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1992 MAZDA MX-6 OEM Service and Repair Workshop Manual

Go to manual page

Sample

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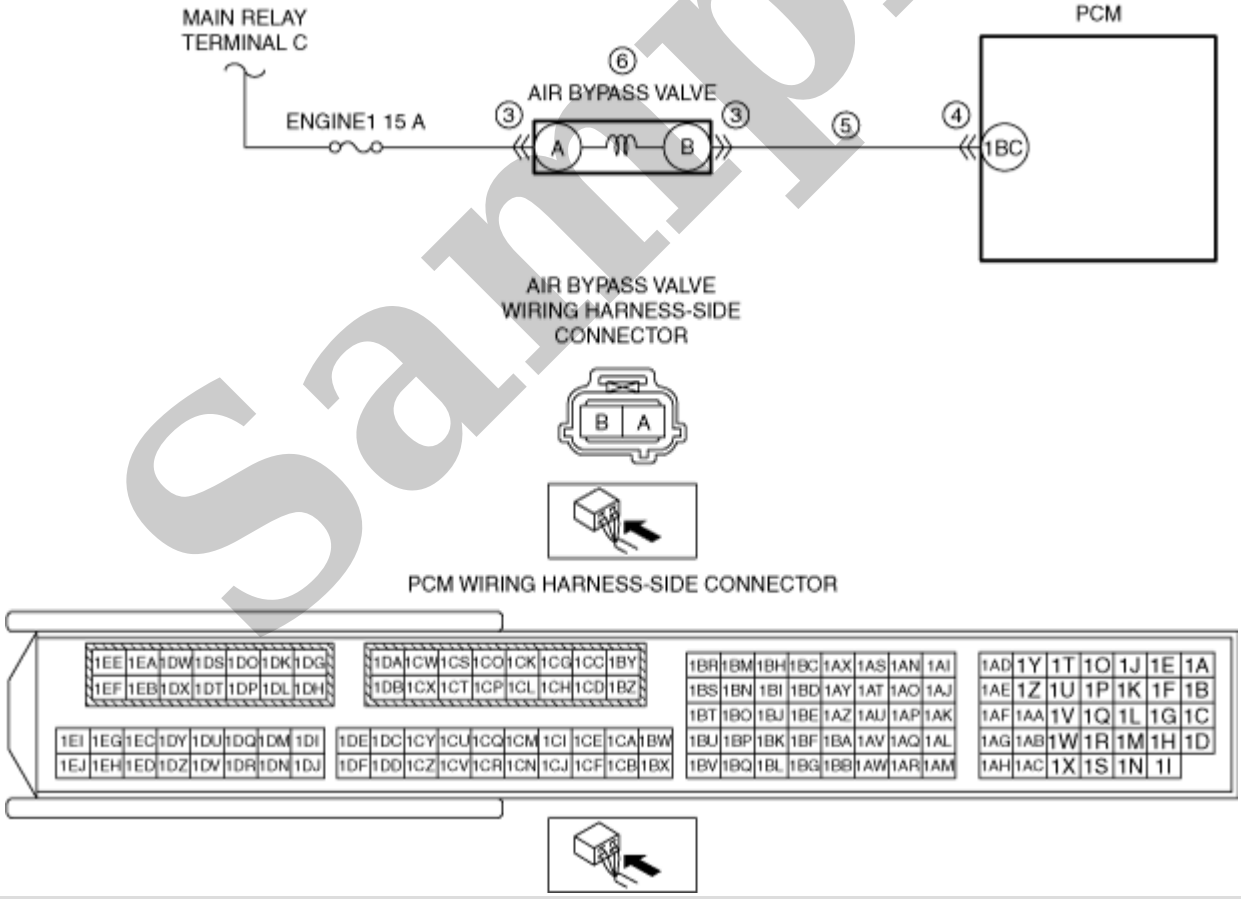
DTC P0035:00 [PCM (SKYACTIV-G 2.5T)]

SM2896466

id0102s821010

DTC P0035:00	Air bypass valve control circuit high input
DETECTION CONDITION	• The air bypass valve control voltage at the PCM terminal 1BC is high for a continuous 5 s relative to the PCM control condition. Diagnostic support note • This is a continuous monitor (other). • The check engine light does not illuminate. • FREEZE FRAME DATA is not available. • Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Stop the supercharging pressure control. (fully open the wastegate valve)
POSSIBLE CAUSE	• Air bypass valve connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between air bypass valve terminal B and PCM terminal 1BC • Air bypass valve malfunction • PCM malfunction



Sample

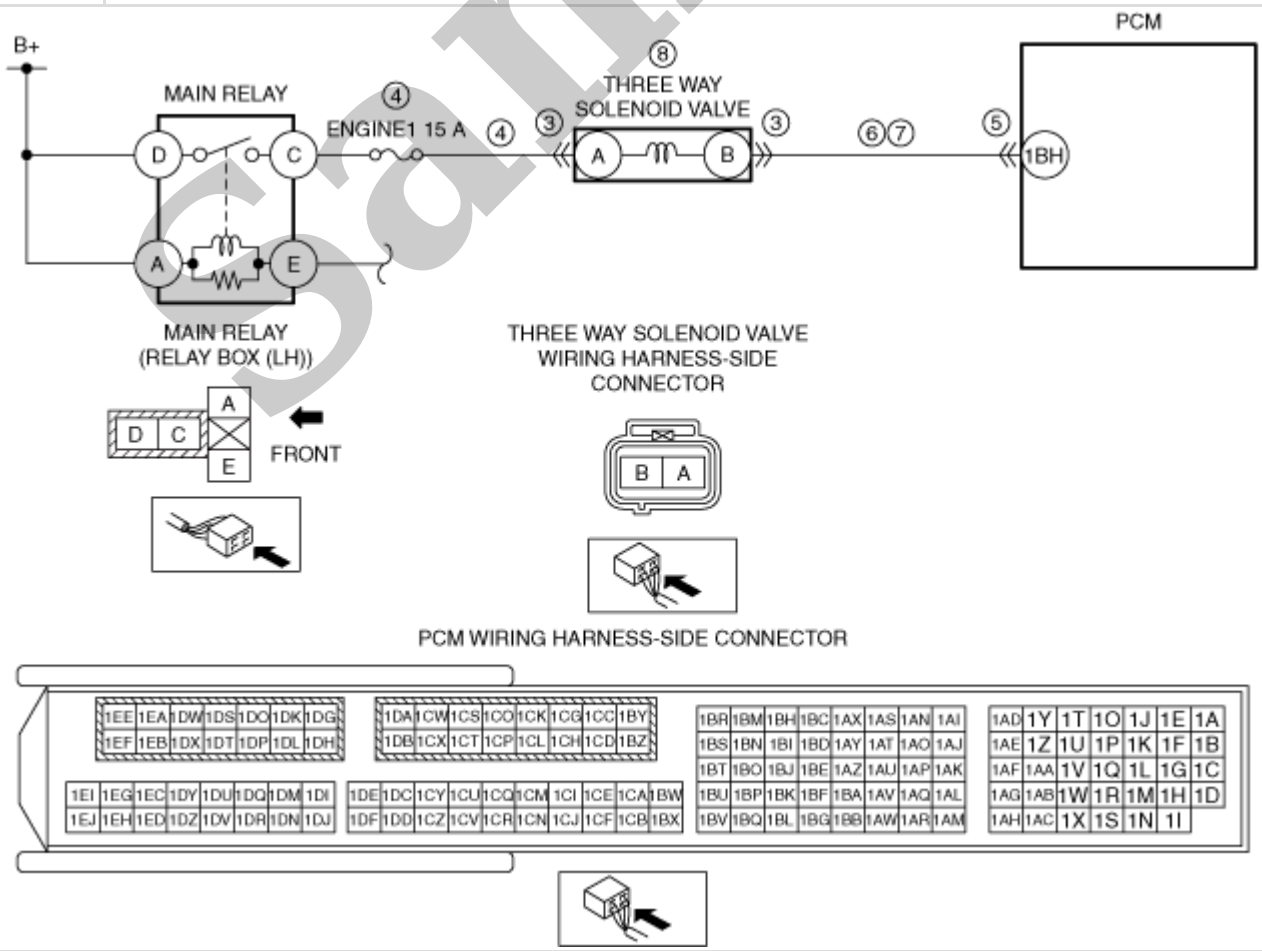
Diagnostic Procedure

DTC P004C:00 [PCM (SKYACTIV-G 2.5T)]

SM2896467

id0102s821020

DTC P004C:00	Three way solenoid valve control circuit low input
DETECTION CONDITION	• The three way solenoid valve control voltage at the PCM terminal 1BH is low for a continuous 5 s relative to the PCM control condition. Diagnostic support note • This is a continuous monitor (other). • The check engine light does not illuminate. • FREEZE FRAME DATA is not available. • Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Three way solenoid valve connector or terminals malfunction • Short to ground or open circuit in three way solenoid valve power supply circuit: — Short to ground in wiring harness between ENGINE1 15 A fuse and three way solenoid valve terminal A — ENGINE1 15 A fuse malfunction — Open circuit in wiring harness between main relay terminal C and three way solenoid valve terminal A • PCM connector or terminals malfunction • Short to ground in wiring harness between three way solenoid valve terminal B and PCM terminal 1BH • Open circuit in wiring harness between three way solenoid valve terminal B and PCM terminal 1BH • Three way solenoid valve malfunction • PCM malfunction



Sample

STEP	INSPECTION	RESULTS	ACTION
6	**INSPECT THREE WAY SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Verify that the three way solenoid valve and PCM connectors are disconnected. • Inspect for continuity between three way solenoid valve terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between three way solenoid valve terminal B and 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 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.
7	**INSPECT THREE WAY SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Verify that the three way solenoid valve and PCM connectors are disconnected. • Inspect for continuity between three way solenoid valve terminal B (wiring harness-side) and PCM terminal 1BH (wiring harness-side). • 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 three way solenoid valve terminal B and 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 9.
8	**INSPECT THREE WAY SOLENOID VALVE** • Inspect the three way solenoid valve. (See THREE WAY SOLENOID VALVE INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the three way solenoid valve, then go to the next step. (See THREE WAY SOLENOID VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.
9	**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 2.5T)].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5T)].) • 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 2.5T].) Go to the next step.
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5T)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5T)].)
		No	DTC troubleshooting completed.

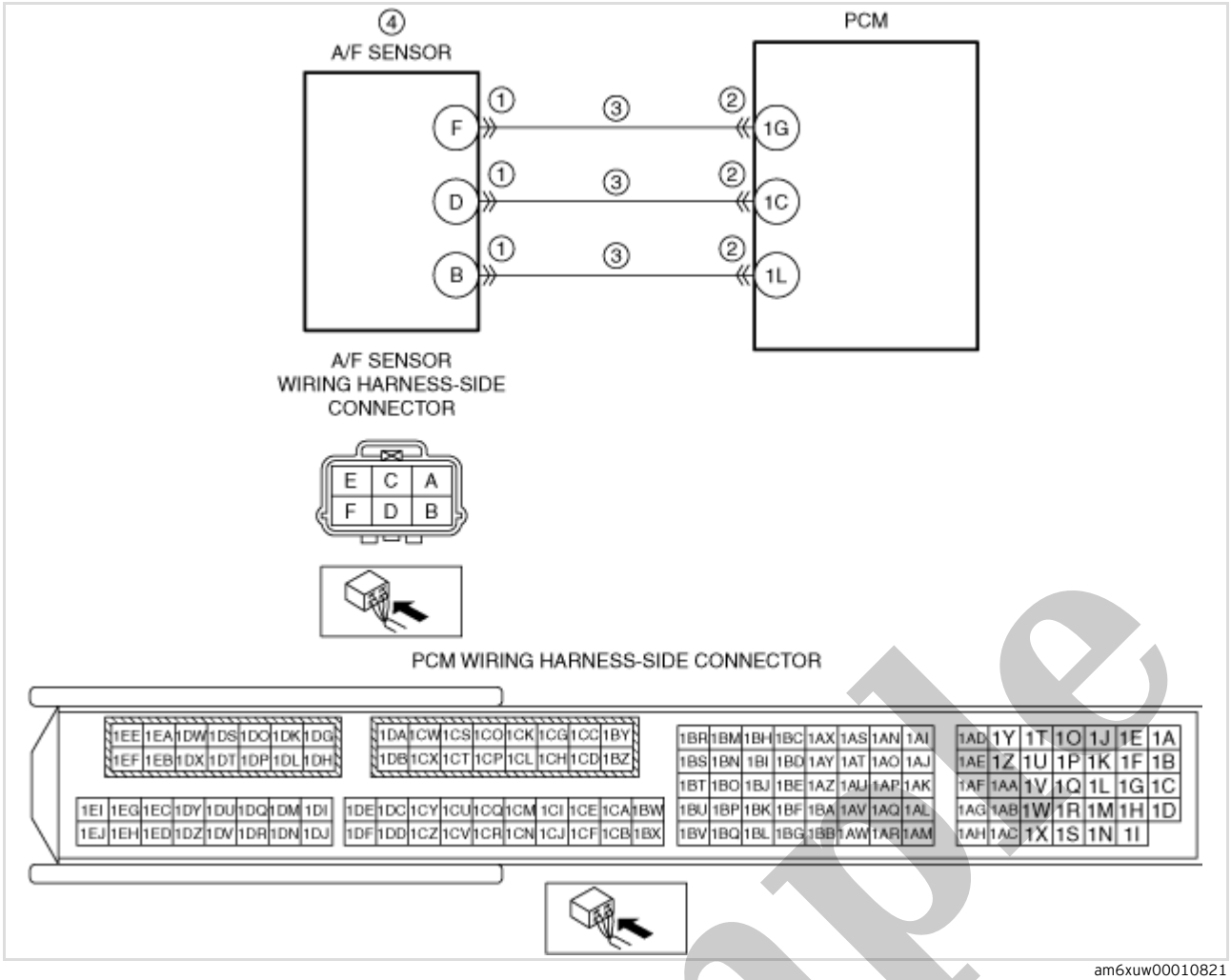
Sample

STEP	INSPECTION	RESULTS	ACTION
7	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 2.5T)].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5T)].) • 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 2.5T].) Go to the next step.
		No	Go to the next step.
8	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5T)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5T)].)
		No	DTC troubleshooting completed.

Sample

STEP	INSPECTION	RESULTS	ACTION
6	**INSPECT TP SENSOR No.1** • Reconnect all disconnected connectors. • Inspect the TP sensor No.1. (See THROTTLE POSITION (TP) SENSOR INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the throttle body, then go to Step 10. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to Step 10.
7	**DETERMINE IF TP SENSOR No.1 SIGNAL CIRCUIT OR TP SENSOR No.1 GROUND CIRCUIT MALFUNCTION** • Switch the ignition off. • Disconnect the throttle body connector. • Access the TP1 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) • Verify the TP1 PID value. • Is the TP1 PID value 5 V or B+?	Yes	Go to the next step.
		No	Go to Step 9.
8	**INSPECT TP SENSOR No.1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Verify that the throttle body connector is disconnected. • Switch the ignition off. • Disconnect the PCM connector. • Inspect for continuity between throttle body terminal F (wiring harness-side) and PCM terminal 1AZ (wiring harness-side). • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between throttle body terminal F and PCM terminal 1AZ. **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 10.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between throttle body terminal F and PCM terminal 1AZ. **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 10.
9	**INSPECT TP SENSOR No.1 CIRCUIT FOR OPEN CIRCUIT** • Verify that the throttle body connector is disconnected. • Switch the ignition off. • Disconnect the PCM connector. • Inspect for continuity between the following terminals (wiring harness-side): — Throttle body terminal E–PCM terminal 1CB — Throttle body terminal C–PCM terminal 1BV • Is there continuity?	Yes	Replace the throttle body, then go to the next step. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Throttle body terminal E–PCM terminal 1CB • Throttle body terminal C–PCM terminal 1BV **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 the next step.

Sample



am6xuw00010821

Sample

Function Explanation (DTC Detection Outline)

• If the voltage between PCM terminal 1C and PCM terminal 1L exceeds the specified range with the A/F sensor activated, the elemen in the A/F sensor could deteriorate. To prevent this, the PCM stops control of the A/F sensor and stores a DTC.

Repeatability Verification Procedure

1. Warm up the engine to allow the engine coolant temperature to reach 80 °C {176 °F} or more.
2. Start the engine and leave it idling for 1 min.

Note

• Match the engine coolant temperature in the recorded FREEZE FRAME DATA/snapshot data, the vehicle speed, and engine speed values to the best extent possible while driving the vehicle.

3. Try to reproduce the malfunction by driving the vehicle for 5 min based on the values in the FREEZE FRAME DATA/snapshot data.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

DTC P0131:00 [PCM (SKYACTIV-G 2.5T)]

SM2896543

id0102s870220

Note

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

Details On DTCs

DESCRIPTION	**A/F sensor circuit low input**	
DETECTION CONDITION	Determination conditions	• Any one of the following conditions is met: — Voltage of A/F sensor terminal F is less than specified value — Voltage of A/F sensor terminal D is less than specified value — Voltage of A/F sensor terminal B is less than specified value
	Preconditions	• Switch the ignition ON (engine off or on) • Battery voltage: 11–18 V *1 • The following DTC is not detected: — Internal PCM malfunction: P064D:00 *1: Standard can be verified by displaying PIDs using M-MDS
	Drive cycle	• 2
	Self test type	• CMDTC self test, KOER self test
	Sensor used	• A/F sensor
FAIL-SAFE FUNCTION	• Fixes duty value of A/F sensor heater • Stops fuel feedback control of A/F sensor	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.	
POSSIBLE CAUSE	• A/F sensor connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — A/F sensor terminal F–PCM terminal 1G — A/F sensor terminal D–PCM terminal 1C — A/F sensor terminal B–PCM terminal 1L • A/F sensor malfunction • PCM malfunction	

System Wiring Diagram

Sample

STEP	INSPECTION	RESULTS	ACTION
3	**PURPOSE: INSPECT A/F SENSOR CIRCUIT FOR SHORT TO GROUND** • Verify that the A/F sensor and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — A/F sensor terminal F — A/F sensor terminal D — A/F sensor terminal B • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • A/F sensor terminal F—PCM terminal 1G • A/F sensor terminal D—PCM terminal 1C • A/F sensor terminal B—PCM terminal 1L **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 5.
		No	Go to the next step.
4	**PURPOSE: DETERMINE INTEGRITY OF A/F SENSOR** • Start the engine and warm it up completely. • Access the O2S11 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) • Drive the vehicle under the following conditions. **Warning** **• 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.** **• While performing this step, always operate the vehicle in a safe and lawful manner.** — After increasing the engine speed to 3,000 rpm, decelerate using engine braking. • Is the displayed PID value as follows? — O2S11: 0.25 mA or more	Yes	Go to the next step.
		No	Replace the A/F sensor, then go to the next step. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
5	**PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5T)].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5T)].) • 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 2.5T].) Go to the next step.
		No	Go to the next step.
6	**PURPOSE: VERIFY IF THERE IS ANY OTHER MALFUNCTION** • Is any other DTC or pending code stored?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5T)].)
		No	DTC troubleshooting completed.

Sample

Function Inspection Using M-MDS

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: 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.
2	PURPOSE: RECORD FREEZE FRAME DATA/SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS 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 and DIAGNOSTIC MONITORING TEST RESULTS (A/F sensor, HO2S related) on the repair order.	–	Go to the Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

• Step 1–2

— Perform an inspection of the A/F sensor and PCM-related connectors.

• Step 3

— Perform an inspection of the short to power supply in wiring harness between A/F sensor and PCM.

• Step 4

— Perform a unit inspection of the A/F sensor.

• Step 5–6

— Verify that the primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: INSPECT A/F SENSOR CONNECTOR CONDITION • Switch the ignition off. • Disconnect the A/F 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 5.
		No	Go to the next step.
2	PURPOSE: 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 5.
		No	Go to the next step.

Sample