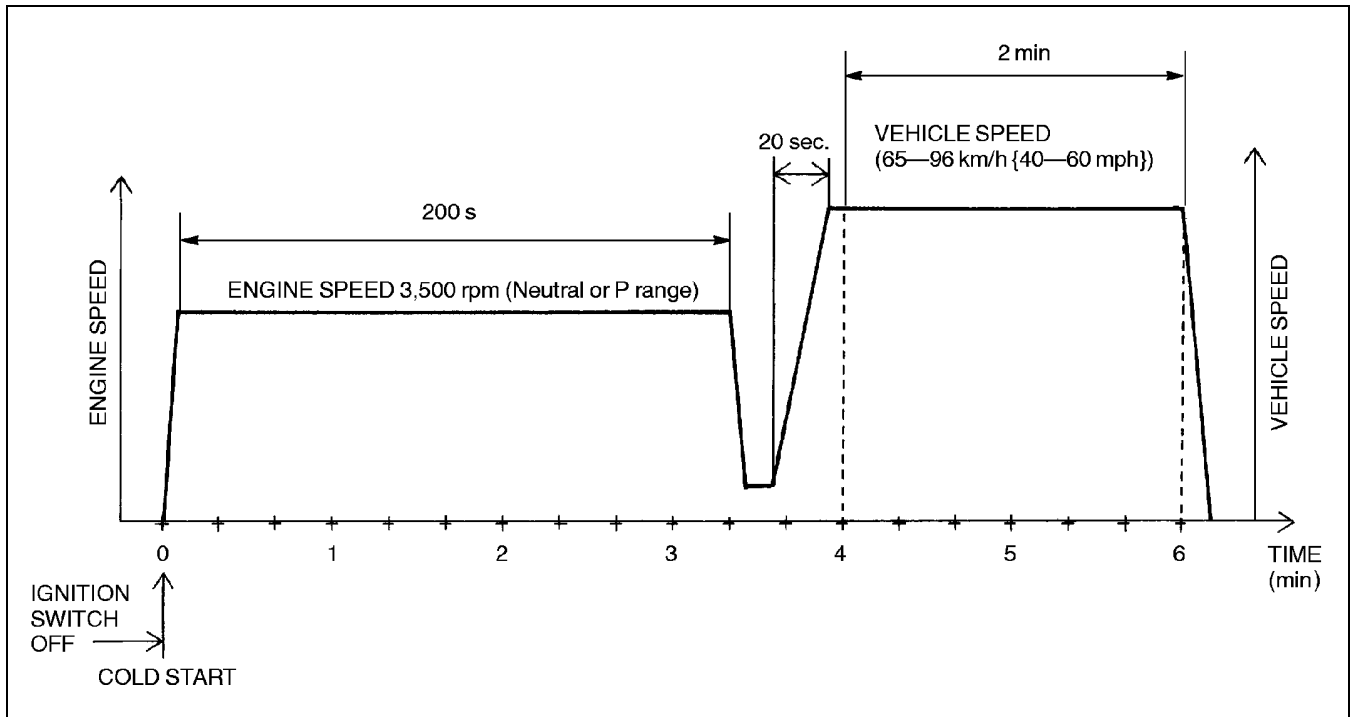
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### Mode 4 (EVAP System Repair Verification Drive Mode)

#### Note

- If Mode 4 cannot be performed (it is impossible to drive the vehicle under Mode 4 condition), perform evaporative system test procedure as an alternative. (See 01-03-56 ENGINE CONTROL SYSTEM OPERATION INSPECTION.)
- Mode 4 can be performed regardless of RFCFLAG status.

1. Verify all following PIDs are within the following specifications. All PIDs must be within the specifications before engine is started to initiate the evaporative monitoring.
  - Barometric pressure: 72.0 kPa {540 mmHg, 21.3 inHg} or higher
  - Intake air temperature: -10—60°C {14—140°F}
  - Fuel tank level: 0.24—2.0 V
  - Engine coolant temperature: -10—35°C {14—95°F}
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 it up completely.



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## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to inspect the completion status.
  - If completed, RFC changes from NO to YES.
  - If not completed, turn the ignition key off then go back to Step 1.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to inspect the monitor results.
  - If MEAS values of 10:21:00 and 10:22:00 are not within the specification, repair has not been completed.
6. Verify no DTCs are available.

### DIAGNOSTIC MONITORING TEST RESULTS

A5U010218881W13

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

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

### DTC TABLE

A5U010218881W14

×:Applicable

DTC No.	Condition	MIL	O/D OFF indicator light flashes	DC	*Monitor item	Memory function	Page
P0010	CMP actuator circuit	ON	NO	1	CCM	×	(See 01-02A-18 DTC P0010)
P0011	CMP - timing over-advanced	ON	NO	2	CCM	×	(See 01-02A-20 DTC P0011)
P0012	CMP - timing over-retarded	ON	NO	2	CCM	×	(See 01-02A-21 DTC P0012)
P0031	HO2S heater control circuit low (front)	ON	NO	2	HO2S heater	×	(See 01-02A-22 DTC P0031)
P0032	HO2S heater control circuit high (front)	ON	NO	2	HO2S heater	×	(See 01-02A-24 DTC P0032)
P0037	HO2S heater control circuit low (rear)	ON	NO	2	HO2S heater	×	(See 01-02A-26 DTC P0037)
P0038	HO2S heater control circuit high (rear)	ON	NO	2	HO2S heater	×	(See 01-02A-27 DTC P0038)
P0101	MAF circuit range/performance problem	ON	NO	2	CCM	×	(See 01-02A-29 DTC P0101)
P0102	MAF circuit low input	ON	NO	1	CCM	×	(See 01-02A-30 DTC P0102)
P0103	MAF circuit high input	ON	NO	1	CCM	×	(See 01-02A-32 DTC P0103)
P0106	BARO circuit performance problem	ON	NO	2	CCM	×	(See 01-02A-34 DTC P0106)
P0107	BARO circuit low input	ON	NO	1	CCM	×	(See 01-02A-35 DTC P0107)

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC No.	Condition	MIL	O/D OFF indicator light flashes	DC	*Monitor item	Memory function	Page
P0108	BARO circuit high input	ON	NO	1	CCM	×	(See 01-02A-37 DTC P0108)
P0111	IAT circuit performance problem	ON	NO	2	CCM	×	(See 01-02A-39 DTC P0111)
P0112	IAT circuit low input	ON	NO	1	CCM	×	(See 01-02A-40 DTC P0112)
P0113	IAT circuit high input	ON	NO	1	CCM	×	(See 01-02A-41 DTC P0113)
P0116	ECT circuit range/performance problem	ON	NO	2	CCM	×	(See 01-02A-43 DTC P0116)
P0117	ECT circuit low input	ON	NO	1	CCM	×	(See 01-02A-45 DTC P0117)
P0118	ECT circuit high input	ON	NO	1	CCM	×	(See 01-02A-46 DTC P0118)
P0121	TP circuit range/performance problem	ON	NO	2	CCM	×	(See 01-02A-48 DTC P0121)
P0122	TP circuit low input	ON	Yes	1	CCM	×	(See 01-02A-50 DTC P0122)
P0123	TP circuit high input	ON	Yes	1	CCM	×	(See 01-02A-51 DTC P0123)
P0125	Insufficient coolant temperature for closed loop fuel control	ON	NO	2	CCM	×	(See 01-02A-53 DTC P0125)
P0126	Coolant thermostat stuck to open	ON	NO	2	Thermostat	×	(See 01-02A-55 DTC P0126, P0128)
P0128		ON	NO	2	Thermostat	×	(See 01-02A-55 DTC P0126, P0128)
P0131	HO2S (front) no inversion (low voltage stuck)	ON	NO	2	CCM	×	(See 01-02A-57 DTC P0131)
P0132	HO2S (front) no inversion (high voltage stuck)	ON	NO	2	CCM	×	(See 01-02A-60 DTC P0132)
P0133	HO2S (front) circuit slow response	ON	NO	2	HO2S	×	(See 01-02A-62 DTC P0133)
P0134	HO2S (front) circuit no activity detected	ON	NO	2	CCM	×	(See 01-02A-65 DTC P0134)
P0138	HO2S (rear) circuit high input	ON	NO	2	CCM	×	(See 01-02A-67 DTC P0138)
P0140	HO2S (rear) circuit no activity detected	ON	NO	2	CCM	×	(See 01-02A-68 DTC P0140)
P0171	Fuel trim system too lean	ON	NO	2	Fuel	×	(See 01-02A-70 DTC P0171)
P0172	Fuel trim system too rich	ON	NO	2	Fuel	×	(See 01-02A-73 DTC P0172)
P0222	TP sensor circuit short	(See 05-02-7 DTC P0222)					
P0223	TP sensor circuit open	(See 05-02-9 DTC P0223)					
P0300	Random misfire detected	Flash / ON	NO	1 or 2	Misfire	×	(See 01-02A-75 DTC P0300)
P0301	Cylinder 1 misfire detected	Flash / ON	NO	1 or 2	Misfire	×	(See 01-02A-78 DTC P0301, P0302, P0303, P0304)
P0302	Cylinder 2 misfire detected	Flash / ON	NO	1 or 2	Misfire	×	
P0303	Cylinder 3 misfire detected	Flash / ON	NO	1 or 2	Misfire	×	
P0304	Cylinder 4 misfire detected	Flash / ON	NO	1 or 2	Misfire	×	
P0327	KS circuit low input	ON	NO	1	CCM	×	(See 01-02A-80 DTC P0327)

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC No.	Condition	MIL	O/D OFF indicator light flashes	DC	*Monitor item	Memory function	Page
P0328	KS circuit high input	ON	NO	1	CCM	×	(See 01-02A-81 DTC P0328)
P0335	CKP sensor circuit malfunction	ON	NO	1	CCM	×	(See 01-02A-82 DTC P0335)
P0340	CMP sensor circuit malfunction	ON	NO	1	CCM	×	(See 01-02A-84 DTC P0340)
P0401	EGR flow insufficient detected	ON	NO	2	EGR	×	(See 01-02A-86 DTC P0401)
P0402	EGR flow excessive detected	ON	NO	2	EGR	×	(See 01-02A-88 DTC P0402)
P0420	Catalyst system efficiency below threshold	ON	NO	2	Catalyst	×	(See 01-02A-89 DTC P0420)
P0442	EVAP control system leak detected (small leak)	ON	NO	2	Evaporative	×	(See 01-02A-90 DTC P0442)
P0443	EVAP control system purge control valve circuit malfunction	OFF	NO	1	Other	—	(See 01-02A-92 DTC P0443)
P0451	FTP sensor performance problem	ON	NO	2	CCM	×	(See 01-02A-94 DTC P0451)
P0452	EVAP control system pressure sensor low input	ON	NO	2	CCM	×	(See 01-02A-96 DTC P0452)
P0453	EVAP control system pressure sensor high input	ON	NO	2	CCM	×	(See 01-02A-97 DTC P0453)
P0455	EVAP control system leak detected (gross leak)	ON	NO	2	Evaporative	×	(See 01-02A-99 DTC P0455)
P0461	Fuel gauge sender unit circuit range/performance	ON	NO	2	CCM	×	(See 01-02A-102 DTC P0461)
P0462	Fuel gauge sender unit circuit low input	ON	NO	2	CCM	×	(See 01-02A-103 DTC P0462)
P0463	Fuel gauge sender unit circuit high input	ON	NO	2	CCM	×	(See 01-02A-104 DTC P0463)
P0464	Fuel gauge sender unit circuit performance problem (slosh check)	ON	NO	2	CCM	×	(See 01-02A-106 DTC P0464)
P0480	Cooling fan relay circuit	OFF	NO	2	CCM	×	(See 01-02A-106 DTC P0480)
P0500	VSS circuit malfunction	ON	Yes	2	CCM	×	(See 01-02A-108 DTC P0500)
P0505	IAC valve circuit malfunction	ON	NO	1	CCM	×	(See 01-02A-112 DTC P0505)
P0506	Idle control system RPM lower than expected	ON	NO	2	CCM	×	(See 01-02A-114 DTC P0506)
P0507	Idle control system RPM higher than expected	ON	NO	2	CCM	×	(See 01-02A-116 DTC P0507)
P0550	PSP switch circuit malfunction	ON	NO	2	CCM	×	(See 01-02A-117 DTC P0550)
P0605	Internal control module read only memory (ROM) error	OFF	NO	—	Other	×	(See 01-02A-118 DTC P0605)
P0703	Brake switch input malfunction	ON	NO	2	CCM	×	(See 01-02A-118 DTC P0703)

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC No.	Condition	MIL	O/D OFF indicator light flashes	DC	*Monitor item	Memory function	Page
P0704	Clutch switch input circuit malfunction	ON	NO	2	CCM	×	(See 01-02A-120 DTC P0704)
P0705	Transmission range (TR) switch circuit malfunction (short circuit)	(See 05-02-11 DTC P0705)					
P0706	Transmission range (TR) switch circuit malfunction (open circuit)	(See 05-02-14 DTC P0706)					
P0715	Input/turbine speed sensor circuit malfunction	(See 05-02-17 DTC P0715)					
P0720	Output speed sensor circuit malfunction	(See 05-02-19 DTC P0720)					
P0725	Engine speed input circuit malfunction	(See 05-02-21 DTC P0725)					
P0741	Torque converter clutch (TCC) solenoid valve malfunction (stuck off)	(See 05-02-23 DTC P0741)					
P0742	Torque converter clutch (TCC) solenoid valve malfunction (stuck on)	(See 05-02-25 DTC P0742)					
P0743	Torque converter clutch (TCC) solenoid valve circuit malfunction	(See 05-02-26 DTC P0743)					
P0751	Shift solenoid A malfunction (stuck off)	(See 05-02-28 DTC P0751)					
P0752	Shift solenoid A malfunction (stuck on)	(See 05-02-30 DTC P0752)					
P0753	Shift solenoid A circuit malfunction	(See 05-02-32 DTC P0753)					
P0756	Shift solenoid B malfunction (stuck off)	(See 05-02-34 DTC P0756)					
P0757	Shift solenoid B malfunction (stuck on)	(See 05-02-35 DTC P0757)					
P0758	Shift solenoid B circuit malfunction	(See 05-02-37 DTC P0758)					
P0850	Neutral switch input circuit malfunction (MT)	ON	NO	2	CCM	×	(See 01-02A-122 DTC P0850)
P1449	CDCV open or short	OFF	NO	—	Other	—	(See 01-02A-124 DTC P1449)
P1450	EVAP control system malfunction (excessive vacuum)	ON	NO	2	CCM	×	(See 01-02A-125 DTC P1450)
P1487	EGR boost sensor solenoid valve circuit malfunction	OFF	NO	—	Other	—	(See 01-02A-127 DTC P1487)
P1496	EGR valve motor coil 1 open or short	OFF	NO	—	Other	—	(See 01-02A-128 DTC P1496)
P1497	EGR valve motor coil 2 open or short	OFF	NO	—	Other	—	(See 01-02A-130 DTC P1497)
P1498	EGR valve motor coil 3 open or short	OFF	NO	—	Other	—	(See 01-02A-132 DTC P1498)
P1499	EGR valve motor coil 4 open or short	OFF	NO	—	Other	—	(See 01-02A-134 DTC P1499)
P1512	VTCS malfunction (stuck close)	ON	NO	2	CCM	×	(See 01-02A-136 DTC P1512)
P1518	VTCS malfunction (stuck open)	ON	NO	2	CCM	×	(See 01-02A-138 DTC P1518)
P1562	PCM +BB voltage low	ON	NO	1	CCM	×	(See 01-02A-140 DTC P1562)
P1569	VTCS solenoid valve circuit low input	ON	NO	2	CCM	×	(See 01-02A-141 DTC P1569)



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC No.	Condition	MIL	O/D OFF indicator light flashes	DC	*Monitor item	Memory function	Page
P1570	VTCS solenoid valve circuit high input	ON	NO	2	CCM	×	(See 01-02A- 143 DTC P1570)
P1601	Communication line error (PCM-TCM)	ON	NO	1	CCM	×	(See 01-02A- 145 DTC P1601)
P1602	Immobilizer unit-PCM communication error	OFF	NO	—	Other	×	(See 01-02A- 147 DTC P1602)
P1603	Key ID number unregistered in PCM	OFF	NO	—	Other	×	(See 01-02A- 149 DTC P1603)
P1604	Code word unregistered in PCM	OFF	NO	—	Other	×	(See 01-02A- 150 DTC P1604)
P1608	PCM internal circuit malfunction	OFF	NO	—	Other	—	(See 01-02A- 150 DTC P1608)
P1621	Code word mismatch after engine cranking	OFF	NO	—	Other	×	(See 01-02A- 151 DTC P1621)
P1622	Key ID number mismatch	OFF	NO	—	Other	×	(See 01-02A- 152 DTC P1622)
P1623	Code word or key ID number read/write error in PCM	OFF	NO	—	Other	×	(See 01-02A- 152 DTC P1623)
P1624	Immobilizer system communication counter=0	OFF	NO	—	Other	×	(See 01-02A- 153 DTC P1624)
P1631	Generator output voltage signal no electricity	OFF	NO	—	Other	×	(See 01-02A- 153 DTC P1631)
P1633	Battery overcharge	OFF	NO	—	Other	×	(See 01-02A- 155 DTC P1633)
P1634	Generator terminal B circuit open	OFF	NO	—	Other	×	(See 01-02A- 156 DTC P1634)

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

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0010

A5U010201084W01

DTC P0010	CMP actuator circuit
<b>DETECTION CONDITION</b> <ul style="list-style-type: none"> <li>PCM monitors OCV (oil control valve) circuit current. If PCM detects OCV (oil control valve) signal current (calculated from OCV (oil control valve)) control circuit current is above/below the threshold voltage (calculate from battery positive voltage), PCM determines that OCV (oil control valve) circuit has malfunction.</li> </ul>	<b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b> <ul style="list-style-type: none"> <li>OCV circuit malfunction</li> <li>Short to GND between OCV (oil control valve) terminal A and PCM terminal 4D</li> <li>Open circuit between OCV (oil control valve) terminal A and PCM terminal 4D</li> <li>Short to GND between OCV (oil control valve) terminal B and PCM terminal 4R</li> <li>Short to power between OCV (oil control valve) terminal B and PCM terminal 4R</li> <li>Open circuit between OCV (oil control valve) terminal B and PCM terminal 4R</li> <li>Poor connection of OCV (oil control valve) connector or PCM connector</li> <li>PCM malfunction</li> </ul>	

OCV  
(OIL CONTROL VALVE)

PCM (31-PIN)

HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

OCV  
(OIL CONTROL VALVE)

HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes
		No
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes
		No
3	<b>CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Clear DTC using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is same DTC detected?</li> </ul>	Yes
		No
4	<b>INSPECT OCV (OIL CONTROL VALVE) CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect OCV (oil control valve) connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes
		No

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
5	<b>INSPECT OCV (OIL CONTROL VALVE) ELECTRICAL MALFUNCTION</b> <ul style="list-style-type: none"> <li>Measure resistance between OCV (oil control valve) terminals A and B (part-side).</li> <li>Is resistance <b>within 6.9—7.9 ohms</b>?</li> </ul>	Yes	Go to next step.
		No	Replace OCV (oil control valve) , then go to Step 14.
6	<b>CLASSIFY MALFUNCTION AT POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between OCV (oil control valve) terminal A (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Malfunction at control circuit. Go to Step 10.
		No	Malfunction at power supply circuit. Go to next step.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 4D (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
8	<b>INSPECT POWER CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check for continuity between OCV (oil control valve) terminal A (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 14.
		No	Go to next step.
9	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF</li> <li>Check for continuity between OCV (oil control valve) terminal A (harness-side) and PCM terminal 4D (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to Step 14.
		No	Repair or replace harness for open circuit, then go to Step 14.
10	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 4R (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
11	<b>INSPECT CONTROL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between OCV (oil control valve) terminal B (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace harness for short to power, then go to Step 14.
		No	Go to next step.
12	<b>INSPECT CONTROL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check for continuity between OCV (oil control valve) terminal B (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 14.
		No	Go to next step.
13	<b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check for continuity between OCV (oil control valve) terminal B (harness-side) and PCM terminal 4R (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
14	<b>VERIFY TROUBLESHOOTING OF DTC P0010 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
15	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0011

A5U010201084W02

<b>DTC P0011</b>	<b>CMP - Timing over-advanced</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Actual valve timing is over-advanced by <b>15 deg.</b> from target valve timing when the OCV (oil control valve) system controls within the maximum valve timing retard.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>OCV (oil control valve) malfunction</li> <li>Spool valve in OCV (oil control valve) is stuck in advance position.</li> <li>Variable valve timing actuator is stuck in advance position.</li> <li>Loose timing belt or improper valve timing due to jumping</li> <li>PCM malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT OCV (OIL CONTROL VALVE) FOR MALFUNCTION</b> <ul style="list-style-type: none"> <li>Start engine .</li> <li>Increase engine speed.</li> <li>Stop engine.</li> <li>Remove the OCV (oil control valve).</li> <li>Check the position of spool valve in OCV (oil control valve).</li> <li>Is spool valve located at valve retard position?</li> </ul>	Yes Go to next step.
		No Replace OCV (oil control valve), then go to Step 6.
4	<b>INSPECT STOPPER PIN MECHANISM</b> <ul style="list-style-type: none"> <li>Remove timing belt.</li> <li>Inspect stopper pin. (See 01-10-9 VARIABLE VALVE TIMING ACTUATOR INSPECTION)</li> <li>Is stopper pin mechanism okay?</li> </ul>	Yes Go to next step.
		No Replace variable valve timing actuator, then go to Step 6.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
5	<b>INSPECT ROTOR POSITION</b> <ul style="list-style-type: none"> <li>Remove variable valve timing actuator.</li> <li>Is rotor position at maximum valve timing retard?</li> </ul>	Yes <b>VARIABLE VALVE TIMING MECHANISM IS NORMAL</b>  <b>Note</b> <ul style="list-style-type: none"> <li>This DTC detected by intermittent concern.</li> <li>Intermittent concern might be removed by cleaning mode of variable valve timing control function.</li> </ul> Go to Step 6.
		No Replace variable valve timing actuator, go to next step.
6	<b>VERIFY TROUBLESHOOTING OF DTC P0011 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is same PENDING CODE of DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

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## DTC P0012

A5U010201084W03

DTC P0012	CMP - Timing over-retarded
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Actual valve timing is over-retarded by <b>10 deg.</b> from target valve timing for <b>5 s</b> when the OCV (oil control valve) system control is within feed-back range.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>OCV (oil control valve) malfunction</li> <li>Low engine oil pressure</li> <li>Spool valve in OCV (oil control valve) is stuck in retard position.</li> <li>Variable valve timing actuator is stuck in retard position.</li> <li>Following oil runners are clogged or have leakage.</li> </ul> <b>Oil runners</b> <ul style="list-style-type: none"> <li>Between oil pressure switch and OCV (oil control valve)</li> <li>Between OCV (oil control valve) and variable valve timing actuator</li> <li>In variable valve timing actuator</li> <li>Loose the timing belt or improper valve timing due to jumping out of timing belt</li> <li>PCM malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>Is DTC P0010 present?</li> </ul>	Yes Go to DTC P0010 troubleshooting procedure. (See 01-02A-18 DTC P0010)
		No Go to next step.
4	<b>VERIFY ENGINE OIL PRESSURE</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Does oil pressure warning light illuminate?</li> </ul>	Yes Inspect engine oil pressure. (See 01-11-3 OIL PRESSURE INSPECTION)
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

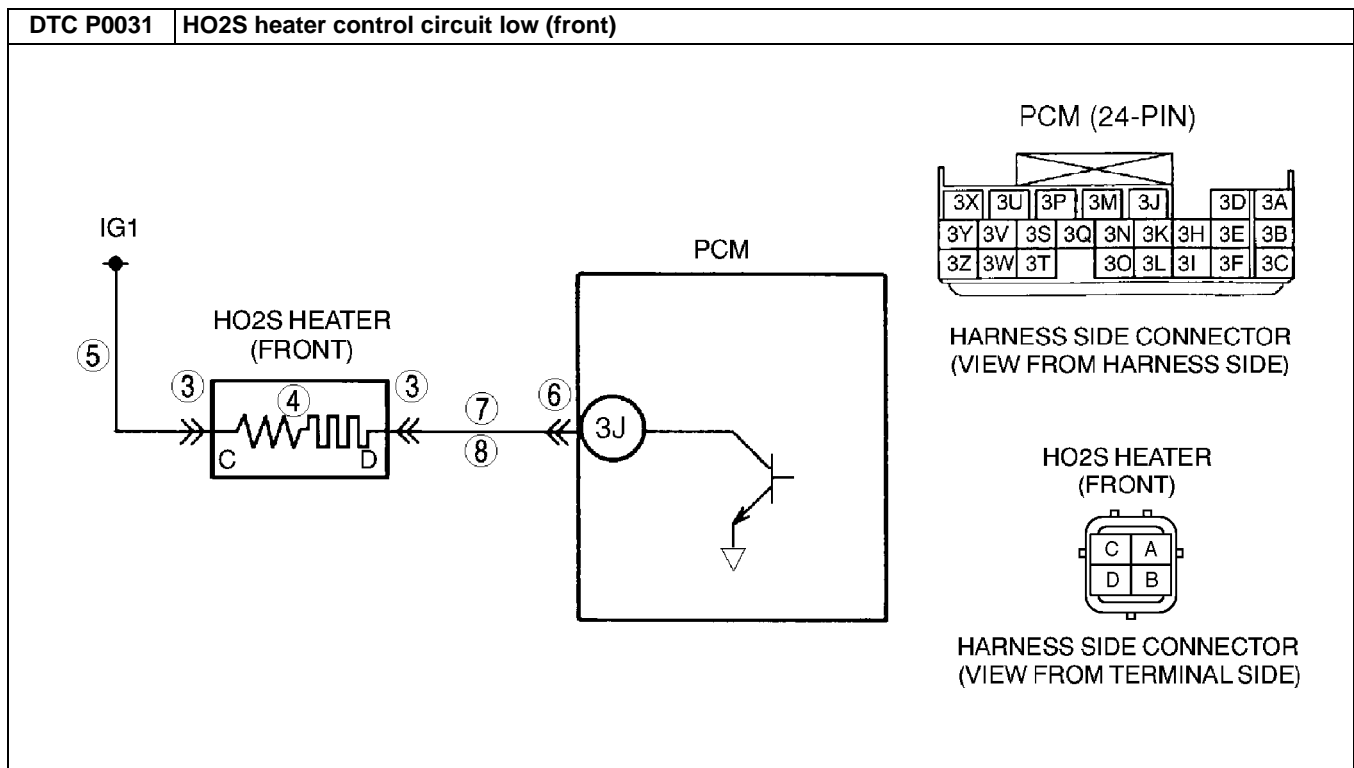
STEP	INSPECTION	ACTION
5	<b>VERIFY TIMING BELT INSTALLATION</b> <ul style="list-style-type: none"> <li>Stop engine.</li> <li>Remove timing belt cover.</li> <li>Is camshaft timing mark at correct point? (See 01-10-10 TIMING BELT REMOVAL/INSTALLATION)</li> </ul>	Yes Go to next step.
		No Reinstall timing belt, then go to Step 8.
6	<b>INSPECT OCV (OIL CONTROL VALVE) FOR MALFUNCTION</b> <ul style="list-style-type: none"> <li>Stop engine.</li> <li>Remove the OCV (oil control valve) .</li> <li>Check the position of spool valve in OCV (oil control valve).</li> <li>Is spool valve located at valve retard position?</li> </ul>	Yes <b>VARIABLE VALVE TIMING MECHANISM IS NORMAL</b> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>This DTC detected by intermittent concern.</li> <li>Intermittent concern might be removed by cleaning mode of variable valve timing control function.</li> </ul> Go to Step 8.
		No Replace OCV, then go to Step 8.
7	<b>INSPECT ENGINE OIL RUNNER</b> <ul style="list-style-type: none"> <li>Inspect following engine oil runners for clogging or leakage.</li> </ul> <b>INSPECTION RUNNER</b> <ul style="list-style-type: none"> <li>Between oil pressure switch and OCV (oil control valve)</li> <li>Between OCV (oil control valve) and variable valve timing actuator</li> <li>In variable valve timing actuator</li> <li>Is there any clogging or leakage?</li> </ul>	Yes Repair or replace suspected malfunction.
		No <b>VARIABLE VALVE TIMING MECHANISM IS NORMAL</b> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>This DTC is detected by intermittent concern.</li> <li>Intermittent concern might be removed by cleaning mode of variable valve timing control function.</li> </ul> Go to Step 8.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0012 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is same PENDING CODE of DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0031

A5U010201084W04

DTC P0031	HO2S heater control circuit low (front)
DETECTION CONDITION	<ul style="list-style-type: none"> <li>PCM monitors the HO2S heater (front) control signal at PCM terminal 3J. If PCM turns the HO2S heater (front) off but voltage at terminal 3J still remains low, PCM determines that HO2S heater (front) circuit has malfunction.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>HO2S heater (front) is controlled by a duty signal.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is an intermittent monitor (HO2S heater).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>HO2S (front) malfunction</li> <li>Open circuit between ignition switch terminal B (harness-side) and HO2S (front) terminal C (harness-side)</li> <li>Open circuit between HO2S (front) terminal D (harness-side) and PCM terminal 3J (harness-side)</li> <li>Short to GND circuit between HO2S (front) terminal D (harness-side) and PCM terminal 3J (harness-side)</li> <li>Poor connection at HO2S (front) or PCM connector</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT HO2S (FRONT) CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect HO2S (front) connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair or replace terminal, then go to Step 9.
		No Go to next step.
4	<b>INSPECT HO2S HEATER (FRONT)</b> <ul style="list-style-type: none"> <li>Measure resistance between HO2S (front) terminals C and D (part-side).</li> <li>Is resistance <b>within 5.0—6.8 ohms</b>?</li> </ul>	Yes Go to next step.
		No Replace the HO2S (front), then go to Step 9.
5	<b>INSPECT POWER CIRCUIT OF HO2S HEATER (FRONT) FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between HO2S (front) terminal C (harness-side) and body GND.</li> <li>Is there voltage <b>B+</b>?</li> </ul>	Yes Go to next step.
		No Repair or replace harness for open circuit, then go to Step 9.
6	<b>INSPECT PCM CONNECTOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 3J (damaged, pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair terminal, then go to Step 9.
		No Go to next step.

## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT CONTROL CIRCUIT OF HO2S HEATER (FRONT) FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check for continuity between HO2S (front) terminal D (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
8	<b>INSPECT CONTROL CIRCUIT OF HO2S HEATER (FRONT) FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check for continuity between HO2S (front) terminal D (harness-side) and PCM terminal 3J.</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is same PENDING CODE of DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

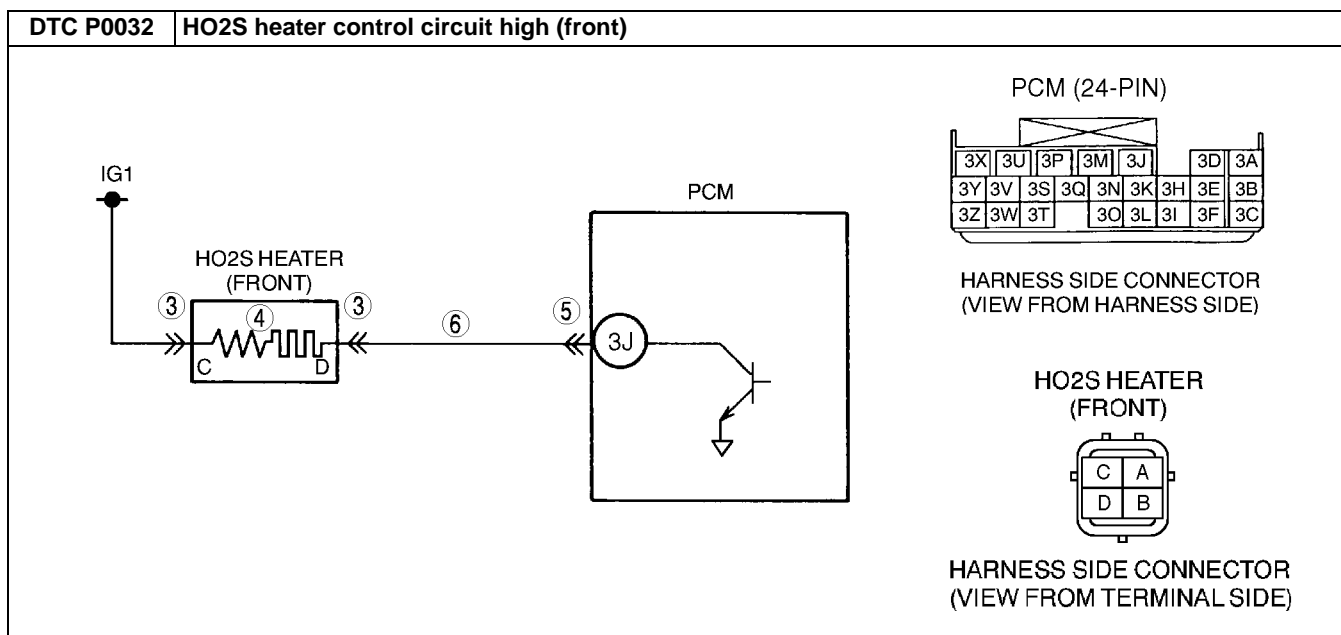
### DTC P0032

A5U010201084W05

DTC P0032	HO2S heater control circuit high (front)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors HO2S heater (front) control signal at PCM terminal 3J. If PCM turns HO2S heater (front) on but voltage at terminal 3J still remains high, PCM determines that HO2S heater (front) circuit has malfunction.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>HO2S heater (front) is controlled by a duty signal.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a intermittent monitor (HO2S heater).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Short to power circuit between HO2S (front) terminal D (harness-side) and PCM terminal 3J (harness-side)</li> <li>Shorted HO2S (front) or PCM terminal</li> <li>PCM malfunction</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT HO2S (FRONT) TERMINALS</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect HO2S (front) connector.</li> <li>Check for bent terminals.</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 7.
		No Go to next step.
4	<b>INSPECT HO2S HEATER (FRONT)</b> <ul style="list-style-type: none"> <li>Measure resistance between HO2S (front) terminals C and D (part-side).</li> <li>Is resistance <b>within 5.0—6.8 ohms</b>?</li> </ul>	Yes Go to next step.
		No Replace the HO2S (front), then go to Step 7.
5	<b>INSPECT PCM TERMINAL</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for bent terminals at terminal 3J.</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair terminal, then go to Step 7.
		No Go to next step.
6	<b>INSPECT HO2S (FRONT) HEATER CONTROL CIRCUIT FOR SHORT TO POWER CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between HO2S (front) terminal D (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Repair or replace harness for short to power circuit, then go to next step.
		No Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## DTC P0037

A5U010201084W06

DTC P0037	HO2S heater control circuit low (rear)
DETECTION CONDITION	<ul style="list-style-type: none"> <li>PCM monitors HO2S heater (rear) control signal at PCM terminal 3P. If the PCM turns HO2S heater (rear) off but voltage at terminal 3P still remains low, PCM determines that HO2S heater (rear) circuit has malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a intermittent monitor (HO2S heater).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>HO2S (rear) malfunction</li> <li>Open circuit between ignition switch terminal B (harness-side) and HO2S (rear) terminal C (harness-side)</li> <li>Open circuit between HO2S (rear) terminal D (harness-side) and PCM terminal 3P (harness-side)</li> <li>Short to GND circuit between HO2S (rear) terminal D (harness-side) and PCM terminal 3P (harness-side)</li> <li>Poor connection at HO2S (rear) or PCM connector</li> <li>PCM malfunction</li> </ul>

Wiring diagram showing the HO2S heater control circuit. The circuit includes the PCM (24-PIN), HO2S HEATER (REAR), and various terminals (3, 4, 6, 7, 8, 3P, 3X, 3Y, 3Z, 3U, 3V, 3W, 3S, 3Q, 3N, 3M, 3J, 3D, 3A, 3E, 3B, 3F, 3C). The diagram shows the connection from IG1 (5) through a fuse to terminal 3 of the HO2S HEATER (REAR), and the connection from terminal 4 to terminal 7, which is connected to terminal 8, leading to terminal 6 of the PCM.

PCM (24-PIN)

HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)

HO2S HEATER (REAR)

HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	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	<b>INSPECT HO2S (REAR) CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect HO2S (rear) connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair or replace terminal, then go to Step 9.
		No Go to next step.
4	<b>INSPECT HO2S HEATER (REAR)</b> <ul style="list-style-type: none"> <li>Measure resistance between HO2S (rear) terminal C and D (part-side).</li> <li>Is resistance <b>within 14.1—18.9 ohms</b>?</li> </ul>	Yes Go to next step.
		No Replace the HO2S (rear), then go to Step 9.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
5	<b>INSPECT HO2S HEATER (REAR) POWER CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between HO2S (rear) terminals C (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 3P (damaged, pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	<b>INSPECT HO2S HEATER (REAR) SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check for continuity between HO2S (rear) terminal D (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
8	<b>INSPECT HO2S HEATER (REAR) CONTROL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Check for continuity between HO2S (rear) terminal D (harness-side) and PCM terminal 3P.</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 9.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

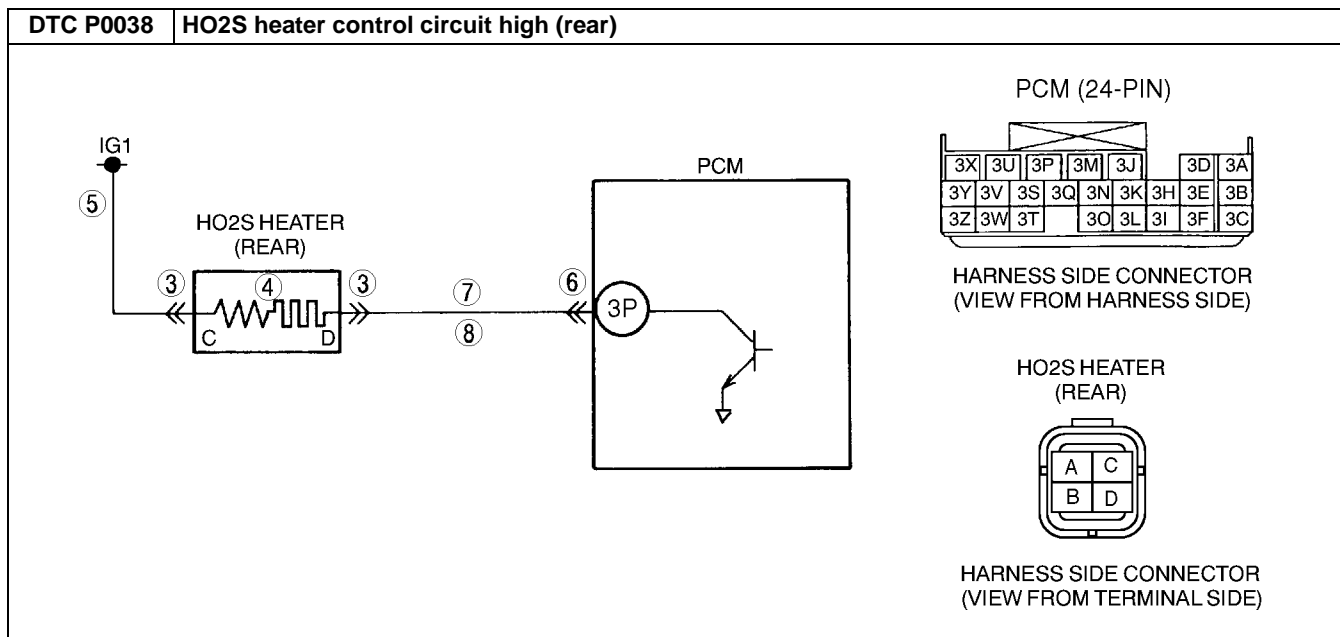
01-02A

## DTC P0038

A5U010201084W07

DTC P0038	HO2S heater control circuit high (rear)
DETECTION CONDITION	<ul style="list-style-type: none"> <li>PCM monitors HO2S heater (rear) control signal at PCM terminal 3P. If the PCM turns HO2S heater (rear) on but voltage at terminal 3P still remains high, PCM determines that HO2S heater (rear) circuit has malfunction.</li> </ul>
	<b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is an intermittent monitor (HO2S heater).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>HO2S (rear) malfunction</li> <li>Short to power circuit between HO2S (rear) terminal D (harness-side) and PCM terminal 3P (harness-side)</li> <li>Shorted HO2S (rear) or PCM terminal</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT HO2S (REAR) TERMINAL</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect HO2S (rear) connector.</li> <li>Check for bent terminals.</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 7.
		No Go to next step.
4	<b>INSPECT HO2S HEATER (REAR)</b> <ul style="list-style-type: none"> <li>Measure resistance between HO2S (rear) terminals C and D (part-side).</li> <li>Is resistance <b>within 14.1—18.9 ohms</b>?</li> </ul>	Yes Go to next step.
		No Replace the HO2S (rear), then go to Step 7.
5	<b>INSPECT PCM TERMINAL</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for bent terminals at terminal 3P.</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair terminal, then go to Step 7.
		No Go to next step.
6	<b>INSPECT HO2S HEATER (REAR) CONTROL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between HO2S (rear) terminal D (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Repair or replace harness for short to power circuit, then go to next step.
		No Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0101

A5U010201084W08

DTC P0101	MAF circuit range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM compares actual input signal from MAF sensor with expected input signal from MAF sensor which PCM calculates by engine speed.</li> <li>If mass intake-air flow amount is <b>above 74.7 g/s {9.88 lb/min}</b> for <b>5 s</b> and engine speed is <b>below 2,000 rpm</b> with engine running, PCM determines that detected mass intake-air flow amount is too high.</li> <li>If mass intake-air flow amount is <b>below 5.3 g/s {0.70 lb/min}</b> for <b>5 s</b> and engine speed is <b>above 500 rpm</b> with engine running, PCM determines that detected mass intake-air flow amount is too low.</li> </ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"> <li>ECT is <b>above 70 °C {158 °F}</b></li> <li>Throttle opening angle is <b>above 50%</b></li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>MAF sensor malfunction</li> <li>Electrical corrosion in MAF RETURN circuit</li> <li>Voltage drops in GND circuit</li> </ul>

01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Connect WDS or equivalent to DLC-2.</li> <li>Start the engine.</li> <li>Access ECT, MAF, TP and RPM PIDs using WDS or equivalent.</li> <li>Warm-up engine until ECT PID is <b>above 70°C {176°F}</b>.</li> <li>Verify that TP PID is <b>above 50%</b>.</li> <li>Read MAF PID while RPM PID is <b>below 2,000 rpm</b>.</li> <li>Is MAF PID reading <b>above 74.7 g/s {9.88 lb/min}</b>?</li> </ul>	Yes Go to Step 5.
		No Go to next step.
4	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Connect WDS or equivalent to DLC-2.</li> <li>Start the engine.</li> <li>Access ECT, MAF, TP and RPM PIDs using WDS or equivalent.</li> <li>Warm-up engine until ECT PID is <b>above 70°C {176°F}</b>.</li> <li>Verify that TP PID is <b>above 50%</b>.</li> <li>Read MAF PID while RPM PID is <b>above 500 rpm</b>.</li> <li>Is MAF PID reading <b>below 5.3 g/s {0.70 lb/min}</b>?</li> </ul>	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
5	<b>CHECK MAF SENSOR TERMINALS FOR ELECTRICAL CORROSION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect MAF sensor connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is any problem corrosion found?</li> </ul>	Yes Repair or replace suspected terminal or MAF sensor, then go to Step 7.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to next step.
		No	Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start the engine.</li> <li>Warm-up engine until ECT PID is <b>above 70°C {176°F}</b>.</li> <li>Verify that TP PID is <b>above 50%</b>.</li> <li>Read MAF and RPM PIDs.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>MAF PID should indicate <b>below 74.7 g/s {9.88 lb/min}</b> while RPM PID is <b>below 2,000 rpm</b>.</li> <li>MAF PID should indicate <b>above 5.3 g/s {0.70 lb/min}</b> while RPM PID is <b>above 500 rpm</b>.</li> </ul> <ul style="list-style-type: none"> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

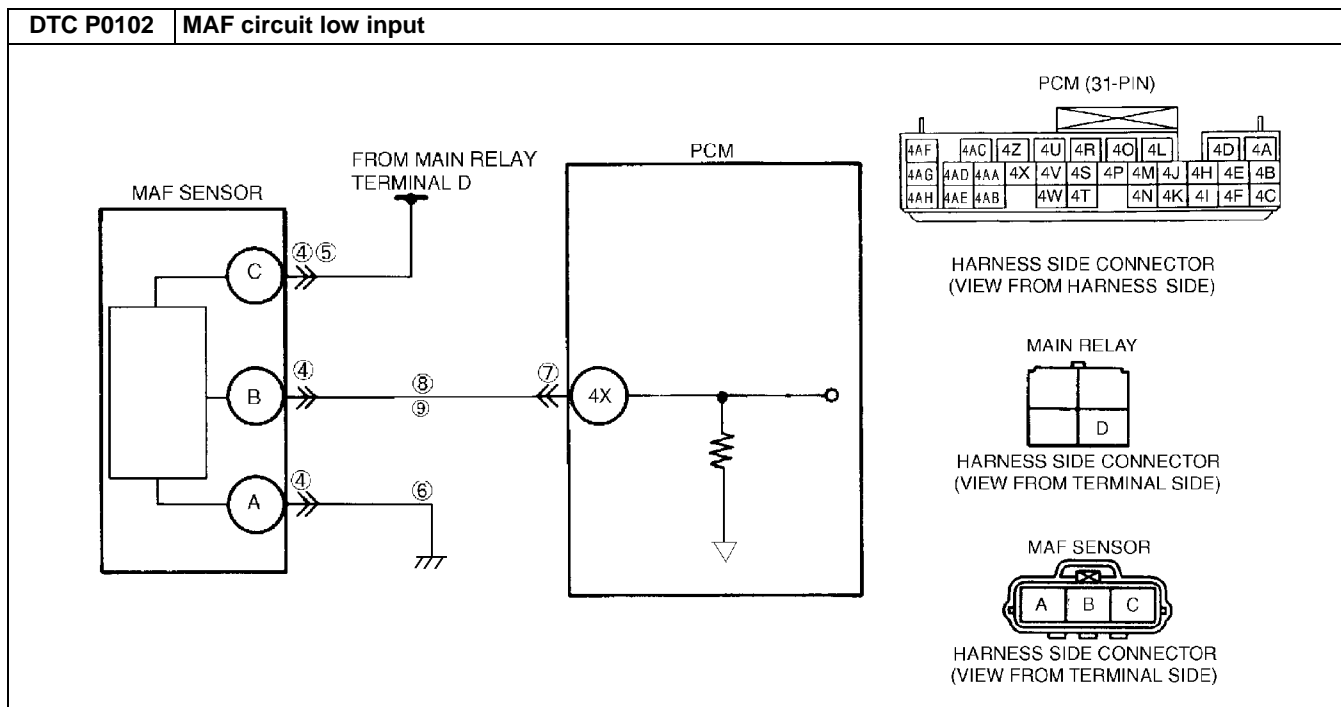
## DTC P0102

A5U010201084W09

DTC P0102	MAF circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from MAF sensor after ignition key is on. If input voltage at PCM terminal 4X is <b>below 0.86 V</b>, PCM determines that MAF circuit has a malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>MAF sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND in wiring between MAF sensor terminal B and PCM terminal 4X</li> <li>Open circuit in wiring between MAF sensor terminal B and PCM terminal 4X</li> <li>Open circuit in wiring between MAF sensor terminal A and PCM terminal 4A</li> <li>PCM malfunction</li> <li>Open circuit in wiring between main relay and MAF sensor terminal C</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes
		No
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes
		No
3	<b>VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Connect WDS or equivalent to DLC-2.</li> <li>Start engine.</li> <li>Access MAF PID using WDS or equivalent.</li> <li>Is MAF PID as specified? <ul style="list-style-type: none"> <li>— MTX: 2.2—3.2 g/s {0.30—0.41 lb/min}</li> <li>— ATX: 2.3—3.2 g/s {0.31—0.41 lb/min}</li> </ul> </li> </ul>	Yes
		No
4	<b>INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect the MAF sensor connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes
		No
5	<b>CHECK POWER SUPPLY CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Check voltage at MAF sensor terminal C (harness-side).</li> <li>Is voltage B+?</li> </ul>	Yes
		No
6	<b>INSPECT MAF SENSOR GND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check for continuity between MAF sensor terminal A (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes
		No

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>• Turn ignition key to OFF.</li> <li>• Disconnect PCM connector.</li> <li>• Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
8	<b>INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Disconnect PCM.</li> <li>• Check for continuity between MAF sensor terminal B (harness-side) and PCM terminal 4X (harness-side).</li> <li>• Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 9.
9	<b>INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT</b> <ul style="list-style-type: none"> <li>• Check continuity between following circuits: <ul style="list-style-type: none"> <li>— MAF sensor terminal B (harness-side) and body GND</li> <li>— MAF sensor connector terminal A (harness-side) and B (harness-side)</li> </ul> </li> <li>• Is there any continuity?</li> </ul>	Yes	Repair or replace suspected harness, then go to next step.
		No	Replace MAF sensor, then go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to connect all disconnected connectors.</li> <li>• Start engine.</li> <li>• Clear DTC from PCM memory using WDS or equivalent.</li> <li>• Access MAF PID using WDS or equivalent.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• MAF PID should indicate as follows. <ul style="list-style-type: none"> <li>— MTX: <b>2.2—3.2 g/s {0.30—0.41 lb/min}</b></li> <li>— ATX: <b>2.3—3.2 g/s {0.31—0.41 lb/min}</b></li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>• Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>• Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

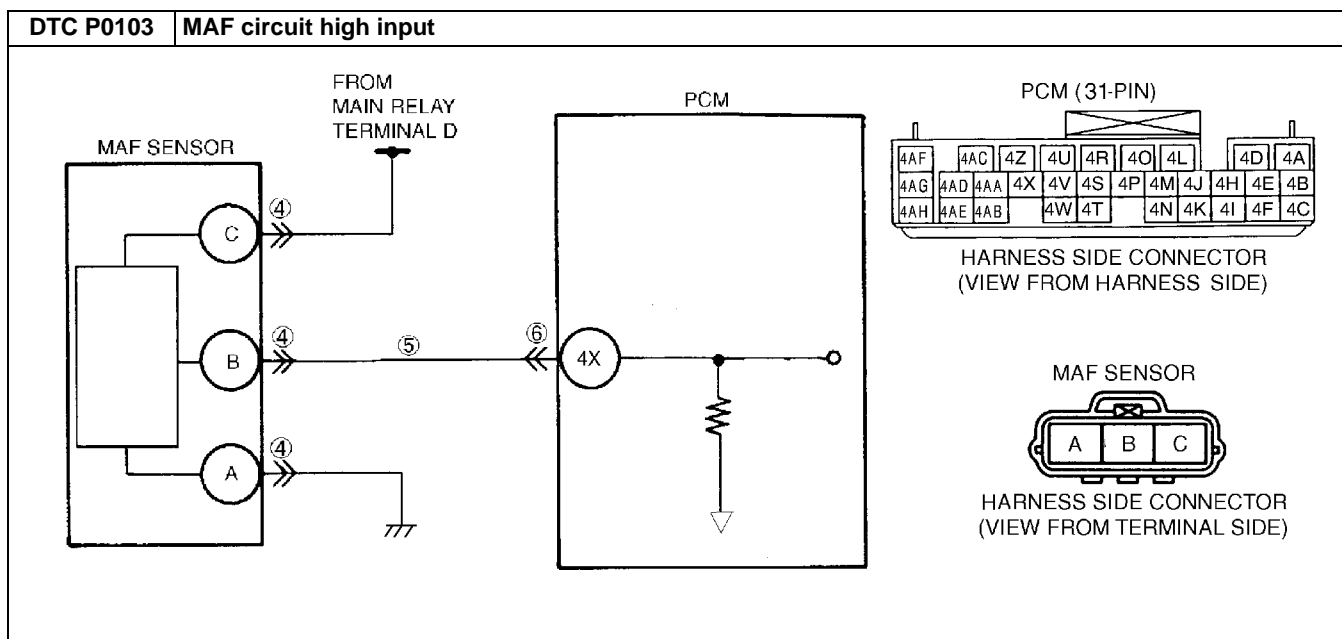
## DTC P0103

A5U010201084W10

DTC P0103	MAF circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>• PCM monitors input voltage from MAF sensor after ignition key is turned on. If input voltage at PCM terminal 4X is <b>above 4.9 V</b>, PCM determines that MAF circuit has a malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>• This is a continuous monitor (CCM).</li> <li>• MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available.</li> <li>• FREEZE FRAME DATA is available.</li> <li>• DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• MAF sensor malfunction</li> <li>• Connector or terminal malfunction</li> <li>• Short to power circuit in wiring between MAF sensor terminal B and PCM terminal 4X.</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	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	<b>VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Connect WDS or equivalent to DLC-2.</li> <li>Start engine.</li> <li>Access MAF PID using WDS or equivalent.</li> <li>Is MAF PID as specified? — MTX: 2.2—3.2 g/s {0.30—0.41 lb/min} — ATX: 2.3—3.2 g/s {0.31—0.41 lb/min}</li> </ul>	Yes Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
		No Go to next step.
4	<b>INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect the MAF sensor connector.</li> <li>Check for bent terminal.</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 7.
		No Go to next step.
5	<b>INSPECT MAF SIGNAL CIRCUIT FOR SHORT TO POWER CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between MAF sensor terminal B (harness-side) and body GND.</li> <li>Is the voltage <b>below 0.1 V</b>?</li> </ul>	Yes Go to next step.
		No Repair or replace suspected harness, then go to Step 7.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for bent terminal.</li> <li>Is there any malfunction?</li> </ul>	Yes Repair terminal, then go to next step.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
7	<b>VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Access MAF PID using WDS or equivalent.</li> </ul> <b>Note</b> <ul style="list-style-type: none"> <li>MAF PID should indicate as follows. <ul style="list-style-type: none"> <li>MTX: <b>2.2—3.2 g/s {0.30—0.41 lb/min}</b></li> <li>ATX: <b>2.3—3.2 g/s {0.31—0.41 lb/min}</b></li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0106

A5U010201084W11

<b>DTC P0106</b>	<b>BARO circuit performance problem</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>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 <b>below 6.4 kPa {48.2 mmHg, 1.8 inHg}</b> PCM determines that there is EGR boost sensor performance problem.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR boost sensor malfunction or substandard performance</li> <li>EGR boost sensor solenoid malfunction</li> <li>Loosed, damaged, misconnected, clogged or frozen moisture in vacuum hose from EGR boost sensor solenoid to EGR boost sensor</li> <li>Loosed, damaged, misconnected, clogged or frozen moisture in vacuum hose from EGR boost sensor solenoid to EGR pipe</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0106 on FREEZE FRAME DATA?</li> </ul>	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
4	<b>INSPECT CONNECTION OF EGR BOOST SENSING RELATED VACUUM HOSES</b> <ul style="list-style-type: none"> <li>Inspect following vacuum hoses for loose, damage, improper connection and/or leakage. <ul style="list-style-type: none"> <li>From EGR boost sensor to EGR boost sensor solenoid</li> <li>From EGR boost sensor solenoid to EGR pipe</li> </ul> </li> <li>Are they okay?</li> </ul>	Yes Go to next step.
		No Repair or replace vacuum hose, then go to Step 8.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
5	<b>INSPECT EGR BOOST SENSOR SOLENOID AIR FILTER FOR CLOGGING</b> <ul style="list-style-type: none"> <li>Is EGR boost sensor solenoid air filter clogged?</li> </ul>	Yes	Repair air clogging, then go to Step 8
		No	Go to next step.
6	<b>INSPECT EGR BOOST SENSOR SOLENOID FOR BEING STUCK OPEN OR CLOSE</b> <ul style="list-style-type: none"> <li>Inspect EGR boost sensor solenoid valve. (See 01-16-10 EGR BOOST SENSOR SOLENOID VALVE INSPECTION)</li> <li>Is EGR boost sensor solenoid okay?</li> </ul>	Yes	Go to next step.
		No	Replace EGR boost sensor solenoid, then go to Step 8.
7	<b>INSPECT EGR BOOST SENSOR</b> <ul style="list-style-type: none"> <li>Inspect EGR boost sensor. (See 01-40-33 EGR BOOST SENSOR INSPECTION)</li> <li>Is EGR boost sensor okay?</li> </ul>	Yes	Go to next step.
		No	Replace EGR boost sensor, then go to next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0106 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Run DRIVE MODE 1, 2 and 3. (See 01-02A-10 OBD-II DRIVE MODE)</li> <li>Stop vehicle.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

01-02A

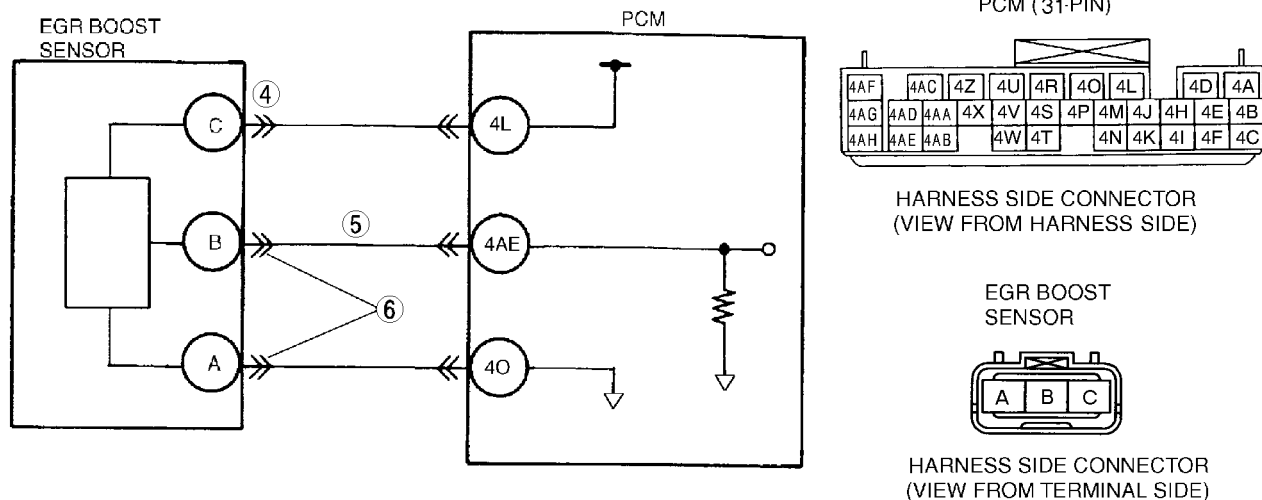
## DTC P0107

A5U010201084W12

DTC P0107	BARO circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from EGR boost sensor when monitoring conditions are met. If input voltage at PCM terminal 4AE is <b>below 0.21 V</b>, PCM determines that EGR boost sensor circuit is malfunctioning.</li> </ul> <b>MONITORING CONDITION</b> <ul style="list-style-type: none"> <li>IAT is <b>above 10°C {50°F}</b>.</li> <li>EGR boost sensor solenoid is turned OFF. (BARO is applied to EGR boost sensor.)</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR boost sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND in wiring between EGR boost sensor terminal B and PCM terminal 4AE</li> <li>Open circuit in wiring between EGR boost sensor terminal C and PCM terminal 4L</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

**DTC P0107 BARO circuit low input**



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>CHECK SIGNAL CIRCUIT VOLTAGE WHEN EGR BOOST SENSOR CONNECTOR IS DISCONNECTED</b> <ul style="list-style-type: none"> <li>Disconnect EGR boost sensor connector.</li> <li>Measure voltage between EGR boost sensor terminal B (harness-side) and body GND.</li> <li>Is voltage <b>above 4.8 V</b>?</li> </ul>	Yes Go to next step
		No Go to Step 5
4	<b>CHECK POWER SUPPLY CIRCUIT VOLTAGE AT EGR BOOST SENSOR CONNECTOR</b> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>If DTC P0122 and P0452 are also retrieved with P0107, go to REFERENCE VOLTAGE troubleshooting procedure. (See 01-03-51 NO.30 REFERENCE VOLTAGE)</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between EGR boost sensor terminal C (harness-side) and body GND.</li> <li>Is voltage <b>within 4.5—5.5 V</b>?</li> </ul>	Yes Check for poor connection of EGR boost sensor terminal C (harness-side). <ul style="list-style-type: none"> <li>Repair or replace terminal if necessary.</li> <li>If okay, replace EGR boost sensor.</li> </ul> Go to Step 7.
		No Check for open circuit between PCM terminal 4L (harness-side) and EGR boost sensor terminal C (harness-side). Repair or replace suspected harness, then go to Step 7.
5	<b>INSPECT EGR BOOST SENSOR SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check continuity between EGR boost sensor terminal B (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes Repair or replace suspected harness, then go to Step 7.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

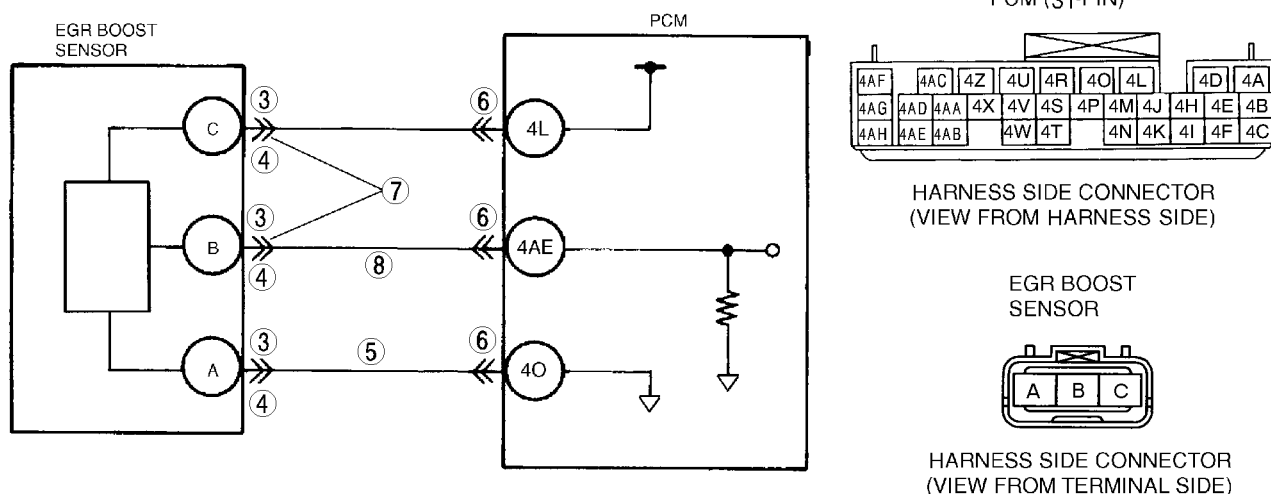
STEP	INSPECTION	ACTION
6	<b>INSPECT EGR BOOST SENSOR SIGNAL AND GND CIRCUIT FOR SHORT EACH OTHER</b> <ul style="list-style-type: none"> <li>Check continuity between EGR boost sensor terminal B and A (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes Repair or replace suspected harness, then go to next step.
		No Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0107 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

01-02A

## DTC P0108

A5U010201084W13

DTC P0108	BARO circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from EGR boost sensor when monitoring conditions are met. If input voltage at PCM terminal 4AE is <b>above 4.8 V</b>, PCM determines that EGR boost sensor circuit is malfunctioning.</li> </ul> <b>MONITORING CONDITION</b> <ul style="list-style-type: none"> <li>IAT is <b>above 10°C {50°F}</b>.</li> <li>EGR boost sensor solenoid is turned OFF. (BARO is applied to EGR boost sensor.)</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR boost sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>Open circuit in wiring between EGR boost sensor terminal A and PCM terminal 4O</li> <li>Open circuit in wiring between EGR boost sensor terminal B and PCM terminal 4AE</li> <li>EGR boost sensor signal circuit shorts to reference voltage (Vref) supply circuit</li> <li>PCM malfunction</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT CONNECTION OF EGR BOOST SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Verify that the EGR boost sensor connector is connected securely.</li> <li>Is connection okay?</li> </ul>	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 9.
4	<b>INSPECT EGR BOOST SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the EGR boost sensor connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace suspected terminal, then go to Step 9.
		No	Go to next step.
5	<b>INSPECT EGR BOOST SENSOR GND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check continuity between EGR boost sensor terminal A (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Check for open circuit between PCM terminal 4O (harness-side) and EGR boost sensor terminal A (harness-side). Repair or replace suspected harness, then go to Step 9.
6	<b>CHECK PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 4O (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
7	<b>INSPECT EGR BOOST SENSOR SIGNAL CIRCUIT FOR SHORT TO REFERENCE VOLTAGE CIRCUIT</b> <ul style="list-style-type: none"> <li>Check for continuity between EGR boost sensor terminal B and C (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace suspected harness, then go to Step 9.
		No	Go to next step.
8	<b>INSPECT EGR BOOST SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check continuity between EGR boost sensor terminal B (harness-side) and PCM terminal 4AE (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0108 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0111

A5U010201084W14

DTC P0111	IAT circuit performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>IAT is higher than ECT by <b>40°C (104°F)</b> and ignition key is ON.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>IAT sensor malfunction</li> <li>Poor connection at IAT sensor or PCM connector</li> <li>PCM malfunction</li> </ul>
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>IAT SENSOR</p> <p>PCM</p> </div> <div style="text-align: center;"> <p>PCM (31-PIN)</p> <p>HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)</p> </div> <div style="text-align: center;"> <p>IAT SENSOR</p> <p>HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p> </div> </div>	

01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	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	<b>INSPECT IAT SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect IAT sensor connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 6.
		No Go to next step.
4	<b>INSPECT IAT SENSOR</b> <ul style="list-style-type: none"> <li>Measure resistance between IAT sensor terminals A and B (part-side).</li> <li>Is the resistance <b>within 2.21—2.69 kilohms [20°C {68°F}]</b>?</li> </ul>	Yes Go to next step.
		No Replace IAT sensor, then go to Step 6.
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminals 4N and 4O (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 6.
		No Go to next step.

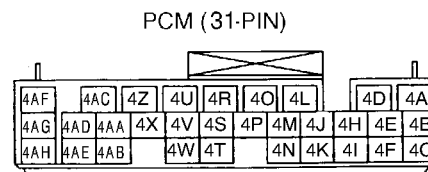
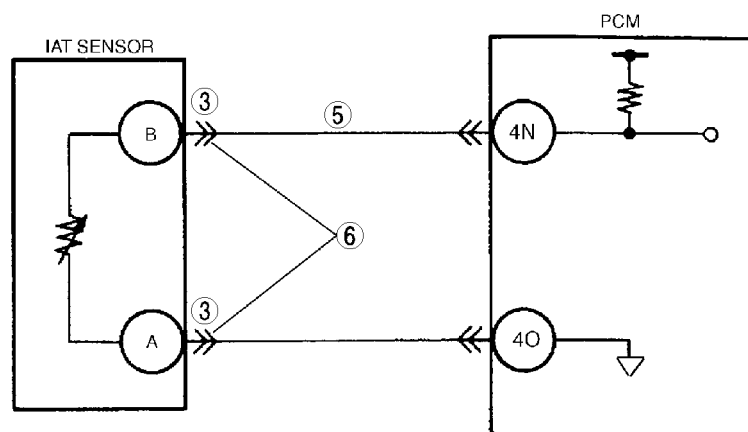
# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
6	<b>VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and run it under FREEZE FRAME DATA condition.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01–02A–10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE)
		No Troubleshooting completed.

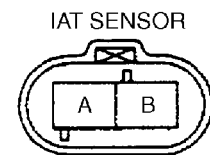
## DTC P0112

A5U010201084W15

<b>DTC P0112</b>	<b>IAT circuit low input</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors IAT sensor signal at PCM terminal 4N. If voltage at PCM terminal 4N is <b>below 0.2 V</b>, the PCM determines that the IAT sensor circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>IAT sensor malfunction</li> <li>Short to GND circuit between IAT sensor terminal B and PCM terminal 4N</li> <li>IAT signal and IAT GND circuit short each other.</li> <li>PCM malfunction</li> </ul>



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
3	<b>INSPECT IAT SENSOR TERMINAL</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect IAT sensor connector.</li> <li>Check for bent terminal of IAT sensor terminal A and B (part-side).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 7.
		No Go to next step.
4	<b>DETERMINE IF IAT SENSOR MALFUNCTION OR HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Disconnect IAT sensor connector.</li> <li>Measure resistance between IAT sensor terminals A and B (part-side).</li> <li>Is the resistance <b>within 2.2—2.69 kilohms [20°C {68°F}]</b>?</li> </ul>	Yes Go to next step.
		No Replace IAT sensor, then go to Step 7.
5	<b>INSPECT IAT SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check continuity between IAT sensor terminal B (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes Repair or replace harness for short to GND, then go to Step 7.
		No Go to next step.
6	<b>INSPECT IAT CIRCUITS FOR SHORT EACH OTHER</b> <ul style="list-style-type: none"> <li>Check continuity between IAT sensor terminal A and B (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes Repair or replace harness for short, then go to next step.
		No Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

01-02A

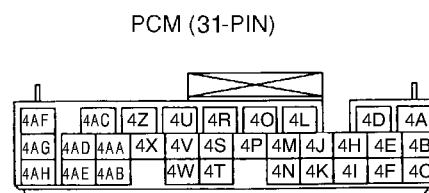
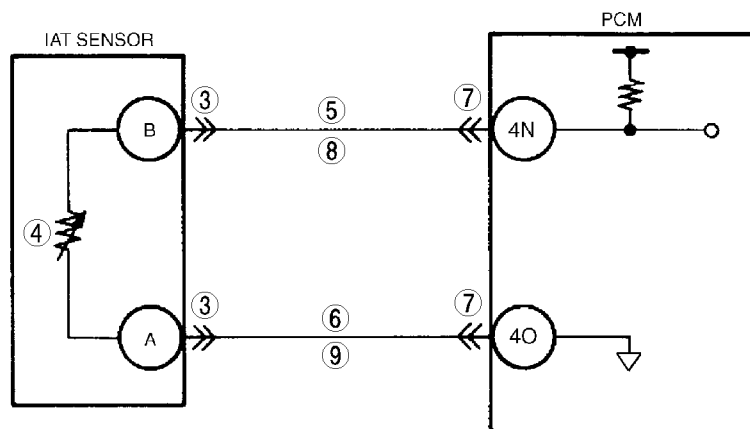
## DTC P0113

A5U010201084W16

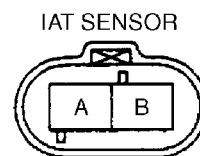
DTC P0113	IAT circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors IAT sensor signal at PCM terminal 4N. If voltage at PCM terminal 4N is <b>above 4.8 V</b>, the PCM determines that the IAT sensor circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is not stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>IAT sensor malfunction</li> <li>Open circuit between IAT sensor terminal B and PCM terminal 4N</li> <li>Short to power circuit between IAT sensor terminal B and PCM terminal 4N</li> <li>Open circuit between IAT sensor terminal A and PCM terminal 4O</li> <li>Short to power circuit between IAT sensor terminal A and PCM terminal 4O.</li> <li>Poor connection at IAT sensor or PCM connector.</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

**DTC P0113 IAT circuit high input**



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> • 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	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> • 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	<b>INSPECT IAT SENSOR CONNECTOR FOR POOR CONNECTION</b> • Turn ignition key to OFF. • Disconnect IAT sensor connector. • Check for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes Repair or replace terminal, then go to Step 10.
		No Go to next step.
4	<b>INSPECT IAT SENSOR</b> • Disconnect IAT sensor connector. • Measure resistance between IAT sensor terminal A and B (part-side). • Is the resistance <b>within 2.21—2.69 kilohms [20°C {68°F}]</b> ?	Yes Go to next step.
		No Replace IAT sensor, then go to Step 10.
5	<b>INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER</b> • Turn ignition key to ON (Engine OFF). • Measure voltage between IAT sensor terminal B (harness-side) and body GND. • Is voltage <b>B+</b> ?	Yes Repair or replace harness for short to power, then go to Step 10.
		No Go to next step.
6	<b>INSPECT IAT SENSOR GROUND CIRCUIT FOR SHORT TO POWER</b> • Measure voltage between IAT sensor terminal A (harness-side) and body GND. • Is voltage <b>B+</b> ?	Yes Repair or replace harness for short to power, then go to Step 10.
		No Go to next step.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> • Turn ignition key to OFF. • Disconnect PCM connector. • Inspect tightness of PCM terminal 4N and 4O (harness-side) using feeler tool. • Is there any malfunction?	Yes Repair or replace terminal, then go to Step 10.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

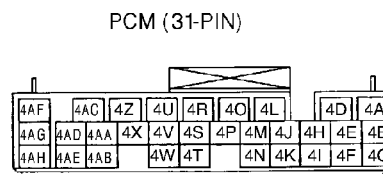
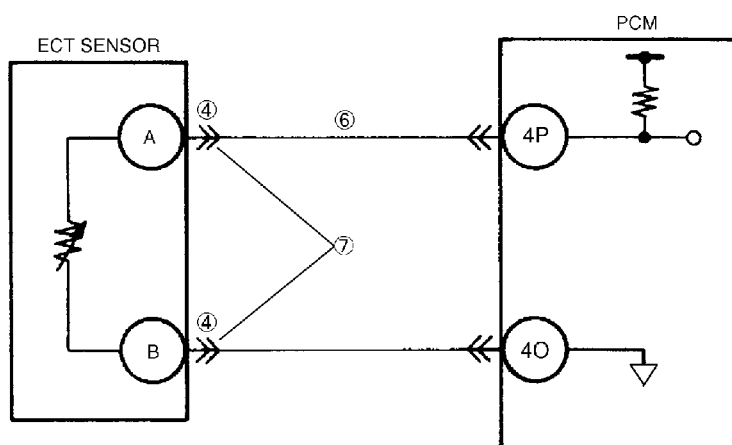
STEP	INSPECTION	ACTION	
8	<b>INSPECT IAT SENSOR SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check continuity between IAT sensor terminal B (harness-side) and PCM terminal 4N (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 10.
9	<b>INSPECT IAT SENSOR GND CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Check continuity between IAT sensor terminal A (harness-side) and PCM terminal 4O (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure." (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

01-02A

## DTC P0116

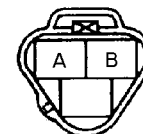
A5U010201084W17

DTC P0116	ECT circuit range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors the maximum value and minimum value of ECT when engine is started and <b>5 min</b> have been passed after leaving the vehicle <b>6 h or more</b>. If difference between maximum and minimum values of ECT is <b>below 5.6°C {10.1°F}</b>, PCM determines that ECT signal circuit has malfunction.</li> </ul>
	<b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ECT sensor malfunction</li> <li>Poor connection at ECT sensor or PCM connector</li> <li>PCM malfunction</li> </ul>



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

ECT SENSOR



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to ne, then go toxt step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect ECT sensor connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
4	<b>INSPECT ECT SENSOR</b> <ul style="list-style-type: none"> <li>Measure resistance between ECT sensor terminals A and B (part-side).</li> <li>Is the resistance <b>within 2.21—2.69 kilohms [20°C {68°F}]</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace ECT sensor, then go to Step 7.
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Inspect PCM terminals 4P and 4O (harness-side) for tightness using feeler tool.</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
6	<b>COMPARE ECT PID VALUE</b> <ul style="list-style-type: none"> <li>Obtain new ECT sensor.</li> <li>Clear DTC using WDS or equivalent.</li> <li>Connect ECT sensor connector to new ECT sensor without installing it to engine.</li> <li>Turn ignition key ON and record ECT PID value.</li> <li>Replace defect ECT sensor with new one.</li> <li>Start engine and wait for <b>5 min.</b></li> <li>Record ECT PID value.</li> <li>Is difference between ECT PID values <b>more than 5.6°C {10.1°F}</b>?</li> </ul>	Yes	Go to step 8.
		No	Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0116 COMPLETED</b> <ul style="list-style-type: none"> <li>Leave vehicle for <b>6 h.</b></li> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and wait for <b>5 min.</b></li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

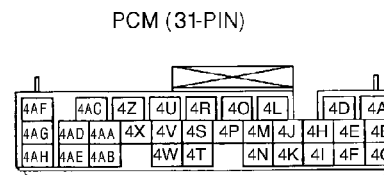
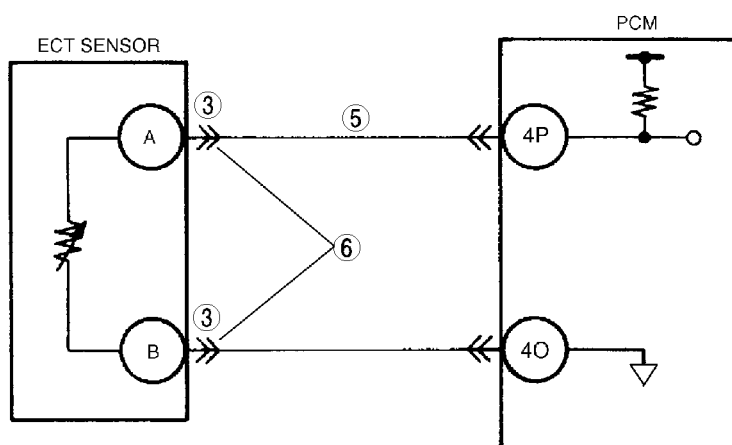
# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0117

A5U010201084W18

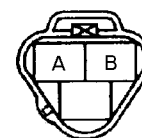
DTC P0117	ECT circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors ECT sensor signal at PCM terminal 4P. If voltage at terminal 4P is <b>below 0.20 V</b>, the PCM determines that the ECT sensor circuit has malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ECT sensor malfunction</li> <li>Short to GND circuit between ECT sensor terminal A and PCM connector terminal 4P</li> <li>ECT signal and GND circuit short each other</li> <li>PCM malfunction</li> </ul>

01-02A



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

ECT SENSOR



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes: Go to next step. No: Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes: Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul> No: Go to next step.
3	<b>INSPECT IF ECT SENSOR TERMINAL IS BENT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect ECT sensor connector.</li> <li>Check for bent ECT sensor terminals A and B (part-side).</li> <li>Is there any malfunction?</li> </ul>	Yes: Repair or replace terminal, then go to Step 8. No: Go to next step.
4	<b>DETERMINE IF ECT SENSOR MALFUNCTION OR HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Measure resistance between ECT sensor terminals A and B (part-side).</li> <li>Is the resistance <b>within 2.27—2.74 kilohms [20°C {68°F}]</b>?</li> </ul>	Yes: Go to next step. No: Replace ECT sensor, then go to Step 7.
5	<b>INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check continuity between ECT sensor terminal A (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes: Repair or replace harness for short to GND, then go to Step 7. No: Go to next step.

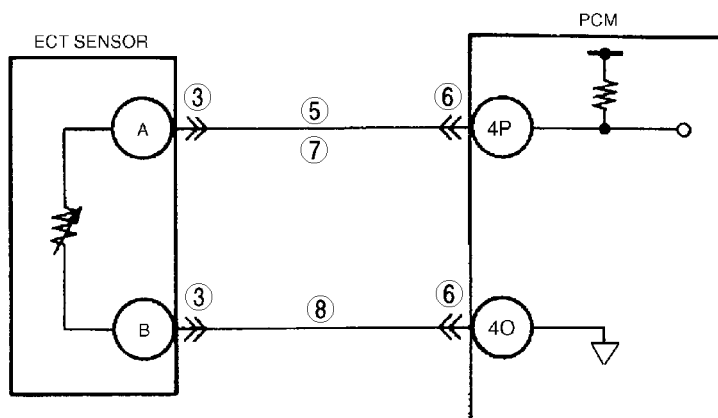
# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
6	<b>INSPECT ECT CIRCUIT FOR SHORT HARNESSES</b> <ul style="list-style-type: none"> <li>Check continuity between ECT sensor terminal A and B (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes Repair or replace harness for short, then go to next step.
		No Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

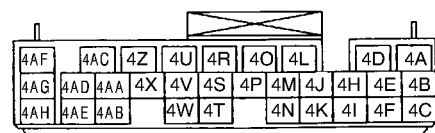
## DTC P0118

A5U010201084W19

<b>DTC P0118</b>	<b>ECT circuit high input</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors ECT sensor signal at PCM terminal 4P. If voltage at terminal 4P is <b>above 4.94 V</b>, the PCM determines that the ECT sensor circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ECT sensor malfunction</li> <li>Open circuit between ECT sensor terminal A and PCM terminal 4P</li> <li>Short to power circuit between ECT sensor terminal A and PCM terminal 4P.</li> <li>Open circuit between ECT sensor terminal B and PCM terminal 4O.</li> <li>Poor connection of ECT sensor or PCM connectors.</li> <li>PCM malfunction</li> </ul>

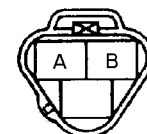


PCM (31-PIN)



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

ECT SENSOR



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Remove ACL box.</li> <li>Disconnect ECT sensor connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
4	<b>DETERMINE IF ECT SENSOR MALFUNCTION OR HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Measure resistance between ECT sensor terminals A and B (part-side).</li> <li>Is the resistance <b>within 2.27—2.74 kilohms [20°C {68°F}]</b>?</li> </ul>	Yes	Go to next step.
		No	Replace ECT sensor, then go to Step 9.
5	<b>INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between ECT sensor terminal A (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 4P and 4O (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
7	<b>INSPECT ECT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check continuity between ECT sensor terminal A (harness-side) and PCM terminal 4P (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
8	<b>INSPECT ECT SENSOR GND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check continuity between ECT sensor terminal B (harness-side) and PCM terminal 4O (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

01-02A

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0121

A5U010201084W20

DTC P0121	TP circuit range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>If PCM detects that throttle valve opening angle is <b>below 12.5%</b> for <b>5 s</b> after following conditions are met, PCM determines that TP is stuck close:  <b>MONITORING CONDITION</b> <ul style="list-style-type: none"> <li>ECT is <b>above 70°C {158°F}</b></li> <li>MAF sensor signal above <b>63.2 g/s {8.36 lb/min}</b></li> </ul> </li> <li>If PCM detects that throttle valve opening angle is <b>above 50%</b> for <b>5 s</b> after following conditions are met, PCM determines that TP is stuck open:  <b>MONITORING CONDITION</b> <ul style="list-style-type: none"> <li>Engine speed <b>above 500 rpm</b></li> <li>MAF sensor signal <b>below 5.3 g/s {0.7 lb/min}</b></li> </ul> </li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>TP sensor malfunction</li> <li>Electrical corrosion in TP signal circuit</li> <li>Voltage drops in reference voltage (Vref) supply circuit</li> <li>PCM malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Retrieve pending code or stored DTC using WDS or equivalent.</li> <li>Is DTC P0101 also retrieved</li> </ul>	Yes Go to DTC P0101 troubleshooting procedure.
		No Go to next step.
3	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
4	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Access ECT, TP and MAF PIDs using WDS or equivalent.</li> <li>Warm up the engine until ECT PID is <b>above 70°C {158°F}</b></li> <li>Drive the vehicle.</li> <li>Read TP PID while MAF PID is <b>above 63.2 g/s {8.36 lb/min}</b>.</li> <li>Is TP PID reading <b>above 12.5%</b>?</li> </ul>	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01–03–4 INTERMITTENT CONCERN TROUBLESHOOTING)
5	<b>VERIFY TP PID</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Access TP, MAF and RPM PIDs using WDS or equivalent.</li> <li>Read TP PID while MAF PID is <b>below 5.3g/s {0.7 lb/min}</b> and RPM PID is <b>above 500 rpm</b>.</li> <li>Is TP PID reading <b>above 50%</b>?</li> </ul>	Yes Go to Step 7.
		No Go to next step.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Drive the vehicle and read MAF PID.</li> <li>Does MAF PID change according to driving condition?</li> </ul>	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING.)
		No	Check MAF sensor and related circuits and terminals. (See 01-40-24 MASS AIR FLOW (MAF) SENSOR INSPECTION.) Repair or replace as necessary, then go to Step 11.
7	<b>CHECK TP SENSOR TERMINALS FOR ELECTRICAL CORROSION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect TP sensor connector.</li> <li>Check for electrical corrosion on male and female TP sensor terminals.</li> <li>Is any electrical corrosion found?</li> </ul>	Yes	Repair or replace suspected terminal or TP sensor, then go to Step 11.
		No	Go to next step.
8	<b>CHECK GND CIRCUIT FOR VOLTAGE DROP</b> <ul style="list-style-type: none"> <li>Check resistance between TP sensor terminal B (harness-side) and body GND.</li> <li>Does resistance read <b>approx. 0 ohm</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace rusted or corroded PCM terminal 4O (harness-side). Disconnect breakout box and go to Step 11.
9	<b>VERIFY TP SENSOR</b> <ul style="list-style-type: none"> <li>Does TP sensor resistance smoothly change while throttle valve is gradually being opened?</li> </ul>	Yes	Go to next step.
		No	Replace TP sensor, then go to Step 11.
10	<b>CHECK PCM TERMINALS FOR ELECTRICAL CORROSION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for electrical corrosion on PCM male and female terminals at 4L, 4V and 4O.</li> <li>Is any electrical corrosion found?</li> </ul>	Yes	Repair terminal, then go to next step.
		No	Go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P0121 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start the engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Access RPM, ECT, TP and MAF PIDs using WDS or equivalent.</li> <li>Verify TP PID is reading <b>below 50%</b> while MAF PID is <b>below 5 g/s {0.66 lb/min}</b> and RPM PID is <b>above 500 rpm</b>.</li> <li>Warm up the engine until ECT PID is reading <b>above 70 °C {158°F}</b>.</li> <li>Drive the vehicle and read TP and MAF PIDs.</li> <li>Verify PID readings are within specifications MAF PID: <b>above 63.2 g/s {8.36 lb/min}</b> TP PID: <b>above 12.5% more than 5 s</b></li> <li>Is pending code of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

01-02A

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0122

A5U010201084W21

DTC P0122	TP circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>If PCM detects TP sensor voltage at PCM terminal 4V <b>below 0.1 V</b> after engine start, PCM determines that TP circuit has a malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction conditions during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>TP sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>Open circuit between TP sensor terminal C and PCM terminal 4V.</li> <li>Short to GND circuit between TP sensor terminal C and PCM terminal 4V.</li> <li>Open circuit between TP sensor terminal A and PCM terminal 4L.</li> <li>Short to GND circuit between TP sensor terminal A and PCM terminal 4L.</li> <li>PCM malfunction.</li> </ul>

TP SENSOR

PCM (31-PIN)

HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

TP SENSOR

HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"><li>Has FREEZE FRAME DATA been recorded?</li></ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"><li>Check for related Service Bulletins and/or on-line repair information availability.</li><li>Is any related repair information available?</li></ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"><li>If vehicle is not repaired, go to next step.</li></ul>
		No	Go to next step.
3	<b>CHECK TP SENSOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"><li>Turn ignition key to OFF.</li><li>Check continuity between TP sensor terminals A and C (part-side).</li><li>Is there continuity?</li></ul>	Yes	Check for poor TP sensor connector terminal C connection. Repair or replace if necessary, then go to next step.
		No	Replace TP sensor, then go to Step 7.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A

STEP	INSPECTION		ACTION
4	<b>CHECK POWER SUPPLY CIRCUIT VOLTAGE AT TP SENSOR CONNECTOR</b>  <b>Note</b> <ul style="list-style-type: none"> <li>If DTC P0107 and P0452 are also retrieved with P0122, go to REFERENCE VOLTAGE troubleshooting procedure. (See 01-03-51 NO.30 REFERENCE VOLTAGE)</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Check voltage at TP sensor terminal A (harness-side).</li> <li>Is voltage <b>within 4.5—5.5 V</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 7.
5	<b>VERIFY TP SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check continuity between TP sensor terminal C (harness-side) and PCM terminal 4V (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 7.
6	<b>VERIFY TP SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between PCM terminal 4V (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace suspected harness, then go to next step.
		No	Repair or replace short circuit between TP signal circuit and TP GND circuit, then go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Depress and release accelerator pedal several times.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

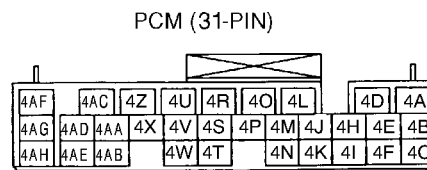
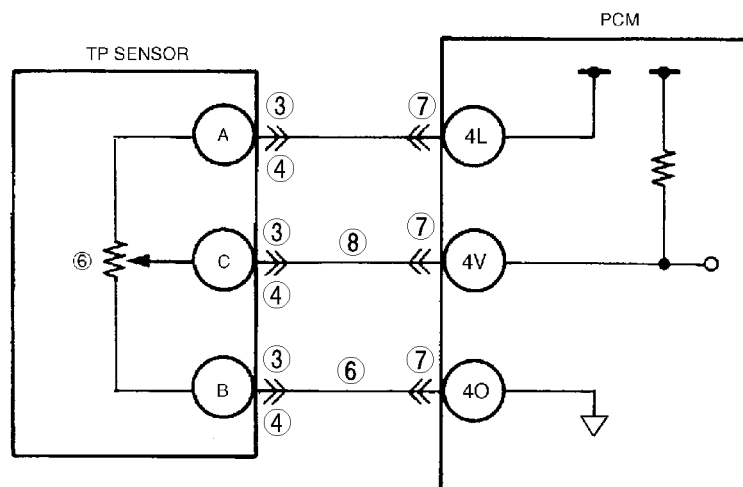
## DTC P0123

A5U010201084W22

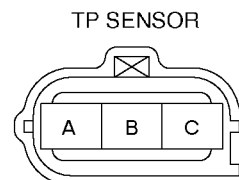
DTC P0123	TP circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>If PCM detects that TP sensor voltage at PCM terminal 4V is <b>above 4.8 V</b> after engine start, PCM determines that TP circuit has a malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction conditions during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>TP sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>Open circuit between TP sensor terminal B and PCM terminal 4O</li> <li>Short to reference voltage (Vref) supply circuit between TP sensor terminal C and PCM terminal 4V</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

**DTC P0123 TP circuit high input**



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> • 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	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> • 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	<b>CHECK TP SENSOR CONNECTOR</b> • 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	<b>INSPECT TP SENSOR CONNECTOR FOR POOR CONNECTION</b> • 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	<b>CHECK TP SENSOR RESISTANCE</b> • Check resistance between following TP sensor terminals (part-side): Terminals A and B: <b>Within 2.5—5 kilohms</b> Terminals B and C: <b>Within 0.2—1.1 kilohms</b> • Is resistance within specification?	Yes Go to next step.
		No Replace TP sensor, then go to Step 9.
6	<b>VERIFY TP SENSOR GND CIRCUIT FOR OPEN AT TP SENSOR CONNECTOR</b> • Check continuity between TP sensor terminal B (harness-side) and body GND. • Is there continuity?	Yes Go to Step 8.
		No Go to next step.
7	<b>CHECK PCM CONNECTOR</b> • Disconnect PCM connector. • Check for poor connection at terminal 4L, 4V and 4O (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes Repair terminal, then go to Step 9.
		No Repair or replace harness for open circuit, then go to Step 9.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
8	<b>VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT</b> <ul style="list-style-type: none"> <li>Check continuity between TP sensor harness-side connector terminals A and C.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Depress and release accelerator pedal several times.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

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## DTC P0125

A5U010201084W23

<b>DTC P0125</b>	<b>Insufficient coolant temperature for closed loop fuel control</b> <ul style="list-style-type: none"> <li>The PCM monitors ECT sensor signal at PCM terminal 4P after engine is started when the 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 ECT to reach the temperature necessary to start closed-loop fuel control.</li> </ul>
<b>DETECTION CONDITION</b>	<b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ECT sensor malfunction</li> <li>Poor connection of connectors</li> <li>PCM malfunction</li> </ul>
<div> <div> </div> <div> <p>PCM (31-PIN)</p> <p>HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)</p> <p>ECT SENSOR</p> <p>HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p> </div> </div>	

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

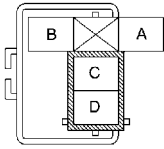
## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>VERIFY CUURENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Clear DTC using WDS or equivalent.</li> <li>Start engine.</li> <li>Warm up engine completely.</li> <li>Access ECT PID.</li> <li>Is ECT PID <b>above 60°C {140°F}</b>?</li> </ul>	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
		No	Go to next step.
4	<b>INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect ECT sensor connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
5	<b>INSPECT ECT SENSOR</b> <ul style="list-style-type: none"> <li>Measure resistance between ECT sensor terminal A and B (part-side).</li> <li>Is resistance <b>approx. 2 kilohms</b>?</li> </ul>	Yes	Go to next step.
		No	Replace ECT sensor, then go to Step 7.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 4P and 4O (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 7.
		No	Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Access ECT PID.</li> <li>Wait until ECT PID <b>below 20°C {68°F}</b>.</li> <li>Start engine and warm it up completely.</li> <li>Is PENDING CODE of same DTC stored?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0126, P0128

A5U010201084W24

DTC P0126 DTC P0128	Coolant thermostat stuck to open
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>If ECT signal never exceeds <b>71°C {160°F}</b> after engine for specifice period, PCM determines that coolant thermostat is stuck open.</li> </ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"> <li>IAT is <b>above -10°C {14°F}</b>.</li> <li>Difference between ECT at engine start and minimum IAT is <b>below 6°C {10.8°F}</b>.</li> <li>Vehicle speed <b>over 9.5km/h {5.9 mph}</b>.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a intermittent monitor (THERMOSTAT).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>DIAGNOSTIC MONITORING TEST RESULTS is available.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Coolant thermostat malfunction</li> <li>Cooling fan malfunction</li> <li>ECT sensor malfunction</li> <li>PCM malfunction</li> </ul>
<p style="text-align: center;">COOLING FAN RELAY</p>  <p style="text-align: center;">HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p>	

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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> • 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	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> • 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	<b>INSPECT FOR OTHER DTCs</b> • Have other DTCs been stored?	Yes Repair circuit malfunction for applicable DTCs.
		No Go to next step.
4	<b>VERIFY COOLANT THERMOSTAT OPERATION</b> • Turn off E/L and A/C. • Remove cooling fan relay located next to main relay box. • Warm up engine until ECT PID reads <b>99 °C {210 °F}</b> . • Short cooling fan relay terminals A and B (harness-side) using a jumper wire. • Monitor ECT PID. • Has ECT PID decreased continuously and stop at <b>84—88 °C {184—190 °F}</b> (thermostat closed)?	Yes Go to Step 6.
		No Go to next step.
5	<b>INSPECT COOLANT THERMOSTAT FOR BEING STUCK OPEN</b> • Remove coolant thermostat and inspect for stuck open. (See 01-12-6 THERMOSTAT INSPECTION) • Is thermostat okay?	Yes Inspect ECT sensor. Replace ECT sensor if necessary, go to next step.
		No Replace coolant thermostat, then go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
6	<b>VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Cool down engine.</li> </ul> <b>Note</b> <ul style="list-style-type: none"> <li>If workshop interior/outdoor temperature difference is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to cool down engine outside of workshop.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Access ECT and IAT PIDs and make sure that each value is within following conditions. <ul style="list-style-type: none"> <li>IAT is <b>above -10°C {14°F}</b>.</li> <li>Difference between ECT and IAT is <b>below 6°C {10.8°F}</b>.</li> </ul> </li> <li>Is there any PID that is out of specification?</li> </ul>	Yes	Take corrective action (e.g. cool down engine), repeat this step.
		No	Go to next step for DTC P0126. Go to Step 8 for DTC P0128.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0126 COMPLETED</b> <ul style="list-style-type: none"> <li>Start engine and turn off E/L and A/C.</li> <li>Access DIAGNOSIS MONITORING TEST RESULTS function and monitor TEST #10:32:00.</li> <li>Drive vehicle from <b>40—100km/h {25—62.5mph}</b> until TEST value is changed.</li> </ul> <b>Note</b> <ul style="list-style-type: none"> <li>This test requires actual driving. Chassis roller cannot be used for this test. Therefore, it is recommended to cool down engine outside of workshop.</li> <li>During test drive, constant speed should be maintained, although 2 or 3 stops is acceptable during every <b>5 min</b> of driving time (e.g. for traffic signals). Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period.</li> <li>Test period depends on ECT at engine start. (e.g. If ECT is <b>-10°C {14°F}</b>, monitoring period is <b>38 min</b> and if ECT is <b>30°C {86°F}</b>, monitoring period is <b>8 min</b>. Therefore, it is recommended to cool down engine out of workshop. )</li> </ul> <ul style="list-style-type: none"> <li>Verify TEST #10:32:00 value.</li> <li>Is value above minimum value?</li> </ul>	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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STEP	INSPECTION	ACTION
8	<b>VERIFY TROUBLESHOOTING OF DTC P0128 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Cool down engine.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Access ECT PID and make sure that ECT PID is within <b>-7—35°C {20—95°F}</b>.</li> <li>Start engine.</li> <li>Warm up engine without depressing accelerator pedal until ECT PID reaches <b>above 71°C {160°F}</b>.</li> <li>Drive vehicle at <b>9.5 km/h {6 mph}</b> or above.</li> <li>Access DIAGNOSTIC MONITORING TEST RESULTS function.</li> <li>Verify TEST #10:31:00 values.</li> <li>Is value below maximum value?</li> </ul>	Yes Go to next step.
		No Replace PCM, then go to next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0131

A5U010201084W25

DTC P0131	HO2S (front) no inversion (low voltage stuck)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from HO2S (front) when the following monitoring conditions are met. If input voltage from sensor remains <b>below 0.45 V</b> for <b>43.3 s</b>, PCM determines that there is no HO2S (front) inversion.</li> </ul> <b>MONITORING CONDITIONS</b> <ul style="list-style-type: none"> <li>Engine speed is <b>above 1,500 rpm</b>.</li> <li>Engine coolant temperature is <b>above 70 °C {158 °F}</b>.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>HO2S (front) malfunction</li> <li>HO2S (front) heater malfunction</li> <li>Fuel injector malfunction</li> <li>Pressure regulator malfunction</li> <li>FP malfunction</li> <li>Fuel delivery hose leakage</li> <li>Fuel filter clogging</li> <li>Fuel return hose leakage</li> <li>Air suction or leakage</li> <li>PCV valve malfunction</li> <li>Purge solenoid valve malfunction</li> <li>Purge solenoid hoses are hooked up incorrectly.</li> <li>Ignition coil malfunction</li> <li>Insufficient compression</li> <li>Engine malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
3	<b>VERIFY RELATED PENDING CODE AND STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then start engine.</li> <li>Verify pending code and stored DTCs using WDS or equivalent.</li> <li>Are other DTCs present?</li> </ul>	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0131 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Warm up engine.</li> <li>Access O2S11 PID using WDS or equivalent.</li> <li>Verify PID while racing engine (in PARK).</li> <li>Is PID reading okay? <ul style="list-style-type: none"> <li><b>More than 0.45 V</b> when suddenly depressing accelerator pedal (rich condition)</li> <li><b>Less than 0.45 V</b> just after release of accelerator pedal (lean condition)</li> </ul> </li> </ul>	Yes	Go to next step.
		No	Replace HO2S (front), then go to Step 18.
6	<b>INSPECT PURGE SOLENOID VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect purge solenoid valve operation.</li> <li>Is purge solenoid valve okay?</li> </ul>	Yes	Go to Step 11.
		No	Replace purge solenoid valve. Then go to Step 18.
7	<b>INSPECT PCV VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Inspect PCV valve operation. (See 01-16-10 PCV VALVE INSPECTION.)</li> <li>Is PCV valve okay?</li> </ul>	Yes	Go to next step.
		No	Replace PCV, then go to Step 18.
8	<b>INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE)</b> <ul style="list-style-type: none"> <li>start engine.</li> <li>Inspect fuel line pressure while engine running. (See 01-14-4 FUEL LINE PRESSURE INSPECTION.)</li> <li>Is fuel line pressure <b>within 370—420 kPa {3.7—4.3 kgf/cm<sup>2</sup>, 53—61 psi}</b>?</li> </ul>	Yes	Go to Step 11.
		No	Go to next step.
9	<b>INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PUMP</b> <ul style="list-style-type: none"> <li>Visually inspect fuel line for any leakage.</li> <li>Is any fuel leakage found?</li> </ul>	Yes	Replace suspected fuel line, then go to Step 18.
		No	Inspect fuel filters for following: <ul style="list-style-type: none"> <li>Restriction or clogging at fuel filter (high-pressure)</li> <li>Foreign material or stain inside fuel filter (low-pressure) <ul style="list-style-type: none"> <li>If restriction or clogging is found at fuel filter (high-pressure), replace fuel filter (high-pressure).</li> <li>If foreign material or stain is found inside fuel filter (low-pressure), clean fuel tank and fuel filter (low-pressure).</li> <li>If all items above are okay, go to next step.</li> </ul> </li> </ul>
10	<b>INSPECT FUEL PUMP MAXIMUM PRESSURE</b> <ul style="list-style-type: none"> <li>Stop engine.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Perform FP maximum pressure test. (See 01-14-12 Fuel Pump (FP) Pressure Inspection.)</li> <li>Is fuel pump maximum pressure <b>less than 640 kPa {6.5 kgf/cm<sup>2</sup>, 92 psi}</b>?</li> </ul>	Yes	Replace pressure regulator, then go to step 18.
		No	Inspect FP circuit for open or poor connection. <ul style="list-style-type: none"> <li>Repair or replace suspected circuit.</li> <li>If circuit is okay, replace fuel pump. Then go to Step 18.</li> </ul>
11	<b>CHECK IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT</b> <ul style="list-style-type: none"> <li>Verify blinking condition on each cylinder using timing light at idle.</li> <li>Do all cylinders show blinking condition?</li> </ul>	Yes	Go to Step 15.
		No	Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
12	<b>CHECK HIGH-TENSION LEADS OF NO BLINKING CYLINDER</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect high-tension leads for installation condition, corrosion on terminal, open lead and damaged cover.</li> <li>Is condition of high-tension lead okay?</li> </ul>	Yes Go to next step.
		No Replace faulty high-tension lead, then go to Step 18.
13	<b>INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect ignition coil connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between ignition coil connector terminal D (harness-side) and body ground.</li> <li>Is voltage reading <b>B+</b>?</li> </ul>	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	<b>INSPECT IGNITION COIL RESISTANCE</b> <ul style="list-style-type: none"> <li>Check ignition coil resistance. (See 01-18-2 IGNITION COIL INSPECTION.)</li> <li>Is coil resistance okay?</li> </ul>	Yes Go to next step.
		No Replace ignition coil, then go to Step 18.
15	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression. (See 01-10-7 COMPRESSION INSPECTION.)</li> <li>Is it okay?</li> </ul>	Yes Go to next step.
		No Implement engine overhaul for repairs, then go to next step.
16	<b>INSPECT FUEL INJECTOR OPERATION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect injector. (See 01-14-17 FUEL INJECTOR INSPECTION.)</li> <li>Is injector okay?</li> </ul>	Yes Go to next step.
		No Replace injector, then go to Step 18.
17	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <p><b>Warning</b></p> <ul style="list-style-type: none"> <li><b>Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</b></li> <li><b>When removing radiator cap, wrap a thick cloth around and turn it slowly.</b></li> </ul> <ul style="list-style-type: none"> <li>Remove radiator cap.</li> <li>Implement procedure to bleed air from engine coolant, then idle engine.</li> <li>Are there any small bubbles which makes engine coolant white at the filler opening?</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>Large bubbles are normal since they remain air coming out from engine coolant passage.</li> </ul>	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	<b>VERIFY TROUBLESHOOTING OF DTC P0131 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Access ECT and RPM PIDs using WDS or equivalent.</li> <li>Make sure that ECT PID is <b>above 70 °C {158 °F}</b>.</li> <li>Increase and keep engine speed <b>above 1,500 rpm</b> for at <b>least 1 min.</b></li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace or reprogram PCM. Then go to next step.
		No Go to next step.

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
19	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE.)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE.)
		No Troubleshooting completed.

## DTC P0132

A5U010201084W26

DTC P0132	HO2S (front) no inversion (high voltage stuck)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from HO2S (front) when the following monitoring conditions are met. If input voltage from sensor remains <b>above 0.45 V</b> for <b>43.3 s</b>, PCM determines that there is no HO2S (front) inversion.</li> </ul> <p><b>MONITORING CONDITIONS</b></p> <ul style="list-style-type: none"> <li>Engine speed is <b>above 1,500 rpm</b>.</li> <li>Engine coolant temperature is <b>above 70 °C {158 °F}</b>.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>HO2S (front) malfunction</li> <li>HO2S (front) heater malfunction</li> <li>Fuel injector malfunction</li> <li>Pressure regulator malfunction</li> <li>FP malfunction</li> <li>Fuel return hose clogging</li> <li>PCV valve malfunction</li> <li>Purge solenoid valve malfunction</li> <li>Purge solenoid hoses are hooked up incorrectly.</li> <li>Engine malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE AND STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then start engine.</li> <li>Verify pending code and stored DTCs using WDS or equivalent.</li> <li>Are other DTCs present?</li> </ul>	Yes Go to appropriate DTC troubleshooting procedures.
		No Go to next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0132 on FREEZE FRAME DATA?</li> </ul>	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Warm up engine.</li> <li>Access O2S11 PID using WDS or equivalent.</li> <li>Verify PID while racing engine (in PARK).</li> <li>Is PID reading okay? <ul style="list-style-type: none"> <li><b>More than 0.45 V</b> when suddenly depressing accelerator pedal (rich condition)</li> <li><b>Less than 0.45 V</b> just after release of accelerator pedal (lean condition)</li> </ul> </li> </ul>	Yes Go to next step.
		No Replace HO2S (front), then go to Step 12.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A

STEP	INSPECTION	ACTION	
6	<b>INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Inspect fuel line pressure while engine running. (See 01-14-4 FUEL LINE PRESSURE INSPECTION.)</li> <li>Is fuel line pressure <b>within 370—420 kPa {3.7—4.3 kgf/cm<sup>2</sup>, 53—61 psi}</b>?</li> </ul>	Yes	Go to Step 9.
		No	Go to next step.
7	<b>VERIFY VACUUM IS LEADING TO PRESSURE REGULATOR</b> <ul style="list-style-type: none"> <li>Disconnect vacuum hose from pressure regulator.</li> <li>Verify that vacuum is felt at opening port of disconnected vacuum hose.</li> <li>Is vacuum felt?</li> </ul>	Yes	Inspect following parts and repair or replace if necessary: <ul style="list-style-type: none"> <li>Fuel pump maximum pressure</li> <li>Fuel return pipe for clogging <ul style="list-style-type: none"> <li>If all items above are okay, replace pressure regulator. Then, go to Step 12.</li> </ul> </li> </ul>
		No	Verify vacuum hoses are connected correctly. <ul style="list-style-type: none"> <li>If okay, replace PRC solenoid valve. Then go to Step 12.</li> <li>If not, reconnect vacuum hoses to correct position. Then go to Step 12.</li> </ul>
8	<b>INSPECT PURGE SOLENOID VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect purge solenoid valve operation.</li> <li>Is purge solenoid valve okay?</li> </ul>	Yes	Go to Step 10.
		No	Replace purge solenoid valve. Then go to Step 12.
9	<b>INSPECT PCV VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Inspect PCV valve operation. (See 01-16-10 PCV VALVE INSPECTION.)</li> <li>Is PCV valve okay?</li> </ul>	Yes	Go to next step.
		No	Replace PCV, then go to Step 12.
10	<b>INSPECT FUEL INJECTOR OPERATION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect injector. (See 01-14-17 FUEL INJECTOR INSPECTION.)</li> <li>Is injector okay?</li> </ul>	Yes	Go to next step.
		No	Replace injector, then go to Step 12.
11	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <p><b>Warning</b></p> <ul style="list-style-type: none"> <li><b>Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</b></li> <li><b>When removing radiator cap, wrap a thick cloth around and turn it slowly.</b></li> </ul> <ul style="list-style-type: none"> <li>Remove radiator cap.</li> <li>Implement procedure to bleed air from engine coolant, then idle engine.</li> <li>Are there any small bubbles which makes engine coolant white at the filler opening?</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>Large bubbles are normal since they remain air coming out from engine coolant passage.</li> </ul>	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.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
12	<b>VERIFY TROUBLESHOOTING OF DTC P0132 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Access ECT and RPM PIDs using WDS or equivalent.</li> <li>Make sure that ECT PID is <b>above 70 °C {158 °F}</b>.</li> <li>Increase and keep engine speed <b>above 1,500 rpm</b> for at <b>least 1 min.</b></li> <li>Is pending code of same DTC present?</li> </ul>	Yes Replace or reprogram PCM. Then go to next step.
		No Go to next step.
13	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01–02A–10 AFTER REPAIR PROCEDURE.)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE.)
		No Troubleshooting completed.

## DTC P0133

A5U010201084W27

DTC P0133	HO2S (Front) circuit slow response
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>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.</li> </ul> <b>MONITORING CONDITIONS</b> <ul style="list-style-type: none"> <li>Drive mode 3</li> <li>Following conditions are met: <ul style="list-style-type: none"> <li>Calculation load is <b>16—50% (MT), 20—50% (AT)</b> [at engine speed <b>2,000 rpm</b>]</li> <li>Engine speed is <b>750—3,100 rpm (MT), 810—3,100 rpm (AT)</b></li> <li>Vehicle speed is <b>over 5.6 km/h {3.5 mph}</b>.</li> <li>Engine coolant temperature is <b>above –10°C {14°F}</b>.</li> </ul> </li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is an intermittent monitor. (OXYGEN SENSOR)</li> <li>MIL illuminates if PCM detects either of above malfunction conditions in two consecutive drive cycles.</li> <li>DIAGNOSTIC MONITORING TEST RESULTS is available.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Front HO2S deterioration</li> <li>Front HO2S heater malfunction</li> <li>PRC solenoid valve malfunction</li> <li>Pressure regulator malfunction</li> <li>FP malfunction</li> <li>Fuel filter clogged or restricted</li> <li>Fuel leakage on fuel line from fuel distribution pipe and fuel pump</li> <li>Fuel return hose clogged</li> <li>Leakage from exhaust system</li> <li>Purge solenoid valve malfunction</li> <li>Purge solenoid hoses improper connection</li> <li>Insufficient compression</li> <li>Engine malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
3	<b>VERIFY RELATED PENDING CODE AND STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then start engine.</li> <li>Verify pending code and/or stored DTCs using WDS or equivalent.</li> <li>Is the following DTC also present? <ul style="list-style-type: none"> <li>— P0442, P0443, P0455, P0031, P0032 or P1450 with P0133</li> </ul> </li> </ul>	Yes	Go to appropriate DTC troubleshooting procedures, then go to Step 15. (See 01–02A–13 DTC TABLE.)
		No	Go to next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0133 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE.)
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS</b> <ul style="list-style-type: none"> <li>Warm up engine.</li> <li>Access O2S11 PID using WDS or equivalent.</li> <li>Check PID under following accelerator pedal conditions (in PARK). <ul style="list-style-type: none"> <li>— <b>More than 0.45 V</b> when suddenly depressing accelerator pedal (rich condition)</li> <li>— <b>Less than 0.45 V</b> just after release of accelerator pedal (lean condition)</li> </ul> </li> <li>Is PID reading okay?</li> </ul>	Yes	Go to Step 8.
		No	Go to next step.
6	<b>INSPECT INSTALLATION OF FRONT HO2S</b> <ul style="list-style-type: none"> <li>Check if HO2S (front) is loosely installed.</li> <li>Is sensor installed securely?</li> </ul>	Yes	Go to next step.
		No	Retighten sensor, then go to Step 15.
7	<b>INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM</b> <ul style="list-style-type: none"> <li>Visually check if any gas leakage is found between exhaust manifold and HO2S (front).</li> <li>Is there any gas leakage?</li> </ul>	Yes	Repair or replace any faulty exhaust parts, then go to Step 15.
		No	Replace sensor, then go to Step 15.
8	<b>INSPECT LONG TERM FUEL TRIM</b> <ul style="list-style-type: none"> <li>Access LONGFT1 PIDs.</li> <li>Compare it with FREEZE FRAME DATA (FFD) recorded at Step 1.</li> <li>Is it below FFD value?</li> </ul>	Yes	Engine is driven under rich condition. Go to next step.
		No	Engine is driven under lean condition. Go to Step 11.
9	<b>INSPECT FUEL LINE PRESSURE (Excessive fuel line pressure)</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Inspect fuel line pressure while engine running. (See 01–14–4 FUEL LINE PRESSURE INSPECTION.)</li> <li>Is fuel line pressure <b>within 370–420 kPa {3.7–4.3 kgf/cm<sup>2</sup>, 53–61 psi}</b>?</li> </ul>	Yes	Go to Step 14.
		No	Go to next step.
10	<b>VERIFY VACUUM IS LED TO PRESSURE REGULATOR</b> <ul style="list-style-type: none"> <li>Disconnect vacuum hose from pressure regulator.</li> <li>Verify that vacuum is felt at opening port of disconnected vacuum hose.</li> <li>Is vacuum felt?</li> </ul>	Yes	Inspect fuel pump maximum pressure and fuel return pipe for clogging. (See 01–14–12 FUEL PUMP (FP) INSPECTION.) <ul style="list-style-type: none"> <li>If any problem is found, repair or replace suspected parts.</li> <li>If all items above are okay, replace pressure regulator. Then go to Step 15.</li> </ul>
		No	Verify vacuum hoses are connected correctly. <ul style="list-style-type: none"> <li>If okay, replace PRC solenoid valve.</li> <li>If not, reconnect vacuum hoses to correct position. Then go to Step 15.</li> </ul>
11	<b>INSPECT FUEL LINE PRESSURE (Low fuel line pressure)</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Inspect fuel line pressure while engine running. (See 01–14–4 FUEL LINE PRESSURE INSPECTION.)</li> <li>Is fuel line pressure <b>within 370–420 kPa {3.7–4.3 kgf/cm<sup>2</sup>, 53–61 psi}</b>?</li> </ul>	Yes	Go to Step 14.
		No	Go to next step.

01–02A

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
12	<b>INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE</b> <ul style="list-style-type: none"> <li>Visually inspect fuel line for any leakage.</li> <li>Is any fuel leakage found?</li> </ul>	Yes	Replace suspected fuel line, then go to Step 15.
		No	Inspect fuel filters for following: <ul style="list-style-type: none"> <li>Restriction or clogging at fuel filter (high-pressure)</li> <li>Foreign material or stain inside fuel filter (low-pressure)</li> </ul> Perform following actions as result. <ul style="list-style-type: none"> <li>If restriction or clogging is found at fuel filter (high-pressure), replace fuel filter (high-pressure).</li> <li>If foreign material or stain is found inside fuel filter (low-pressure), clean fuel tank and fuel filter (low-pressure).</li> <li>If all items above are okay, go to next step.</li> </ul>
13	<b>INSPECT FUEL PUMP MAXIMUM PRESSURE</b> <ul style="list-style-type: none"> <li>Perform fuel pump maximum pressure test. (See 01-14-12 FUEL PUMP (FP) INSPECTION.)</li> <li>Is fuel pump maximum pressure <b>less than 637 kPa {6.5 kgf/cm<sup>2</sup>, 92 psi}</b>?</li> </ul>	Yes	Replace pressure regulator, then go to step 15.
		No	Inspect fuel pump circuit for open or poor connection. <ul style="list-style-type: none"> <li>Repair or replace suspected circuit.</li> <li>If circuit is okay, replace fuel pump.</li> </ul> Then go to Step 15.
14	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b>  <b>Warning</b> <ul style="list-style-type: none"> <li><b>Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</b></li> <li><b>When removing radiator cap, wrap a thick cloth around and turn it slowly.</b></li> </ul> <ul style="list-style-type: none"> <li>Remove radiator cap.</li> <li>Implement procedure to bleed air from engine coolant, then idle engine.</li> <li>Are there any small bubbles, which makes engine coolant white at the filler opening?</li> </ul> <b>Note</b> <ul style="list-style-type: none"> <li>Large bubbles are normal since they remain air coming out from engine coolant passage.</li> </ul>	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.
15	<b>VERIFY TROUBLESHOOTING OF DTC P0133 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Run OBD-II DRIVE MODE 1 and 3. (See 01-02A-10 OBD-II DRIVE MODE.)</li> <li>Stop vehicle and access ON BOARD SYSTEM READINESS TEST to inspect DRIVE MODE completion status.</li> <li>Verify RFC changes to YES for OXYGEN SENSOR.               <ul style="list-style-type: none"> <li>If not, run DRIVE MODE again.</li> </ul> </li> <li>Access DIAGNOSTIC MONITORING TEST RESULTS.</li> <li>Verify following TEST # values:               <ul style="list-style-type: none"> <li>10:01:11, 10:02:11 or 10:03:11</li> </ul> </li> <li>Are they all below MAX value?</li> </ul>	Yes	Go to next step.
		No	Replace PCM, then go to next step.
16	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE.)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE.)
		No	Troubleshooting completed.

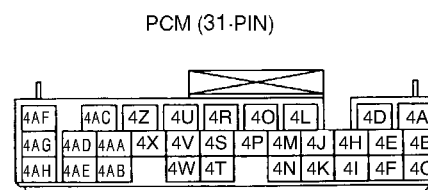
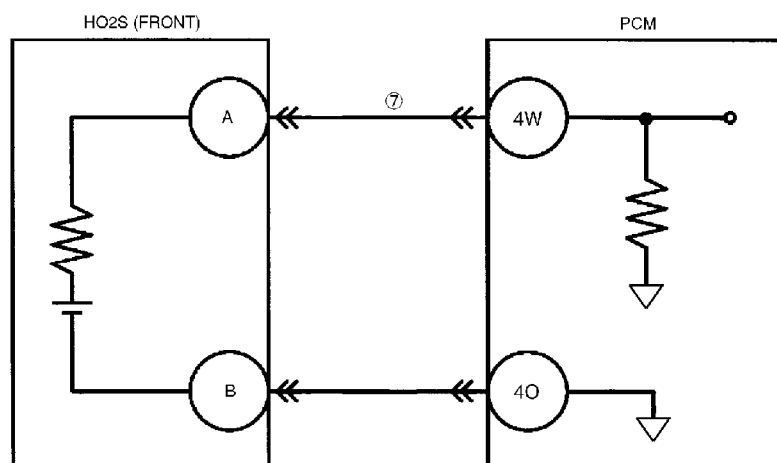


# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

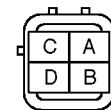
## DTC P0134

A5U010201084W28

DTC P0134	HO2S (front) circuit no activity detected
DETECTION CONDITION	<ul style="list-style-type: none"> <li>PCM monitors input voltage from HO2S (front) when the following monitoring conditions are met. If input voltage from sensor never <b>exceed 0.55 V</b> for <b>54.2 s</b>, PCM determines that sensor circuit is not activated.</li> </ul> <p><b>MONITORING CONDITIONS</b></p> <ul style="list-style-type: none"> <li>— Drive mode 3</li> <li>— Following conditions are met <ul style="list-style-type: none"> <li>• Engine speed is <b>above 1,500 rpm</b>.</li> <li>• ECT is <b>above 70°C {158°F}</b>.</li> </ul> </li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>• This is a continuous monitor (CCM).</li> <li>• MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>• PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>• FREEZE FRAME DATA is available.</li> <li>• DTC is stored in the PCM memory.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• HO2S (front) deterioration</li> <li>• HO2S (front) heater malfunction</li> <li>• Leakage exhaust system</li> <li>• Open or short to GND circuit between following terminal and PCM terminal <ul style="list-style-type: none"> <li>— For P0134: HO2S (front) terminal A and PCM terminal 4W</li> </ul> </li> <li>• Insufficient compression</li> <li>• Engine malfunction</li> </ul>


HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

HO2S (FRONT)


HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Check for related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	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	<b>VERIFY RELATED PENDING CODE AND STORED DTCS</b> <ul style="list-style-type: none"> <li>• Turn ignition key to OFF, then ON (Engine OFF).</li> <li>• Verify pending code and stored DTCs using WDS or equivalent.</li> <li>• Is other DTC present except P0131 and P0132?</li> </ul>	Yes Go to appropriate DTC troubleshooting procedures.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0134 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE)
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS</b> <ul style="list-style-type: none"> <li>Warm up engine.</li> <li>Access O2S11 PID using WDS or equivalent.</li> <li>Check PID under following AP condition (in PARK).</li> <li>Is PID reading okay?                             <ul style="list-style-type: none"> <li><b>More than 0.55 V</b> when suddenly depressing AP (rich condition).</li> <li><b>Less than 0.55 V</b> just after release of AP (lean condition)</li> </ul> </li> </ul>	Yes	Go to Step 8.
		No	Go to next step.
6	<b>INSPECT INSTALLATION OF HO2S (FRONT)</b> <ul style="list-style-type: none"> <li>Check if HO2S (front) is loosely installed.</li> <li>Is sensor installed securely?</li> </ul>	Yes	Go to next step.
		No	Install sensor securely, go to Step 10.
7	<b>INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM</b> <ul style="list-style-type: none"> <li>Visually check if any gas leakage is found between exhaust manifold and front or HO2S (rear).</li> <li>Is there any gas leakage?</li> </ul>	Yes	Repair or replace any faulty exhaust parts, then go to Step 10.
		No	<ul style="list-style-type: none"> <li>Inspect the following harnesses for open or short to GND circuit, repair or replace harness if necessary                             <ul style="list-style-type: none"> <li>HO2S (front) terminal A (harness-side) to PCM terminal 4W (harness-side)                                     <ul style="list-style-type: none"> <li>Repair or replace harness if necessary.</li> </ul> </li> </ul> </li> <li>If all items above are okay, replace faulty sensor.</li> </ul> Go to Step 10.
8	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <p><b>Warning</b></p> <ul style="list-style-type: none"> <li><b>Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</b></li> <li><b>When removing radiator cap, wrap a thick cloth around and turn it slowly.</b></li> </ul> <ul style="list-style-type: none"> <li>Remove radiator cap.</li> <li>Implement procedure to bleed air from engine coolant, then idle engine.</li> <li>Are there any small bubble, which makes engine coolant white the filler opening?</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>Large bubbles are normal since they remain air coming out from engine coolant passage.</li> </ul>	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	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression. (See 01–10–7 COMPRESSION INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0134</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Access RPM and ECT PIDs.</li> <li>Verify that ECT PID is reading <b>above 70°C {158°F}</b>.</li> <li>Increase engine speed <b>above 1,500 rpm</b> (RPM PID reading) <b>more than 54.2 s.</b></li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.

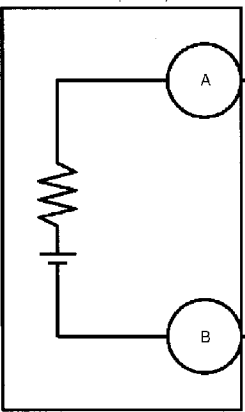
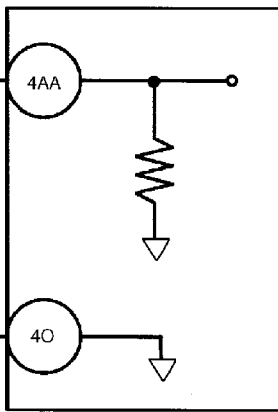
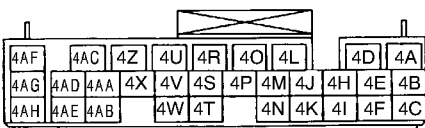
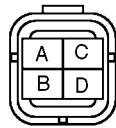
# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0138

A5U010201084W29

01-02A

DTC P0138	HO2S (rear) circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from HO2S (rear) when monitoring conditions are met. If input voltage from sensor is <b>above 0.45 V</b> for <b>6 s</b> during deceleration fuel cut, PCM determines that the circuit input is high.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>HO2S (rear) malfunction</li> <li>Short to power circuit in wiring between following HO2S (rear) terminal A and PCM terminal 4AA.</li> </ul>
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>HO2S (REAR)</p>  </div> <div style="text-align: center;"> <p>PCM</p>  </div> <div style="text-align: center;"> <p>PCM (31-PIN)</p>  <p>HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)</p> </div> <div style="text-align: center;"> <p>HO2S (REAR)</p>  <p>HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p> </div> </div>	

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"><li>If vehicle is not repaired, go to next step.</li></ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then ON (Engine OFF).</li> <li>Verify pending code or stored DTCs using WDS or equivalent.</li> <li>Is other DTC present?</li> </ul>	Yes Go to appropriate DTC troubleshooting procedures. (See 01-02A-13 DTC TABLE)
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0138 on FREEZE FRAME DATA?</li> </ul>	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01–02A–13 DTC TABLE)
5	<b>INSPECT HO2S (REAR) SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect HO2S (rear) connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between HO2S (rear) terminal (harness-side) and body GND.</li> <li>Is any voltage reading?</li> </ul>	Yes Replace short to power supply circuit, then go to Step 7.
		No Go to next step.
6	<b>VERIFY CUURENT INPUT SIGNAL STATUS</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Access O2S12 PID using WDS or equivalent.</li> <li>Verify PID while racing engine at least <b>10 times</b> (in PARK).</li> <li>Does PID reading stay <b>above 0.45 V</b>?</li> </ul>	Yes Repair or replace sensor, then go to next step.
		No Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0138 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Run DRIVE MODE 1 and 3.</li> <li>Is PENDING CODE of same DTC present.</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform “After Repair Procedure”. (See 01–02A–10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE)
		No Troubleshooting completed.

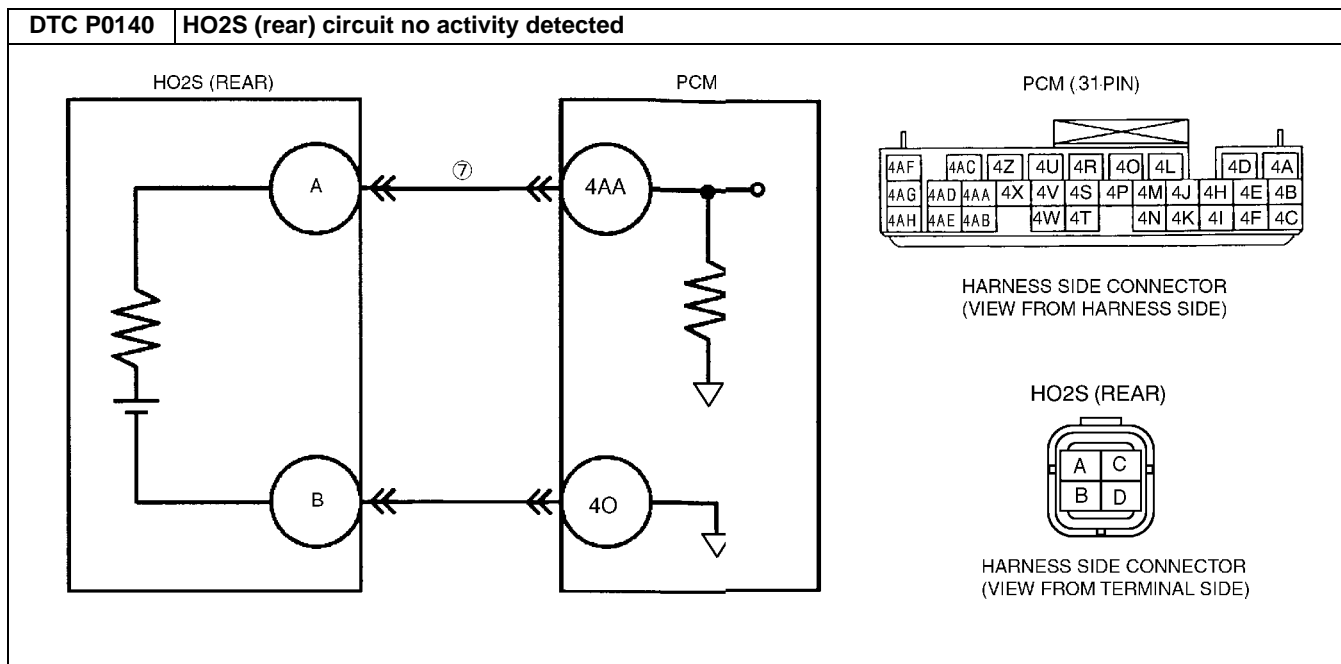
## DTC P0140

A5U010201084W30

DTC P0140	HO2S (rear) circuit no activity detected
DETECTION CONDITION	<ul style="list-style-type: none"> <li>PCM monitors input voltage from HO2S (rear) when the following monitoring conditions are met. If input voltage from sensor never <b>exceeds 0.55 V</b> for <b>54.2 s</b>, PCM determines that sensor circuit is not activated.</li> </ul> <b>MONITORING CONDITIONS</b> <ul style="list-style-type: none"> <li>Drive mode 3</li> <li>Following conditions are met: <ul style="list-style-type: none"> <li>Engine speed is <b>above 1,500 rpm</b>.</li> <li>ECT is <b>above 70°C {158°F}</b>.</li> </ul> </li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
	<b>POSSIBLE CAUSE</b> <ul style="list-style-type: none"> <li>HO2S (rear) deterioration</li> <li>HO2S (rear) heater malfunction</li> <li>Leakage exhaust system</li> <li>Open or short to GND circuit between HO2S (rear) terminal A and PCM terminal 4AA</li> <li>Insufficient compression</li> <li>Engine malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A



## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>VERIFY RELATED PENDING CODE AND STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then ON (Engine OFF).</li> <li>Verify pending code and stored DTCs using WDS or equivalent.</li> <li>Is other DTC present except P0131 and P0132?</li> </ul>	Yes	Go to appropriate DTC troubleshooting procedures. (See 01-02A-13 DTC TABLE)
		No	Go to next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0140 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-13 DTC TABLE)
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS</b> <ul style="list-style-type: none"> <li>Warm up engine.</li> <li>Access O2S12 PID using WDS or equivalent.</li> <li>Verify PID while racing engine at least <b>10 times</b> (in PARK).</li> <li>Is PID reading okay? <ul style="list-style-type: none"> <li><b>More than 0.55 V</b> at least once during engine racing.</li> </ul> </li> </ul>	Yes	Go to Step 8.
		No	Go to next step.
6	<b>INSPECT INSTALLATION OF HO2S (REAR)</b> <ul style="list-style-type: none"> <li>Check if HO2S (rear) is loosely installed.</li> <li>Is sensor installed securely?</li> </ul>	Yes	Go to next step.
		No	Install sensor securely, then go to Step 10.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
7	<b>INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM</b> <ul style="list-style-type: none"> <li>Visually check if there is any gas leakage between exhaust pipe and HO2S (rear).</li> <li>Is there any gas leakage?</li> </ul>	Yes Repair or replace any faulty exhaust parts, then go to Step 10.
		No <ul style="list-style-type: none"> <li>Inspect the following harnesses for open or short to GND circuit, repair or replace harness if necessary. <ul style="list-style-type: none"> <li>HO2S (rear) terminal A (harness-side) to PCM terminal 4AA (harness-side) <ul style="list-style-type: none"> <li>Repair or replace harness if necessary.</li> </ul> </li> </ul> </li> <li>If all items above are okay, replace faulty sensor. Go to Step 10.</li> </ul>
8	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <p><b>Warning</b></p> <ul style="list-style-type: none"> <li><b>Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</b></li> <li><b>When removing radiator cap, wrap a thick cloth around and turn it slowly.</b></li> </ul> <ul style="list-style-type: none"> <li>Remove radiator cap.</li> <li>Implement procedure to bleed air from engine coolant, then idle engine.</li> <li>Are there any small bubbles, which makes engine coolant white the filler opening?</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>Large bubbles are normal since they remain air coming out from engine coolant passage.</li> </ul>	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	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression. (See 01-10-7 COMPRESSION INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes Go to next step.
		No Implement engine overhaul for repairs, then go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0140 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Access RPM and ECT PIDs.</li> <li>Verify that ECT PID is reading <b>above 70°C {158°F}</b>.</li> <li>Increase engine speed <b>above 1,500 rpm</b> (RPM PID reading) <b>more than 54.2 s</b>.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0171

A5U010201084W31

DTC P0171	Fuel trim system too lean
DETECTION CONDITION	<ul style="list-style-type: none"> <li>PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) values when the monitoring conditions are met or the DRIVE MODE 1 is run. If fuel trim exceeds preprogrammed criteria, PCM determines that the fuel system is too lean.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor. (FUEL SYSTEM)</li> <li>MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>

## 01-02A-70

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0171	Fuel trim system too lean
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Misfire</li> <li>• HO2S (front) deterioration</li> <li>• HO2S (front) heater malfunction</li> <li>• Pressure regulator malfunction</li> <li>• FP malfunction</li> <li>• Fuel filter clogged or restricted</li> <li>• Fuel leakage on fuel line from fuel delivery pipe and FP</li> <li>• Leakage exhaust system</li> <li>• Purge solenoid valve malfunction</li> <li>• Purge solenoid hoses improper connection</li> <li>• Insufficient compression</li> </ul>

01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Check for related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>• If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCs</b> <ul style="list-style-type: none"> <li>• Turn ignition key to OFF, then ON (Engine OFF).</li> <li>• Verify related PENDING CODE or stored DTCs.</li> <li>• Is other DTCs present?</li> </ul>	Yes If misfire DTC is present, go to Step 8. If other DTC is present, go to appropriate DTC troubleshooting procedures. (See 01-02A-13 DTC TABLE)
		No If drive ability concern is present, go to Step 8. If not, go to next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>• Is DTC P0171 on FREEZE FRAME DATA?</li> </ul>	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)</b> <ul style="list-style-type: none"> <li>• Access ECT, MAF, TP and VSS PIDs using WDS or equivalent. (See 01-40-6 Using SST (WDS or Equivalent))</li> <li>• Is there any signal that is far out of specification when ignition key is ON and engine runs?</li> </ul>	Yes Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 19.
		No Go to next step.
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b> <ul style="list-style-type: none"> <li>• Inspect same PIDs as Step 5 while simulating FREEZE FRAME DATA condition.</li> <li>• Is there any input signal which causes drastic changes?</li> </ul>	Yes Inspect suspected sensor and related wiring harnesses, and repair or replace it. go to Step 19.
		No Go to next step.
7	<b>VERIFY CURRENT INPUT SIGNAL STATUS OF HO2S (FRONT)</b> <ul style="list-style-type: none"> <li>• Access O2S11 PID using WDS or equivalent.</li> <li>• Check PID under following AP condition (in PARK).</li> <li>• Is PID reading okay? <ul style="list-style-type: none"> <li>— <b>More than 0.45 V</b> when suddenly depressing AP (rich condition).</li> <li>— <b>Less than 0.45 V</b> just after release of AP (lean condition)</li> </ul> </li> </ul>	Yes Inspect for air suction due to cracks, damages and loose parts between following parts: <ul style="list-style-type: none"> <li>• From ACL to TB</li> <li>• From TB to dynamic chamber</li> <li>• From dynamic chamber to intake manifold</li> <li>• Vacuum hoses</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• Engine speed may change when rust penetrating agent is sprayed on the air suction area.</li> </ul> <p>Repair or replace any faulty part, then go to Step 19.</p>
		No Visually inspect for any gas leakage between exhaust manifold and HO2S (front). <ul style="list-style-type: none"> <li>• If there is no leakage, replace HO2S (front).</li> </ul> <p>Go to Step 19.</p>

## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
8	<b>INSPECT MAF V PID</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Access MAF PID using WDS or equivalent.</li> <li>Verify that MAF PID changes quickly according to racing engine RPM.</li> <li>Is MAF PID response okay?</li> </ul>	Yes	Go to next step.
		No	Replace MAF sensor, then go to Step 19.
9	<b>INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE-AIR SYSTEM</b> <ul style="list-style-type: none"> <li>Visually inspect intake-air system for loose, cracked or damaged hoses.</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace source of air suction, then go to Step 19.
		No	Go to next step.
10	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>If engine does not start, inspect fuel line pressure with ignition key ON.</li> </ul> <ul style="list-style-type: none"> <li>Inspect fuel line pressure while engine running. (See 01-14-4 FUEL LINE PRESSURE INSPECTION)</li> <li>Is fuel line pressure <b>within 370—420 kPa {3.7—4.3 kgf/cm<sup>2</sup>, 53—61 psi}</b>?</li> </ul>	Yes	Go to Step 13.
		No	If fuel line pressure is excessively high: Inspect FP maximum pressure and fuel return for clogging. <ul style="list-style-type: none"> <li>If any problem is found, repair or replace suspected parts.</li> <li>If all items above are okay, replace pressure regulator. Go to Step 19.</li> </ul> If fuel line pressure is too low: Go to next step.
11	<b>INSPECT FP MAXIMUM PRESSURE</b> <ul style="list-style-type: none"> <li>Stop engine.</li> <li>Perform FP maximum pressure test. (See 01-14-12 FUEL PUMP (FP) INSPECTION)</li> <li>Is FP maximum pressure <b>less than 640 kPa {6.5 kgf/cm<sup>2</sup>, 92 psi}</b>?</li> </ul>	Yes	Go to next step.
		No	Inspect FP circuit for open or poor connection. Repair or replace suspected circuit, then go to Step 19. <ul style="list-style-type: none"> <li>If circuit is okay, replace FP. Go to Step 19.</li> </ul>
12	<b>INSPECT FUEL LINE FROM FP TO FUEL DELIVERY PIPE</b> <ul style="list-style-type: none"> <li>Visually inspect fuel line for any leakage.</li> <li>Is any fuel leakage found?</li> </ul>	Yes	Replace suspected fuel line, then go to Step 19.
		No	Inspect fuel filters for following: <ul style="list-style-type: none"> <li>Restriction or clogging at fuel filter (high-pressure side).</li> <li>Foreign materials or staining inside fuel filter (low-pressure side)</li> </ul> Perform following actions as result. <ul style="list-style-type: none"> <li>If restriction or clogging is found at fuel filter (high-pressure side), replace fuel filter.</li> <li>If foreign materials or staining is found inside fuel filter (low-pressure side), clean fuel tank and filter.</li> <li>If all items above are okay, replace pressure regulator. Go to Step 19.</li> </ul>
13	<b>CHECK IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT</b> <ul style="list-style-type: none"> <li>Verify blinking condition on each cylinder using timing light at idle.</li> <li>Do all cylinders show blinking condition?</li> </ul>	Yes	Go to Step 17.
		No	Go to next step.
14	<b>CHECK HIGH-TENSION LEADS OF NO BLINKING CYLINDER</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect high-tension leads for installation condition, corrosion on terminal, open lead and damaged cover.</li> <li>Is condition of high-tension lead okay?</li> </ul>	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 19.
15	<b>INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect ignition coil connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Check voltage at ignition coil connector terminal A (harness-side) and body GND.</li> <li>Is there voltage reading <b>B+</b>?</li> </ul>	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 19.
16	<b>INSPECT IGNITION COIL RESISTANCE</b> <ul style="list-style-type: none"> <li>Check ignition coil resistance. (See 01-18-2 IGNITION COIL INSPECTION)</li> <li>Is coil resistance okay?</li> </ul>	Yes	Go to next step.
		No	Replace ignition coil, then go to Step 19.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
17	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression. (See 01–10–7 COMPRESSION INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes Go to next step.
		No Implement engine overhaul for repairs, then go to Step 19.
18	<b>INSPECT FUEL INJECTOR OPERATION</b> <ul style="list-style-type: none"> <li>Remove fuel injector.</li> <li>Inspect fuel injector operation.</li> <li>Is fuel injector okay?</li> </ul>	Yes Go to next step.
		No Replace injector, then go to next step.
19	<b>VERIFY TROUBLESHOOTING OF DTC P0171 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Run DRIVE MODE 1, 2 and 3.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
20	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform “After Repair Procedure”. (See 01–02A–10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE)
		No Troubleshooting completed.

01–02A

## DTC P0172

A5U010201084W32

<b>DTC P0172</b>	<b>Fuel trim system too rich</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) values when the monitoring conditions are met or the DRIVE MODE 1 is run. If fuel trim exceeds pre programmed criteria, PCM determines that the fuel system is too rich.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor. (FUEL SYSTEM)</li> <li>MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Misfire</li> <li>HO2S (front) deterioration</li> <li>HO2S (front) heater malfunction</li> <li>Pressure regulator malfunction</li> <li>FP malfunction</li> <li>Purge solenoid valve malfunction</li> <li>Purge solenoid hoses improper connection</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then ON (Engine OFF).</li> <li>Verify related pending code or stored DTCs.</li> <li>Is other DTC present?</li> </ul>	Yes Go to appropriate DTC troubleshooting procedures.
		No If drivability concern or rough idle is present, go to Step 9. If not, go to next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0172 on FREEZE FRAME DATA?</li> </ul>	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)</b> <ul style="list-style-type: none"> <li>Access ECT, MAF, TP and VSS PIDs using WDS or equivalent. (See 01-40-6 Using SST (WDS or Equivalent))</li> <li>Is there any signal that is far out of specification when ignition key is ON and engine runs?</li> </ul>	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Go to Step 10.
		No	Go to next step.
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b> <ul style="list-style-type: none"> <li>Inspect same PIDs as Step 5 data while simulating FREEZE FRAME DATA condition.</li> <li>Is there any input signal which causes drastic changes?</li> </ul>	Yes	Inspect suspected sensor and related wiring harnesses, and repair or replace it. Go to Step 10.
		No	Go to next step.
7	<b>VERIFY CURRENT INPUT SIGNAL STATUS OF Front HO2S</b> <ul style="list-style-type: none"> <li>Access O2S11 PID using WDS or equivalent.</li> <li>Check PID under following AP condition (in PARK).</li> <li>Is PID reading okay? <ul style="list-style-type: none"> <li><b>More than 0.45 V</b> when suddenly depressing AP (rich condition).</li> <li><b>Less than 0.45 V</b> just after release of AP (lean condition)</li> </ul> </li> </ul>	Yes	Go to next step.
		No	Replace suspected HO2S (front). Go to Step 10.
8	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect fuel line pressure while running engine.</li> <li>Is fuel line pressure <b>within 370—420 kPa {3.7—4.3 kgf/cm<sup>2</sup>, 53—61 psi}</b>?</li> </ul>	Yes	Go to next step.
		No	Inspect FP maximum pressure and fuel return for clogging. <ul style="list-style-type: none"> <li>If any problem found, repair or replace suspected parts.</li> <li>If all items above are okay, replace pressure regulator.</li> </ul> Go to Step 11.
9	<b>INSPECT PURGE SOLENOID VALVE FOR STUCK OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect both hoses from purge solenoid valve.</li> <li>Blow air through purge solenoid valve.</li> <li>Does air flow?</li> </ul>	Yes	Replace purge solenoid valve. Go to Step 10.
		No	Go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0172 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Run DRIVE MODE 1, 2 and 3.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0300

A5U010201085W01

DTC P0300	Random misfire detection
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>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 <b>200 crankshaft revolutions</b> and <b>1,000 crankshaft revolutions</b> and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, PCM determines that a misfire, which can damage the TWC or affect emission performance, has occurred.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (MISFIRE).</li> <li>MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle.</li> <li>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.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>CKP sensor malfunction</li> <li>CMP sensor malfunction</li> <li>Ignition coil malfunction</li> <li>High-tension lead malfunction</li> <li>MAF sensor contamination</li> <li>Excess air suction in intake-air system (between MAF sensor and dynamic chamber)</li> <li>FP malfunction</li> <li>Pressure regulator malfunction</li> <li>Fuel line clogged</li> <li>Fuel filter clogged</li> <li>Fuel leakage in fuel line</li> <li>Purge control solenoid valve malfunction</li> <li>PCV valve malfunction</li> <li>EGR valve malfunction</li> <li>Vacuum hoses damages or improper connection</li> <li>Related connector and terminal malfunction</li> <li>Related wiring harness malfunction</li> </ul>

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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Verify related pending code or stored DTCs.</li> <li>Is other DTCs present?</li> </ul>	Yes Go to appropriate DTC troubleshooting. (See 01-02A-13 DTC TABLE)
		No Go to next step.
4	<b>VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY AT ON/IDLE)</b> <ul style="list-style-type: none"> <li>Access ECT, IAT, MAF, RPM, TP and VSS PIDs using WDS or equivalent. (See 01-40-6 Using SST (WDS or Equivalent))</li> <li>Is there any signal that is far out of specification when ignition switch is ON and engine is idling?</li> </ul>	Yes Inspect suspected circuit and/or part according to inspection results, then go to Step 22. (See 01-40-6 Using SST (WDS or Equivalent))
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b> <ul style="list-style-type: none"> <li>Inspect same PIDs with step 4 while simulating FREEZE FRAME DATA condition.</li> <li>Is there any signal which causes drastic changes?</li> </ul>	Yes	Inspect suspected circuit and/or part according to inspection results, then go to Step 22. (See 01-40-6 Using SST (WDS or Equivalent))
		No	Go to next step.
6	<b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect CMP sensor. (See 01-40-29 CAMSHAFT POSITION (CMP) SENSOR INSPECTION)</li> <li>Is CMP sensor okay?</li> </ul>	Yes	Go to next step.
		No	Inspect installation condition and damage on timing belt and gears, repair faulty parts. <ul style="list-style-type: none"> <li>If it is okay, replace CMP sensor.</li> </ul> Go to Step 22.
7	<b>VERIFY CKP SENSOR INSTALLATION CONDITION</b> <ul style="list-style-type: none"> <li>Check for CKP sensor looseness.</li> <li>Is CKP sensor loose?</li> </ul>	Yes	Retighten CKP sensor, then go to Step 22.
		No	Go to next step.
8	<b>CHECK IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT</b> <ul style="list-style-type: none"> <li>Verify blinking condition on each cylinder using timing light at idle.</li> <li>Do all cylinders show blinking condition?</li> </ul>	Yes	Go to Step 12.
		No	Go to next step.
9	<b>CHECK HIGH-TENSION LEADS OF NO BLINKING CYLINDER</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect high-tension leads for installation condition, corrosion on terminal, open lead, and damaged cover.</li> <li>Is condition of high-tension lead okay?</li> </ul>	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 22.
10	<b>INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect ignition coil connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between ignition coil terminal A (harness-side) and body GND.</li> <li>Is voltage reading <b>B+</b>?</li> </ul>	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 22.
11	<b>INSPECT IGNITION COIL RESISTANCE</b> <ul style="list-style-type: none"> <li>Check ignition coil resistance. (See 01-18-2 IGNITION COIL INSPECTION)</li> <li>Is coil resistance okay?</li> </ul>	Yes	Go to Step 22.
		No	Replace ignition coil, then go to Step 22.
12	<b>INSPECT MAF V PID</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Access MAF PID using WDS or equivalent.</li> <li>Verify that MAF PID changes quickly according to race engine RPM.</li> <li>Is MAF PID response okay?</li> </ul>	Yes	Go to next step.
		No	Replace MAF sensor, then go to Step 22.
13	<b>INSPECT EXCESSIVE AIR SUCTION IN INTAKE-AIR SYSTEM</b> <ul style="list-style-type: none"> <li>Inspect for air leakage at following: <ul style="list-style-type: none"> <li>Between MAF sensor and TB</li> <li>Between TB and dynamic chamber</li> </ul> </li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace suspected part, then go to Step 22.
		No	Go to next step.
14	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Inspect fuel line pressure. (See 01-14-4 FUEL LINE PRESSURE INSPECTION)</li> <li>Is fuel line pressure okay?</li> </ul>	Yes	Go to Step 17.
		No	If fuel line pressure is excess high, check as follows: <ul style="list-style-type: none"> <li>FP maximum pressure (See 01-14-12 FUEL PUMP (FP) INSPECTION)</li> <li>Fuel return line for clogged <ul style="list-style-type: none"> <li>If all above are okay, replace pressure regulator.</li> </ul> </li> </ul> Go to Step 22. If fuel line pressure is too low, go to next step.
15	<b>INSPECT FP MAXIMUM PRESSURE</b> <ul style="list-style-type: none"> <li>Inspect FP maximum pressure. (See 01-14-12 FUEL PUMP (FP) INSPECTION)</li> <li>Is FP maximum pressure <b>less than 640 kPa {6.5 kgf/cm<sup>2</sup>, 92 psi}</b>?</li> </ul>	Yes	Go to next step.
		No	Inspect FP circuit for open or poor connection. Repair or replace suspected circuit, then go to Step 22. <ul style="list-style-type: none"> <li>If okay, replace FP, go to Step 22.</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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STEP	INSPECTION		ACTION
16	<b>INSPECT FUEL LINE FROM FP TO FUEL DELIVERY PIPE</b> <ul style="list-style-type: none"> <li>Visually inspect for fuel leakage in fuel line.</li> <li>Is any fuel leakage found?</li> </ul>	Yes	Replace suspected fuel line, then go to Step 22.
		No	Inspect fuel filters for following: <ul style="list-style-type: none"> <li>Restriction or clogging at fuel filter (high-pressure side).</li> <li>Foreign materials or stain inside fuel filter (low-pressure side)</li> </ul> Perform following actions as result. <ul style="list-style-type: none"> <li>If restriction or clogging is found at fuel filter (high-pressure side), replace fuel filter.</li> <li>If foreign materials or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter.</li> <li>If all items above are okay, replace pressure regulator.</li> </ul> , Go to Step 22.
17	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression. (See 01-10-7 COMPRESSION INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to Step 22.
18	<b>INSPECT OPERATION OF PURGE CONTROL SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Inspect purge solenoid valve. (See 01-16-8 PURGE SOLENOID VALVE INSPECTION)</li> <li>Is purge control solenoid valve operation okay?</li> </ul>	Yes	Go to next step.
		No	Replace purge control solenoid valve, then go to Step 22.
19	<b>INSPECT PCV VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Remove PCV valve and check valve operation. (See 01-16-10 PCV VALVE INSPECTION)</li> <li>Is PCV valve operation okay?</li> </ul>	Yes	Replace PCV valve, then go to Step 22.
		No	Go to next step.
20	<b>INSPECT OPERATION OF EGR VALVE</b> <ul style="list-style-type: none"> <li>Remove EGR valve.</li> <li>Visually check for stuck open condition.</li> <li>Is EGR valve stuck open?</li> </ul>	Yes	Repair or replace EGR valve, then go to Step 22.
		No	Go to next step.
21	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <p><b>Warning</b></p> <ul style="list-style-type: none"> <li><b>Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</b></li> <li><b>When removing radiator cap, wrap thick cloth around and turn it slowly.</b></li> </ul> <ul style="list-style-type: none"> <li>Remove radiator cap.</li> <li>Implement procedure to bleed air from engine coolant, then idle engine.</li> <li>Are there any small bubbles which makes engine coolant white at the filler opening?</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>Large bubbles are normal since they remain air coming out from engine coolant passage.</li> </ul>	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.
22	<b>VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and perform DRIVE MODE 1. (See 01-02A-11 Mode 1 (PCM Adaptive Memory Produce Drive Mode))</li> <li>Is PENDING CODE or stored code of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
23	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0301, P0302, P0303, P0304

A5U010201085W02

<b>DTC P0301</b> <b>DTC P0302</b> <b>DTC P0303</b> <b>DTC P0304</b>	<b>Cylinder No.1 misfire detection</b> <b>Cylinder No.2 misfire detection</b> <b>Cylinder No.3 misfire detection</b> <b>Cylinder No.4 misfire detection</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>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 <b>200 crankshaft revolutions</b> and <b>1,000 crankshaft revolutions</b> and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, PCM determines that a misfire, which can damage the TWC or affect emission performance, has occurred.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (MISFIRE).</li> <li>MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle.</li> <li>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.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Spark plug malfunction</li> <li>High-tension lead malfunction</li> <li>Fuel injector malfunction</li> <li>Air suction in intake-air system (between dynamic chamber and cylinder head)</li> <li>Inadequate engine compression due to engine internal malfunction</li> <li>Related connector or terminal malfunction</li> <li>Related wiring harness malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Verify related pending code or stored DTCs.</li> <li>Is other DTCs present?</li> </ul>	Yes Go to appropriate DTC troubleshooting. (See 01-02A-13 DTC TABLE)
		No Go to next step.
4	<b>VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON /IDLE)</b> <ul style="list-style-type: none"> <li>Access ECT, IAT, MAF, RPM, TP and VSS PIDs using WDS or equivalent. (See 01-40-6 Using SST (WDS or Equivalent))</li> <li>Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?</li> </ul>	Yes Inspect suspected circuit and/or part according to inspection results. Go to Step 13. (See 01-40-6 Using SST (WDS or Equivalent))
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b> <ul style="list-style-type: none"> <li>Inspect same PIDs with Step 4 while simulating FREEZE FRAME DATA condition.</li> <li>Is there any signal which causes drastic changes?</li> </ul>	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 13. (See 01-40-6 Using SST (WDS or Equivalent))
		No	Go to next step.
6	<b>INSPECT SPARK PLUG CONDITION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Remove spark plug from suspected cylinder.</li> <li>Check spark plug condition: <ul style="list-style-type: none"> <li>Cracks</li> <li>Excess wear</li> <li>Gap</li> <li>Wet</li> </ul> </li> <li>Is any problem found on spark plug?</li> </ul>	Yes	<ul style="list-style-type: none"> <li>If spark plug is wet, fuel flooding is suspected. Go to Step 12.</li> <li>If spark plug has cracks, excess wear or improper gap, replace faulty spark plug. Then go to Step 13.</li> </ul>
		No	Go to next step.
7	<b>VERIFY HIGH-TENSION LEAD CONDITION</b> <ul style="list-style-type: none"> <li>Remove high-tension lead.</li> <li>Check for high-tension lead condition and resistance. <ul style="list-style-type: none"> <li>Cracks</li> <li>Spark shorts to cylinder head through high-tension lead insulator.</li> </ul> </li> <li>Is high-tension lead okay?</li> </ul>	Yes	Go to next step.
		No	Replace high-tension lead, then go to Step 13.
8	<b>INSPECT INTAKE-AIR SYSTEM FOR AIR SUCTION</b> <ul style="list-style-type: none"> <li>Inspect for air leakage at following: <ul style="list-style-type: none"> <li>Around connection of dynamic chamber and intake manifold</li> <li>Around connection of intake manifold and cylinder head</li> </ul> </li> <li>Is air leakage found?</li> </ul>	Yes	Repair or replace suspected part, then go to Step 13.
		No	Go to next step.
9	<b>INSPECT FUEL INJECTOR HARNESS</b> <ul style="list-style-type: none"> <li>Remove intake-air system parts.</li> <li>Disconnect fuel injector connector on suspected cylinder.</li> <li>Connect TEST LIGHT (LED) to fuel injector connector terminals.</li> <li>Check dim of light during cranking.</li> <li>Does TEST LIGHT (LED) illuminate?</li> </ul>	Yes	Go to next step.
		No	Check for fuel injector harnesses. Repair or replace if necessary, then go to Step 13.
10	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <p><b>Warning</b></p> <ul style="list-style-type: none"> <li>Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</li> <li>When removing radiator cap, wrap thick cloth around and turn it slowly.</li> </ul> <ul style="list-style-type: none"> <li>Remove radiator cap.</li> <li>Implement procedure to bleed air from engine coolant, then idle engine.</li> <li>Are there any small bubbles which makes engine coolant white the filler opening?</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>Large bubbles are normal since they remain air coming out from engine coolant passage.</li> </ul>	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 12.
		No	Go to next step.
11	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression. (See 01-10-7 COMPRESSION INSPECTION)</li> <li>Is engine compression okay?</li> </ul>	Yes	Go to next step.
		No	Overhaul the engine, then go to next step.

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
12	<b>INSPECT FUEL INJECTOR OPERATION</b> <ul style="list-style-type: none"> <li>Remove fuel injector from suspected cylinder.</li> <li>Swap injector with injector on other cylinder.</li> <li>Start engine and idle it.</li> <li>Does misfire DTC move to cylinder which suspected injector?</li> </ul>	Yes Replace injector, then go to Step 13.
		No Go to next step.
13	<b>VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Perform DRIVE MODE 1. (See 01-02A-11 Mode 1 (PCM Adaptive Memory Produce Drive Mode))</li> <li>Is same PENDING CODE or stored code of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0327

A5U010201085W03

<b>DTC P0327</b>	<b>KS circuit low input</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>If PCM detects KS voltage is <b>below 1.25 V</b> at PCM terminal 4M after ignition key turned to ON, PCM determines that KS circuit has a malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. Therefore, PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>KS malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND circuit between KS terminal and PCM terminal 4M</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>CHECK KNOCK SIGNAL CIRCUIT FOR SHORT TO BODY GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect KS connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between knock sensor terminal A (harness-side) and body GND.</li> <li>Is voltage <b>approx. 5 V</b>?</li> </ul>	Yes Go to step 5.
		No Go to next step.
4	<b>CHECK PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 6.
		No Repair or replace harness for short to GND, then go to step 6.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
5	<b>CHECK KS</b> <ul style="list-style-type: none"> <li>Measure resistance between KS terminal A (part-side) and sensor body GND.</li> <li>Is resistance <b>approx. 560 kilohms</b>?</li> </ul>	Yes Go to next step.
		No Replace KS, then go to next step.
6	<b>VERIFY TROUBLESHOOTING OF DTC P0327 COMPLETED</b> <ul style="list-style-type: none"> <li>Leave vehicle for <b>6 h</b>.</li> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and wait for <b>5 min</b>.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

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## DTC P0328

A5U010201085W04

<b>DTC P0328</b>	<b>Knock signal (KS) circuit high input</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>If PCM detects KS voltage at PCM terminal 4M is <b>above 3.75 V</b> after ignition key turned to ON, PCM determines that KS circuit has a malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. Therefore, PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>KS malfunction</li> <li>Connector or terminal malfunction</li> <li>Open circuit in wiring between KS terminal A and PCM terminal 4M</li> </ul>
<p>PCM</p> <p>KS</p> <p>PCM (31-PIN)</p> <p>HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p> <p>KS</p> <p>HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p>	

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and /or on-line repair information availability.</li> <li>Is any related repair Information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair Information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
3	<b>CHECK KNOCK SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect KS connector.</li> <li>Turn ignition key ON (Engine OFF).</li> <li>Measure voltage between KS terminal A (harness-side) and body GND.?</li> <li>Is voltage <b>approx. 5 V</b>?</li> </ul>	Yes Go to Step 4.
		No Go to next step.
4	<b>CHECK PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 5.
		No Repair or replace harness for open, then go to Step 5.
5	<b>CHECK KS</b> <ul style="list-style-type: none"> <li>Measure resistance between KS terminal A (part-side) and sensor body.</li> <li>Is resistance <b>approx. 560 kilohms</b>?</li> </ul>	Yes Go to next step.
		No Replace KS, then go to next step.
6	<b>VERIFY TROUBLESHOOTING OF DTC P0328 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

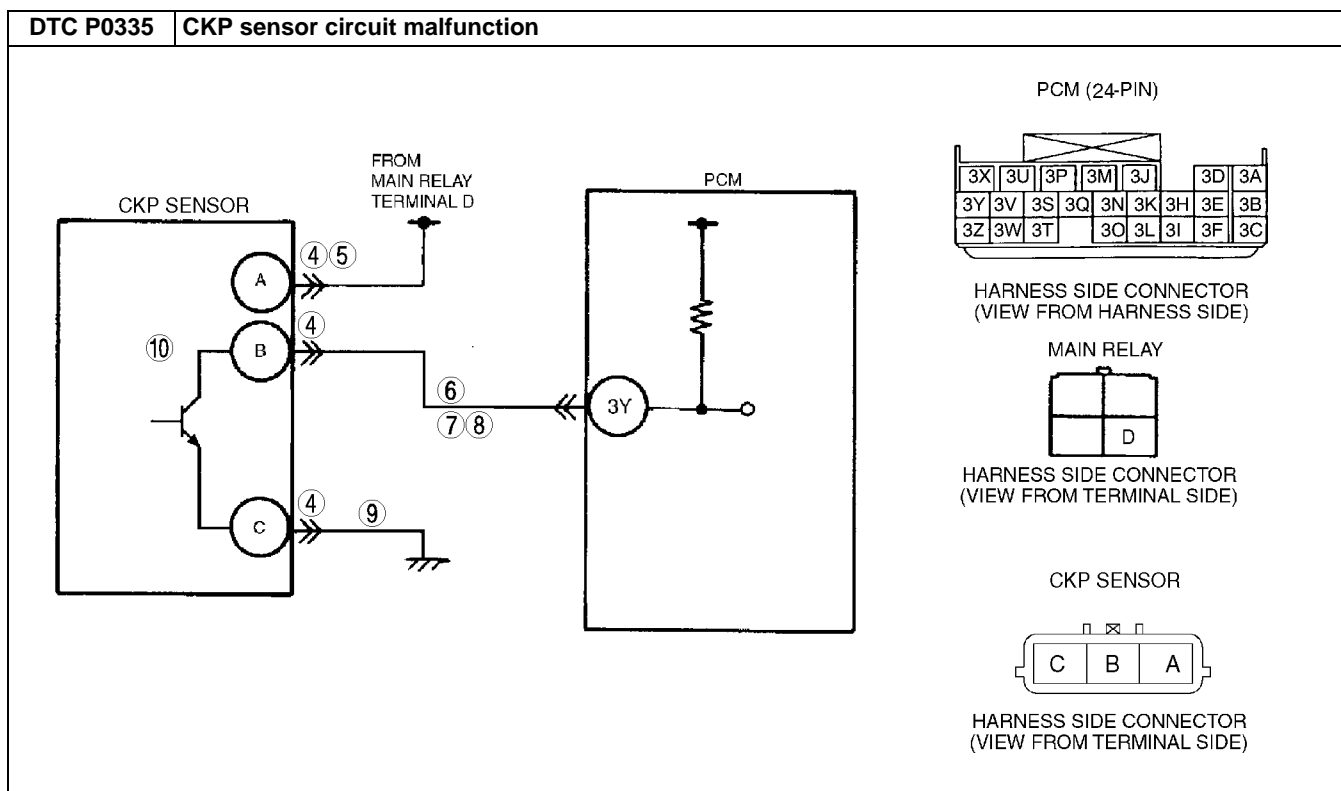
## DTC P0335

A5U010201085W05

DTC P0335	CKP sensor circuit malfunction
DETECTION CONDITION	<ul style="list-style-type: none"> <li>If PCM does not receive input voltage from CKP sensor for <b>4.2 s</b> while MAF sensor output voltage is between <b>2.0—4.9 V</b>, PCM determines that CKP sensor circuit has a malfunction.</li> </ul>
	<b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction conditions during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>CKP sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>CKP sensor is dirty.</li> <li>Open circuit between main relay terminal D and CKP sensor terminal A</li> <li>Open circuit between CKP sensor terminal B and PCM terminal 3Y</li> <li>Open circuit between CKP sensor terminal C and body GND</li> <li>Short to power circuit between CKP sensor terminal B and PCM terminal 3Y</li> <li>Short to GND circuit between main relay terminal D and CKP sensor terminal A</li> <li>Short to GND circuit between CKP sensor terminal B and PCM terminal 3Y</li> <li>Crankshaft pulley malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair Information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
4	<b>INSPECT POOR CONNECTION OF CKP SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect CKP sensor connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 11.
		No Go to next step.
5	<b>INSPECT POWER SUPPLY CIRCUIT AT CKP SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between CKP sensor terminal A (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Go to next step
		No Repair or replace harness for open circuit or short to GND, then go to Step 11.
6	<b>INSPECT CKP SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check continuity between CKP sensor terminal B (harness-side) and PCM terminal 3Y (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes Go to next step
		No Repair or replace harness for open, then go to Step 11.

## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT CKP SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (engine OFF).</li> <li>Measure voltage between CKP sensor terminal 3Y(harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace harness for short to power, then go to Step 11.
		No	Go to next step.
8	<b>INSPECT CKP SENSOR SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between CKP sensor terminal B (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 11.
		No	Go to next step.
9	<b>INSPECT CKP SENSOR GND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check continuity between CKP sensor terminal C (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step
		No	Repair or replace for open, then go to Step 11.
10	<b>INSPECT CKP SENSOR</b> <ul style="list-style-type: none"> <li>Check pulsation signal comes out from PCM terminal 3Y (harness-side) using voltmeter while cranking engine.</li> <li>Is there any signal?</li> </ul>	Yes	Go to next step.
		No	Check crankshaft pulley for damage. Replace crankshaft pulley, then go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

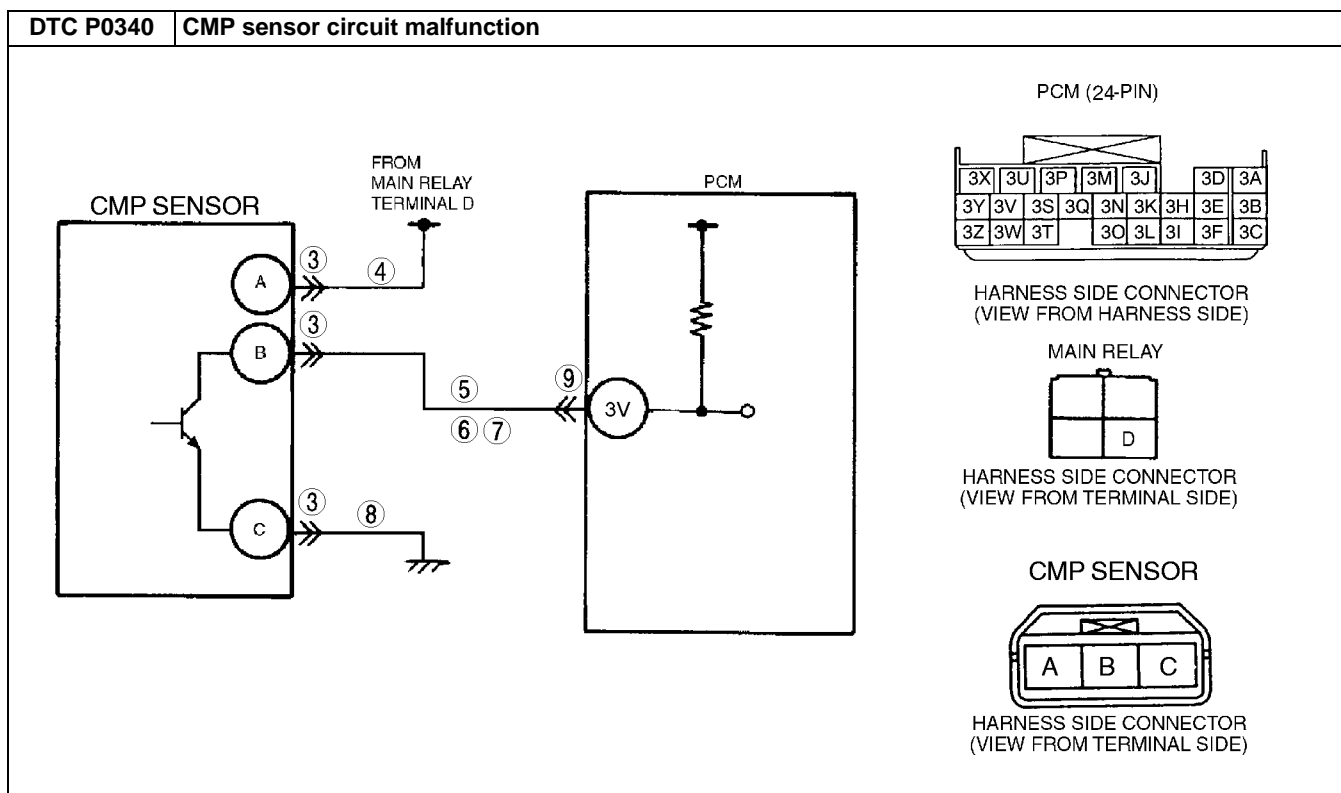
### DTC P0340

A5U010201085W06

DTC P0340	CMP sensor circuit malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from CMP sensor while MAF is <b>above 2.7 g/s {0.36 lb/min}</b>. If PCM does not receive pulse signal the proper signal timing basis on the CKP sensor signal, determines that CMP circuit has malfunction</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction continuous during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>CMP sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>CMP sensor is dirty.</li> <li>Open circuit between main relay terminal D and CMP sensor terminal A</li> <li>Open circuit between CMP sensor terminal B and PCM terminal 3V</li> <li>Open circuit between CMP sensor terminal C and body GND</li> <li>Short to GND circuit between main relay terminal D and CMP sensor terminal A</li> <li>Short to GND circuit between CMP sensor terminal B and PCM terminal 3V</li> <li>CKP sensor malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related Service Information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
4	<b>INSPECT POOR CONNECTION OF CMP SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect CMP sensor connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 12.
		No	Go to next step.
5	<b>INSPECT POWER SUPPLY CIRCUIT AT CMP SENSOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between CMP sensor terminal C (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step
		No	Repair or replace for open circuit or short to GND, then go to Step 12.
6	<b>INSPECT CMP SENSOR SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition switch to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check continuity between CMP sensor terminal B (harness-side) and PCM terminal 3V (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step
		No	Repair or replace for open, then go to Step 12.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT CMP SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>• Turn ignition key to ON (engine OFF).</li> <li>• Measure voltage between CMP sensor terminal B (harness-side) and body GND.</li> <li>• Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step
		No	Repair or replace harness for short to power, then go to Step 12.
8	<b>INSPECT CMP SENSOR SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>• Check continuity between CMP sensor terminal B (harness-side) and body GND.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 12.
		No	Go to next step.
9	<b>INSPECT CMP SENSOR GND CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>• Check continuity between CMP sensor terminal C (harness-side) and body GND.</li> <li>• Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace for open, then go to Step 12.
10	<b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>• Check pulsation signal comes out from PCM terminal 3V (harness-side) using voltmeter while cranking engine.</li> <li>• Is there any signal?</li> </ul>	Yes	Go to next step.
		No	Check camshaft pulley for damage. Replace pulley and go to Step 12.
11	<b>INSPECT CKP SENSOR</b> <ul style="list-style-type: none"> <li>• Check CKP sensor for following. <ul style="list-style-type: none"> <li>— CKP sensor is dirty.</li> <li>— Crankshaft pulley is damaged.</li> <li>— DTC P0335 is displayed. etc.</li> </ul> </li> <li>• Has above condition been detected?</li> </ul>	Yes	Repair or replace for malfunctioning parts, then go to next step.
		No	Go to next step.
12	<b>VERIFY TROUBLESHOOTING OF DTC P0340 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to connect all disconnected connectors.</li> <li>• Turn ignition key to ON (Engine OFF).</li> <li>• Clear DTC from PCM memory using WDS or equivalent.</li> <li>• Start engine.</li> <li>• Access MAF PID.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• MAF PID should indicate <b>above 2.7 g/s {0.36 lb/min}</b> during this test.</li> </ul> <ul style="list-style-type: none"> <li>• Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
13	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>• Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

## DTC P0401

A5U010201086W01

DTC P0401	EGR flow insufficient detected
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>• Difference in intake manifold pressure when EGR is operated and when it is stopped is too small.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>• This is an intermittent monitor (EGR).</li> <li>• MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>• DIAGNOSTIC MONITORING TEST RESULTS and PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>• FREEZE FRAME DATA is available.</li> <li>• DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• EGR valve malfunction</li> <li>• EGR boost sensor malfunction</li> <li>• EGR boost sensor solenoid valve malfunction</li> <li>• EGR gasket malfunction</li> <li>• PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT FOR OTHER DTCS</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Have other DTCS been stored?</li> </ul>	Yes	Repair circuit malfunction for applicable DTCS.
		No	Go to next step.
4	<b>INSPECT VACUUM HOSE CONDITION</b> <ul style="list-style-type: none"> <li>Inspect vacuum hoses for clogs, damage, freezing, or vacuum leakage.</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace vacuum hoses, then go to Step 9.
		No	Go to next step.
5	<b>INSPECT EGR VALVE MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect EGR valve. (See 01-16-9 EGR VALVE INSPECTION)</li> <li>Is EGR valve okay?</li> </ul>	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 9.
6	<b>INSPECT EGR BOOST SENSOR MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect EGR boost sensor. (See 01-40-33 EGR BOOST SENSOR INSPECTION)</li> <li>Is EGR boost sensor okay?</li> </ul>	Yes	Go to next step.
		No	Replace EGR boost sensor, then go to Step 9.
7	<b>INSPECT EGR BOOST SENSOR SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Inspect EGR boost sensor solenoid valve. (See 01-16-10 EGR BOOST SENSOR SOLENOID VALVE INSPECTION)</li> <li>Is EGR boost sensor solenoid valve okay?</li> </ul>	Yes	Replace EGR boost sensor solenoid valve, then go to Step 9.
		No	Go to next step.
8	<b>INSPECT EGR VALVE PASSAGE</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Remove EGR valve.</li> <li>Is gasket installation normal?</li> </ul>	Yes	Go to next step.
		No	Install gasket correctly, then go to next step.
9	<b>MONITOR EGR SYSTEM BY DRIVE MODE</b> <ul style="list-style-type: none"> <li>Run Drive Mode 1 and Mode 2. (See 01-02A-10 OBD-II DRIVE MODE)</li> <li>Check EGR System Monitor completion status using On-Board Readiness Test function.</li> <li>Has EGR system been monitored?</li> </ul>	Yes	Go to next step.
		No	Retry this step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0401 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Access DIAGNOSTIC MONITORING TEST RESULTS of generic OBD-II functions. (See 01-02A-10 Diagnostic Monitoring Test Results Access Procedure)</li> <li>Verify TEST ID 10:41:00 value.</li> <li>Is value within specification?</li> </ul>	Yes	Go to next step.
		No	Replace PCM, then go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## DTC P0402

A5U010201086W02

DTC P0402	EGR flow excessive detected
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>• Difference in intake manifold pressure when EGR is operated and when it is stopped is too large.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>• This is an intermittent monitor (EGR).</li> <li>• MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>• PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>• FREEZE FRAME DATA is available.</li> <li>• DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• EGR valve gasket is not installed.</li> <li>• EGR valve gasket has been damaged.</li> <li>• PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Check for related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	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	<b>INSPECT FOR OTHER DTCs</b> <ul style="list-style-type: none"> <li>• Turn ignition key to OFF then ON (Engine OFF).</li> <li>• Have other DTCs been stored?</li> </ul>	Yes Repair circuit malfunction for applicable DTCs.
		No Go to next step.
4	<b>INSPECT EGR VALVE GASKET</b> <ul style="list-style-type: none"> <li>• Turn ignition key to OFF.</li> <li>• Remove EGR valve.</li> <li>• Is EGR valve gasket installed?</li> </ul>	Yes Go to next step.
		No Install EGR valve gasket, then go to Step 6.
5	<b>INSPECT EGR VALVE GASKET MALFUNCTION</b> <ul style="list-style-type: none"> <li>• Does EGR valve gasket have any cracks and/or damage?</li> </ul>	Yes Replace EGR valve gasket, then go to Step 6.
		No Go to next step.
6	<b>MONITOR EGR SYSTEM BY DRIVE MODE</b> <ul style="list-style-type: none"> <li>• Run Drive Mode 1 and Mode 2. (See 01-02A-10 OBD-II DRIVE MODE)</li> <li>• Check EGR system Monitor has checked using On-Board Readiness Test function.</li> <li>• Has EGR system been monitored?</li> </ul>	Yes Go to next step.
		No Retry this step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0402 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to connect all disconnected connectors.</li> <li>• Access DIAGNOSTIC MONITORING TEST RESULTS of generic OBD-II functions. (See 01-02A-10 Diagnostic Monitoring Test Results Access Procedure)</li> <li>• Verify TEST ID 10:41:00 value.</li> <li>• Is value within specification?</li> </ul>	Yes Go to next step.
		No Replace PCM, then go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>• Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0420

A5U010201086W03

DTC P0420	Catalyst system efficiency below threshold
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>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 middle 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 determined that catalyst system has deteriorated.</li> </ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"> <li>Engine speed <b>1,090—3,090 rpm</b></li> <li>Calculated load <b>16—55%<sup>*1</sup></b></li> <li>Vehicle speed <b>26.4—103 km/h {16.4—64.3 mph}</b></li> </ul> <p><sup>*1</sup>: Minimum calculated load value varies depending on engine speed.</p> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is an intermittent monitor. (CATALYST)</li> <li>MIL illuminates if PCM detects the above malfunction conditions in consecutive two drive cycles.</li> <li>DIAGNOSTIC MONITORING TEST RESULTS and PENDING CODE are stored if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>TWC deterioration or malfunction</li> <li>Exhaust gas leakage</li> <li>Looseness of HO2S (front)</li> <li>Looseness of HO2S (rear)</li> <li>HO2S (front) malfunction</li> </ul>

01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Verify related pending code or stored DTCs.</li> <li>Are there other DTCs?</li> </ul>	Yes Go to appropriate DTC troubleshooting.
		No Go to next step.
4	<b>INSPECT GAS LEAKAGE OF EXHAUST SYSTEM</b> <ul style="list-style-type: none"> <li>Visually inspect exhaust gas leakage in exhaust system.</li> <li>Is there any gas leakage?</li> </ul>	Yes Repair or replace faulty exhaust parts, then go to Step 8.
		No Go to next step.
5	<b>INSPECT INSTALLATION OF FRONT AND HO2S (REAR)</b> <ul style="list-style-type: none"> <li>Inspect for looseness of HO2S (front) and HO2S (rear).</li> <li>Is it okay?</li> </ul>	Yes Go to next step.
		No Retighten sensor, then go to Step 8.
6	<b>INSPECT HO2S (FRONT) VOLTAGE</b> <ul style="list-style-type: none"> <li>Access O2S11 PID using WDS or equivalent.</li> <li>Verify PID while racing engine (in PARK or NEUTRAL).</li> <li>Is PID reading okay? <ul style="list-style-type: none"> <li><b>More than 0.45 V</b> when suddenly depressing AP (rich condition)</li> <li><b>Less than 0.45 V</b> just after release AP (lean condition)</li> </ul> </li> </ul>	Yes Go to next step.
		No Replace suspected sensor, then go to Step 8.
7	<b>CHECK TWC</b> <ul style="list-style-type: none"> <li>Remove TWC.</li> <li>Inspect TWC.</li> <li>(*See 01-16-11 THREEWAY CATALYTIC CONVERTER (TWC) INSPECTION)</li> <li>Is there any problem?</li> </ul>	Yes Replace TWC, then go to next step.
		No Replace HO2S (rear), then go to next step.

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
8	<b>VERIFY TROUBLESHOOTING OF DTC P0420 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine and perform DRIVE MODE except for DRIVE MODE 4. (See 01-02A-10 OBD-II DRIVE MODE)</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0442

A5U010201086W04

DTC P0442	EVAP system leak detected (small leak)
DETECTION CONDITION	<ul style="list-style-type: none"> <li>PCM measures the FTP (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 differential exceeds the threshold, PCM determines that the EVAP system has a small leak. This monitor can activate when the PCM determines that the CONSTANT LEAK DETECTED test results are passed.</li> </ul> <b>MONITORING CONDITION</b> <ul style="list-style-type: none"> <li>FTP (ftp2-ftp1): <b>1.27 kPa {129.5 mmAq, 5.10 inAq}</b></li> <li>PCM monitors EVAP system when driving under following conditions: <ul style="list-style-type: none"> <li>Remaining fuel <b>15—85%</b></li> <li>IAT at engine start <b>-10—60°C {14—140°F}</b></li> <li>ECT at engine start <b>-10—35°C {14—95°F}</b></li> <li>Atmospheric pressure <b>above 72.2 kPa {542 mmHg, 21.3 inHg}</b></li> <li>Vehicle speed <b>39.5—120.3 km/h {24.5—74.5 mph}</b></li> <li>RPM <b>1000—4000 rpm</b></li> <li>Calculated load <b>9.4—65%</b></li> <li>Throttle opening angle <b>3.13—31.6%</b></li> <li>IAT during monitor <b>-10—60°C {14—140°F}</b></li> <li>ECT during monitor <b>70—100°C {158—212°F}</b></li> </ul> </li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is an intermittent monitor (Evaporative leak monitor).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>DIAGNOSTIC MONITORING TEST RESULTS and PENDING CODE are stored if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
	<b>POSSIBLE CAUSE</b> <ul style="list-style-type: none"> <li>Purge solenoid valve malfunction</li> <li>CDCV malfunction</li> <li>Loose or defective fuel filler cap</li> <li>Charcoal canister malfunction</li> <li>Catch tank malfunction</li> <li>Rollover valve malfunction</li> <li>Cracked fuel tank</li> <li>Fuel tank component parts poorly installed</li> <li>EVAP hose damaged or loose</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
3	<b>INSPECT FOR OTHER DTCS</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Verify stored DTCs.</li> <li>Is DTCs P0443 and/or P1449 present?</li> </ul>	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	<b>INSPECT FUEL FILLER CAP</b> <ul style="list-style-type: none"> <li>Verify fuel filler cap is not either loose or damaged.</li> <li>Is it okay?</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>When fuel filler caps other than OEM caps are attached, it is considered malfunction.</li> </ul>	Yes	Go to next step.
		No	Retighten fuel filler cap or replace it, if it is damaged. Go to Step 15.
5	<b>INSPECT WHOLE SYSTEM OF EVAP SYSTEM</b> <ul style="list-style-type: none"> <li>Implement "Whole system inspection". (See 01-03-59 Whole system inspection)</li> <li>Does WDS or equivalent value drop below specified readings and hold for <b>minimum of 2 min</b>?</li> </ul>	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	<b>INSPECT LEAKAGE OF FROM CHARCOAL CANISTER TO FUEL TANK</b> <ul style="list-style-type: none"> <li>Implement "Inspection from charcoal canister to fuel tank". (See 01-03-59 Inspection from charcoal canister to fuel tank)</li> <li>Does WDS or equivalent value drop below specified readings and hold for a <b>minimum of 2 min</b>?</li> </ul>	Yes	Go to Step 9.
		No	Go to next step.
7	<b>INSPECT ATTACHED ACCESSORIES ON FUEL TANK</b> <ul style="list-style-type: none"> <li>Remove fuel tank and visually inspect for damage, insufficient sealing or poorly attached accessories on fuel tank, such as fuel gauge.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to Step 15.
8	<b>INSPECT ROLLOVER VALVE</b> <ul style="list-style-type: none"> <li>Remove rollover valve and inspect for damage.</li> <li>Is it okay?</li> </ul>	Yes	Inspect and repair or replace for detached, incorrectly installed or cracked on following hoses: <ul style="list-style-type: none"> <li>From charcoal canister to fuel tank</li> </ul> Go to Step 15.
		No	Replace rollover valve, then go to Step 15.
9	<b>INSPECT LEAKAGE OF FROM CHARCOAL CANISTER TO PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Implement "Inspection from charcoal canister to purge solenoid valve". (See 01-03-59 Inspection from charcoal canister to purge solenoid valve)</li> <li>Does vacuum drop below specified readings and hold for a <b>minimum of 2 min</b>?</li> </ul>	Yes	Go to Step 15.
		No	Go to next step.
10	<b>INSPECT CATCH TANK</b> <ul style="list-style-type: none"> <li>Remove catch tank and inspect for plugging, damages and pinhole using vacuum pump.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace catch tank, then go to Step 15.
11	<b>INSPECT PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Remove purge solenoid valve and inspect for damage and air leak.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 15.
12	<b>INSPECT CHARCOAL CANISTER</b> <ul style="list-style-type: none"> <li>Remove charcoal canister and inspect for damage and pinhole.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 15.
13	<b>INSPECT CDCV</b> <ul style="list-style-type: none"> <li>Remove CDCV and inspect for damage and air leak.</li> <li>Is it okay?</li> </ul>	Yes	Inspect and repair or replace for detached incorrectly installed or cracked hoses from charcoal canister to CDCV. Go to Step 15.
		No	Replace CDCV, then go to Step 15.

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## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
14	<b>INSPECT LEAKAGE OF EVAP CONTROL SYSTEM</b> <ul style="list-style-type: none"> <li>Inspect EVAP control system for leakage using evaporative emission tester. (See 01-16-3 FUEL-FILLER CAP INSPECTION)</li> <li>Does any leak found?</li> </ul>	Yes Repair or replace faulty area, then go to next step.
		No Go to next step.
15	<b>VERIFY EVAP SYSTEM REPAIRED</b> <ul style="list-style-type: none"> <li>Carry out evaporative system test even if it is not test condition. (See 01-03-58 Evaporative Emission (EVAP) System Leak Inspection Using Leak Tester)</li> <li>Is system test result of small leak okay?</li> </ul>	Yes EVAP system repaired. Go to Step 20.
		No Go to next step.
16	<b>DECIDE ON AFTER REPAIR PROCEDURE ACCORDING TO REPAIR SHOP CONDITION</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Is repair shop possible to perform Drive Mode 4?</li> </ul>	Yes Go to Step 21.
		No Go to next step.
17	<b>VERIFY EVAP SYSTEM REPAIRED BY EVAP SYSTEM TEST</b> <ul style="list-style-type: none"> <li>Carry out EVAP system test. (See 01-03-58 Evaporative Emission (EVAP) System Leak Inspection Using Leak Tester)</li> <li>Is system test result okay?</li> </ul>	Yes EVAP system repaired. Go to Step 20.
		No Replace PCM, then go to Step 20.
18	<b>MONITOR EVAP SYSTEM BY DRIVE MODE 4</b> <ul style="list-style-type: none"> <li>Run Drive Mode 4. (See 01-02A-12 Mode 4 (EVAP System Repair Verification Drive Mode))</li> <li>Stop vehicle and access ON BOARD SYSTEM READINESS TESTS to inspect Drive Mode completion status.</li> <li>Has EVAPORATIVE PURGE SYSTEM monitored?</li> </ul>	Yes Go to next step.
		No Go back to step 16.
19	<b>VERIFY EVAP SYSTEM REPAIRED</b> <ul style="list-style-type: none"> <li>Access DIAGNOSTIC MONITORING TEST RESULTS.</li> <li>Verify TEST ID 10:21:00 value. (See 01-02A-10 Diagnostic Monitoring Test Results Access Procedure)</li> <li>Is it below MAX value?</li> </ul>	Yes Go to next step.
		No Replace PCM, then go next step.
20	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

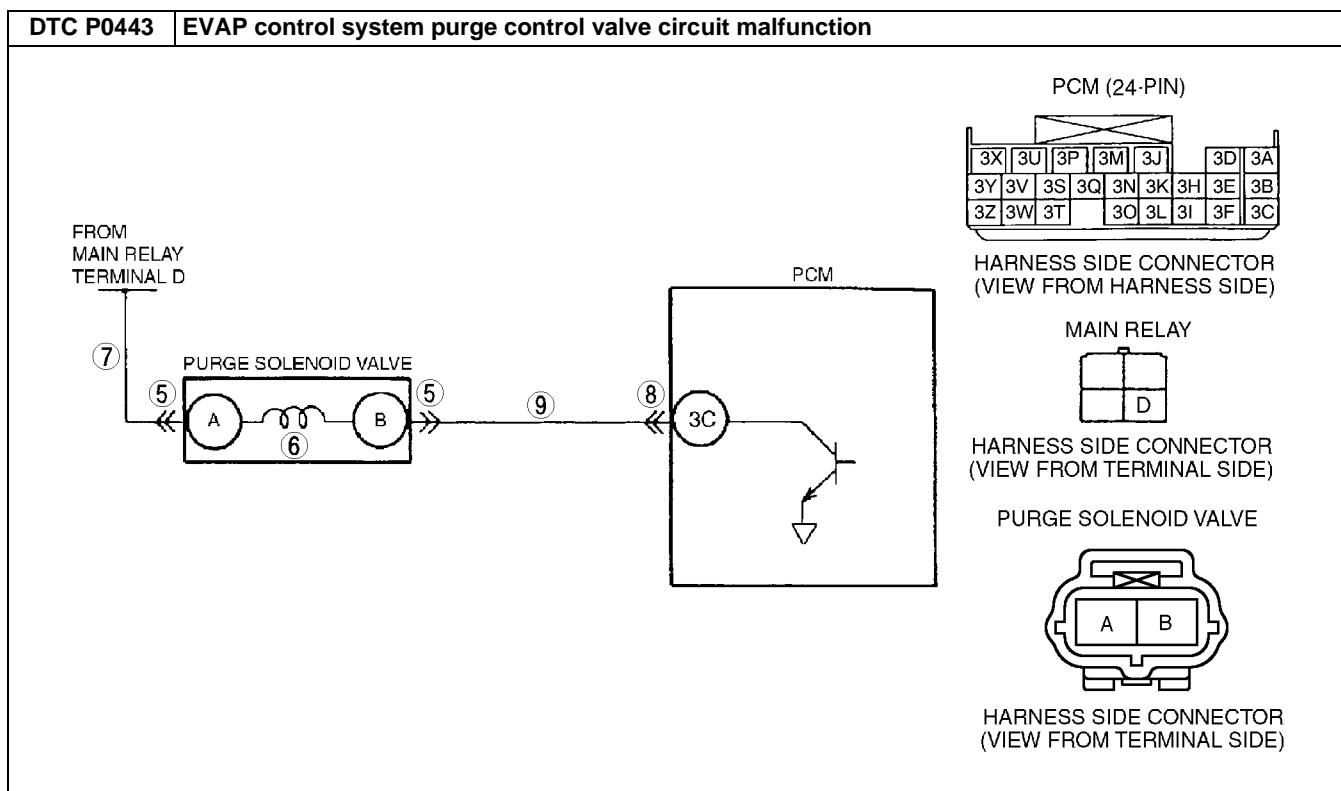
### DTC P0443

A5U010201086W05

DTC P0443	EVAP control system purge control valve circuit malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltages from purge solenoid valve just after turning the ignition key to ON. If voltage at PCM terminal 3C is <b>below 2.7 V</b>, the PCM determines that the purge solenoid valve circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a diagnostic support DTC (monitored once per key cycle).</li> <li>MIL does not come on.</li> <li>FREEZE FRAME DATA is not available.</li> <li>DTC is not stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Purge solenoid valve malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND in wiring between purge solenoid valve terminal B and PCM terminal 3C</li> <li>Open circuit in wiring between main relay terminal D and purge solenoid valve terminal A</li> <li>Open circuit in wiring between purge solenoid valve terminal B and PCM terminal 3C</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded.</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes Go to next step.
		No Refer to intermittent concern. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
4	<b>CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION</b> <ul style="list-style-type: none"> <li>Disconnect purge solenoid valve tube that is connected to intake manifold.</li> <li>Connect vacuum pump to purge solenoid valve.</li> <li>Pump vacuum pump several times and stop.</li> <li>Wait a few second.</li> <li>Is vacuum maintained?</li> </ul>	Yes Go to Step 5.
		No Go to next step.
5	<b>INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect purge solenoid valve connector.</li> <li>Pump vacuum pump several times and stop to pumps then wait a few second.</li> <li>Is vacuum maintained?</li> </ul>	Yes Repair or replace harness for short to GND, then go to Step 10.
		No Replace purge solenoid valve, then go to Step 10.
6	<b>INSPECT POOR CONNECTION OF PURGE SOLENOID VALVE CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 10.
		No Go to next step.

## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"><li>• Measure resistance between purge solenoid valve terminals (part-side).</li><li>• Is resistance <b>within 22—26 ohms</b>?</li></ul>	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
8	<b>INSPECT PURGE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"><li>• Turn ignition key to ON (Engine OFF).</li><li>• Measure voltage between purge solenoid valve connector terminal A and body GND.</li><li>• Is voltage <b>B+</b>?</li></ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 10.
9	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"><li>• Turn ignition key to OFF.</li><li>• Disconnect PCM connector.</li><li>• Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li><li>• Is there any malfunction?</li></ul>	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
10	<b>INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"><li>• Connect purge solenoid valve connector.</li><li>• Disconnect PCM connector.</li><li>• Turn ignition key to ON (Engine OFF).</li><li>• Measure voltage between PCM terminal 3C (harness-side) and body GND.</li><li>• Is voltage <b>B+</b>?</li></ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Turn ignition key to OFF then ON (Engine OFF).</li><li>• Clear DTC from PCM memory using WDS or equivalent.</li><li>• Is same DTC present?</li></ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform “After Repair Procedure”. (See 01–02A–10 AFTER REPAIR PROCEDURE)</li><li>• Is any DTC present?</li></ul>	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE)
		No	Troubleshooting completed.

### DTC P0451

A5U010201086W06

DTC P0451	FTP sensor performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Difference in FTP, which PCM monitors while operating evaporative leak monitor function or purge solenoid valve is intentionally closed, is too small or too large.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>FTP sensor malfunction</li> <li>Purge solenoid valve malfunction</li> <li>CDCV malfunction</li> <li>Poor connection of CDCV, FTP sensor and/or PCM connection</li> <li>Short circuit in wiring at CDCV</li> <li>Charcoal canister clogging</li> </ul>

### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"><li>Has FREEZE FRAME DATA been recorded?</li></ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT FOR OTHER DTCS</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Verify stored DTC.</li> <li>Have DTCs P0443 and/or P1449 been stored?</li> </ul>	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	<b>INSPECT PURGE SOLENOID VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Inspect purge solenoid valve. (See 01-16-8 PURGE SOLENOID VALVE INSPECTION)</li> <li>Is purge solenoid valve okay?</li> </ul>	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 8.
5	<b>INSPECT CDCV OPERATION</b> <ul style="list-style-type: none"> <li>Inspect CDCV. (See 01-16-6 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION)</li> <li>Is CDCV okay?</li> </ul>	Yes	Go to next step.
		No	Replace CDCV, then go to Step 8.
6	<b>INSPECT CHARCOAL CANISTER FOR CLOGGING</b> <ul style="list-style-type: none"> <li>Remove charcoal canister and inspect for clogging. (See 01-16-6 CHARCOAL CANISTER INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 8.
7	<b>INSPECT FTP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect FTP sensor. (See 01-40-25 FUEL TANK PRESSURE (FTP) SENSOR INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace FTP sensor, then go to Step 8.
8	<b>MONITOR EVAP SYSTEM BY DRIVE MODE 4</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Run Drive Mode 4 (See 01-02A-12 Mode 4 (EVAP System Repair Verification Drive Mode))</li> <li>Stop vehicle and access ON BOARD SYSTEM READINESS TESTS menu of GENERIC OBD-II FUNCTIONS to inspect Drive Mode completion status.</li> <li>Has EVAPORATIVE PURGE SYSTEM monitored?</li> </ul>	Yes	Go to next step.
		No	Verify monitoring condition for evaporative system test is okay, repeat this step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0451 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

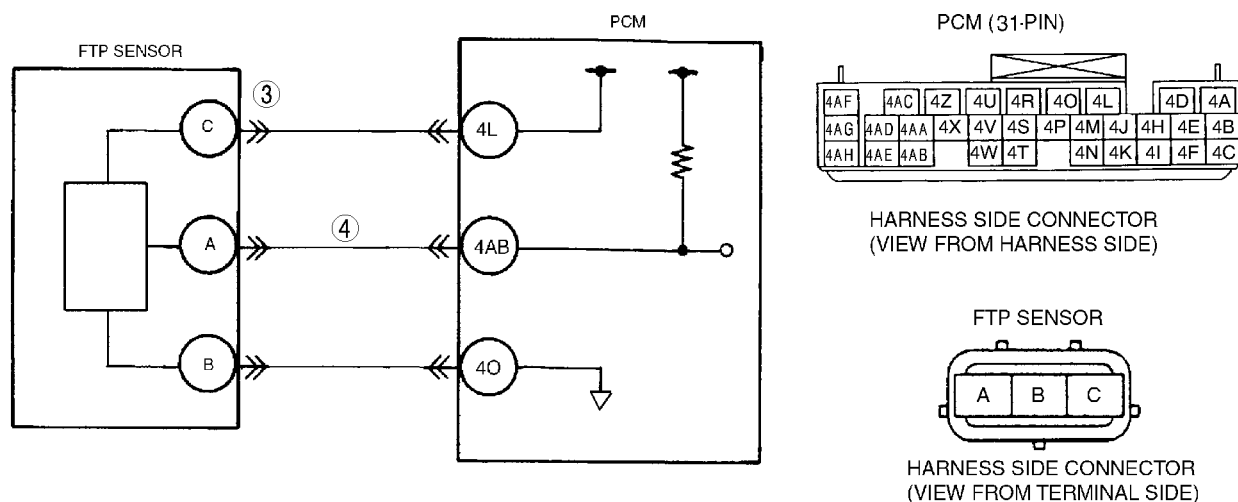
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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0452

A5U010201086W07

DTC P0452	EVAP control system pressure sensor low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from FTP sensor when monitoring conditions are met. If PCM terminal 4AB voltage is <b>below 0.2 V</b> after engine is started. PCM determines that FTP sensor circuit has malfunctioning.</li> </ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"> <li>ECT is <b>below 80°C {176°F}</b>.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous CCM monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>FTP sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND in wiring harness between FTP sensor terminal A and PCM terminal 4AB</li> <li>Open circuit in wiring harness between FTP sensor terminal C and PCM terminal 4L</li> <li>PCM malfunction</li> </ul>



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes: Go to next step. No: Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes: Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, go to next step. No: Go to next step.
3	<b>CHECK POWER SUPPLY CIRCUIT VOLTAGE AT FTP SENSOR CONNECTOR</b> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>If DTC P0107 and P0122 are also retrieved with P0452, then go to REFERENCE VOLTAGE troubleshooting procedure. (See 01-03-51 NO.30 REFERENCE VOLTAGE)</li> </ul> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Check voltage between FTP sensor terminal C (harness-side) and body GND.</li> <li>Is voltage <b>within 4.5—5.5 V</b>?</li> </ul>	Yes: Check for poor FTP sensor terminal C connection. Repair or replace as necessary. • If okay, replace FTP sensor. Go to Step 5. No: Go to next step.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

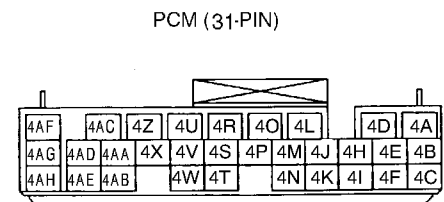
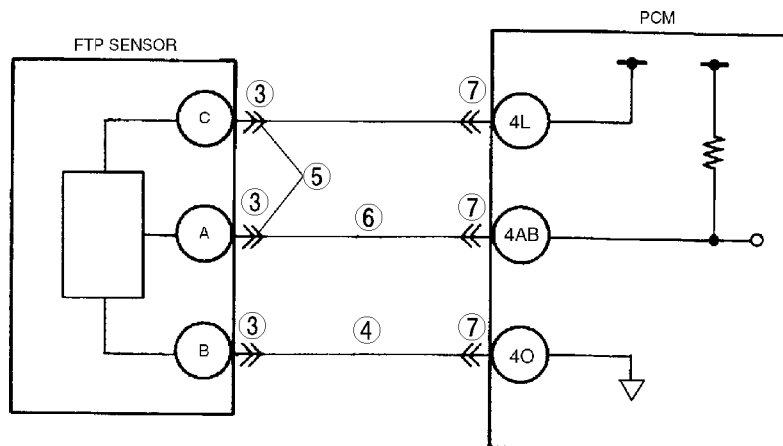
STEP	INSPECTION	ACTION
4	<b>INSPECT FTP SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check continuity between PCM terminal 4AB and GND.</li> <li>Is there any continuity?</li> </ul>	Yes Repair or replace suspected harness, then go to next step.
		No Check for FTP signal circuit and FTP GND circuit for shorts. Repair or replace suspected harness, then go to next step.
5	<b>VERIFY TROUBLESHOOTING OF DTC P0452 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

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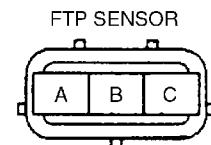
## DTC P0453

A5U010201086W08

DTC P0453	EVAP control system pressure sensor high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from FTP sensor when monitoring condition is met. If PCM terminal voltage is <b>above 4.8 V</b> after engine is started, PCM determines that FTP sensor circuit has malfunction.</li> </ul> <b>MONITORING CONDITION</b> — ECT is <b>below 80°C {176°F}</b> . <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above detection condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>FTP sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>Open circuit in wiring between FTP sensor terminal A and PCM terminal 4AB</li> <li>Open circuit in wiring between from FTP sensor terminal B and PCM terminal 4O</li> <li>FTP sensor signal circuit short to reference voltage (vref) supply circuit</li> </ul>



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT POOR CONNECTION OF FTP SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect FTP sensor connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace suspected terminal, then go to Step 8.
		No	Go to next step.
4	<b>INSPECT FTP SENSOR GND CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Check continuity between FTP sensor terminal B (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace suspected terminal, then go to Step 8.
5	<b>INSPECT FTP SIGNAL CIRCUIT FOR SHORT TO REFERENCE VOLTAGE CIRCUIT</b> <ul style="list-style-type: none"> <li>Check continuity between FTP sensor terminal A and C.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace suspected harness, then go to Step 8.
		No	Go to next step.
6	<b>INSPECT FTP SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Check continuity between FTP sensor terminal A and PCM terminal 4AB</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 8.
7	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminals 4L, 4AB and 4O (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to next step.
		No	Go to next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0453 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P0455

A5U010201086W09

DTC P0455	EVAP control system leak detected (gross leak)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM measures the FTP (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 while monitoring conditions are met. If FTP is below threshold, PCM determines that the EVAP system is blocked or has a large leak.</li> </ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"> <li>Target pressure (ftp 1): <b>-0.993 kPa {-101.3 mmAq, -3.99 inAq}</b></li> <li>PCM monitors EVAP system when driving under following conditions: <ul style="list-style-type: none"> <li>Remaining fuel <b>15—85%</b></li> <li>IAT at engine start <b>-10—60°C {14—140°F}</b></li> <li>ECT at engine start <b>-10—35°C {14.0—95°F}</b></li> <li>Atmospheric pressure <b>above 72.2 kPa {542 mmHg, 21.3 inHg}</b></li> <li>Vehicle speed <b>39.5—120.3 km/h {24.5—74.5 mph}</b></li> <li>RPM <b>1000—4000 rpm</b></li> <li>Calculated load <b>9.4—65%</b></li> <li>Throttle opening angle <b>3.13—31.6%</b></li> <li>IAT during monitor <b>-10—60°C {14—140°F}</b></li> <li>ECT during monitor <b>70—100°C {158—212°F}</b></li> </ul> </li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is an intermittent monitor (Evaporative leak monitor).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>DIAGNOSTIC MONITORING TEST RESULTS and PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Purge solenoid valve malfunction</li> <li>Canister drain cut valve (CDCV) malfunction</li> <li>Loose, missing or defective fuel filler cup</li> <li>Charcoal canister malfunction</li> <li>Catch tank malfunction</li> <li>Rollover valve malfunction</li> <li>Cracked fuel tank</li> <li>Fuel tank component parts poorly installed</li> <li>EVAP hose damaged or loose</li> <li>FTP sensor malfunction</li> </ul>

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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT FOR OTHER DTCS</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Verify stored DTC.</li> <li>Is DTCs P0443 and/or P1449 present?</li> </ul>	Yes Go to appropriate DTC inspection.
		No Go to next step.
4	<b>INSPECT FUEL FILLER CAP</b> <ul style="list-style-type: none"> <li>Verify fuel-filler cap is not either disconnected, loose or damaged.</li> <li>Is it okay?</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>When fuel-filler caps other than OEM caps are attached, it is considered malfunction.</li> </ul>	Yes Go to next step.
		No Retighten fuel-filler cap or replace it, if it is damaged. Go to Step 24.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
5	<b>INSPECT PURGE SOLENOID VALVE FOR BEING STUCK</b> <ul style="list-style-type: none"> <li>Inspect purge solenoid valve. (See 01-16-8 PURGE SOLENOID VALVE INSPECTION)</li> <li>Is purge solenoid valve okay?</li> </ul>	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 24.
6	<b>INSPECT CDCV FOR BEING STUCK</b> <ul style="list-style-type: none"> <li>Inspect CDCV. (See 01-16-6 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION)</li> <li>Is CDCV okay?</li> </ul>	Yes	Go to next step.
		No	Replace CDCV, then go to Step 24.
7	<b>DETERMINE IF EVAP CONTROL SYSTEM FOR LEAKAGE OR BLOCKAGE</b> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>If evaporative emission tester is not available, go to next step.</li> <li>Carry out EVAP control system inspection using evaporative emission tester. (See 01-03-59 Evaporative Emission (EVAP) System Leak Inspection Using Vacuum Pump)</li> <li>Does red "FAILED" light turn ON (leakage)?</li> </ul>	Yes	Tester detects leakage. <ul style="list-style-type: none"> <li>Inspect EVAP control system for leakage using evaporative emission tester. (See 01-03-58 Evaporative Emission (EVAP) System Leak Inspection Using Leak Tester)</li> <li>Repair or replace faulty area, then go to Step 24.</li> </ul>
		No	Go to next step.
8	<b>VERIFY REPAIR SHOP CONDITION</b> <ul style="list-style-type: none"> <li>Is repair shop possible to perform Drive Mode 4?</li> </ul>	Yes	Go to next step.
		No	Go to Step 14.
9	<b>INSPECT PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Inspect purge solenoid valve. (See 01-16-8 PURGE SOLENOID VALVE INSPECTION)</li> <li>Is purge solenoid valve okay?</li> </ul>	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 24.
10	<b>INSPECT FTP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect FTP sensor. (See 01-40-25 FUEL TANK PRESSURE (FTP) SENSOR INSPECTION)</li> <li>Is FTP sensor okay?</li> </ul>	Yes	Go to next step.
		No	Replace FTP sensor, then go to Step 24.
11	<b>INSPECT CATCH TANK</b> <ul style="list-style-type: none"> <li>Remove catch tank and inspect for plugging, damages and pinhole using vacuum pump.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace catch tank, then go to Step 24.
12	<b>INSPECT CHARCOAL CANISTER</b> <ul style="list-style-type: none"> <li>Remove charcoal canister and inspect for damage and pinhole.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 24.
13	<b>INSPECT CDCV</b> <ul style="list-style-type: none"> <li>Inspect CDCV. (See 01-16-6 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION)</li> <li>Is CDCV okay?</li> </ul>	Yes	Inspect and repair or replace for detached incorrectly installed or cracked EVAP system hoses. Go to Step 24.
		No	Replace CDCV, then go to Step 24.
14	<b>INSPECT WHOLE SYSTEM OF EVAP CONTROL SYSTEM</b> <ul style="list-style-type: none"> <li>Implement "01-03A ENGINE CONTROL SYSTEM OPERATION INSPECTION, EVAP System Leak Inspection Using Vacuum Pump, Whole system inspection." (See 01-03-59 Whole system inspection)</li> <li>Does voltage change under to specified readings and hold for <b>minimum of 2 min</b>?</li> </ul>	Yes	No leaks were detected in EVAP control system at this time. Go to Step 24.
		No	Go to next step.
15	<b>INSPECT FTP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect FTP sensor. (See 01-40-25 FUEL TANK PRESSURE (FTP) SENSOR INSPECTION)</li> <li>Is FTP sensor okay?</li> </ul>	Yes	Go to next step.
		No	Replace FTP sensor, then go to Step 24.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
16	<b>INSPECT LEAKAGE OF FROM CHARCOAL CANISTER TO FUEL TANK</b> <ul style="list-style-type: none"> <li>Implement "01-03A ENGINE CONTROL SYSTEM OPERATION INSPECTION, EVAP System Leak Inspection Using Vacuum Pump, Inspection from charcoal canister to fuel tank". (See 01-03-59 Inspection from charcoal canister to fuel tank)</li> <li>Does voltage change under to specified readings and hold for <b>minimum of 2 min</b>?</li> </ul>	Yes	Go to Step 20.
		No	Go to next step.
17	<b>INSPECT ATTACHED ACCESSORIES ON FUEL TANK</b> <ul style="list-style-type: none"> <li>Remove fuel tank and visually inspect for damage, insufficient sealing or poorly attached accessories on fuel tank, such as fuel gauge.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to Step 24.
18	<b>INSPECT FUEL SHUT-OFF VALVE</b> <ul style="list-style-type: none"> <li>Inspect fuel shut-off valve for ventilation. (See 01-16-4 FUEL SHUT-OFF VALVE/ ROLLOVER VALVE INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace fuel tank, then go to Step 24.
19	<b>INSPECT ROLLOVER VALVE</b> <ul style="list-style-type: none"> <li>Inspect rollover valve for ventilation.</li> <li>Is it okay?</li> </ul>	Yes	Inspect and repair or replace for detached, incorrectly installed or cracked on following hoses: <ul style="list-style-type: none"> <li>From charcoal canister to fuel tank go to Step 24.</li> </ul>
		No	Replace fuel tank, then go to Step 24.
20	<b>INSPECT LEAKAGE FROM CHARCOAL CANISTER TO PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Implement "01-03A ENGINE CONTROL SYSTEM OPERATION INSPECTION, EVAP System Leak Inspection Using Vacuum Pump, Inspection from charcoal canister to purge solenoid valve". (See 01-03-59 Inspection from charcoal canister to purge solenoid valve)</li> <li>Does vacuum drop below specified readings and hold for a <b>minimum of 2 min</b>?</li> </ul>	Yes	Go to Step 24.
		No	Go to next step.
21	<b>INSPECT PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Remove purge solenoid valve and inspect for damage and air leak.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 24.
22	<b>INSPECT CHARCOAL CANISTER</b> <ul style="list-style-type: none"> <li>Remove charcoal canister and inspect for plugging, damage and pinhole.</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 24.
23	<b>INSPECT CDCV</b> <ul style="list-style-type: none"> <li>Inspect CDCV. (See 01-16-6 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION)</li> <li>Is CDCV okay?</li> </ul>	Yes	Inspect and repair or replace for detached incorrectly installed or cracked hoses from charcoal canister to CDCV. go to next step.
		No	Replace CDCV, then go to next step.
24	<b>DECIDE ON AFTER REPAIR PROCEDURE ACCORDING TO REPAIR SHOP CONDITION</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Is repair shop possible to perform Drive Mode 4?</li> </ul>	Yes	Go to Step 26.
		No	Go to next step.
25	<b>MONITOR EVAP SYSTEM BY DRIVE MODE 4</b> <ul style="list-style-type: none"> <li>Run Drive Mode 4. (See 01-02A-12 Mode 4 (EVAP System Repair Verification Drive Mode))</li> <li>Stop vehicle and access ON BOARD SYSTEM READINESS TESTS to inspect Drive Mode completion status.</li> <li>Has EVAPORATIVE PURGE SYSTEM monitored?</li> </ul>	Yes	Go to next step.
		No	Verify monitoring condition for EVAP system test or drive mode 4 is okay, go back to Step 24.

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## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
26	<b>VERIFY EVAP SYSTEM REPAIRED</b> <ul style="list-style-type: none"> <li>Access DIAGNOSTIC MONITORING TEST RESULTS I FUNCTIONS.</li> <li>Verify TEST ID 10:22:00 value. (See 01-02A-10 Diagnostic Monitoring Test Results Access Procedure)</li> <li>Is it below maximum value?</li> </ul>	Yes Go to next step.
		No Replace PCM, then go to next step.
27	<b>INSPECT WHOLE SYSTEM OF EVAP CONTROL SYSTEM</b> <ul style="list-style-type: none"> <li>Implement "01-03A ENGINE CONTROL SYSTEM OPERATION INSPECTION, EVAP System Leak Inspection Using Vacuum Pump, Whole system inspection". (See 01-03-59 Whole system inspection)</li> <li>Does voltage change under to specified readings and hold for <b>minimum of 2 min</b>?</li> </ul>	Yes Go to next step.
		No Replace PCM, then go to next step.
28	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

### DTC P0461

A5U010201086W10

DTC P0461	Fuel gauge sender unit circuit range/performance
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors fuel gauge sender unit input voltage difference before and after PCM-calculated fuel consumption has reached <b>16.8 L {17.6 US qt, 14.8 Imp qt}</b>. If fuel gauge sender unit operation reflects <b>1 % less</b> than PCM-calculated fuel consumption, PCM determines that fuel gauge sender unit range/performance is in error.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Fuel gauge sender unit malfunction or substandard performance</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT FUEL GAUGE SENDER UNIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect fuel gauge sender unit. (See 09-22-8 FUEL GAUGE SENDER UNIT INSPECTION)</li> <li>Is fuel gauge sender unit okay?</li> </ul>	Yes Replace PCM, then go to next step.
		No Repair or replace fuel gauge sender unit, then go to next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

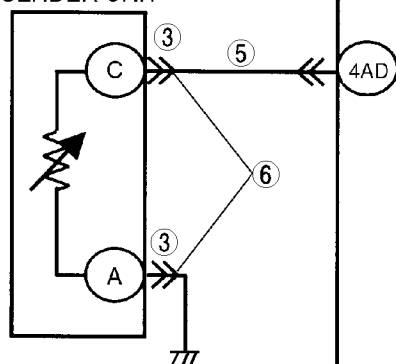
DTC P0462

A5U010201086W11

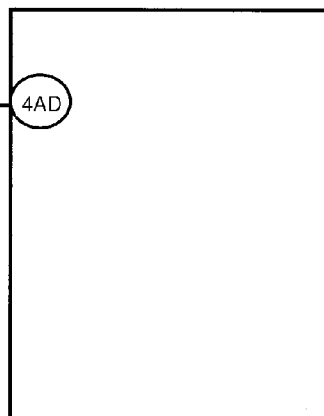
DTC P0462	Fuel gauge sender unit circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the voltage of the fuel gauge sender unit. If the PCM detects PCM terminal 4AD voltage <b>below 0.1 V for 5 s</b>, the PCM determines that the fuel gauge sender unit circuit has a malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Fuel gauge sender unit malfunction</li> <li>Short to GND circuit between fuel gauge sender unit terminal C and PCM terminal 4AD</li> <li>Short circuit between fuel level signal circuit and fuel gauge sender unit GND circuit</li> <li>PCM malfunction</li> <li>Bent terminals of fuel gauge sender unit</li> </ul>

01-02A

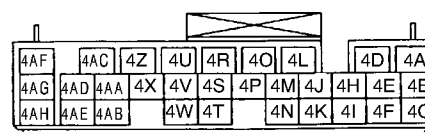
FUEL GAUGE SENDER UNIT



PCM

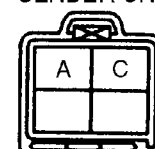


PCM (31-PIN)



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

FUEL GAUGE SENDER UNIT



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes
		No
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes
		No
3	<b>INSPECT TERMINAL FOR BENT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect fuel gauge sender unit connector.</li> <li>Check for bent terminal.</li> <li>Is there any malfunction?</li> </ul>	Yes
		No
4	<b>CLASSIFY FUEL GAUGE SENDER UNIT OR HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect fuel gauge sender unit. (See 09-22-8 FUEL GAUGE SENDER UNIT INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes
		No

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

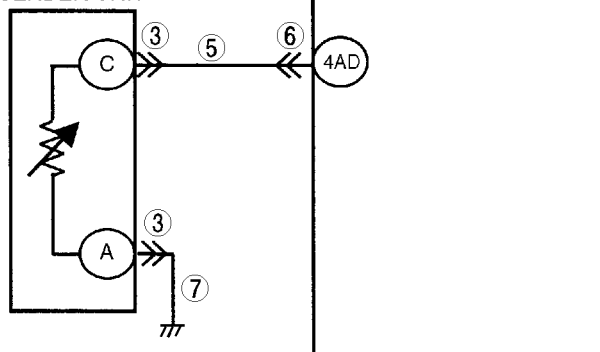
STEP	INSPECTION	ACTION	
5	<b>INSPECT FUEL LEVEL SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check continuity between fuel gauge sender unit terminal C (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace suspected harness, then go to Step 7.
		No	Go to next step.
6	<b>INSPECT FUEL GAUGE SENDER UNIT CIRCUITS FOR SHORTS</b> <ul style="list-style-type: none"> <li>Check continuity between fuel gauge sender unit terminals A and C (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace suspected harness, then go to Step 7.
		No	Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0462 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

## DTC P0463

A5U010201086W12

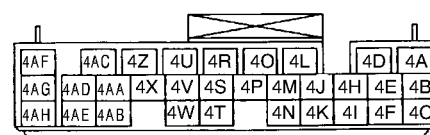
DTC P0463	Fuel gauge sender unit circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the voltage of the fuel gauge sender unit. If the PCM detected PCM terminal 4AD voltage <b>above 5.4 V</b> for <b>5 s</b>, the PCM determines that the fuel gauge sender unit circuit has a malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
	<b>POSSIBLE CAUSE</b> <ul style="list-style-type: none"> <li>Fuel gauge sender unit malfunction</li> <li>Open circuit between fuel gauge sender unit terminal C and PCM terminal 4AD</li> <li>Open circuit between fuel gauge sender unit terminal A and body GND</li> <li>Poor connection of fuel gauge sender unit and/or PCM connector</li> <li>PCM malfunction</li> </ul>

FUEL GAUGE SENDER UNIT



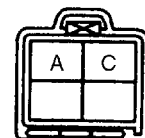
PCM

PCM (31-PIN)



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

FUEL GAUGE SENDER UNIT



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT FUEL GAUGE SENDER UNIT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect fuel gauge sender unit connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair suspected terminal, then go to Step 8.
		No	Go to next step.
4	<b>CLASSIFY FUEL GAUGE SENDER UNIT OR HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect fuel gauge sender unit. (See 09-22-8 FUEL GAUGE SENDER UNIT INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Repair or replace if necessary, go to Step 8.
		No	Go to next step.
5	<b>INSPECT FTL SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between fuel gauge sender unit terminal C (harness-side) and body GND.</li> <li>Is voltage <b>above 4.5—5.5 V</b>?</li> </ul>	Yes	Go to Step 8.
		No	Go to next step.
6	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair suspected terminal, then go to Step 8.
		No	Repair or replace open circuit between fuel gauge sender unit terminal C (harness-side) and PCM terminal 4AD (harness-side), then go to Step 8.
7	<b>INSPECT FUEL GAUGE SENDER UNIT GND CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check continuity between fuel gauge sender unit terminal A (harness-side) and body GND.</li> <li>Are there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0463 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

01-02A

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## DTC P0464

A5U010201086W13

DTC P0464	Fuel gauge sender unit circuit performance (slosh check)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors fuel gauge sender unit input voltage at PCM terminal 4AD while engine is running. If differences are <b>above specified</b> for <b>14 s</b> while vehicle stops, PCM determines that fuel tank level signal is incorrect.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Fuel gauge sender unit malfunction or substandard performance</li> <li>Vehicle speed signal circuit malfunction</li> </ul>

### Diagnostic procedure

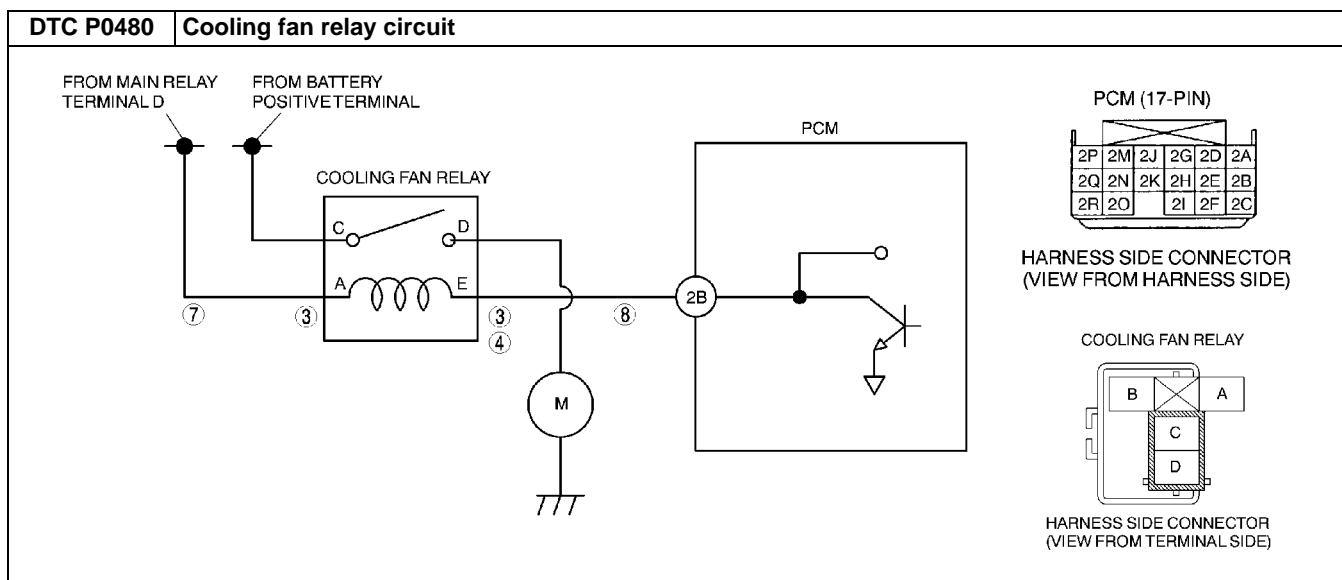
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT FUEL GAUGE SENDER UNIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect fuel gauge sender unit. (See 09-22-8 FUEL GAUGE SENDER UNIT INSPECTION)</li> <li>Is fuel gauge sender unit okay?</li> </ul>	Yes Replace PCM, then go to next step.
		No Repair or replace fuel gauge sender unit, go to next step.
4	<b>VERIFY VEHICLE SPEED SIGNAL CIRCUIT</b> <ul style="list-style-type: none"> <li>Measure voltage PCM terminal 3T while driving.</li> <li>Is voltage <b>approx. 2.5 V</b>?</li> </ul>	Yes Go to next step.
		No Inspect vehicle speed signal circuit, go to next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0480

A5U010201086W14

DTC P0480	Cooling fan relay circuit
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors control signal to cooling fan relay coil control circuit. If signal at PCM terminal 2B remains low or high, PCM determines that cooling fan relay circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM)</li> <li>PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycles.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Cooling fan relay malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND circuit in wiring between cooling fan relay terminal E and PCM terminal 2B</li> <li>Open circuit in wiring between cooling fan relay terminal E and PCM terminal 2B</li> <li>Open circuit in wiring between main relay terminal D and cooling fan relay terminal C</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any Service Information available?</li> </ul>	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	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Operate A/C to operate cooling fan relay.</li> <li>Is same of DTC present?</li> </ul>	Yes Go to next step.
		No Refer to intermittent concern. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
3	<b>INSPECT POOR CONNECTION OF COOLING FAN RELAY</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect cooling fan relay connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair or replace terminals, then go to Step 9.
		No Go to next step.
4	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between cooling fan relay terminal E (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Go to next step.
		No Repair or replace harness, then go to Step 9.
5	<b>INSPECT COOLING FAN RELAY</b> <ul style="list-style-type: none"> <li>Inspect cooling fan relay.</li> <li>Is cooling fan relay okay?</li> </ul>	Yes Go to next step.
		No Replace cooling fan relay, then go to Step 9.
6	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 2B (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair terminal, then go to Step 9.
		No Go to next step.
7	<b>INSPECT CONTROL CIRCUIT FOR SHORT</b> <ul style="list-style-type: none"> <li>Check for continuity between cooling fan relay terminal E (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes Repair or replace harness for short to GND, then go to Step 9.
		No Measure voltage between cooling fan relay terminal E and body GND. • If voltage is <b>B+</b> , repair or replace harness for short to power, go to next step. • If voltage is <b>approx. 0 V</b> , go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
8	<b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check for continuity between cooling fan relay terminal E (harness-side) and PCM terminal 2B (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Operate A/C for operate cooling fan relay.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

## DTC P0500

A5U010201087W01

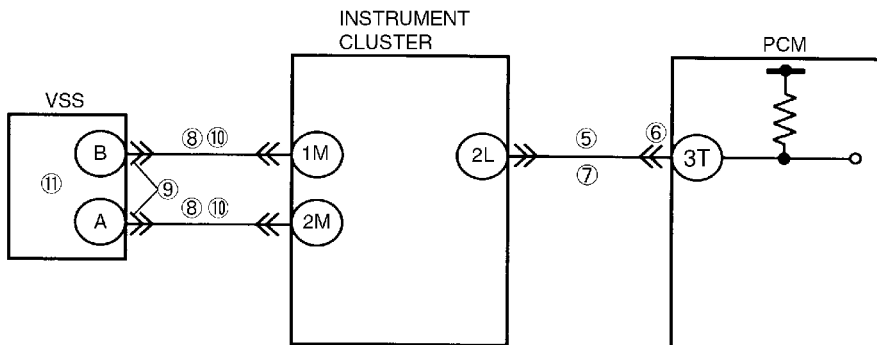
DTC P0500	VSS circuit malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Vehicle speed signal is <b>below 3.76 km/h {2.34 mph}</b> for <b>25.6 s or more</b> after following monitoring conditions are met:  <b>Monitoring conditions</b> <ul style="list-style-type: none"> <li>Shift range in D, S or L range (AT)</li> <li>Shift in gear and clutch pedal released (MT)</li> <li>Charging efficiency is <b>above 40% or above</b></li> <li>Engine speed is above <b>2000 rpm or above</b></li> </ul> </li> <li><b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>HOLD indicator light flashes.</li> <li>DTC is stored in the PCM memory.</li> </ul> </li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PCM malfunction</li> <li>Instrument cluster malfunction</li> <li>VSS malfunction</li> <li>Open circuit between VSS terminal A and instrument cluster terminal 2M (MT)</li> <li>Short to GND between VSS terminal A and instrument cluster terminal 2M (MT)</li> <li>Open circuit between VSS terminal B and instrument cluster terminal 1M (MT)</li> <li>Short to GND between VSS terminal B and instrument cluster terminal 1M (MT)</li> <li>Open circuit between PCM terminal 3T and instrument cluster terminal 2L</li> <li>Short to GND between PCM terminal 3T and instrument cluster terminal 2L</li> <li>Open circuit between output speed sensor terminal A and TCM terminal W (AT)</li> <li>Short to GND circuit between output speed sensor terminal A and TCM terminal W (AT)</li> <li>Open circuit between output speed sensor terminal B and TCM terminal Z (AT)</li> <li>Short to GND circuit between output speed sensor terminal B and TCM terminal Z (AT)</li> <li>Open circuit between TCM terminal AC and instrument cluster terminal 2M (AT)</li> <li>Short to GND circuit between TCM terminal AC and instrument cluster terminal 2M (AT)</li> <li>Damaged connector between VSS and instrument cluster (MT)</li> <li>Damaged connector between output speed sensor and TCM (AT)</li> <li>Damaged connector between TCM and instrument cluster (AT)</li> <li>Damaged connector between instrument cluster and PCM</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

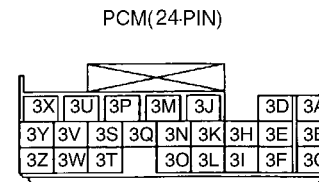
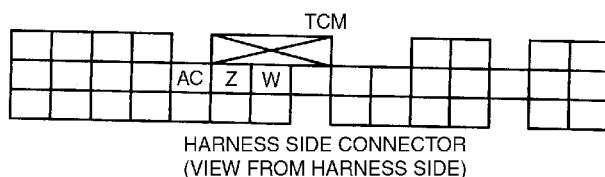
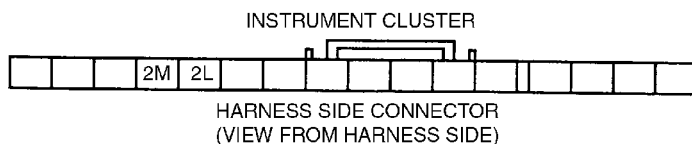
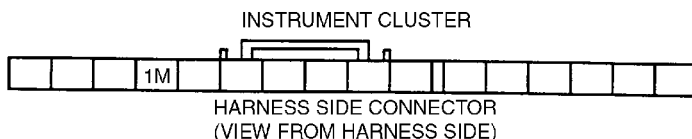
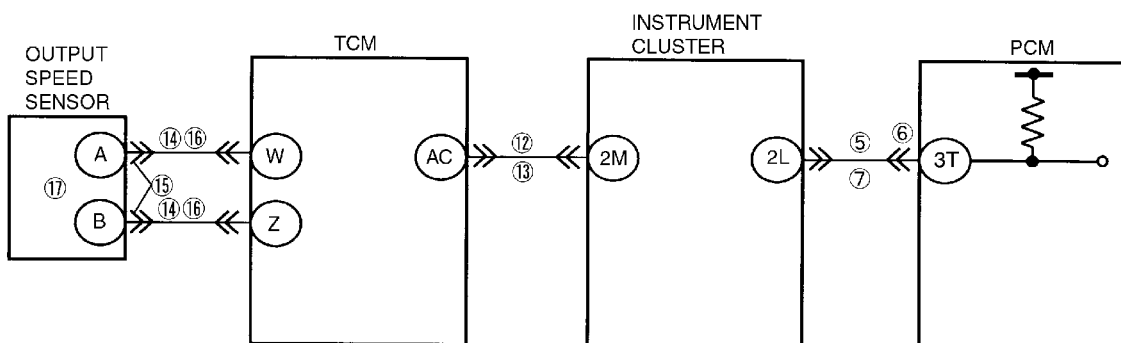
01-02A

DTC P0500 VSS circuit malfunction

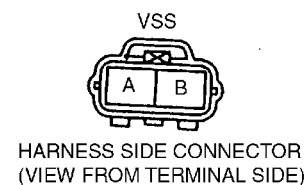
MT



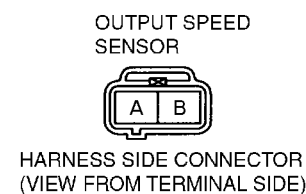
AT



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME PID DATA been recorded?</li> </ul>	Yes: Go to next step. No: Record FREEZE FRAME PID DATA on repair order, then go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>CLASSIFY VSS SIDE OR PCM SIDE MALFUNCTION</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Drive vehicle.</li> <li>Does speedometer needle move when driving vehicle?</li> </ul>	Yes	Go to next step.
		No	<b>MT:</b> Go to Step 8. <b>AT:</b> Go to Step 12.
4	<b>VERIFY DTC P0500 PRESENT</b> <ul style="list-style-type: none"> <li>Clear DTC from memory using WDS or equivalent.</li> <li>Warm up the engine.</li> <li>Access LOAD and RPM PID using WDS or equivalent.</li> <li>Drive vehicle under following condition for <b>25.6 s or more</b> while monitoring PIDs. <ul style="list-style-type: none"> <li>— LOAD PID: <b>40% or above</b></li> <li>— RPM PID: <b>2,000 rpm or above</b></li> </ul> </li> <li>Is DTC P0500 present?</li> </ul>	Yes	Go to next step.
		No	Go to Step 6.
5	<b>INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Ignition key to OFF.</li> <li>Disconnect cruise control module and PCM connector.</li> <li>Check continuity between PCM terminal 3T and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness, then go to Step 18.
		No	Replace speedometer, then go to Step 18.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion etc.).</li> <li>Is connection okay?</li> </ul>	Yes	Go to next step.
		No	Repair or replace pin or connection, then go to Step 18.
7	<b>INSPECT PCM CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Check continuity between PCM terminal 3T (harness-side) and instrument cluster terminal 2L (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to Step 18.
		No	Repair or replace harness, then go to Step 18.
8	<b>INSPECT VEHICLE SPEED SIGNAL CIRCUIT AT INSTRUMENT CLUSTER FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect instrument cluster and VSS connector.</li> <li>Check continuity between following terminals. <ul style="list-style-type: none"> <li>— VSS terminal A (harness-side) and instrument cluster terminal 2M (harness-side)</li> <li>— VSS terminal B (harness-side) and instrument cluster terminal 1M (harness-side)</li> </ul> </li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 18.
9	<b>INSPECT VEHICLE SPEED SIGNAL CIRCUIT AT INSTRUMENT CLUSTER CIRCUIT FOR SHORT</b> <ul style="list-style-type: none"> <li>Check continuity between VSS connector terminal A and B (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short, then go to Step 18.
		No	Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
10	<b>INSPECT VEHICLE SPEED SIGNAL AT INSTRUMENT CLUSTER FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between instrument cluster terminal (harness-side) and body GND. <ul style="list-style-type: none"> <li>— 1M and body GND</li> <li>— 2M and body GND</li> </ul> </li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 18.
		No	Go to next step.
11	<b>INSPECT VSS OUTPUT VOLTAGE</b> <ul style="list-style-type: none"> <li>Remove the VSS.</li> <li>Inspect voltage between VSS connector (parts-side)</li> <li>Is voltage okay? (See 05-11A-4 VEHICLE SPEEDOMETER SENSOR INSPECTION [M15M-D])</li> </ul>	Yes	Inspect speedometer, then go to Step 18.
		No	Replace VSS, go Step 18.
12	<b>INSPECT VEHICLE SPEED SIGNAL AT INSTRUMENT CLUSTER FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between TCM terminal AC (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 18.
		No	Go to next step.
13	<b>INSPECT VEHICLE SPEED SIGNAL AT INSTRUMENT CLUSTER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition switch to OFF.</li> <li>Disconnect instrument cluster and TCM connector.</li> <li>Check continuity between instrument cluster terminal 2M (harness-side) and TCM terminal AC (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 18.
14	<b>INSPECT OUTPUT SPEED SIGNAL AT TCM FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect TCM and output speed sensor connector.</li> <li>Check continuity between following terminals. <ul style="list-style-type: none"> <li>— Output speed sensor terminal A (harness-side) and TCM terminal W (harness-side)</li> <li>— Output speed sensor terminal B (harness-side) and TCM terminal Z (harness-side)</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 18.
15	<b>INSPECT OUTPUT SPEED SIGNAL CIRCUIT AT TCM FOR SHORT</b> <ul style="list-style-type: none"> <li>Check continuity between output speed sensor terminal A and B (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short, then go to Step 18.
		No	Go to next step.
16	<b>INSPECT VEHICLE SPEED SIGNAL AT TCM FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between TCM terminal (harness-side) and body GND. <ul style="list-style-type: none"> <li>W and body GND</li> <li>Z and body GND</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 18.
		No	Go to next step.
17	<b>INSPECT OUTPUT SPEED SENSOR RESISTANCE</b> <ul style="list-style-type: none"> <li>Disconnect output speed sensor connector.</li> <li>Measure resistance between output speed sensor terminal A and B (parts-side).</li> <li>Is resistance okay? (See 05-13-17 OUTPUT SPEED SENSOR INSPECTION)</li> </ul>	Yes	Inspect vehicle speedometer, then go to next step.
		No	Replace output speed sensor, then go to next step.

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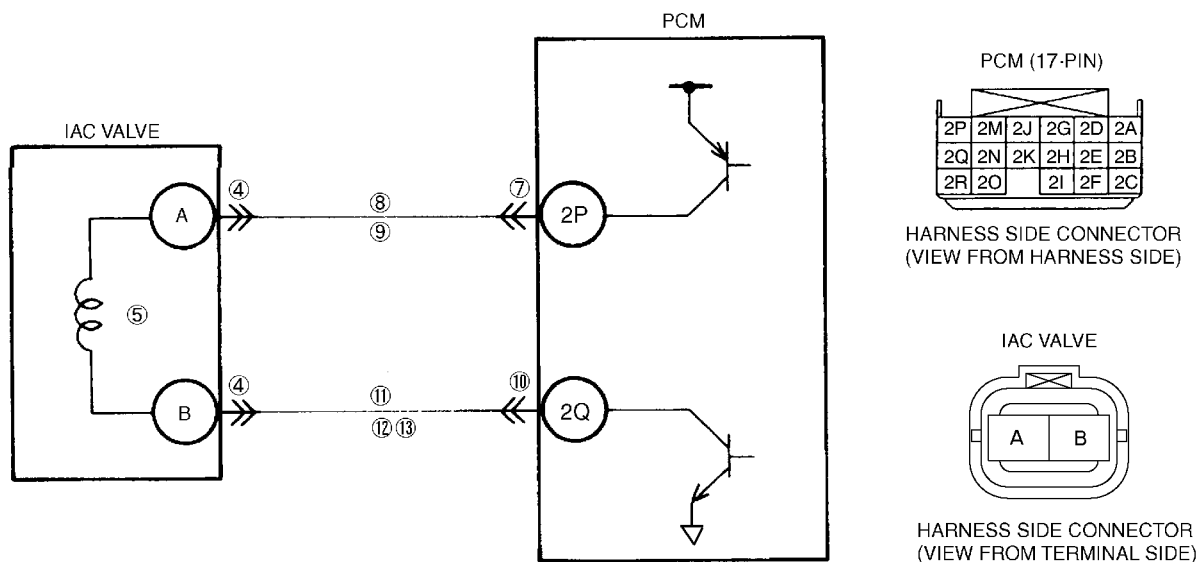
# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
18	<b>VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Access LOAD and RPM PID using WDS or equivalent.</li> <li>Drive vehicle under following condition for <b>25.6 s or more</b> while monitoring PIDs. <ul style="list-style-type: none"> <li>LOAD PID: <b>40% or above</b></li> <li>RPM PID: <b>2,000 rpm or above</b></li> </ul> </li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
19	<b>VERIFY REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is there any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0505

A5U010201087W02

DTC P0505	IAC valve circuit malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the IAC valve circuit voltage. If the PCM detects that IAC control signal does not change for <b>1 s</b>, the PCM determines that the IAC valve circuit has malfunction.</li> </ul> <b>Monitoring conditions</b> <ul style="list-style-type: none"> <li>Following conditions are not: <ul style="list-style-type: none"> <li>Except cranking</li> <li>At battery voltage <b>above 11V</b></li> <li>IAC valve actuation time is <b>18.1—69.9%</b>.</li> </ul> </li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle.</li> <li>PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>IAC valve circuit malfunction</li> <li>Short to GND between IAC valve terminal A and PCM terminal 2P</li> <li>Open circuit between IAC valve terminal A and PCM terminal 2P</li> <li>Short to GND between IAC valve terminal B and PCM terminal 2Q</li> <li>Short to power between IAC valve terminal B and PCM terminal 2Q</li> <li>Open circuit between IAC valve terminal B and PCM terminal 2Q</li> <li>Poor connection of IAC valve connector or PCM connector</li> <li>PCM malfunction</li> </ul>





# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Clear DTC using WDS or equivalent.</li> <li>Start engine and warm it up completely.</li> <li>Is same DTC detected?</li> </ul>	Yes	Go to next step.
		No	Go to intermittent concern. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
4	<b>INSPECT IAC VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect IAC valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	<b>INSPECT IAC VALVE ELECTRICAL MALFUNCTION</b> <ul style="list-style-type: none"> <li>Measure resistance between IAC valve terminals A and B (part-side).</li> <li>Is resistance <b>within 8.7— 10.5 ohms (24°C {75°F})</b>?</li> </ul>	Yes	Go to next step.
		No	Replace IAC valve, then go to Step 14.
6	<b>DETERMINE IF MALFUNCTION AT POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between IAC valve terminal A (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Malfunction at control circuit. Go to Step 10.
		No	Malfunction at power supply circuit. Go to next step.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 2P (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.
8	<b>INSPECT POWER CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check continuity between IAC valve terminal A (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 14.
		No	Go to next step.
9	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF</li> <li>Disconnect PCM connector.</li> <li>Check continuity between IAC valve terminal A (harness-side) and PCM terminal 2P (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for open circuit, then go to Step 14.
		No	Go to Step 14.
10	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 2Q (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 14.
		No	Go to next step.

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## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
11	<b>INSPECT CONTROL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between IAC valve terminal B (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace harness for short to power, then go to Step 14.
		No	Go to next step.
12	<b>INSPECT CONTROL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check continuity between IAC valve terminal B (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 14.
		No	Go to next step.
13	<b>INSPECT CONTROL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check continuity between IAC valve terminal B (harness-side) and PCM terminal 2Q (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for open, then go to next step.
		No	Go to next step.
14	<b>VERIFY TROUBLESHOOTING OF DTC P1504 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start the engine and warm it up completely.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
15	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

### DTC P0506

A5U010201087W03

DTC P0506	Idle control system RPM lower than expected
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Actual idle speed is lower than expected by <b>100 rpm for 14 s</b>, when brake pedal is depressed (brake switch is ON) and steering wheel is held straight ahead (PSP switch is OFF).</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>If atmospheric pressure is <b>less than 72.2 kPa {542 mmHg, 21.3 inHg}</b> or IAT is <b>below -10°C {14°F}</b>, PCM cancels diagnostic of P0506.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
	<p><b>POSSIBLE CAUSE</b></p> <ul style="list-style-type: none"> <li>IAC valve malfunction</li> <li>ACL element clogged</li> <li>Air intake passage clogged</li> <li>A/C relay control circuit malfunction</li> <li>Generator control circuit malfunction</li> <li>Purge solenoid valve malfunction</li> <li>Low engine compression (Over capacity of blow-by gas)</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	<b>VERIFY RELATED PENDING OR STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then ON (Engine OFF).</li> <li>Verify pending code or stored DTCs using WDS or equivalent.</li> <li>Is other DTC present?</li> </ul>	Yes Repair applicable DTCs. (See 01-02A-13 DTC TABLE)
		No Go to next step.
4	<b>INSPECT IAC VALVE MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect IAC valve. (See 01-13-5 IDLE AIR CONTROL (IAC) VALVE INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes Go to next step.
		No Replace IAC valve, then go to Step 11.
5	<b>INSPECT A/C MAGNET CLUTCH OPERATION</b> <ul style="list-style-type: none"> <li>Turn blower motor switch off.</li> <li>Is magnetic clutch still on?</li> </ul>	Yes Refer to "A/C is always on or A/C compressor runs continuously." of ENGINE SYMPTOM TROUBLESHOOTING, then go to Step 11. (See 01-03-47 NO.24 A/C ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY)
		No Go to next step.
6	<b>INSPECT GENERATOR CONTROL CIRCUIT MALFUNCTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect generator connector.</li> <li>Turn ignition key to ON.</li> <li>Measure voltage between generator terminal D (Harness-side) and body GND.</li> <li>Is voltage 0 V?</li> </ul>	Yes Go to next step.
		No Repair short to power circuit in generator control circuit, then go to Step 11.
7	<b>INSPECT PURGE SOLENOID VALVE CONTROL MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect purge solenoid valve. (See 01-16-8 PURGE SOLENOID VALVE INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes Go to next step.
		No Replace purge solenoid valve, then go to Step 11.
8	<b>INSPECT ACL ELEMENT</b> <ul style="list-style-type: none"> <li>Remove ACL element with engine running.</li> <li>Is engine speed increased?</li> </ul>	Yes Replace ACL element, then go to Step 11.
		No Go to next step.
9	<b>INSPECT TB PASSAGE</b> <ul style="list-style-type: none"> <li>Is TB clogged?</li> </ul>	Yes Clean or replace TB passage, then go to Step 11.
		No Go to next step.
10	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression. (See 01-10-7 COMPRESSION INSPECTION)</li> <li>Is engine compression okay?</li> </ul>	Yes Go to next step.
		No Overhaul engine, then go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Depress brake pedal for <b>14.1 s or more</b>.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

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# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## DTC P0507

A5U010201087W04

DTC P0507	Idle control system RPM higher than expected
DETECTION CONDITION	<ul style="list-style-type: none"> <li>Actual idle speed is higher than expected by <b>200 rpm</b> for <b>14 s</b>, when brake pedal is depressed (brake switch is ON) and steering wheel is held straight ahead (PSP switch is OFF).</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>If atmospheric pressure is <b>less than 72.2 kPa {542 mmHg, 21.3 inHg}</b> or intake-air temperature is <b>below -10°C {14°F}</b>, PCM cancels diagnostic of P0507.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>IAC valve malfunction</li> <li>Accelerator cable misadjusting</li> <li>Throttle valve malfunction</li> <li>Vacuum hose misconnection</li> <li>PCM malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then ON (Engine OFF).</li> <li>Verify pending code or stored DTCs using WDS or equivalent.</li> <li>Is other DTC present?</li> </ul>	Yes Repair applicable DTCs. (See 01-02A-13 DTC TABLE)
		No Go to next step.
4	<b>INSPECT IAC VALVE MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect IAC valve. (See 01-13-5 IDLE AIR CONTROL (IAC) VALVE INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes Go to next step.
		No Replace IAC valve, then go to Step 9.
5	<b>INSPECT ACCELERATOR CABLE FREE PLAY</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Is accelerator cable free play okay? (See 01-13-9 ACCELERATOR CABLE INSPECTION/ADJUSTMENT)</li> </ul>	Yes Go to next step.
		No Adjust accelerator cable free play, then go to Step 9. (See 01-13-9 ACCELERATOR CABLE INSPECTION/ADJUSTMENT)
6	<b>INSPECT VACUUM HOSE CONNECTION</b> <ul style="list-style-type: none"> <li>Are vacuum hoses connecting accurately? (See 01-13-3 VACUUM HOSE ROUTING DIAGRAM)</li> </ul>	Yes Go to next step.
		No Reconnect vacuum hose accurately, then go to Step 9.
7	<b>VISUAL INSPECT THROTTLE VALVE</b> <ul style="list-style-type: none"> <li>Remove TB.</li> <li>Is throttle valve fully closed?</li> </ul>	Yes Go to next step.
		No Clean or replace TB, then go to next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start the engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Depress brake pedal for <b>14.1 s or more</b>.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0550

A5U010201087W05

01-02A

DTC P0550	PSP switch circuit malfunction
DETECTION CONDITION	<ul style="list-style-type: none"> <li>The PCM monitors PSP switch signal at PCM terminal 4C. If input voltage is low voltage (switch stays on) for <b>1 minute</b> when the VSS is <b>above 60.1 km/h {37.3 mph}</b> and ECT is <b>above 60°C {140°F}</b>, the PCM determines that PSP switch circuit has malfunction.</li> </ul>
	<b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>PSP switch malfunction</li> <li>Short to GND between PSP switch terminal and PCM terminal 4C</li> <li>PCM malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"><li>If vehicle is not repaired, go to next step.</li></ul>
		No Go to next step.
3	<b>INSPECT PSP SWITCH</b> <ul style="list-style-type: none"> <li>Inspect PSP switch. (See 01-40-35 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes Replace the PSP switch, then go to Step 5.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
4	<b>INSPECT PSP SWITCH SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check continuity between PSP switch terminal (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes Repair or replace harness for short to GND, then go to next step.
		No Go to next step.
5	<b>VERIFY TROUBLESHOOTING OF DTC P0550 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Start the engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Drive vehicle <b>above 60.1 km/h {37.3 mph}</b> for <b>1 min.</b></li> <li>Verify that ECT PID <b>above 60°C {140°F}</b> using WDS or equivalent.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0605

A5U010201088W01

<b>DTC P0605</b>	<b>Internal control module read only memory (ROM) error</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM internal ROM damaged.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PCM internal ROM damaged.</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>PERFORM DTC CONFIRMATION PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform DTC CONFIRMATION PROCEDURE.</li> <li>Is the same DTC present during KOEO Self-Test?</li> </ul>	Yes Replace PCM, go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
2	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

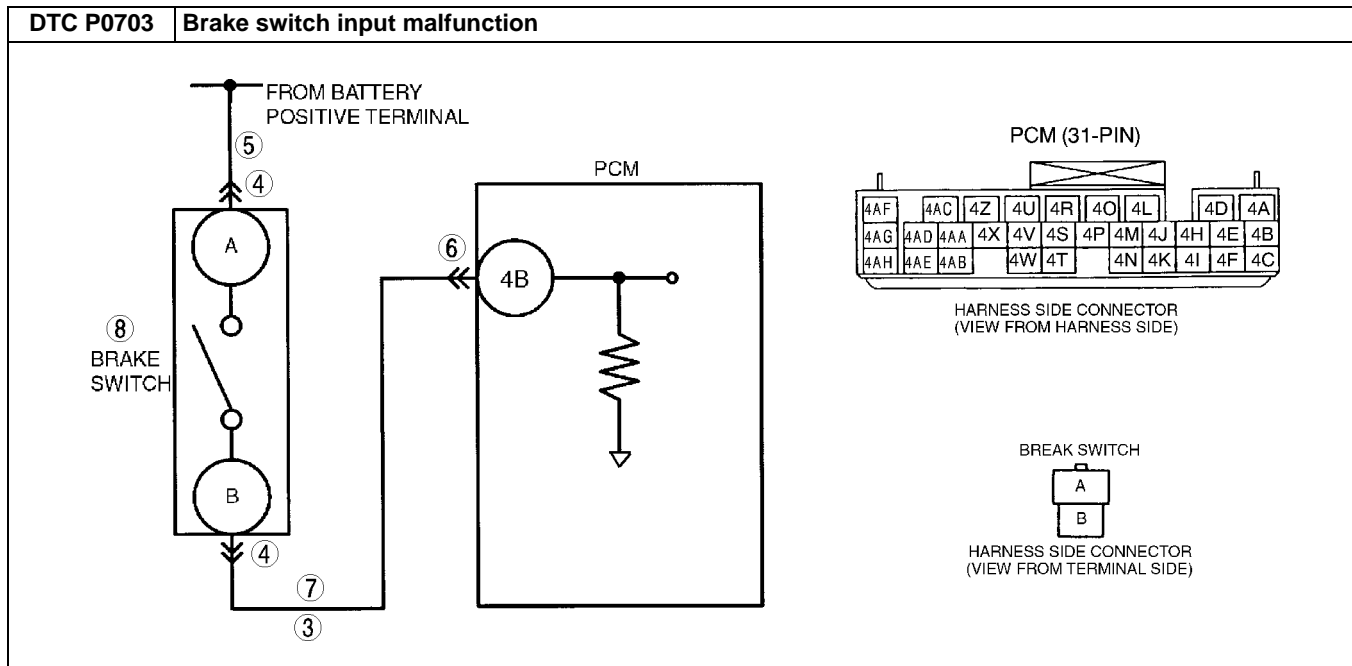
## DTC P0703

A5U010201089W01

<b>DTC P0703</b>	<b>Brake switch input malfunction</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors changes in input voltage from the brake switch. If PCM does not detected the PCM terminal 4B voltage changes at <b>10 times</b> while vehicle speed <b>above 30 km/h {18.6 mph}</b> and vehicle stopped repeatedly, it determines that brake switch circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Brake switch malfunction</li> <li>Open harness between brake switch terminal B and PCM connector terminal 4B</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	<b>INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Measure voltage between brake switch connector terminal B and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Repair or replace harness for short to power, then go to Step 9.
		No Go to Step 9.
4	<b>INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition switch to OFF.</li> <li>Disconnect brake switch connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, then go to Step 9.
		No Go to next step.
5	<b>INSPECT BRAKE SWITCH POWER CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Measure voltage between brake switch connector terminal A and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Go to next step.
		No Repair or replace brake switch power circuit for open, then go to Step 9.
6	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition switch to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair terminal, then go to Step 9.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Connect brake switch connector.</li> <li>Turn ignition switch to ON.</li> <li>Depress brake pedal and measure voltage between PCM terminal 4B (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
8	<b>INSPECT BRAKE SWITCH</b> <ul style="list-style-type: none"> <li>Inspect brake switch.</li> <li>(See 04-11-5 BRAKE SWITCH INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace brake switch, then go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using NGS tester.</li> <li>Drive vehicle <b>30 km/h {18.6 mph} or more.</b></li> <li>Depress and release brake pedal <b>above 10 times</b> during drive vehicle.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure".</li> <li>(See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

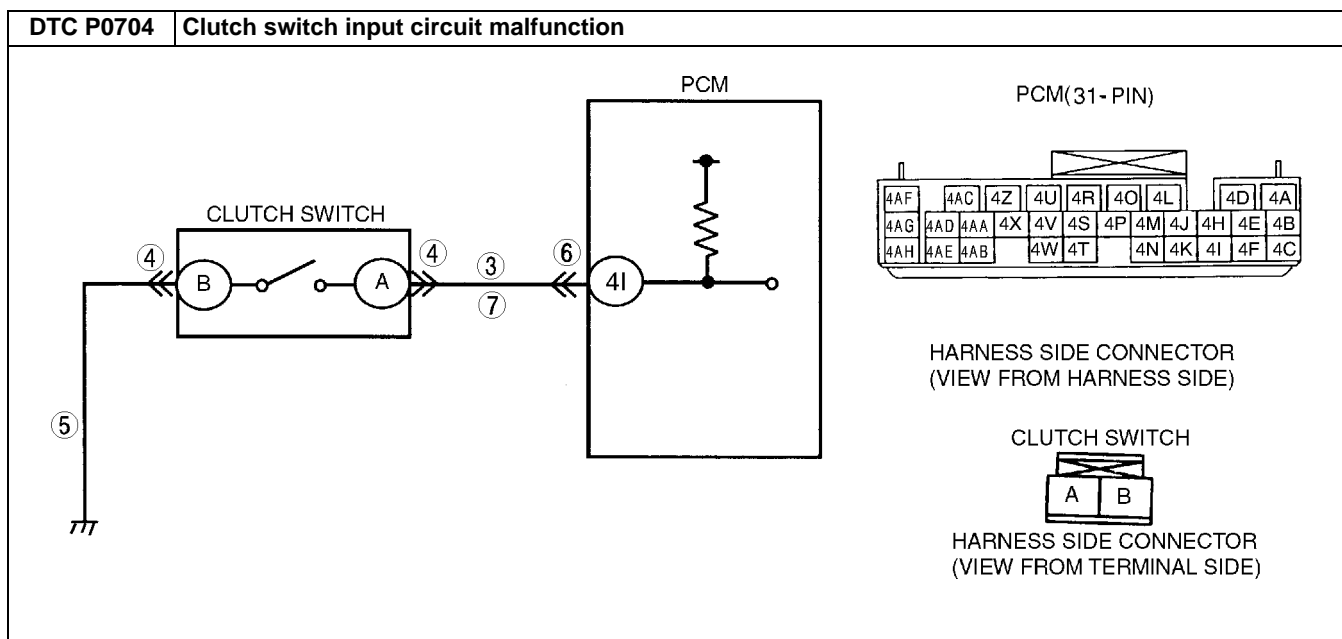
## DTC P0704

A5U010201089W02

DTC P0704	Clutch switch input circuit malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors changes in input voltage from the clutch switch. If PCM does not detected the PCM terminal 4I voltage changes at <b>10 times</b> while vehicle speed <b>above 30 km/h {18.6 mph}</b> and vehicle stopped repeatedly, it determines that clutch switch circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Clutch switch malfunction</li> <li>Open harness between clutch switch terminal A and PCM connector 4I</li> <li>Short to power between clutch switch terminal A and PCM connector 4I</li> <li>Short to GND between clutch switch terminal A and PCM terminal 4I</li> <li>Open harness between clutch switch terminal B and GND</li> <li>Short to power between clutch switch terminal B and GND</li> <li>PCM malfunction</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



01-02A

## Diagnostic procedure

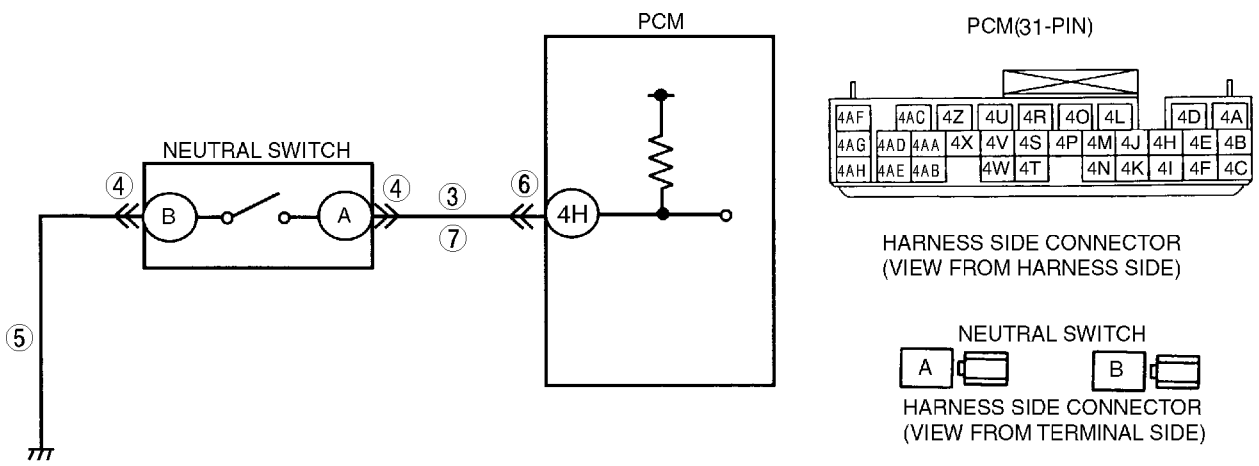
STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABLE</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information available.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Measure voltage between clutch switch connector terminal A and body GND.</li> <li>Is voltage <b>0V</b>?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 8.
		No	Go to next step.
4	<b>INSPECT CLUTCH SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect clutch switch connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 13.
		No	Go to next step.
5	<b>INSPECT CLUTCH SWITCH GND CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Check continuity between clutch switch terminal B (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace clutch switch connector GND circuit for open, then go to Step 8.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check poor connection (damaged, pulled-out terminals, corrosion, ect.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
7	<b>INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Disconnect clutch switch connector.</li> <li>Check continuity between clutch switch connector terminal A (harness-side) and PCM terminal 4I (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
8	<b>VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Drive vehicle <b>30 km/h {18.6 mph} or more.</b></li> <li>Depress and release clutch pedal <b>above 10 times</b> during driving.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P0850

A5U010201089W03

<b>DTC P0850</b>	<b>Neutral switch input circuit malfunction</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors changes in input voltage from the neutral switch. If PCM does not detected the PCM terminal 4H voltage does not change while vehicle speed <b>above 30 km/h {18.6 mph}</b> and clutch pedal depressed <b>above 10 times</b>, it determines that neutral switch circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Neutral switch malfunction</li> <li>Open harness between neutral switch terminal A and PCM connector 4H</li> <li>Short to power between neutral switch terminal A and PCM connector 4H</li> <li>Short to GND between neutral switch terminal A and PCM terminal 4H</li> <li>Open harness between neutral switch terminal B and GND</li> <li>Short to power between neutral switch terminal B and GND</li> <li>PCM malfunction</li> </ul>
 <p>The diagram illustrates the electrical circuit for the Neutral Switch input to the PCM. On the left, a 'NEUTRAL SWITCH' is shown with terminals 4 and 5. Terminal 4 is connected to terminal 4H of the 'PCM' connector. Terminal 5 is connected to ground. The PCM connector is a 31-pin connector with terminals 4AF, 4AC, 4Z, 4U, 4R, 4O, 4L, 4D, 4A, 4AG, 4AD, 4AA, 4X, 4V, 4S, 4P, 4M, 4J, 4H, 4E, 4B, 4AH, 4AE, 4AB, 4W, 4T, 4N, 4K, 4I, 4F, and 4C. Below the PCM connector, the 'HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)' is shown. Below the harness side connector, the 'NEUTRAL SWITCH' is shown with terminals A and B. The 'HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)' is shown below the neutral switch.</p>	

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information available.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Measure voltage between neutral switch connector terminal A and body GND.</li> <li>Is voltage <b>0 V</b>?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 8.
		No	Go to next step.
4	<b>INSPECT POOR CONNECTION OF NEUTRAL SWITCH CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect neutral switch connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
5	<b>INSPECT NEUTRAL SWITCH GND CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Check continuity between neutral switch terminal B (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace neutral switch connector GND circuit for open, then go to Step 8.
6	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
7	<b>INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Disconnect neutral switch connector.</li> <li>Check continuity between neutral switch connector terminal A (harness-side) and PCM terminal 4H (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 8.
8	<b>INSPECT NEUTRAL SWITCH</b> <ul style="list-style-type: none"> <li>Perform neutral switch inspection. (See 01-40-34 NEUTRAL SWITCH INSPECTION)</li> <li>Is neutral switch okay?</li> </ul>	Yes	Go to next step.
		No	Replace neutral switch, then go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0850 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Drive vehicle <b>30 km/h {18.6 mph}</b> or more.</li> <li>Shift up or down <b>above 14 times</b> while driving.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

01-02A

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P1449

A5U010201083W01

DTC P1449	CDCV open or short
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors the input voltages from CDCV just after turning the ignition key to ON. If voltage at PCM terminal 3E remains low or high, PCM determines that CDCV circuit has malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a diagnostic support DTC (monitored one per key cycle).</li> <li>MIL does not illuminate.</li> <li>FREEZE FRAME DATA is not available.</li> <li>DTC is not stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>CDCV malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND in wiring between CDCV terminal B and PCM terminal 3E</li> <li>Open circuit in wiring between main relay terminal D and CDCV terminal A</li> <li>Open circuit in wiring between CDCV terminal B (harness-side) and PCM terminal 3E</li> <li>Short to power circuit between CDCV terminal B and PCM terminal 3E</li> <li>PCM malfunction</li> </ul>

FROM MAIN RELAY TERMINAL D

CDCV

PCM

PCM (24-PIN)

HARNESS SIDE CONNECTOR (VIEW FROM HARNESS SIDE)

CDCV

HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes
		No
2	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes
		No
3	<b>INSPECT POOR CONNECTION OF CDCV CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check for poor connection (damaged/pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes
		No
4	<b>INSPECT CDCV</b> <ul style="list-style-type: none"> <li>Measure resistance between CDCV terminals (part-side).</li> <li>Is resistance 17—21 ohms?</li> </ul>	Yes
		No
5	<b>INSPECT CDCV POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between CDCV terminal A (harness-side) and body GND.</li> <li>Is voltage B+?</li> </ul>	Yes
		No

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A

STEP	INSPECTION	ACTION
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 3E. (damaged/pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair terminal, then go to Step 9.
		No Go to next step.
7	<b>INSPECT CDCV CONTROL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for continuity between CDCV terminal B (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes Repair or replace harness for short to GND, then go to Step 9.
		No Go to next step.
8	<b>INSPECT CDCV CONTROL CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between CDCV terminal B (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	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 PCM terminal 3E. <ul style="list-style-type: none"> <li>If there is continuity, go to next step.</li> <li>If there is no continuity, repair or replace harness for open, go to next step.</li> </ul>
9	<b>VERIFY TROUBLESHOOTING OF DTC P1449 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

## DTC P1450

A5U010201083W02

DTC P1450	EVAP control system malfunction (excessive vacuum)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors FTP signal when monitoring conditions are met. If vacuum is <b>above -3.92 kPa {-400 mmHg, 15.7 inHg}</b> for <b>10 s</b>, PCM determines the excessive vacuum.</li> </ul> <b>MONITORING CONDITION</b> <ul style="list-style-type: none"> <li>IAT is <b>above -10°C {14°F}</b>.</li> <li>ECT is <b>100°C {212°F} or below</b>.</li> <li>Vehicle speed is <b>99.6 km/h {61.9 mph} or below</b>.</li> <li>ECT at engine start is <b>below 35°C {95°F}</b>.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>CDCV malfunction</li> <li>Air filter clogged</li> <li>Charcoal canister malfunction</li> <li>Evaporative drain passage clogged</li> <li>FTP sensor malfunction</li> <li>Purge solenoid valve malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION		ACTION
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>VERIFY RELATED STORED DTC</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Verify stored DTC.</li> <li>Is DTC P0443 present?</li> </ul>	Yes	Go to appropriate DTC inspection.
		No	Go to next step.
4	<b>INSPECT OPERATION SOUND OF CDCV</b> <ul style="list-style-type: none"> <li>Inspect CDCV. (See 01-16-6 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION.)</li> <li>Is CDCV okay?</li> </ul>	Yes	Go to next step.
		No	Replace it if necessary, go to Step 9.
5	<b>INSPECT PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Disconnect vacuum hose that connects to intake manifold from purge solenoid valve.</li> <li>Connect vacuum pump to purge solenoid valve.</li> <li>Pump vacuum several times and stop to pump then wait <b>a few s.</b></li> <li>Is vacuum maintained?</li> </ul>	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, go to Step 9.
6	<b>INSPECT CHARCOAL CANISTER FOR CLOGGING</b> <ul style="list-style-type: none"> <li>Remove charcoal canister and inspect for clogging. (See 01-16-6 CHARCOAL CANISTER INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace charcoal canister, then go to Step 9.
7	<b>INSPECT FTP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect FTP sensor. (See 01-40-25 FUEL TANK PRESSURE (FTP) SENSOR INSPECTION)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Replace FTP sensor, then go to Step 9.
8	<b>INSPECT AIR FILTER FOR CLOGGING</b> <ul style="list-style-type: none"> <li>Remove and inspect air filter connected to CDCV for clogging.</li> <li>Is it okay?</li> </ul>	Yes	Inspect for clogging in following area: <ul style="list-style-type: none"> <li>From charcoal canister to CDCV</li> <li>Drain passage <ul style="list-style-type: none"> <li>Repair or replace faulty area, then go to next step.</li> </ul> </li> </ul>
		No	Repair or replace air filter, then go to next step.
9	<b>MONITOR EVAP SYSTEM BY DRIVE MODE 4</b> <ul style="list-style-type: none"> <li>Run Drive Mode 4. (See 01-02A-12 Mode 4 (EVAP System Repair Verification Drive Mode))</li> <li>Stop vehicle and access ON BOARD SYSTEM READINESS TESTS menu of GENERIC OBD-II FUNCTIONS to inspect Drive Mode completion status.</li> <li>Has EVAPORATIVE PURGE SYSTEM been monitored?</li> </ul>	Yes	Go to next step.
		No	Verify monitoring condition for EVAP system test, then go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P1450 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

DTC P1487

A5U010201083W03

DTC P1487	EGR boost sensor solenoid valve circuit malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltages from EGR boost sensor solenoid valve just after turning the ignition key to ON. If voltage at PCM terminal 3D is <b>below 2.7 V</b> the PCM determines that the EGR boost sensor solenoid valve circuit has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR boost sensor solenoid valve malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND in wiring between EGR boost sensor solenoid valve terminal B and PCM terminal 3D</li> <li>Open circuit in wiring between main relay terminal D and EGR boost sensor solenoid valve terminal A</li> <li>Open circuit in wiring between EGR boost sensor solenoid valve terminal B and PCM terminal 3T</li> <li>PCM malfunction</li> </ul>

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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to next step.
		No Go to next step.
2	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
3	<b>DETERMINE IF OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION</b> <ul style="list-style-type: none"> <li>Disconnect EGR boost sensor solenoid valve tube at solenoid side that connects to EGR valve.</li> <li>Connect vacuum pump to EGR boost solenoid valve.</li> <li>Apply vacuum.</li> <li>Wait for 5 s.</li> <li>Is vacuum maintained?</li> </ul>	Yes Go to Step 5.
		No Go to next step.
4	<b>INSPECT EGR BOOST SENSOR SOLENOID VALVE FOR PASSAGE CONTROL</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR boost sensor solenoid valve connector.</li> <li>Apply vacuum and wait for 5 s.</li> <li>Is vacuum maintained?</li> </ul>	Yes Repair or replace harness between solenoid valve terminal B and PCM terminal 3D for short to GND, then go to Step 10.
		No Replace EGR boost sensor solenoid valve, then go to Step 10.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
5	<b>INSPECT EGR BOOST SENSOR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal, then go to Step 10.
		No	Go to next step.
6	<b>INSPECT EGR BOOST SENSOR SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Measure resistance between EGR boost sensor solenoid valve terminals (part-side).</li> <li>Is resistance <b>within 23—27 ohms</b>?</li> </ul>	Yes	Go to next step.
		No	Replace EGR boost sensor solenoid valve, then go to Step 10.
7	<b>INSPECT EGR BOOST SENSOR SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between EGR boost sensor solenoid valve terminal A (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 10.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 3D (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
9	<b>INSPECT EGR BOOST SENSOR SOLENOID VALVE CONTROL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Connect EGR boost sensor solenoid valve connector.</li> <li>Disconnect PCM connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between PCM terminal 3D (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P1487 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01–02A–10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE)
		No	Troubleshooting completed.

## DTC P1496

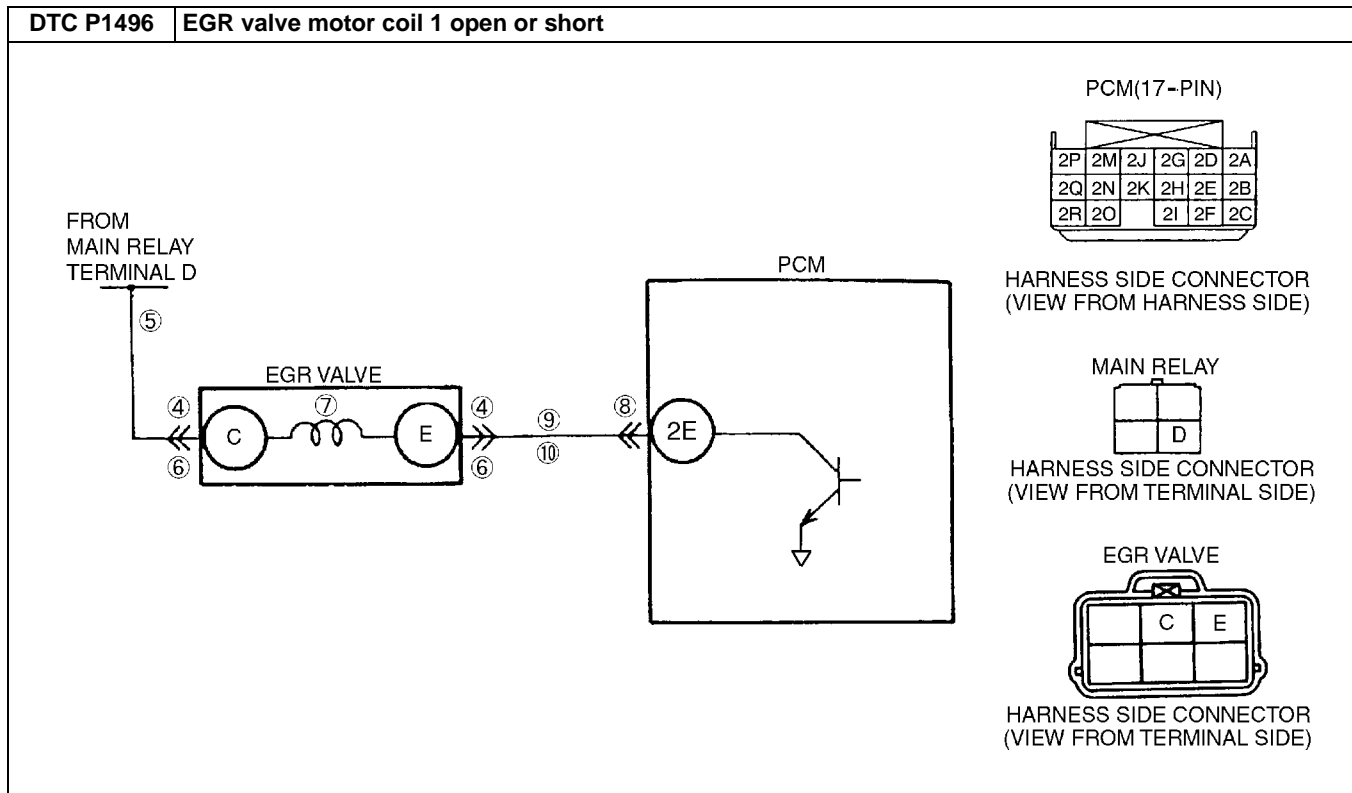
A5U010201083W04

DTC P1496	EGR valve motor coil 1 open or short
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltages from EGR valve coil control circuit just after turning the ignition key to ON. If voltage at PCM terminal 2E is <b>below 2.7 V</b>, the PCM determines that the EGR valve circuit has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR valve malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND circuit in wiring between EGR valve terminal E and PCM terminal 2E</li> <li>Open circuit in wiring between EGR valve terminal E and PCM terminal 2E</li> <li>Open circuit in wiring between main relay terminal D and EGR valve terminal C</li> <li>PCM malfunction</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
2	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes Go to next step.
		No Refer to intermittent concern. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
3	<b>DETERMINE IF POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION</b> <ul style="list-style-type: none"> <li>Is same DTC and P1497 present?</li> </ul>	Yes Malfunction at EGR valve or power circuit. Go to next step.
		No Malfunction at EGR valve or control circuit. Go to Step 6.
4	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.
5	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between EGR valve terminal C (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Inspect EGR valve coil 1 and 2. (See 01-16-9 EGR VALVE INSPECTION) • If there is a malfunction, replace EGR valve, and 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	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT EGR VALVE</b> <ul style="list-style-type: none"> <li>Measure resistance between EGR valve terminal C and E (part-side).</li> <li>Is resistance <b>approx. 22 Ω</b>?</li> </ul>	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 2E (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	<b>INSPECT CONTROL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between EGR valve terminal E (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 11.
		No	Go to next step.
10	<b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check continuity between EGR valve terminal E (harness-side) and PCM terminal 2E (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P1496 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

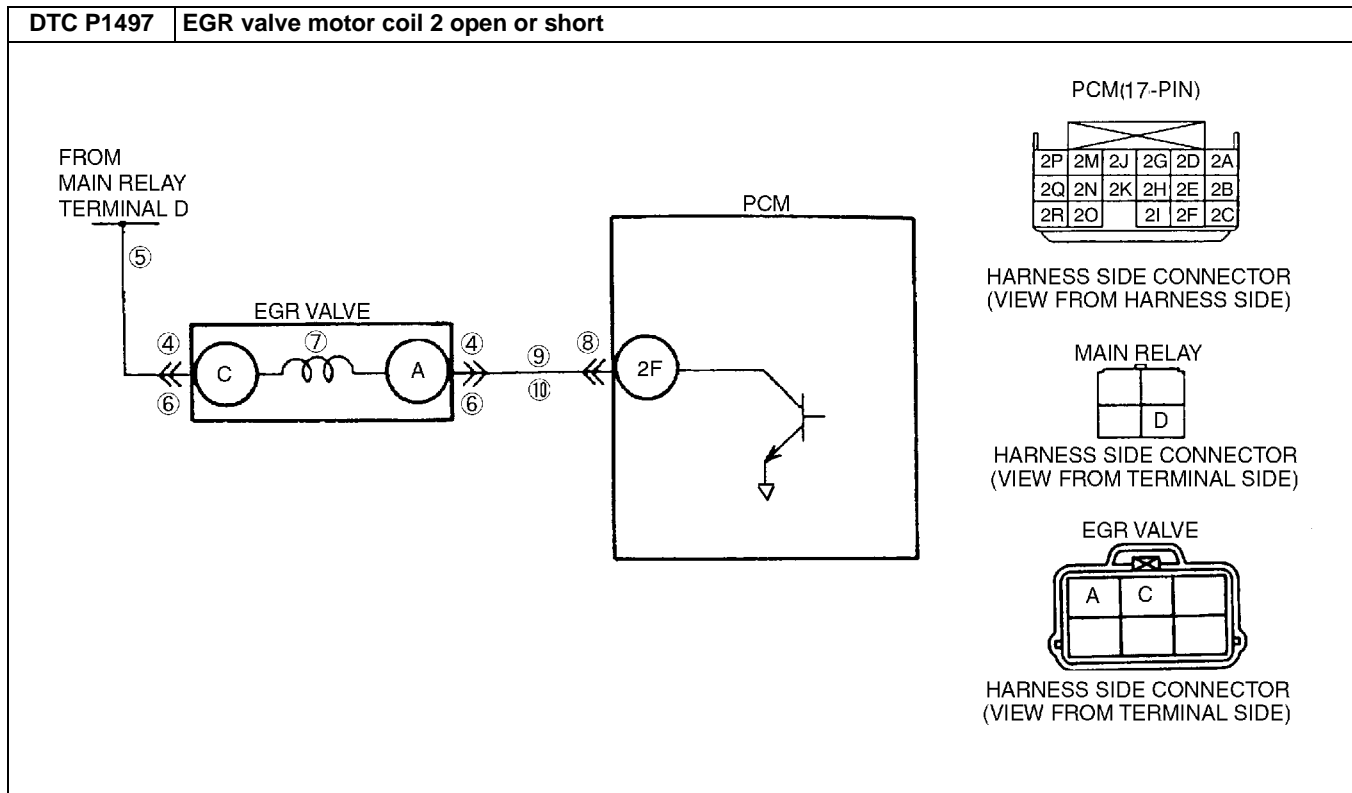
## DTC P1497

A5U010201083W05

<b>DTC P1497</b>	<b>EGR valve motor coil 2 open or short</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltages from EGR valve coil control circuit just after turning the ignition key to ON. If voltage at PCM terminal 2F is <b>below 0.6 V</b>, the PCM determines that the EGR valve circuit has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR valve malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND circuit in wiring between EGR valve terminal A and PCM terminal 2F</li> <li>Open circuit in wiring between EGR valve terminal A and PCM terminal 2F</li> <li>Open circuit in wiring between main relay terminal D and EGR valve terminal C</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
2	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes Go to next step.
		No Refer to intermittent concern. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
3	<b>DETERMINE IF POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION</b> <ul style="list-style-type: none"> <li>Are same DTC and P1496 present?</li> </ul>	Yes Malfunction at EGR valve or power circuit. Go to next step.
		No Malfunction at EGR valve or control circuit. Go to Step 6.
4	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.
5	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between EGR valve terminal C (harness-side) and body GND.</li> <li>Is voltage B+?</li> </ul>	Yes Inspect EGR valve coil 1 and 2 (See 01-16-9 EGR VALVE INSPECTION) • If there is a malfunction, replace EGR valve, and 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	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT EGR VALVE</b> <ul style="list-style-type: none"> <li>Measure resistance between EGR valve terminal C and A (part-side).</li> <li>Is resistance <b>approx. 22 ohms</b>?</li> </ul>	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 2F (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	<b>INSPECT CONTROL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between EGR valve terminal A (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 11.
		No	Go to next step.
10	<b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check continuity between EGR valve terminal A (harness-side) and PCM terminal 2F (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P1497 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to OFF, then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

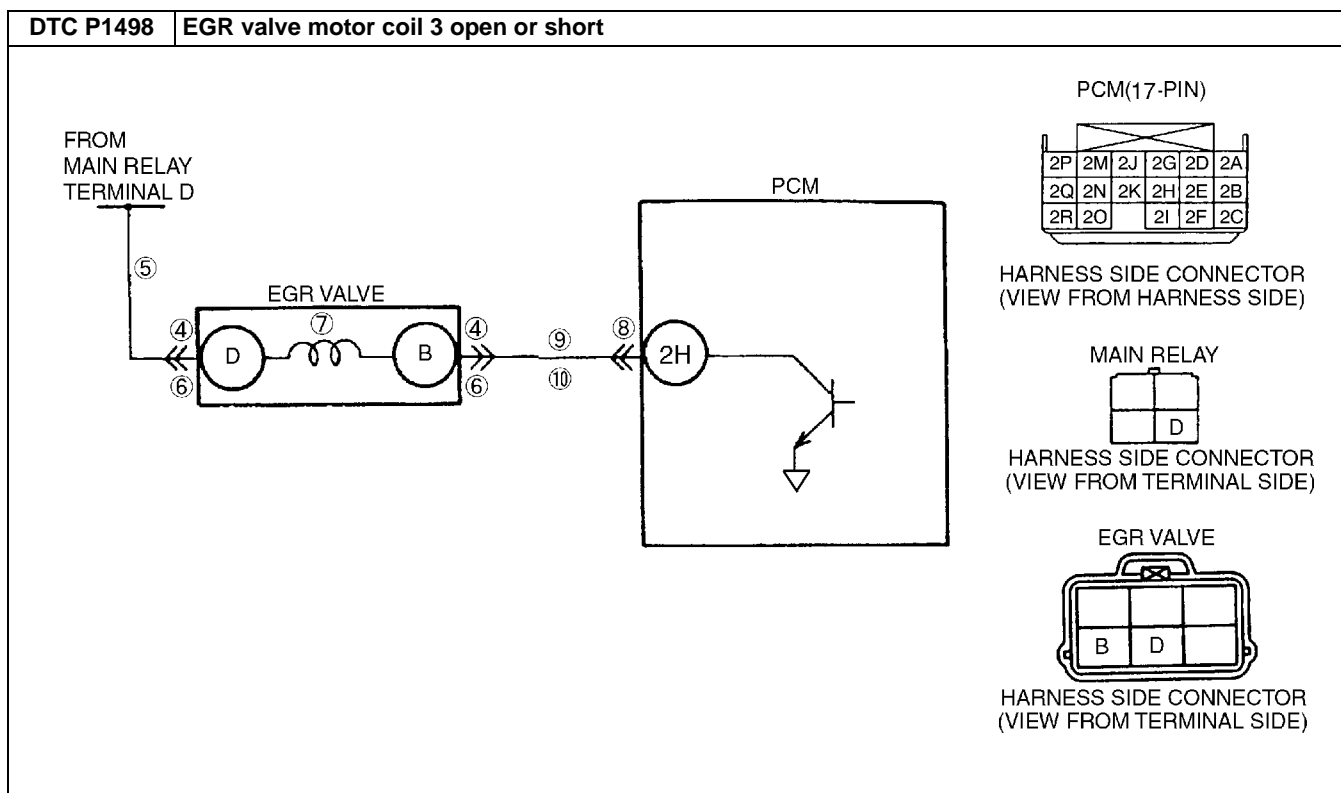
## DTC P1498

A5U010201083W06

<b>DTC P1498</b>	<b>EGR valve motor coil 3 open or short</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltages from EGR valve coil control circuit just after the ignition key to ON. If voltage at PCM terminal 2H is <b>below 0.6 V</b>, the PCM determines that the EGR valve circuit has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR valve malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND circuit in wiring between EGR valve terminal B and PCM terminal 2H</li> <li>Open circuit in wiring between EGR valve terminal B and PCM terminal 2H</li> <li>Open circuit in wiring between main relay terminal D and EGR valve terminal D</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
2	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes Go to next step.
		No Refer to intermittent concern. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
3	<b>DETERMINE IF POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION</b> <ul style="list-style-type: none"> <li>Are same DTC and P1499 present?</li> </ul>	Yes Malfunction at power circuit. Go to next step.
		No Malfunction at EGR valve or control circuit. Go to Step 6.
4	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.
5	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between EGR valve terminal D (harness-side) and body GND.</li> <li>Is voltage B+?</li> </ul>	Yes Inspect EGR valve coil 3 and 4 (See 01-16-9 EGR VALVE INSPECTION) • If there is a malfunction, replace EGR valve, and 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	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT EGR VALVE</b> <ul style="list-style-type: none"> <li>Measure resistance between EGR valve terminal D and B (part-side).</li> <li>Is resistance <b>approx. 22 ohms</b>?</li> </ul>	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 2H (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminals, then go to Step 11.
		No	Go to next step.
9	<b>INSPECT CONTROL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between EGR valve terminal B (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 11.
		No	Go to next step.
10	<b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check continuity between EGR valve terminal B (harness-side) and PCM terminal 2H (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P1498 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to OFF, then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

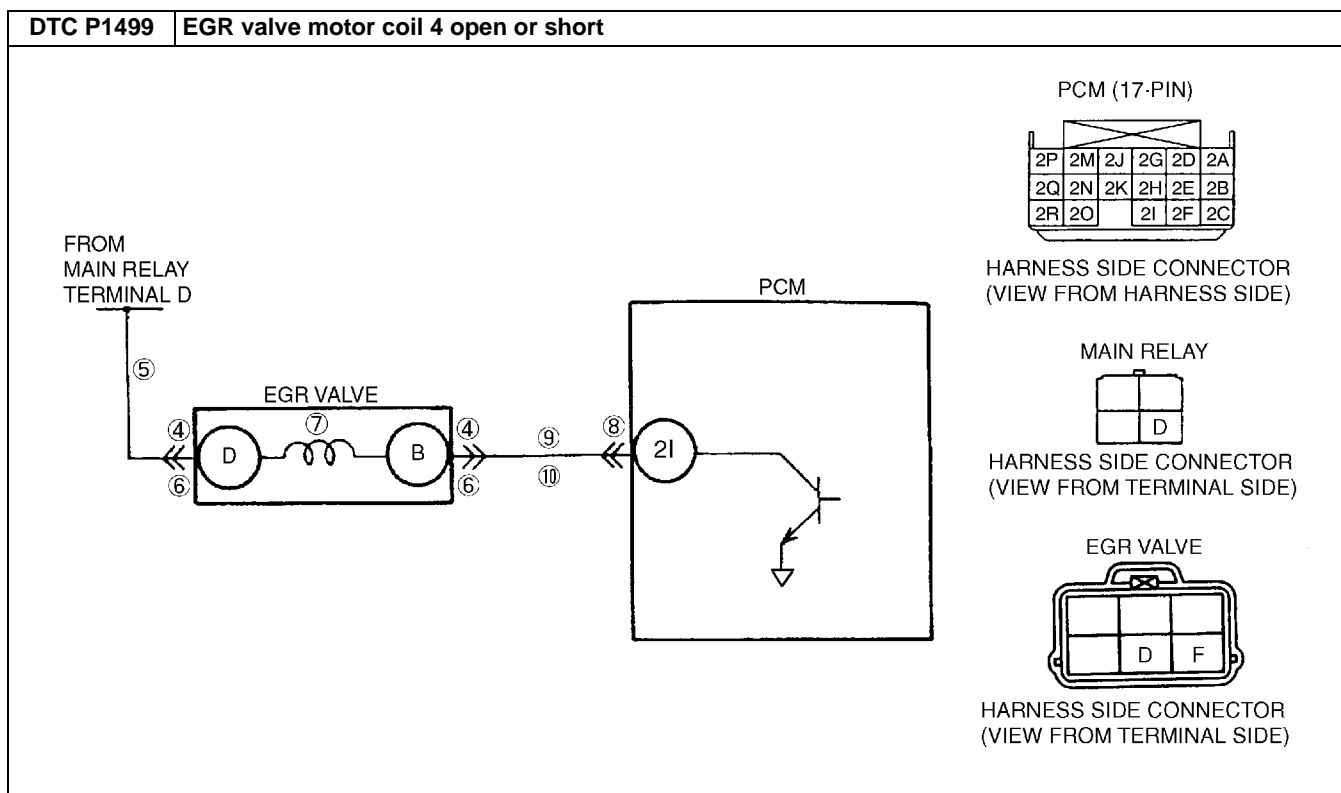
## DTC P1499

A5U010201083W07

<b>DTC P1499</b>	<b>EGR valve motor coil 4 open or short</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltages from EGR valve coil control circuit just after turning the ignition key to ON. If voltage at PCM terminal 2I is <b>below 2.7 V</b>, the PCM determines that the EGR valve circuit has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR valve malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to GND circuit in wiring between EGR valve terminal F and PCM terminal 2I</li> <li>Open circuit in wiring between EGR valve terminal F and PCM terminal 2I</li> <li>Open circuit in wiring between main relay terminal D and EGR valve terminal D</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

01-02A



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
2	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes Go to next step.
		No Refer to intermittent concern. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
3	<b>DETERMINE IF POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION</b> <ul style="list-style-type: none"> <li>Are same DTC and P1498 present?</li> </ul>	Yes Malfunction at power circuit. Go to next step.
		No Malfunction at EGR valve or control circuit. Go to Step 6.
4	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.
5	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between EGR valve terminal D (harness-side) and body GND.</li> <li>Is voltage B+?</li> </ul>	Yes Inspect EGR valve coil 3 and 4 (See 01-16-9 EGR VALVE INSPECTION) • If there is a malfunction, replace EGR valve, and 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	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect EGR valve connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.

## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT EGR VALVE</b> <ul style="list-style-type: none"> <li>Measure resistance between EGR valve terminal D and F (part-side).</li> <li>Is resistance <b>approx. 22 ohms</b>?</li> </ul>	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 11.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 2I (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	<b>INSPECT CONTROL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between EGR valve terminal F (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 11.
		No	Go to next step.
10	<b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check continuity between EGR valve terminal F (harness-side) and PCM terminal 2I (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P1499 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Turn ignition key to OFF, then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

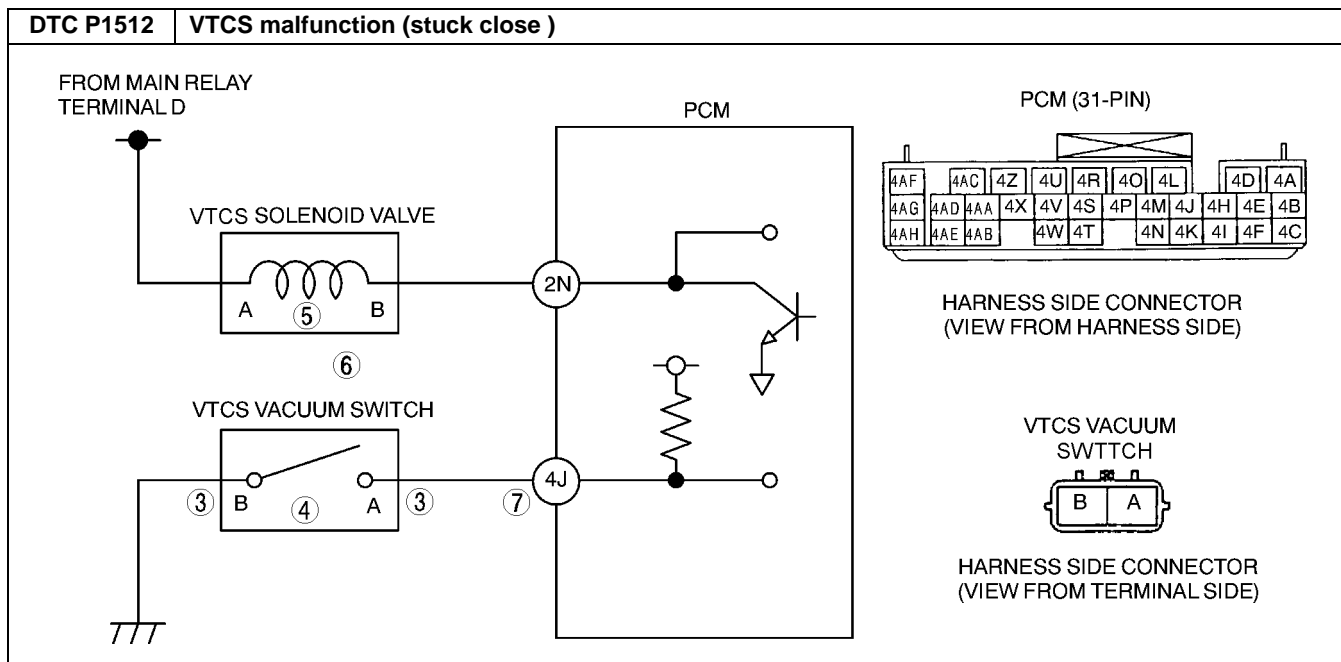
### DTC P1512

A5U010201083W08

DTC P1512	VTCS malfunction (stuck close )
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors changes in input voltage from the VTCS vacuum switch. If voltage at PCM terminal 4J remains low when VTCS solenoid valve OFF, PCM determines that VTCS vacuum switch has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Short to GND harness between VTCS vacuum switch terminal A and PCM terminal 4J.</li> <li>VTCS vacuum switch malfunction (stuck close)</li> <li>Connector or terminal malfunction.</li> <li>VTCS solenoid valve malfunction (stuck close)</li> <li>PCM malfunction</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT VTCS VACUUM SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect VTCS vacuum switch connector.</li> <li>Check for poor connection (damaged/pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, go Step 9.
		No Go to next step.
4	<b>INSPECT VTCS VACUUM SWITCH FOR BEING STUCK CLOSE</b> <ul style="list-style-type: none"> <li>Inspect VTCS vacuum switch. (See 01-13-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) VACUUM SWITCH INSPECTION)</li> <li>Is VTCS vacuum switch okay?</li> </ul>	Yes Go to next step.
		No Replace VTCS vacuum switch, then go to Step 9.
5	<b>INSPECT VTCS SOLENOID VALVE FOR BEING STUCK CLOSE</b> <ul style="list-style-type: none"> <li>Inspect VTCS solenoid valve. (See 01-13-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION)</li> <li>Is VTCS solenoid valve okay?</li> </ul>	Yes Go to next step.
		No Replace VTCS solenoid valve, then go to Step 9.
6	<b>INSPECT VACUUM LINES FOR MISCONNECTION</b> <ul style="list-style-type: none"> <li>Inspect vacuum line. (See 01-13-3 VACUUM HOSE ROUTING DIAGRAM)</li> <li>Is vacuum line okay?</li> </ul>	Yes Go to Step 9.
		No Repair or replace vacuum line, then go to Step 9.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

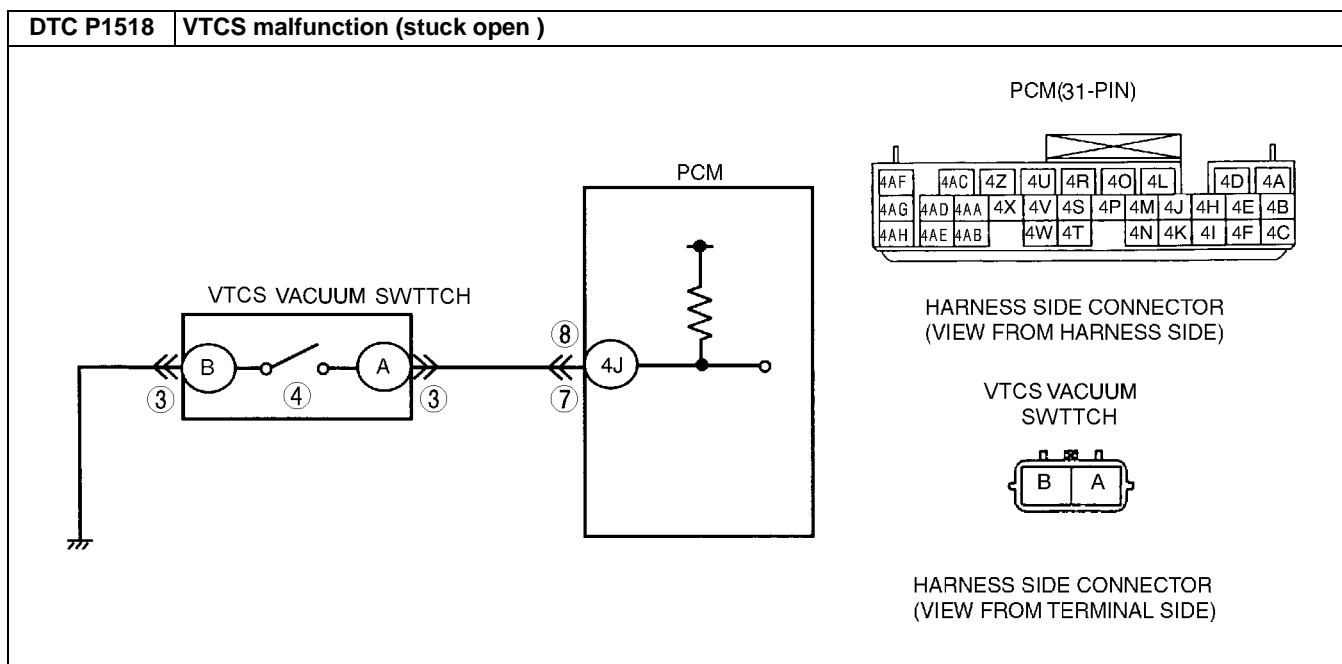
STEP	INSPECTION	ACTION	
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 4J (damaged/pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
8	<b>INSPECT VTCS VACUUM SWITCH SIGNAL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect for continuity between PCM connector male terminal 4J and body GND with PCM connector and VTCS vacuum switch connector disconnected.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to next step.
		No	Go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P1512 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

## DTC P1518

A5U010201083W09

DTC P1518	VTCS malfunction (stuck open )
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors changes in input voltage from the VTCS vacuum switch. If voltage at PCM terminal 4J remains high when VTCS solenoid valve ON, PCM determines that VTCS vacuum switch has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Open harness between VTCS vacuum switch terminal A and PCM terminal 4J</li> <li>Open harness between VTCS vacuum switch terminal B and GND</li> <li>Short to power harness between VTCS vacuum switch terminal A and PCM terminal 4J</li> <li>VTCS vacuum switch malfunction (stuck open)</li> <li>VTCS solenoid valve malfunction (stuck open)</li> <li>Connector or terminal malfunction.</li> <li>PCM malfunction.</li> <li>Vacuum line malfunction.</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



01-02A

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	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	<b>INSPECT VTCS VACUUM SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect VTCS vacuum switch connector.</li> <li>Check for poor connection (damaged/pilled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace terminal, go Step 10.
		No Go to next step.
4	<b>INSPECT VTCS VACUUM SWITCH GND CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Measure continuity between VTCS vacuum switch connector B and body GND.</li> <li>Is there continuity?</li> </ul>	Yes Go to next step.
		No Repair or replace for open circuit, go Step 10.
5	<b>INSPECT VTCS VACUUM SWITCH FOR BEING STUCK OPEN</b> <ul style="list-style-type: none"> <li>Inspect VTCS vacuum switch. (See 01-13-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) VACUUM SWITCH INSPECTION)</li> <li>Is VTCS vacuum switch okay?</li> </ul>	Yes Go to next step.
		No Replace VTCS vacuum switch, then go to Step 10.
6	<b>INSPECT VTCS SOLENOID VALVE FOR BEING STUCK OPEN</b> <ul style="list-style-type: none"> <li>Inspect VTCS solenoid valve. (See 01-13-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION)</li> <li>Is VTCS solenoid valve okay?</li> </ul>	Yes Go to next step.
		No Replace VTCS solenoid valve, then go to Step 10.
7	<b>INSPECT VACUUM LINES FOR LEAKAGE</b> <ul style="list-style-type: none"> <li>Inspect vacuum line. (See 01-13-3 VACUUM HOSE ROUTING DIAGRAM)</li> <li>Is vacuum lines okay?</li> </ul>	Yes Go to Step 10.
		No Repair or replace vacuum line, then go to Step 10.

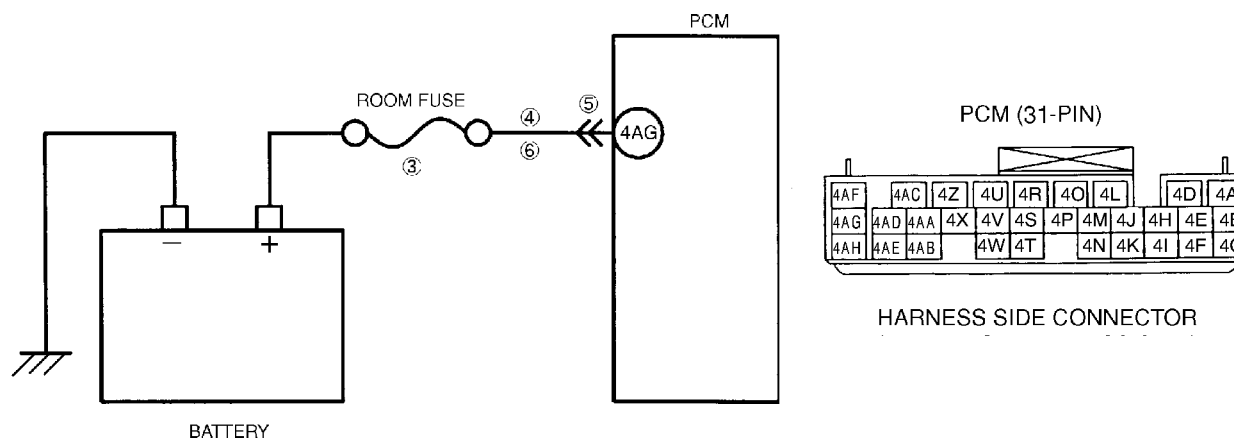
# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 4J (damaged/pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 10.
		No	Go to next step.
9	<b>INSPECT VTCS VACUUM SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Turn ignition key OFF.</li> <li>Turn ignition key to ON (engine OFF).</li> <li>Measure voltage between PCM terminal 4J and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace harness for short to power, then go to Step 10.
		No	Go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P1518 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure".(See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

## DTC P1562

A5U010201083W10

DTC P1562	PCM +BB voltage low
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the voltage of back-up battery positive terminal at PCM terminal 4AG after engine started. If the PCM detected battery positive terminal voltage <b>below 2.5 V</b> when cranking, the PCM determines that the backup voltage circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition during first drive cycle. Therefore, PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Meltdown ROOM fuse.</li> <li>Open circuit or short to GND in wiring between battery positive terminal and PCM terminal 4AG</li> <li>Poor connection of PCM connector.</li> <li>PCM malfunction</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
3	<b>INSPECT ROOM FUSE</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect ROOM fuse for failure and proper.</li> <li>Is it okay?</li> </ul>	Yes Go to Step 5.
		No <ul style="list-style-type: none"> <li>If ROOM fuse has been melt down, go to next step.</li> <li>If ROOM fuse is not installed correctly, install it correctly</li> </ul> Go to Step 7.
4	<b>INSPECT MONITOR CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Disconnect both battery cables.</li> <li>Measure resistance between ROOM fuse left terminal and body GND.</li> <li>Is resistance <b>more than 500 ohms</b>?</li> </ul>	Yes Go to Step 7.
		No Repair or replace harness between ROOM fuse left terminal and PCM terminal 4AG for short to GND and install new fuse, then go to Step 7.
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection at terminal 4AG (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair terminals, then go to Step 7.
		No Go to next step.
6	<b>INSPECT MONITOR CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Disconnect battery cables.</li> <li>Check continuity between ROOM fuse left terminal and PCM terminal 4AG (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes Go to next step.
		No Repair or replace harness for open, then go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P1562 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

01-02A

## DTC P1569

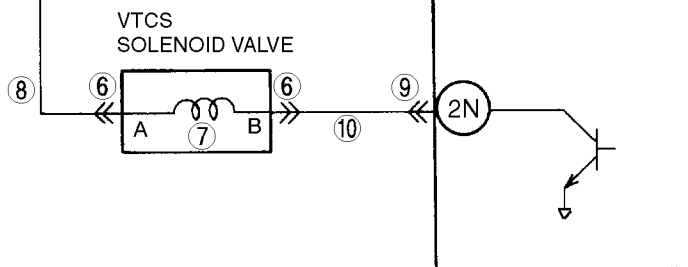
A5U010201083W11

DTC P1569	VTCS solenoid valve circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltages from VTCS solenoid valve. If voltage at PCM 2N is low when VTCS solenoid valve OFF, PCM determines that VTCS solenoid valve has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
	<b>POSSIBLE CAUSE</b> <ul style="list-style-type: none"> <li>Poor connection of connectors at PCM and/or VTCS solenoid valve</li> <li>Short to GND in wiring between VTCS solenoid valve terminal B and PCM terminal 2N</li> <li>Open circuit in wiring between main relay terminal D and VTCS solenoid valve terminal A</li> <li>Open circuit in wiring between VTCS solenoid valve terminal B and PCM terminal 2N</li> <li>VTCS solenoid valve malfunction</li> <li>PCM malfunction</li> </ul>

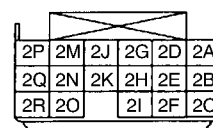
# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## DTC P1569 VTCS solenoid valve circuit low input

FROM MAIN  
RELAY TERMINAL D



PCM (17-PIN)



HARNESS SIDE CONNECTOR  
(VIEW FROM HARNESS SIDE)

VTCS  
SOLENOID VALVE



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>CHECK FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
4	<b>DETERMINE IF OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION</b> <ul style="list-style-type: none"> <li>Disconnect VTCS solenoid valve tube that connects to intake manifold.</li> <li>Connect vacuum pump to VTCS solenoid valve.</li> <li>Apply vacuum and wait 5 s.</li> <li>Is vacuum maintained?</li> </ul>	Yes	Go to Step 6.
		No	Go to next step.
5	<b>INSPECT VTCS SOLENOID VALVE FOR PASSAGE CONTROL</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect VTCS solenoid valve connector.</li> <li>Is vacuum maintained?</li> </ul>	Yes	Repair or replace harness between PCM terminal 2N and VTCS solenoid valve terminal B for short to GND, then go to Step 11.
		No	Replace VTCS solenoid valve, then go to Step 11.
6	<b>INSPECT VTCS SOLENOID VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check for poor connection (damaged/pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair or replace terminal, then go to Step 11.
		No	Go to next step.
7	<b>INSPECT VTCS SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Measure resistance between VTCS solenoid valve terminals (part-side).</li> <li>Is resistance <b>more than 28 ohms</b>?</li> </ul>	Yes	Go to next step.
		No	Replace VTCS solenoid valve, then go to Step 11.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION	
8	<b>INSPECT VTCS SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect VTCS solenoid valve connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between VTCS solenoid valve terminal A (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 11.
9	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at PCM terminal 2N (damaged/pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
10	<b>INSPECT VTCS SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Connect VTCS solenoid valve connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between PCM terminal 2N and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open or short to GND circuit, then go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P1569 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

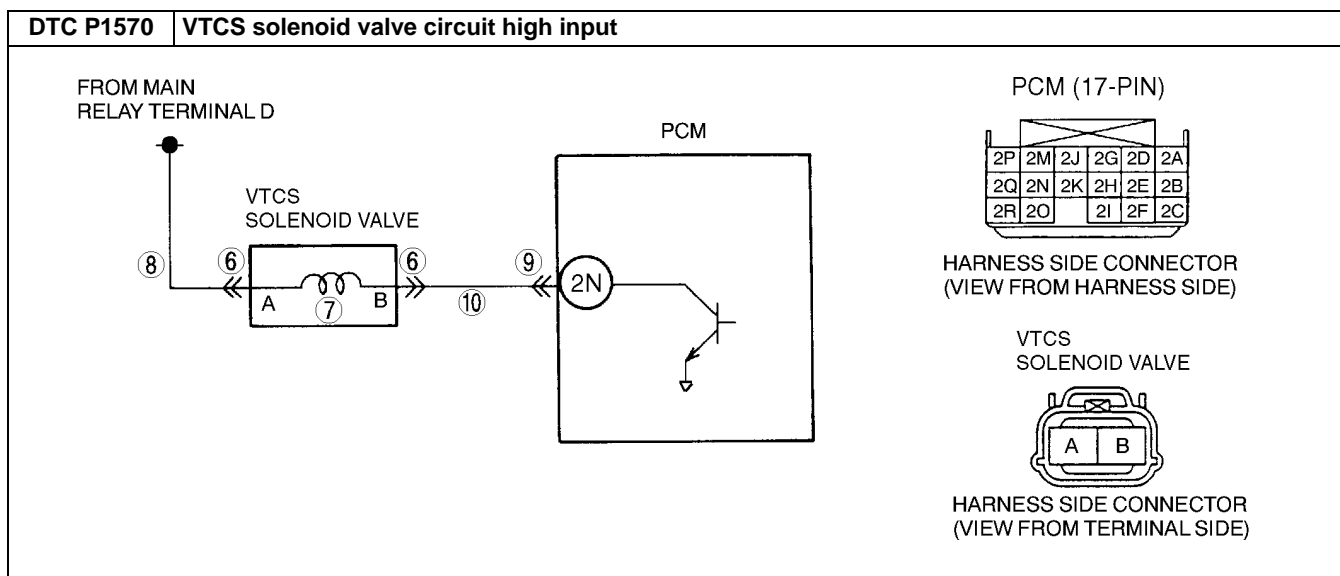
01-02A

## DTC P1570

A5U010201083W12

DTC P1570	VTCS solenoid valve circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltages from VTCS solenoid valve. If voltage at PCM 2N is high when the VTCS solenoid valve ON, PCM determines that VTCS solenoid valve malfunction.</li> </ul> <b>MONITORING CONDITIONS</b> <ul style="list-style-type: none"> <li>Engine speed is <b>above 3,500 rpm</b>.</li> <li>ECT is <b>below 70 °C {158 °F}</b>.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Poor connection of connectors at PCM and/or VTCS solenoid valve</li> <li>Short to power circuit in wiring between VTCS solenoid valve terminal B and PCM terminal 2N</li> <li>Open circuit in wiring between main relay terminal D and VTCS solenoid valve terminal A</li> <li>Open circuit in wiring between VTCS solenoid valve terminal B and PCM terminal 2N</li> <li>VTCS solenoid valve malfunction</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]



## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>CHECK FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>DETERMINE IF INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01-03-4 INTERMITTENT CONCERN TROUBLESHOOTING)
4	<b>DETERMINE IF OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION</b> <ul style="list-style-type: none"> <li>Disconnect VTCS solenoid valve tube that connects to intake manifold.</li> <li>Connect vacuum pump to VTCS solenoid valve.</li> <li>Apply vacuum and wait 5 s.</li> <li>Is vacuum maintained?</li> </ul>	Yes	Go to Step 6.
		No	Go to next step.
5	<b>INSPECT VTCS SOLENOID VALVE FOR PASSAGE CONTROL</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect VTCS solenoid valve connector.</li> <li>Is vacuum maintained?</li> </ul>	Yes	Repair or replace harness between PCM terminal 2N and VTCS solenoid valve terminal B for short to GND, then go to Step 11.
		No	Replace VTCS solenoid valve, then go to Step 11.
6	<b>INSPECT VTCS SOLENOID VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check for poor connection (damaged/pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair or replace terminal, then go to Step 11.
		No	Go to next step.
7	<b>INSPECT VTCS SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Measure resistance between VTCS solenoid valve terminals (part-side).</li> <li>Is resistance <b>more than 28 ohms</b>?</li> </ul>	Yes	Go to next step.
		No	Replace VTCS solenoid valve, then go to Step 11.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
8	<b>INSPECT VTCS SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect VTCS solenoid valve connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between VTCS solenoid valve terminal A (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Go to next step.
		No Repair or replace harness for open, then go to Step 11.
9	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection at PCM terminal 2N (damaged/pulled-out pins, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair terminal, then go to Step 11.
		No Go to next step.
10	<b>INSPECT VTCS SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Disconnect VTCS solenoid valve connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between PCM terminal 2N and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Repair or replace harness for short to power circuit, then go to next step.
		No Go to next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P1570 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

01-02A

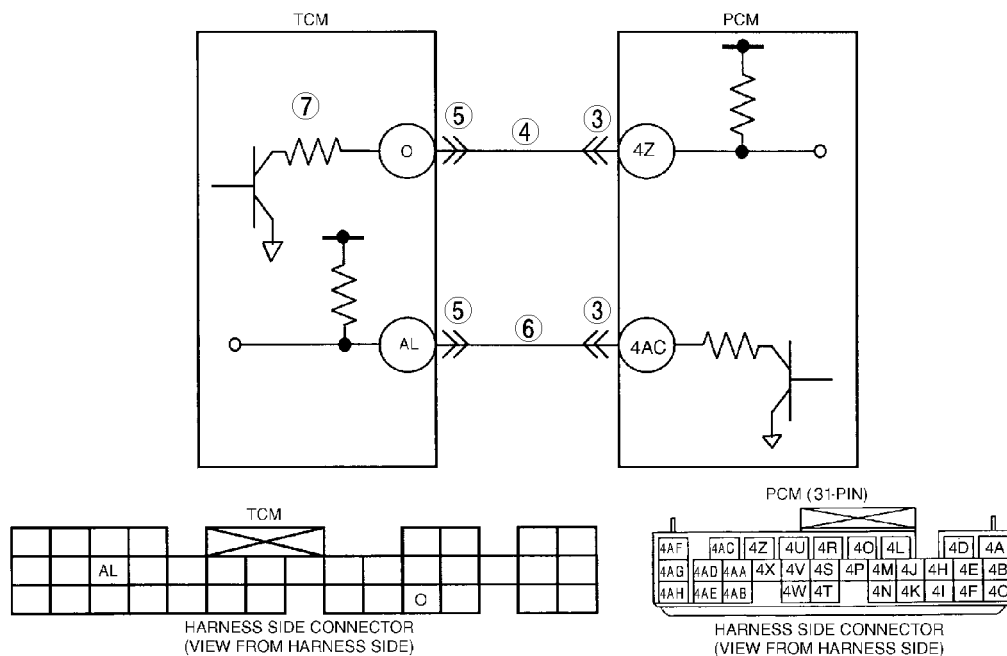
## DTC P1601

A5U010201083W13

DTC P1601	Communication line error (PCM-TCM)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Open or short circuit between PCM terminal 4Z and TCM terminal O</li> <li>Open or short circuit between PCM terminal 4AC and TCM terminal AL</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Poor connection at PCM or TCM connector</li> <li>Short to GND circuit between PCM terminal 4Z and TCM terminal O.</li> <li>Short to GND circuit between PCM terminal 4AC and TCM terminal AL.</li> <li>Open circuit between PCM terminal 4Z and TCM terminal O.</li> <li>Open circuit between PCM terminal 4AC and TCM terminal AL.</li> <li>Short to power circuit between PCM terminal 4Z and TCM terminal O.</li> <li>Short to power circuit between PCM terminal 4AC and TCM terminal AL.</li> <li>TCM malfunction.</li> <li>PCM malfunction.</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## DTC P1601 Communication line error (PCM-TCM)



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes: Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul> No: Go to next step.
2	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes: Repair or replace terminal, go to Step 7.                     No: Go to next step.
3	<b>CHECK SERIAL COMMUNICATION CIRCUIT AT PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between PCM terminal 4Z (harness-side) and body GND.</li> <li>Is voltage <b>within 4.5—5.5 V</b>?</li> </ul>	Yes: Go to next step.                     No: Check for open or short circuit between PCM terminal 4Z and TCM terminal O, go to Step 7.
4	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect TCM connector.</li> <li>Check for poor connection (damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes: Repair or replace terminal, go to Step 7.                     No: Go to next step.
5	<b>INSPECT SERIAL COMMUNICATION CIRCUIT AT TCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Connect PCM connector.</li> <li>Disconnect TCM connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between TCM terminal AL (harness-side) and body GND.</li> <li>Is voltage <b>within 4.5—5.5 V</b>?</li> </ul>	Yes: Go to next step.                     No: Check for open or short circuit between TCM terminal AL and PCM terminal 4AC, go to Step 7.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

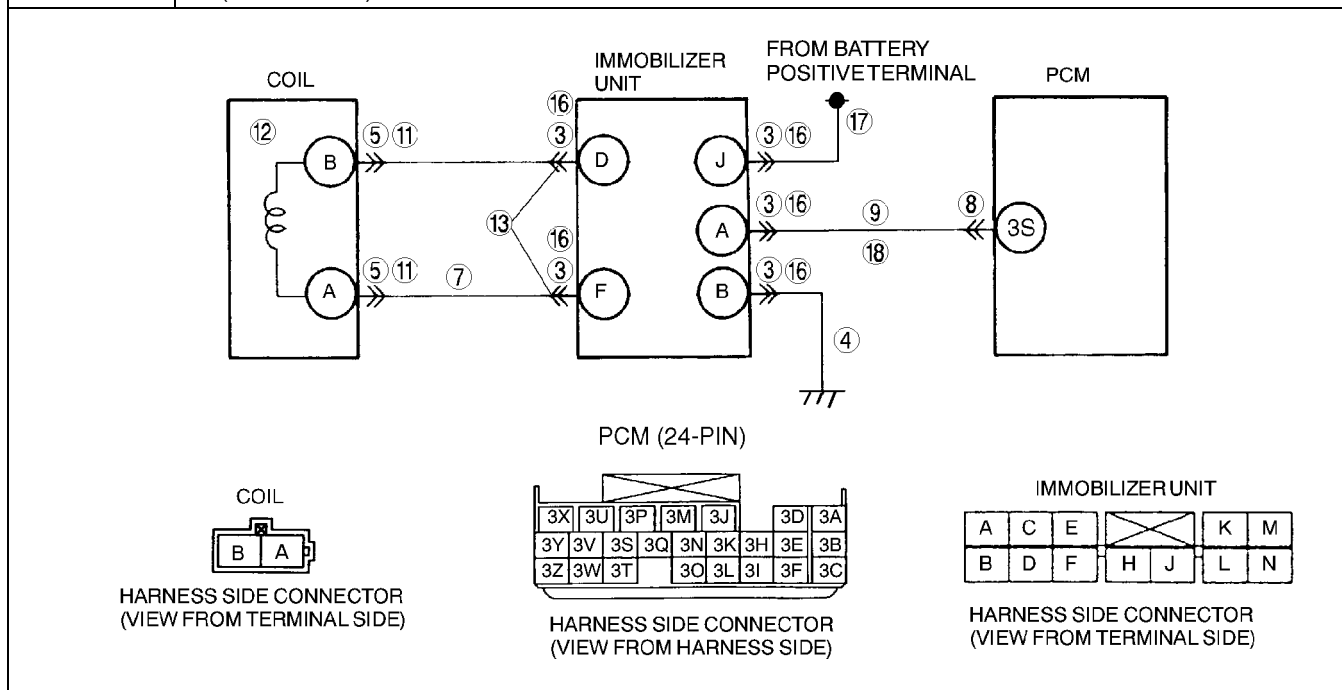
STEP	INSPECTION	ACTION
6	<b>INSPECT TCM</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Connect all connector.</li> <li>Perform TCM DTC Inspection and voltage Inspection.</li> <li>Is TCM okay?</li> </ul>	Yes Go to next step.
		No Replace TCM, go to Step 7.
7	<b>VERIFY TROUBLESHOOTING OF DT P1601 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, go to next step.
		No Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

01-02A

## DTC P1602

A5U010201083W14

<b>DTC P1602</b>	<b>Immobilizer unit-PCM communication error</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Command transmission from the PCM to the immobilizer unit exceeds limit.</li> <li>No response from immobilizer unit</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Immobilizer unit malfunction</li> <li>Coil (immobilizer system) malfunction</li> <li>Key (transponder) malfunction</li> <li>PCM malfunction</li> <li>Open circuit in wiring between immobilizer unit terminal A (harness-side) and PCM terminal 3S (harness-side)</li> <li>Open circuit in wiring between immobilizer unit terminal B (harness-side) and body GND</li> <li>Open circuit in wiring between immobilizer unit terminal F (harness-side) and coil terminal A (harness-side)</li> <li>Open circuit in wiring between immobilizer unit terminal D (harness-side) and coil terminal B (harness-side)</li> <li>Short to GND circuit in wiring between immobilizer unit terminal A (harness-side) and PCM terminal 3S (harness-side)</li> <li>Short to GND circuit in wiring between immobilizer unit terminal F (harness-side) and coil terminal A (harness-side)</li> <li>Short to GND circuit in wiring between immobilizer unit terminal D (harness-side) and coil terminal B (harness-side)</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
2	<b>DETERMINE IF NO DTC DETECTED OR SOME DTC DETECTED</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF and ON (Engine OFF).</li> <li>Has DTC P1624 been detected?</li> </ul>	Yes	Go to step 10.
		No	Go to next step.
3	<b>INSPECT IMMOBILIZER UNIT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect immobilizer unit connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminals, then go to Step 19.
		No	Go to next step.
4	<b>INSPECT GND CIRCUIT OF IMMOBILIZER UNIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Measure resistance between immobilizer unit terminal C (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 19.
5	<b>INSPECT COIL TERMINAL</b> <ul style="list-style-type: none"> <li>Disconnect coil connector.</li> <li>Check for bent terminals.</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminals, then go to Step 19.
		No	Go to next step.
6	<b>INSPECT COIL FOR SHORT CIRCUIT</b> <ul style="list-style-type: none"> <li>Check for continuity between coil terminal A (part-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Replace coil, then go to Step 19.
		No	Go to next step.
7	<b>INSPECT COIL CIRCUIT FOR SHORT</b> <ul style="list-style-type: none"> <li>Connect coil connector.</li> <li>Check for continuity between immobilizer unit terminal F (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short circuit, then go to Step 19.
		No	Go to next step.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace harness, then go to Step 19.
		No	Go to next step.
9	<b>INSPECT COMMUNICATION LINE FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Measure continuity between immobilizer unit terminal A (harness-side) and PCM terminal 3S.</li> <li>Is there any continuity?</li> </ul>	Yes	Go to Step 19.
		No	Repair or replace harness for open circuit, then go to Step 19.
10	<b>CLASSIFY MALFUNCTION BY ANOTHER DETECTED DTCS</b> <ul style="list-style-type: none"> <li>Has DTC P1602 been detected?</li> </ul>	Yes	Go to Step 14.
		No	Go to next step.
11	<b>INSPECT COIL CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect coil connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes	Repair or replace harness, then go to Step 19.
		No	Go to next step.
12	<b>INSPECT COIL FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect coil connector.</li> <li>Measure resistance between coil terminals (part-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to next step.
		No	Replace coil, then go to Step 19.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
13	<b>INSPECT COIL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Connect coil connector.</li> <li>Measure the resistance between immobilizer connector terminals F and D (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes Go to Step 19.
		No Repair or replace harness for open circuit, then go to Step 19.
14	<b>DETERMINE IF MALFUNCTION BY ANOTHER DETECTED DTCS.</b> <ul style="list-style-type: none"> <li>Has immobilizer unit DTC 03 been detected?</li> </ul>	Yes Key has not transponder, replace with registered key. Go to Step 19.
		No Go to next step.
15	<b>DETERMINE IF MALFUNCTION BY ANOTHER DETECTED DTCS.</b> <ul style="list-style-type: none"> <li>Has immobilizer unit DTC 01 been detected?</li> </ul>	Yes Key that using for ignition is not registered. Reprogram key or use another registered key, then go to next step. (See 09–14–20 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No Go to next step.
16	<b>INSPECT POOR CONNECTION OF IMMOBILIZER UNIT CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect immobilizer unit connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Are there any malfunctions?</li> </ul>	Yes Repair or replace harness, then go to next step.
		No Go to next step.
17	<b>INSPECT IMMOBILIZER UNIT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between immobilizer connector J (harness-side) and body GND.</li> <li>Is voltage B+?</li> </ul>	Yes Go to next step.
		No Repair or replace harness for open circuit, then go to Step 19.
18	<b>INSPECT COMMUNICATION LINE FOR SHORT HARNESS</b> <ul style="list-style-type: none"> <li>Measure resistance between immobilizer unit terminal A (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes Repair or replace harness for short, then go to next step.
		No Go to next step.
19	<b>VERIFY TROUBLESHOOTING OF DTC P1602 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
20	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01–02A–10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE)
		No Troubleshooting completed.

01–02A

## DTC P1603

A5U010201083W15

<b>DTC P1603</b>	<b>Key ID numbers unregistered in PCM</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Key ID numbers are not registered in PCM.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Immobilizer system reprogram procedure (code word) was not performed after replacing PCM.</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.

## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
2	<b>VERIFY DTC P1603 DETECTED AGAIN</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Perform code word reprogram procedure. (See 09–14–20 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No Go to next step.
3	<b>VERIFY TROUBLESHOOTING OF DTC P1603 COMPLETED</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform “After Repair Procedure”. (See 01–02A–10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE)
		No Troubleshooting completed.

### DTC P1604

A5U010201083W16

<b>DTC P1604</b>	<b>Code word unregistered in PCM</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Code word is not registered in PCM.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Immobilizer system reprogram procedure (key IDs) was not performed after replacing PCM.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
2	<b>VERIFY DTC P1604 DETECTED AGAIN</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Perform key ID number reprogram procedure. (See 09–14–20 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No Go to next step.
3	<b>VERIFY TROUBLESHOOTING OF DTC P1604 COMPLETED</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform “After Repair Procedure”. (See 01–02A–10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01–02A–13 DTC TABLE)
		No Troubleshooting completed.

### DTC P1608

A5U010201083W17

<b>DTC P1608</b>	<b>PCM internal circuit malfunction</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>If the PCM receive abnormal signals from output devices, the PCM determines that PCM has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Short power circuit to output device control circuit (purge solenoid valve, EGR valve, VTCS solenoid valve, EGR boost sensor solenoid valve and/or CDCV).</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information • If vehicle is not repaired, go to next step.
		No Go to next step.
2	<b>INSPECT OUTPUT DEVICE CONTROL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Disconnect output device ( purge solenoid valve, EGR valve, VTCS solenoid valve, EGR boost sensor solenoid valve and/or CDCV) connectors.</li> <li>Measure voltage following connectors. <ul style="list-style-type: none"> <li>Purge solenoid valve terminal B (harness-side) and body GND</li> <li>EGR valve terminal E (harness-side) and body GND</li> <li>EGR valve terminal A (harness-side) and body GND</li> <li>EGR valve terminal B (harness-side) and body GND</li> <li>EGR valve terminal F (harness-side) and body GND</li> <li>VTCS solenoid valve terminal B (harness-side) and body GND</li> <li>EGR boost sensor solenoid valve terminal B (harness-side) and body GND</li> <li>CDCV terminal B (harness-side) and body GND</li> </ul> </li> <li>Are voltages <b>approx. 0 V</b></li> </ul>	Yes Go to next step.
		No Repair or replace appropriate harness for short to power, then go to next step.
3	<b>VERIFY TROUBLESHOOTING OF DTC P1608 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC using WDS or equivalent.</li> <li>Start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

01-02A

## DTC P1621

A5U010201083W18

<b>DTC P1621</b>	<b>Code word mismatch after engine cranking</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Code words stored in PCM and Immobilizer unit do not match</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Immobilizer system reprogram procedure (code word) was not performed correctly after replacing immobilizer unit or PCM.</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	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	<b>VERIFY DTC P1621 DETECTED AGAIN</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Perform code word reprogram procedure. (See 09-14-20 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No Go to next step.

## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
3	<b>VERIFY TROUBLESHOOTING OF DTC P1603 COMPLETED</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

### DTC P1622

A5U010201083W19

<b>DTC P1622</b>	<b>Key ID number mismatch</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>ID numbers stored in immobilizer unit (IU) and PCM do not match. This DTC is indicated only after immobilizer unit is replaced and system is reprogrammed.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Transformation of key ID number stored in PCM.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
2	<b>VERIFY DTC P1622 DETECTED AGAIN</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Go to next step.
		No Go to Step 4.
3	<b>CHECK IF ENGINE STARTS NORMALLY USING ANOTHER REGISTERED KEY</b> <ul style="list-style-type: none"> <li>Does engine start with another registered key?</li> </ul>	Yes Previous key is defective. Discard it.
		No Go to next step.
4	<b>VERIFY TROUBLESHOOTING OF DTC P1603 COMPLETED</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

### DTC P1623

A5U010201083W20

<b>DTC P1623</b>	<b>Code word or key ID number read/write error in PCM</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM internal EEPROM is damaged.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PCM internal EEPROM is damaged.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

STEP	INSPECTION	ACTION
2	<b>VERIFY DTC P1623 DETECTED AGAIN</b> <ul style="list-style-type: none"> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
3	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

01-02A

## DTC P1624

A5U010201083W21

<b>DTC P1624</b>	<b>Immobilizer system communication counter = 0</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM detected immobilizer system communication malfunction more than three times.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Engine start was attempted more than three times under malfunction.</li> <li>Code word mismatch</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any repair information available?</li> </ul>	Yes Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No Go to next step.
2	<b>FOLLOW OTHER DETECTED DTC FIRST</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF and then to START.</li> <li>Has P1602 been detected?</li> </ul>	Yes Go to DTC P1602 inspection. (See 01-02A-147 DTC P1602)
		No Go to next step.
3	<b>INSPECT IMMOBILIZER UNIT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Has P1621 been detected?</li> </ul>	Yes Go to DTC P1621 inspection. (See 01-02A-151 DTC P1621)
		No Go to next step.
4	<b>VERIFY TROUBLESHOOTING OF DTC P1624 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

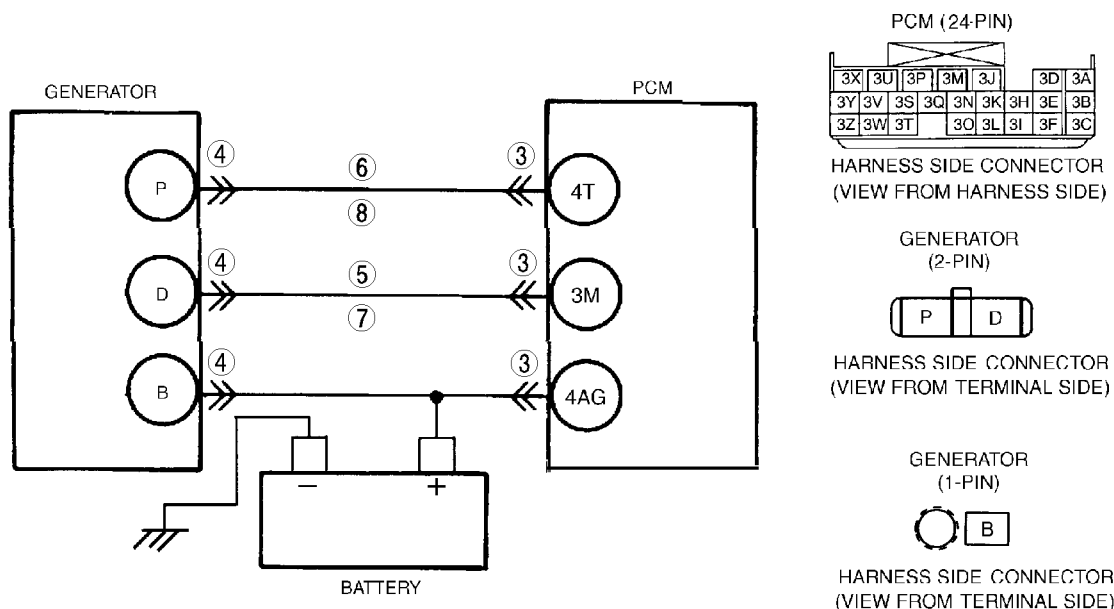
## DTC P1631

A5U010201083W22

<b>DTC P1631</b>	<b>Generator output voltage signal no electricity</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltage from the generator. If the PCM detected that the generator output voltage <b>below 8.5 V</b> for <b>5 s</b> while engine running, the PCM determines that the charging system has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Open or short to GND circuit between the generator terminal P and the PCM terminal 4T</li> <li>Open or short to GND circuit between the generator terminal D and the PCM terminal 3M</li> <li>Cut drive belt off or came drive belt off.</li> <li>Generator malfunction <ul style="list-style-type: none"> <li>Rectifier circuit malfunction</li> <li>Brush abrasion</li> </ul> </li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## DTC P1631 Generator output voltage signal no electricity



### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
2	<b>INSPECT DRIVE BELT CONDITION</b> <ul style="list-style-type: none"> <li>Verify that drive belt auto tensioner indicator mark is not exceeding limit. (See 01-10-3 DRIVE BELT INSPECTION)</li> <li>Is front drive belt okay?</li> </ul>	Yes	Go to next step.
		No	Replace and/or adjust drive belt, then go to Step 9.
3	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminals, then go to Step 9.
		No	Go to next step.
4	<b>INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect generator connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminals, then go to Step 9.
		No	Go to next step.
5	<b>INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO GND</b> <ul style="list-style-type: none"> <li>Check continuity between generator terminal D (harness-side) and body GND.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
6	<b>INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR GND</b> <ul style="list-style-type: none"> <li>Check continuity between generator terminal P (harness-side) and body GND.</li> <li>Is there any continuity?</li> </ul>	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

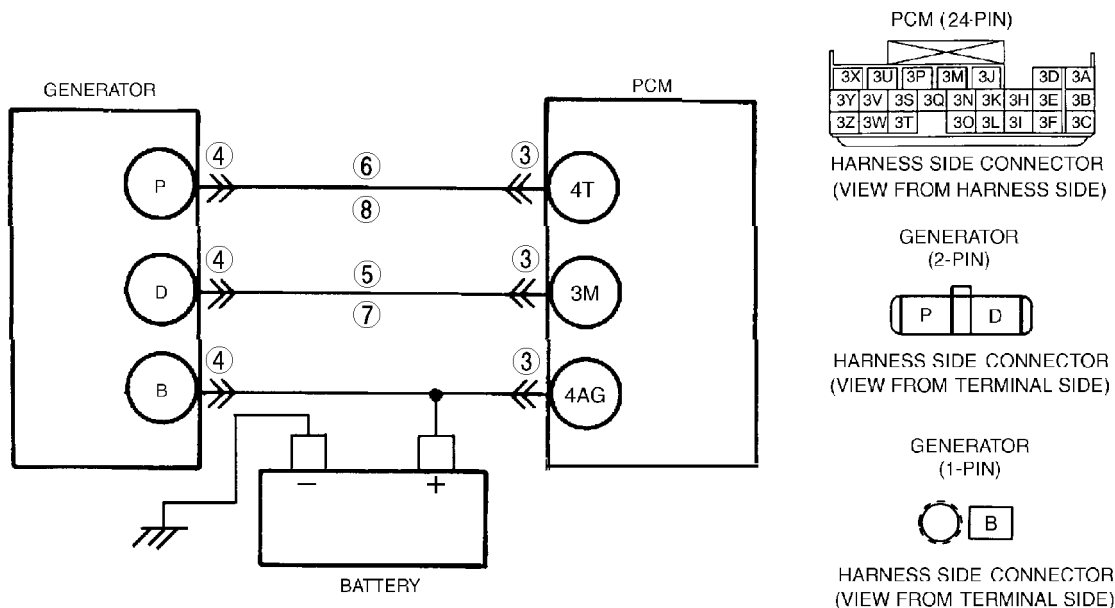
STEP	INSPECTION	ACTION
7	<b>INSPECT GENERATOR CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Measure resistance between generator terminal D (harness-side) and PCM terminal 3M (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes Go to next step.
		No Repair or replace harness for open circuit, then go to Step 9.
8	<b>INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Measure resistance between generator terminal P (harness-side) and PCM terminal 4T (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes Repair or replace generator, then go to next step.
		No Repair or replace harness for open, then go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P1631 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition switch to OFF, then start engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.

01-02A

## DTC P1633

A5U010201083W23

<b>DTC P1633</b>	<b>Battery overcharge</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltage from the generator and battery positive terminal. If the PCM detected that the generator output voltage <b>above 18.5 V</b> or battery voltage <b>above 16.0 V</b> for <b>5 s</b> while engine running, the PCM determines that the charging system has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Short to power circuit between the generator connector terminal D and the PCM connector terminal 3M</li> <li>Generator malfunction</li> <li>PCM malfunction</li> </ul>



# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnostic according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
2	<b>INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect generator connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminals, then go to Step 7.
		No	Go to next step.
3	<b>DETERMINE IF GENERATOR MALFUNCTION OR OTHER MALFUNCTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between generator terminal D (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Malfunction at the generator. Go to Step 6.
4	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect PCM connector.</li> <li>Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace pins, then go to Step 7.
		No	Go to next step.
5	<b>INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between generator terminal D (harness-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace harness for short to power, then go to Step 7.
		No	Go to Step 7.
6	<b>INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Measure resistance between generator terminal D (part-side) and body GND.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace generator, then go to Step 7.
		No	Go to next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P1633 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF then ON (Engine OFF).</li> <li>Is same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No	Troubleshooting completed.

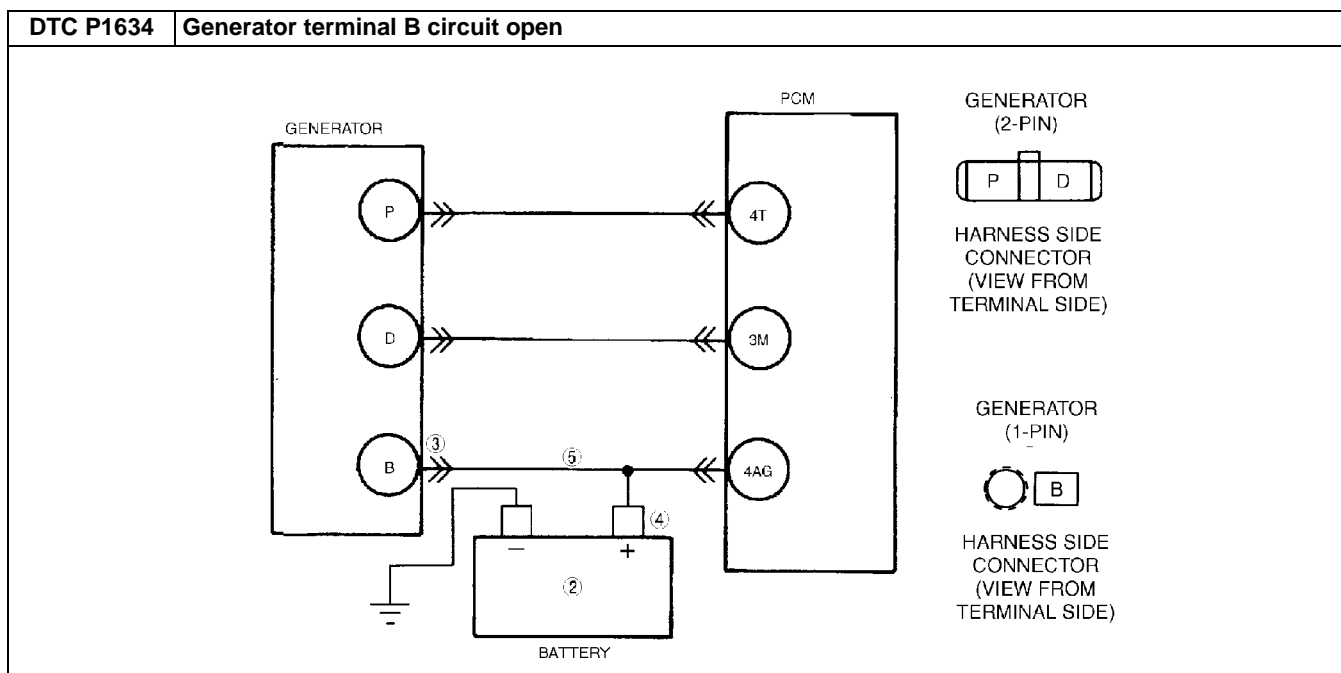
## DTC P1634

A5U010201083W24

<b>DTC P1634</b>	<b>Generator terminal B circuit open</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input voltage from the generator and battery positive terminal. If the PCM detected that the generator output voltage <b>above 17.0 V</b> and battery voltage <b>below 11.0 V</b> for <b>5 s</b> while engine running, the PCM determines that the charging system has malfunction.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Open circuit between the generator terminal B and the battery positive terminal</li> <li>Battery malfunction</li> <li>PCM malfunction</li> </ul>

# ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (BP)]

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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
2	<b>INSPECT BATTERY</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect battery.</li> <li>(See 01-17-2 BATTERY INSPECTION)</li> <li>Is battery okay?</li> </ul>	Yes Replace battery, then go to Step 6.
		No Go to next step.
3	<b>INSPECT GENERATOR TERMINAL FOR POOR INSTALLATION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Check for looseness of generator terminal B installation nut.</li> <li>Is nut loose?</li> </ul>	Yes Tighten generator terminal B installation nut, then go to Step 6.
		No Go to next step.
4	<b>INSPECT POOR INSTALLATION OF BATTERY POSITIVE TERMINAL</b> <ul style="list-style-type: none"> <li>Check for looseness of battery positive terminal.</li> <li>Is terminal loose?</li> </ul>	Yes Connect battery positive terminal correctly, then go to Step 6.
		No Go to next step.
5	<b>INSPECT BATTERY CHARGING CIRCUIT</b> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Disconnect battery positive terminal.</li> <li>Does engine stall?</li> </ul>	Yes Repair or replace harness between generator terminal B and battery positive terminal, then go to next step.
		No Go to next step.
6	<b>VERIFY TROUBLESHOOTING OF DTC P1634 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to connect all disconnected connectors.</li> <li>Clear DTC from PCM memory using WDS or equivalent.</li> <li>Turn ignition key to OFF, then start the engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace PCM, then go to next step.
		No Go to next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure".</li> <li>(See 01-02A-10 AFTER REPAIR PROCEDURE)</li> <li>Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection. (See 01-02A-13 DTC TABLE)
		No Troubleshooting completed.