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 F (CB) OEM Service and Repair Workshop Manual

Go to manual page

Step	Inspection	Results	Action
4	**PURPOSE: INSPECT EXHAUST SHUTTER VALVE CIRCUITS FOR SHORT CIRCUIT** • Verify that the exhaust shutter valve and PCM connectors are disconnected. • Inspect for continuity between exhaust shutter valve terminals A and B (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: • Exhaust shutter valve terminal A—PCM terminal 1CS • Exhaust shutter valve terminal B—PCM terminal 1CT **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 8.
		No	Go to the next step.
5	**PURPOSE: INSPECT EXHAUST SHUTTER VALVE CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the exhaust shutter valve and PCM connectors are disconnected. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the PCM detecting an open circuit.** • Measure the voltage at the following terminals (wiring harness-side): — Exhaust shutter valve terminal A — Exhaust shutter valve terminal B • Is the voltage 0 V?	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 A—PCM terminal 1CS • Exhaust shutter valve terminal B—PCM terminal 1CT **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 8.
6	**PURPOSE: INSPECT EXHAUST SHUTTER VALVE CIRCUIT FOR OPEN CIRCUIT** • Verify that the exhaust shutter valve and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between the following terminals (wiring harness-side): — Exhaust shutter valve terminal A —PCM terminal 1CS — Exhaust shutter valve terminal B —PCM terminal 1CT • 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 A—PCM terminal 1CS • Exhaust shutter valve terminal B—PCM terminal 1CT **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 8.
7	**PURPOSE: INSPECT EXHAUST SHUTTER VALVE** • Reconnect all disconnected connectors. • Inspect the exhaust shutter valve. (See EXHAUST SHUTTER VALVE POSITION SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the TWC, then go to the next step. (See EXHAUST SHUTTER VALVE POSITION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.

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	**DETERMINE IF APP SENSOR No.1 OR WIRING HARNESS MALFUNCTION** • Access the APP1 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Verify the APP1 PID value. • Is the APP1 PID value 5 V or B+?	Yes	Go to Step 7.
		No	Go to the next step.
4	**INSPECT APP SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 9.
		No	Go to the next step.
5	**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.
6	**INSPECT APP SENSOR No.1** • Reconnect all disconnected connectors. • Inspect the APP sensor No.1. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the accelerator pedal, then go to Step 9. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to Step 9.
7	**INSPECT APP SENSOR No.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Switch the ignition off. • Disconnect the APP sensor connector. • Access the APP1 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Verify the APP1 PID value. • Is the APP1 PID value 5 V or B+?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between APP sensor terminal B and PCM terminal 2BN. **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 9.
		No	Go to the next step.

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 APP SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the 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 APP SENSOR No.2 CIRCUIT FOR SHORT TO GROUND** • Verify that the APP sensor and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — APP sensor terminal F — APP 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: • APP sensor terminal F–PCM terminal 2AO • APP sensor terminal E–PCM terminal 2BB **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.
6	**INSPECT APP SENSOR No.2 SIGNAL CIRCUIT AND GROUND CIRCUIT FOR SHORT TO EACH OTHER** • Verify that the APP sensor and PCM connectors are disconnected. • Inspect for continuity between APP sensor terminals E and D (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: • APP sensor terminal E–PCM terminal 2BB • APP sensor terminal D–PCM terminal 2BG **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 9.
		No	Go to the next step.

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	**DETERMINE IF APP SENSOR No.2 OR WIRING HARNESS MALFUNCTION** • Access the APP2 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Verify the APP2 PID value. • Is the APP2 PID value 5 V or B+?	Yes	Go to Step 7.
		No	Go to the next step.
4	**INSPECT APP SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 9.
		No	Go to the next step.
5	**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.
6	**INSPECT APP SENSOR No.2** • Reconnect all disconnected connectors. • Inspect the APP sensor No.2. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the accelerator pedal, then go to Step 9. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to Step 9.
7	**INSPECT APP SENSOR No.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Switch the ignition off. • Disconnect the APP sensor connector. • Access the APP2 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Verify the APP2 PID value. • Is the APP2 PID value 5 V or B+?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between APP sensor terminal E and PCM terminal 2BB. **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 9.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
4	VERIFY RELATED PENDING CODE AND/OR DTC • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PENDING CODE/DTC P0122:00, P0123:00, P0222:00 or P0223:00 also present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC P0122:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0123:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0222:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0223:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	Go to the next step.
5	INSPECT THROTTLE BODY CONNECTOR CONDITION • Switch the ignition off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 8.
		No	Go to the next step.
6	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 8.
		No	Go to the next step.
7	INSPECT TP SENSOR No.1 AND No.2 • Reconnect all disconnected connectors. • Inspect the TP sensor No.1 and No.2. (See THROTTLE POSITION (TP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the throttle body, then go to the next step. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G (WITHOUT EGR COOLER)].) (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G (WITH EGR COOLER)].)
		No	Go to the next step.
8	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.
9	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 P20F8:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM3511161

id0102s920340

Note

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

Details on DTCs

DESCRIPTION	**Swirl control circuit range/performance problem**	
DETECTION CONDITION	Determination conditions	• The actual opening angle of the swirl control valve is larger or smaller than its target opening angle for the specified time.
	Preconditions	• Battery voltage: above 11 V *1 • Engine coolant temperature: 20 °C {68 °F} or more *1 • The following DTCs are not detected: — P2008:00, P2016:00 and P2017:00 *1: Standard can be verified by displaying PIDs using M-MDS
	Drive cycle	• 1
	Self test type	• CMDTC self test, KOEO self test, KOER self test
	Sensor used	• Swirl control valve position sensor
FAIL-SAFE FUNCTION	• Increases the idle speed while idling. • Inhibits the AWS control. • Limits intake air amount • Stops the swirl control. • Stops the EGR control.	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.	

3.Drive the IMRC_CMDPS from 0 ° to the maximum value using the simulation item IMRC_CMDPS.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

Item	Definition	Unit	Condition/Specification
IMRC_ACTPS	Actual swirl control valve position angle	%	• Displays actual swirl control valve position angle.

Function Inspection Using M-MDS

STEP	INSPECTION	RESULTS	ACTION
1	**VERIFY RELATED REPAIR INFORMATION OR SERVICE INFORMATION AVAILABILITY** • Verify related Service Bulletins, on-line repair information, or Service Information availability. • Is any related Information available?	Yes	Perform repair or diagnosis according to the available information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**PURPOSE: 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.
3	**PURPOSE: VERIFY CONNECTOR CONNECTIONS** • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — IMRC_ACTPS • Does the PID value fluctuate when the following connectors are shaken? — Swirl control valve position sensor — PCM	Yes	Repair or replace the applicable wiring harness or connector parts. Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 11.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

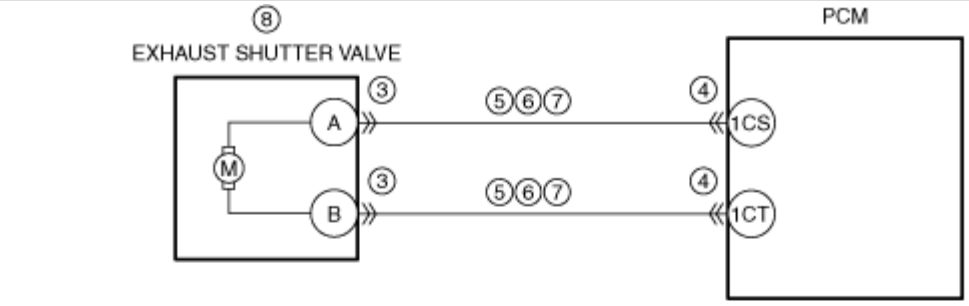
• Step 1–10

— Perform an inspection of the connectors and wiring harnesses between the swirl control valve actuator, swirl control valve position sensor and the PCM.

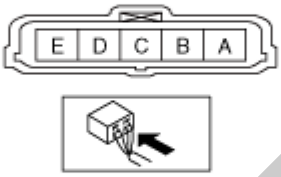
• Step 11–12

STEP	INSPECTION	RESULTS	ACTION
8	**PURPOSE: INSPECT SWIRL CONTROL VALVE POSITION SENSOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the swirl control valve actuator, swirl control valve position sensor and PCM connectors are disconnected. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the PCM detecting an open circuit.** • Measure the voltage at the following terminals (wiring harness-side): — Swirl control valve position sensor terminal C — Swirl control valve position sensor terminal B • Is the voltage 0 V?	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: • Swirl control valve position sensor terminal C–PCM terminal 1BB • Swirl control valve position sensor terminal B–PCM terminal 1BH **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 11.
9	**PURPOSE: INSPECT SWIRL CONTROL VALVE POSITION SENSOR CIRCUIT FOR OPEN CIRCUIT** • Verify that the swirl control valve actuator, swirl control valve position sensor and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between the following terminals (wiring harness-side): — Swirl control valve position sensor terminal A–PCM terminal 1K — Swirl control valve position sensor terminal C–PCM terminal 1BB — Swirl control valve position sensor terminal B–PCM terminal 1BH • 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: • Swirl control valve position sensor terminal A–PCM terminal 1K • Swirl control valve position sensor terminal C–PCM terminal 1BB • Swirl control valve position sensor terminal B–PCM terminal 1BH **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 11.
10	**PURPOSE: INSPECT SWIRL CONTROL VALVE POSITION SENSOR** • Inspect the swirl control valve position sensor. (See SWIRL CONTROL VALVE POSITION SENSOR INSPECTION [SKYACTIV-G (WITH EGR COOLER)].) • Is there any malfunction?	Yes	Replace the swirl control valve position sensor, then go to the next step. (See SWIRL CONTROL VALVE POSITION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G (WITH EGR COOLER)].)
		No	Go to the next step.

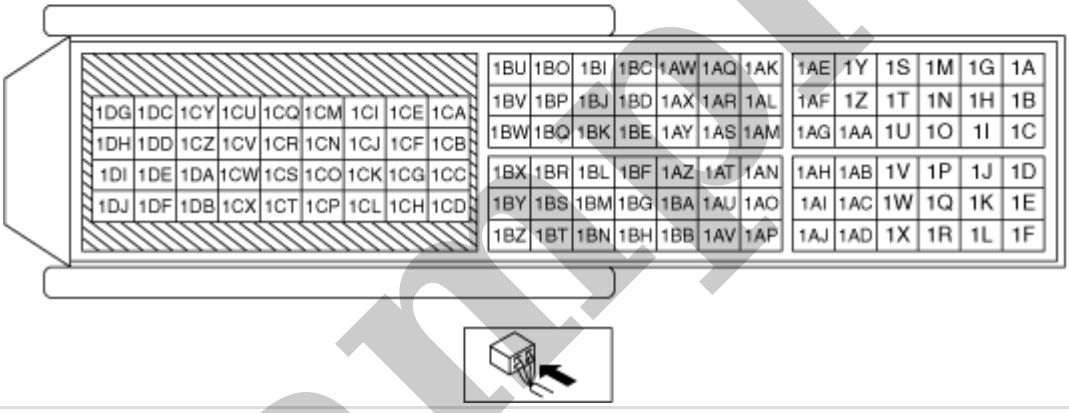
DESCRIPTION	Exhaust shutter valve circuit/open



EXHAUST SHUTTER VALVE
WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR



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

• Not applicable

PID Item/Simulation Item Used In Diagnosis

• Not applicable

Function Inspection Using M-MDS

• Not applicable