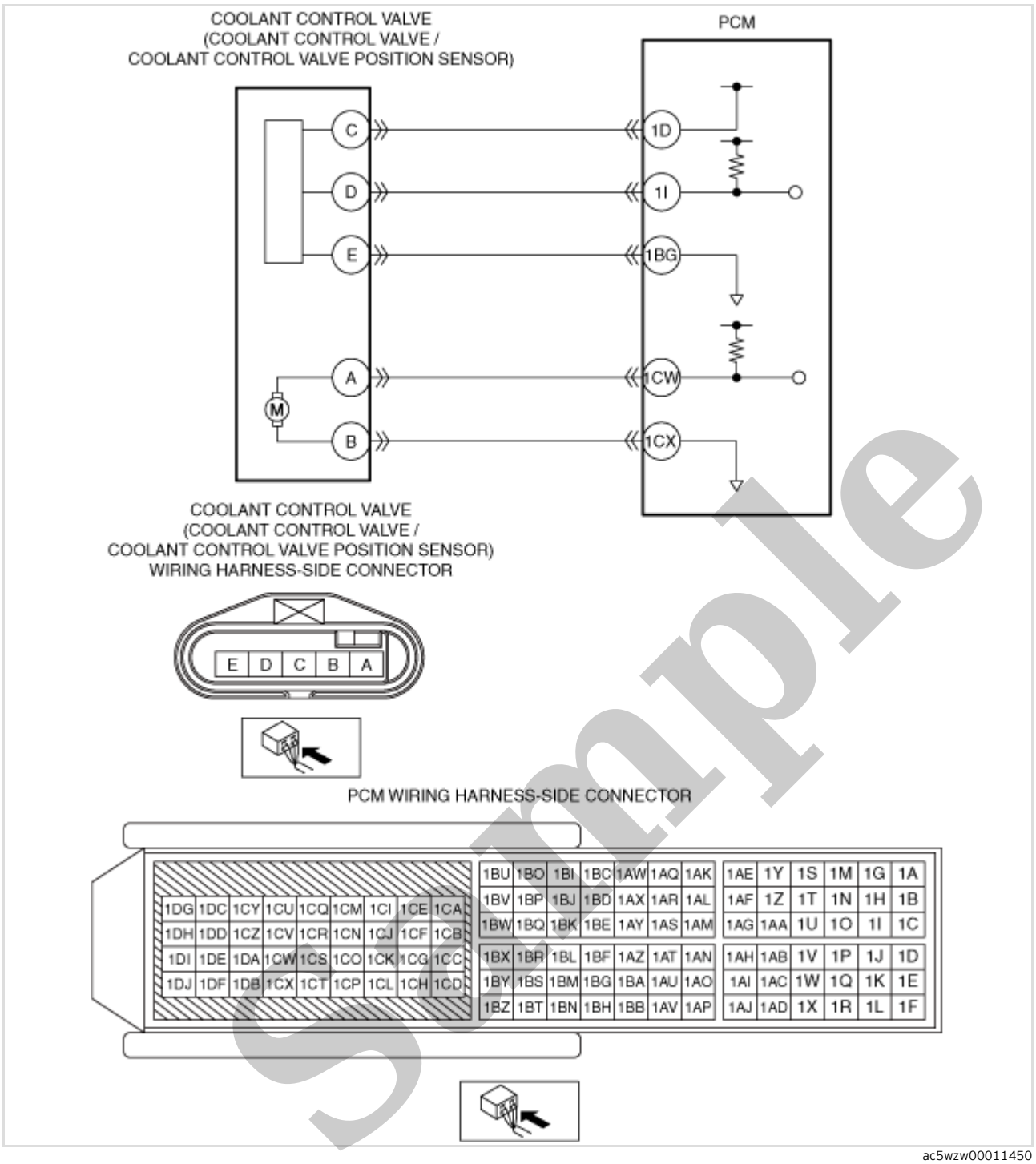
Your Ultimate Source for OEM Repair Manuals

FactoryManuals.net is a great resource for anyone who wants to save money on repairs by doing their own work. The manuals provide detailed instructions and diagrams that make it easy to understand how to fix a vehicle.

1997 MAZDA 323 C (BH) OEM Service and Repair Workshop Manual

Go to manual page

System Wiring Diagram



ac5wzw00011450

Function Explanation (DTC Detection Outline)

• When a condition continues in which the coolant control valve does not operate even if the PCM applies maximum voltage to the valve, the PCM determines that the valve is stuck and stores a DTC.

Repeatability Verification Procedure

1.Warm up the engine to allow the engine coolant temperature to reach 50–95 °C {122–203 °F}.

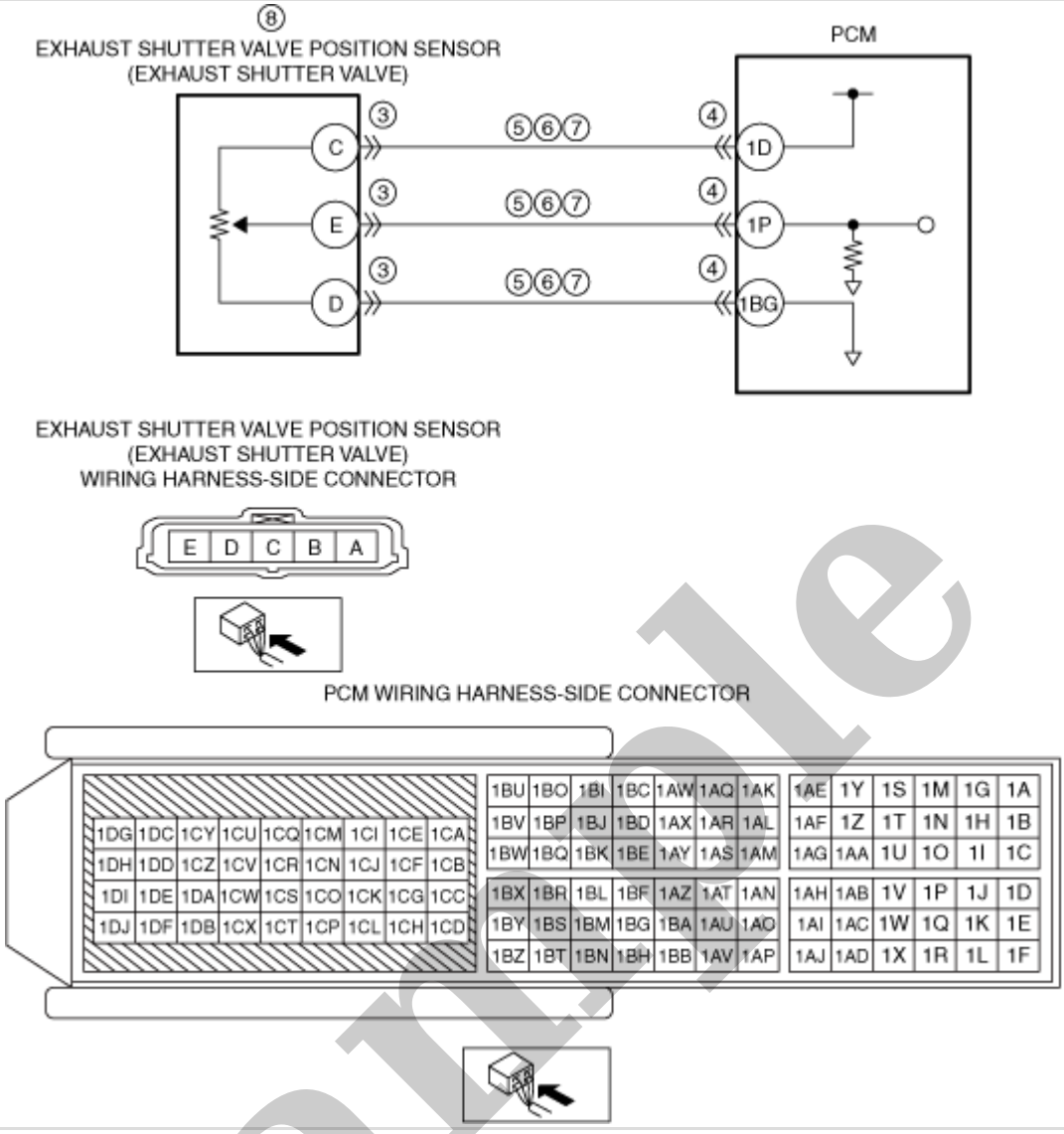
Note

STEP	INSPECTION	RESULTS	ACTION
2	**INSPECT COOLANT CONTROL VALVE CIRCUIT FOR SHORT TO GROUND** • Verify that the coolant control valve/coolant control valve position sensor and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — Coolant control valve/coolant control valve position sensor terminal A — Coolant control valve/coolant control valve position sensor terminal B — Coolant control valve/coolant control valve position sensor terminal C — Coolant control valve/coolant control valve position sensor terminal D — Coolant control valve/coolant control valve position sensor terminal E • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Coolant control valve/coolant control valve position sensor terminal A—PCM terminal 1CW • Coolant control valve/coolant control valve position sensor terminal B—PCM terminal 1CX • Coolant control valve/coolant control valve position sensor terminal C—PCM terminal 1D • Coolant control valve/coolant control valve position sensor terminal D—PCM terminal 1I • Coolant control valve/coolant control valve position sensor terminal E—PCM terminal 1BG **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to power supply. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to power supply. Go to Step 7.
		No	Go to the next step.
3	**INSPECT COOLANT CONTROL VALVE/COOLANT CONTROL VALVE POSITION SENSOR CIRCUITS FOR SHORT TO EACH OTHER** • Verify that the coolant control valve/coolant control valve position sensor and PCM connectors are disconnected. • Inspect for continuity between coolant control valve/coolant control valve position sensor terminals A, B, C, D and E (wiring harness-side). • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Coolant control valve/coolant control valve position sensor terminal A—PCM terminal 1CW • Coolant control valve/coolant control valve position sensor terminal B—PCM terminal 1CX • Coolant control valve/coolant control valve position sensor terminal C—PCM terminal 1D • Coolant control valve/coolant control valve position sensor terminal D—PCM terminal 1I • Coolant control valve/coolant control valve position sensor terminal E—PCM terminal 1BG **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to each other. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to each other. Go to Step 7.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
4	VERIFY DTC TROUBLESHOOTING COMPLETED • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.
5	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

STEP	INSPECTION		ACTION
3	**INSPECT EXHAUST SHUTTER VALVE CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the exhaust shutter valve connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 9.
		No	Go to the next step.
4	**INSPECT PCM CONNECTOR CONDITION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 9.
		No	Go to the next step.
5	**INSPECT EXHAUST SHUTTER VALVE POSITION SENSOR CIRCUIT FOR OPEN CIRCUIT** • Verify that the exhaust shutter valve and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Exhaust shutter valve terminal C–PCM terminal 1D — Exhaust shutter valve terminal E–PCM terminal 1P • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Exhaust shutter valve terminal C–PCM terminal 1D • Exhaust shutter valve terminal E–PCM terminal 1P **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 9.
6	**INSPECT EXHAUST SHUTTER VALVE POSITION SENSOR CIRCUIT FOR SHORT TO GROUND** • Verify that the exhaust shutter valve and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — Exhaust shutter valve terminal C — Exhaust shutter valve terminal E • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Exhaust shutter valve terminal C–PCM terminal 1D • Exhaust shutter valve terminal E–PCM terminal 1P **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to ground. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to ground. Go to Step 9.
		No	Go to the next step.

DTC P2BF7:00	Exhaust shutter valve position sensor circuit high input



Diagnostic Procedure

STEP	INSPECTION		ACTION
1	RECORD VEHICLE STATUS WHEN DTC WAS DETECTED TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture of the PC function. • Record the freeze frame data/snap shot data.	–	Go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

DTC P3400:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896728

id0102s951700

Note

• To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

Details On DTCs

Description	**Cylinder deactivation system malfunction**	
Detection condition	Determination conditions	• A condition continues in which both the intake valve and exhaust valve for No.1 or No.4 cylinder open mistakenly during cylinder deactivation control.
	Preconditions	• During cylinder deactivation control
	Malfunction determination period	• 0.5 s period
	Drive cycle	• 2
	Self test type	• CMDTC self test
	Sensor used	• A/F sensor
Fail-safe function	• Inhibits the cylinder deactivation control.	
Vehicle status when DTCs are output	• Not applicable	
Possible cause	• Switchable HLA malfunction • OCV for No.1 cylinder deactivation malfunction • OCV for No.4 cylinder deactivation malfunction • Intake valve and exhaust valve for No.1 cylinder stuck open malfunction • Intake valve and exhaust valve for No.4 cylinder stuck open malfunction • Engine oil solenoid valve malfunction • Engine oil malfunction — Use of unspecified engine oil — Engine oil leakage — Low engine oil pressure — Engine oil runners are clogged or have leakage • PCM malfunction	

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• If both the intake valve and exhaust valve for the deactivated cylinders open mistakenly, the intake air flows to the exhaust pipe and the A/F in the exhaust gas changes to lean. If a large A/F fluctuation during cylinder deactivation is determined, the PCM determines that both the intake valve and exhaust valve for the No.1 or 4 cylinder are open, and stores a DTC.

Repeatability Verification Procedure

• Not applicable

Step	Inspection	Results	Action
9	PURPOSE: INSPECT ENGINE OIL PRESSURE • Inspect the engine oil pressure. (See OIL PRESSURE INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to repair completion verification.
10	PURPOSE: VERIFY IF MALFUNCTION RELATED TO ENGINE OIL LEAK OR RESTRICTION AFFECTS DIAGNOSTIC RESULTS • Start the engine. • Verify if there is engine oil leakage in the oil passage or restriction. • Is there engine oil leakage in the oil passage or restriction?	Yes	Repair or replace the malfunctioning location. Add genuine engine oil, then go to Step 11. (See ENGINE OIL REPLACEMENT [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
11	PURPOSE: VERIFY THAT VEHICLE IS REPAIRED • Install/connect the part removed/disconnected during the troubleshooting procedure. • Clear the DTC recorded in the memory. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Replicate the vehicle conditions at the time the DTC was detected using the following procedure. — Start the engine and warm it up completely. **Warning** **• While performing this step, always operate the vehicle in a safe and lawful manner.** **• When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later.** — Drive the vehicle under the freeze frame data/snapshot data condition. • Perform the DTC inspection for the PCM. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.
12	PURPOSE: VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

DTC P2199:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896726

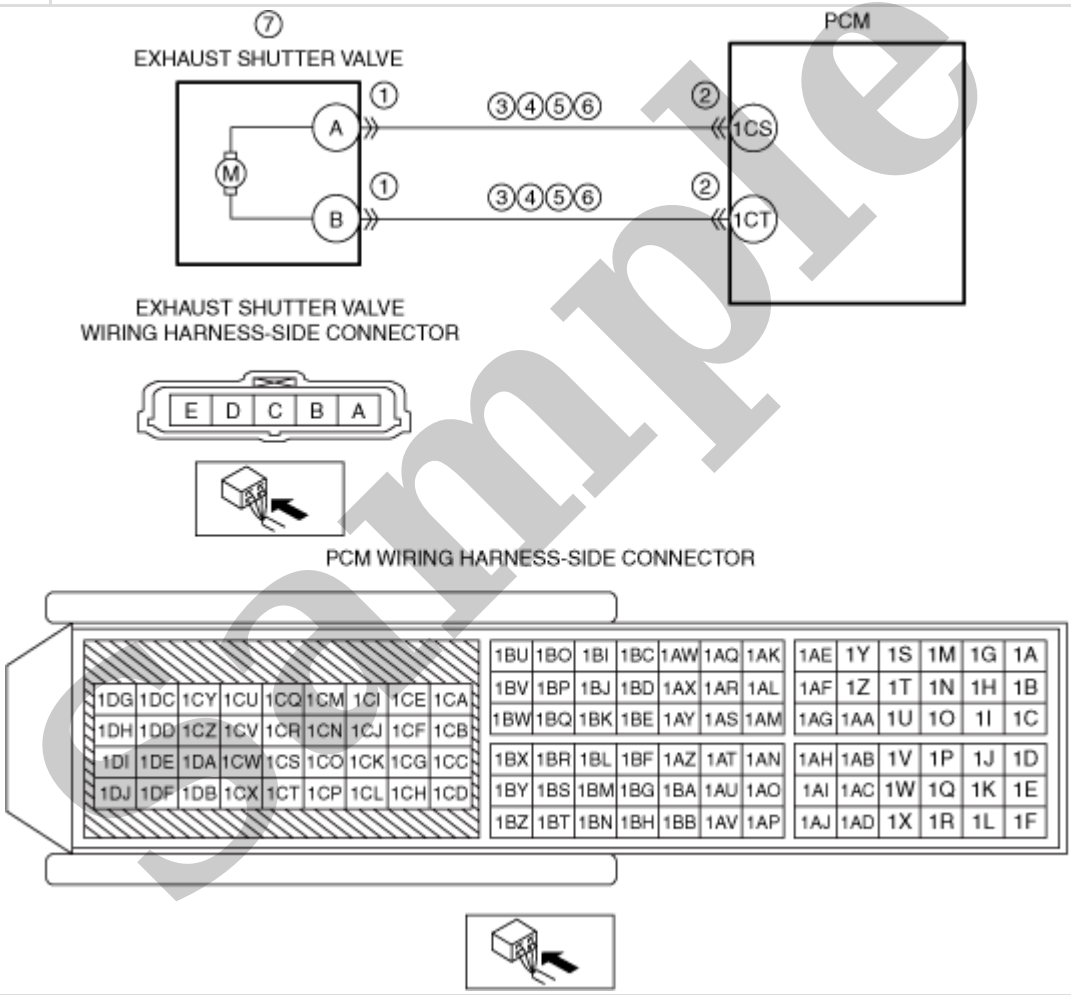
id0102s941510

DTC P2199:00	IAT sensor No.2 correlation problem
DETECTION CONDITION	• IAT sensor No.1 and IAT sensor No.2 are compared and correlation error occurs. Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. (The check engine light may be illuminated depending on the malfunction conditions.) • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• MAP sensor/IAT sensor No.2 connector or terminals malfunction • IAT sensor No.1 malfunction • IAT sensor No.2 malfunction • PCM connector or terminals malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture function of the PC. • Record the FREEZE FRAME DATA/snapshot data on the repair order.	–	Go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT MAP SENSOR/IAT SENSOR No.2 CONNECTOR CONDITION • Switch the ignition off. • Disconnect the MAP sensor/IAT sensor No.2 connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 7.
		No	Go to the next step.

Description	Exhaust shutter valve range/performance problem
Possible cause	• Exhaust shutter valve connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — Exhaust shutter valve terminal A—PCM terminal 1CS — Exhaust shutter valve terminal B—PCM terminal 1CT • Exhaust shutter valve circuits are shorted to each other • Short to power supply in wiring harness between the following terminals: — Exhaust shutter valve terminal A—PCM terminal 1CS — Exhaust shutter valve terminal B—PCM terminal 1CT • Open circuit in wiring harness between the following terminals: — Exhaust shutter valve terminal A—PCM terminal 1CS — Exhaust shutter valve terminal B—PCM terminal 1CT • Exhaust shutter valve malfunction (valve stuck closed) • PCM malfunction



Function Explanation (DTC Detection Outline)

• The PCM calculates the target opening angle appropriate to the engine conditions relative to the actual opening angle based on the exhaust shutter valve position sensor signal and provides feedback to the exhaust shutter valve control.
• With the preconditions met, the PCM verifies the conformity of the actual opening angle relative to the target opening angle of the exhaust shutter valve. If the actual opening angle does not conform to the normal determination range relative to the target opening angle during the malfunction determination period (approx. 5 s), the PCM determines a malfunction in the exhaust shutter valve and stores a DTC.

Repeatability Verification Procedure