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1997 MAZDA Xedos 9 OEM Service and Repair Workshop Manual

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STEP	INSPECTION	RESULTS	ACTION
		No	Inspect the ENGINE2 15 A fuse. • If the fuse is blown: — Refer to the wiring diagram and verify whether or not there is a common connector between ENGINE2 15 A fuse and exhaust CMP sensor terminal C. **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. • Replace the fuse. • If the fuse is damaged: — Replace the fuse. • If the fuse is normal: — Refer to the wiring diagram and verify whether or not there is a common connector between sub relay terminal C and exhaust CMP sensor terminal C. **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 14.

DTC P0089:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896640

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Note

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

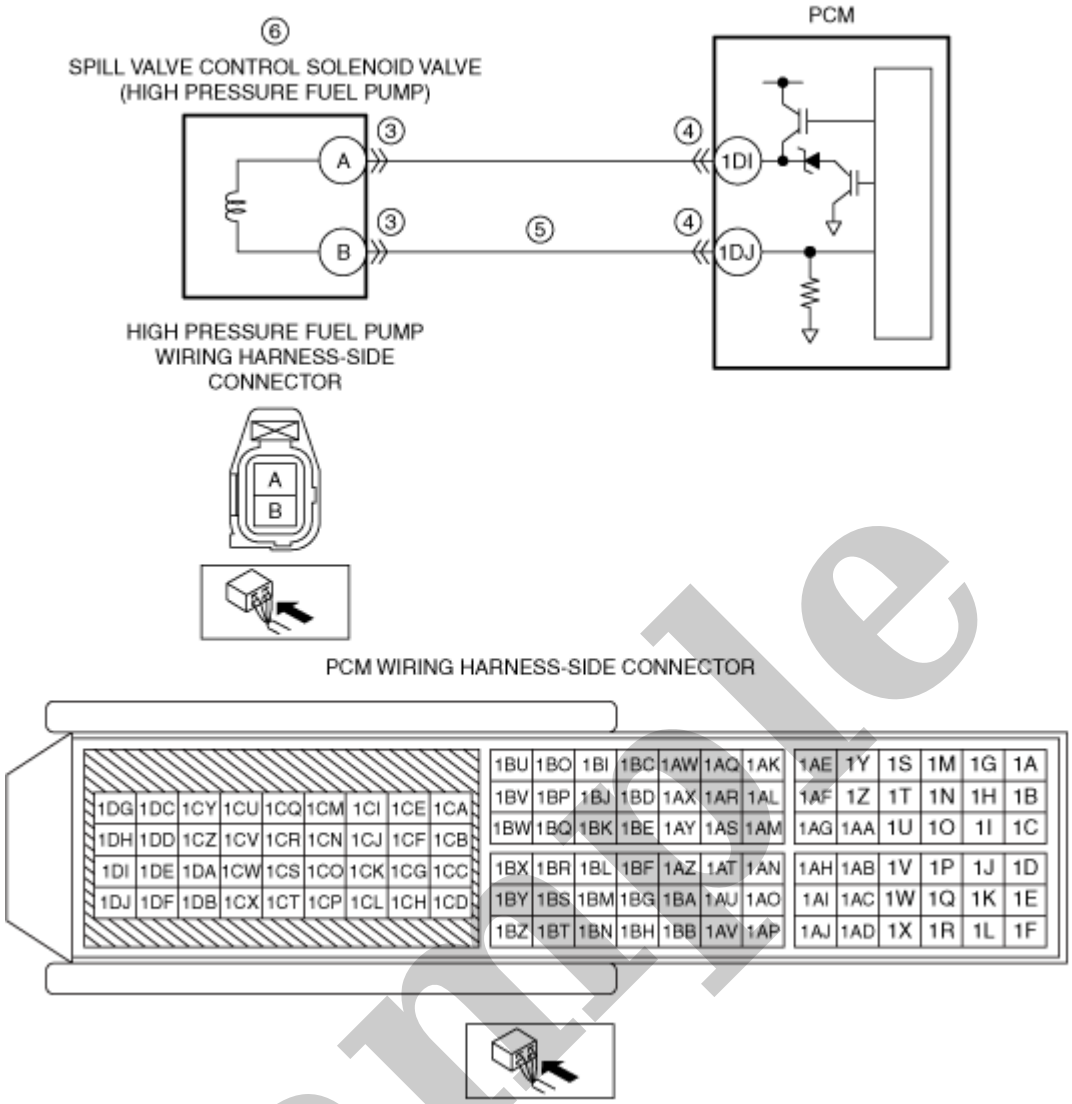
Details On DTCs

DESCRIPTION	**Spill valve control solenoid valve control circuit range/performance problem**	
DETECTION CONDITION	Determination conditions	• If any of the following conditions is met under condition A or condition B: **Condition A:** — The average fuel pressure on the high pressure side, measured by the fuel pressure sensor, exceeds the specified value. **Condition B:** — The fuel pressure decreases to the specification or less instantaneously after the fuel pressure on the high pressure side measured by the fuel pressure sensor exceeds the specification.
	Preconditions	**Condition A:** • Engine speed: 500 rpm or more *1 • The fuel injection amount cumulative value after engine start is the specification or more. • The following DTCs are not detected: — Fuel pressure sensor: P0087:00, P0088:00, P0192:00, P0193:00 — High pressure fuel pump: P0091:00, P0092:00 **Condition B:** • While engine is running • Fuel pressure sensor output voltage: 0.16–4.87 V *1 (Except U.S.A., CANADA and Israel) • Fuel pressure sensor output voltage: 0.66–4.87 V *1 (U.S.A., CANADA and Israel) • The following DTCs are not detected: — Fuel pressure sensor: P0192:00, P0193:00 — High pressure fuel pump: P0091:00, P0092:00 *1: Standard can be verified by displaying PIDs using M-MDS
	Malfunction determination period	**Condition A:** • 2 s period **Condition B:** • Not applicable
	Drive cycle	• 1
	Self test type	• CMDTC self test, KOER self test
	Sensor used	• Fuel pressure sensor
FAIL-SAFE FUNCTION	• Limits intake air amount • Stops high pressure fuel pump control. • The upper limit of the engine speed is 2,500 rpm. • The lower limit of the engine speed is 1,000 rpm.	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.	

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: REPLACE HIGH PRESSURE FUEL SYSTEM RELATED PARTS DUE TO MALFUNCTION IN HIGH PRESSURE FUEL SYSTEM PARTS • Replace the following parts. — High pressure fuel pump (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G (WITHOUT EGR COOLER)].) (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G (WITH EGR COOLER)].) — High pressure fuel pipe (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G (WITHOUT EGR COOLER)].) (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G (WITH EGR COOLER)].) — Fuel injector No.1 (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) — Fuel injector No.2 — Fuel injector No.3 — Fuel injector No.4 — Fuel distributor (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)	–	Go to the next step.
2	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 2.5 (WITH CYLINDER DEACTIVATION))].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the same Pending DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
3	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 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
3	**INSPECT HIGH PRESSURE FUEL PUMP CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the high pressure fuel pump 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.
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 8.
		No	Go to the next step.
5	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Verify that the high pressure fuel pump and PCM connectors are disconnected. • Inspect for continuity between high pressure fuel pump 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 high pressure fuel pump terminal B and PCM terminal 1DJ. **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 8.
		No	Go to the next step.
6	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE CIRCUIT FOR OPEN CIRCUIT** • Verify that the high pressure fuel pump and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — High pressure fuel pump terminal A—PCM terminal 1DI — High pressure fuel pump terminal B—PCM terminal 1DJ • 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: • High pressure fuel pump terminal A—PCM termina 1DI • High pressure fuel pump terminal B—PCM termina 1DJ **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	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE** • Reconnect all disconnected connectors. • Inspect the spill valve control solenoid valve. (See HIGH PRESSURE FUEL PUMP INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the high pressure fuel pump, then go to the next step. (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G (WITHOUT EGR COOLER)].) (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G (WITH EGR COOLER)].)
		No	Go to the next step.

DTC P0092:00	Fuel pressure regulator control circuit high input



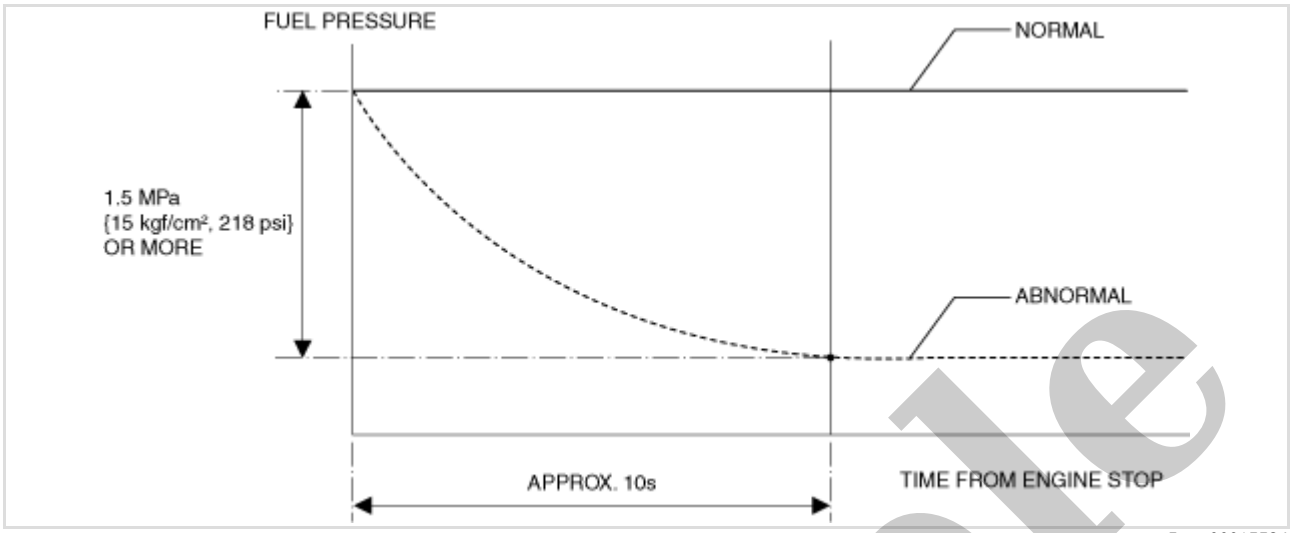
Diagnostic Procedure

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.

• Not applicable

Function Explanation (DTC Detection Outline)

• The PCM diagnoses the fuel injector's oil-tight holding performance based on the signal from the high-pressure fuel pressure sensor. If the fuel pressure difference in the high-pressure fuel line between when the engine is stopped and after a specified period has elapsed is the specified value or more, the fuel injector is determined to have poor oil-tight holding performance.
• If the PCM determines the malfunction, it stores a DTC.



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Repeatability Verification Procedure

1. Warm up the engine to allow the engine coolant temperature to reach 80 °C {176 °F} or more.
2. Leave engine idling for 15 min.
3. Turn the climate control system on for 10 s and then turn it off.
4. Switch the ignition off for 30 s or more.

PID Item/Simulation Item Used In Diagnosis

• Not applicable

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: IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is the DTC P2292:00 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure for DTC on FREEZE FRAME DATA. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)

DTC P0069:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

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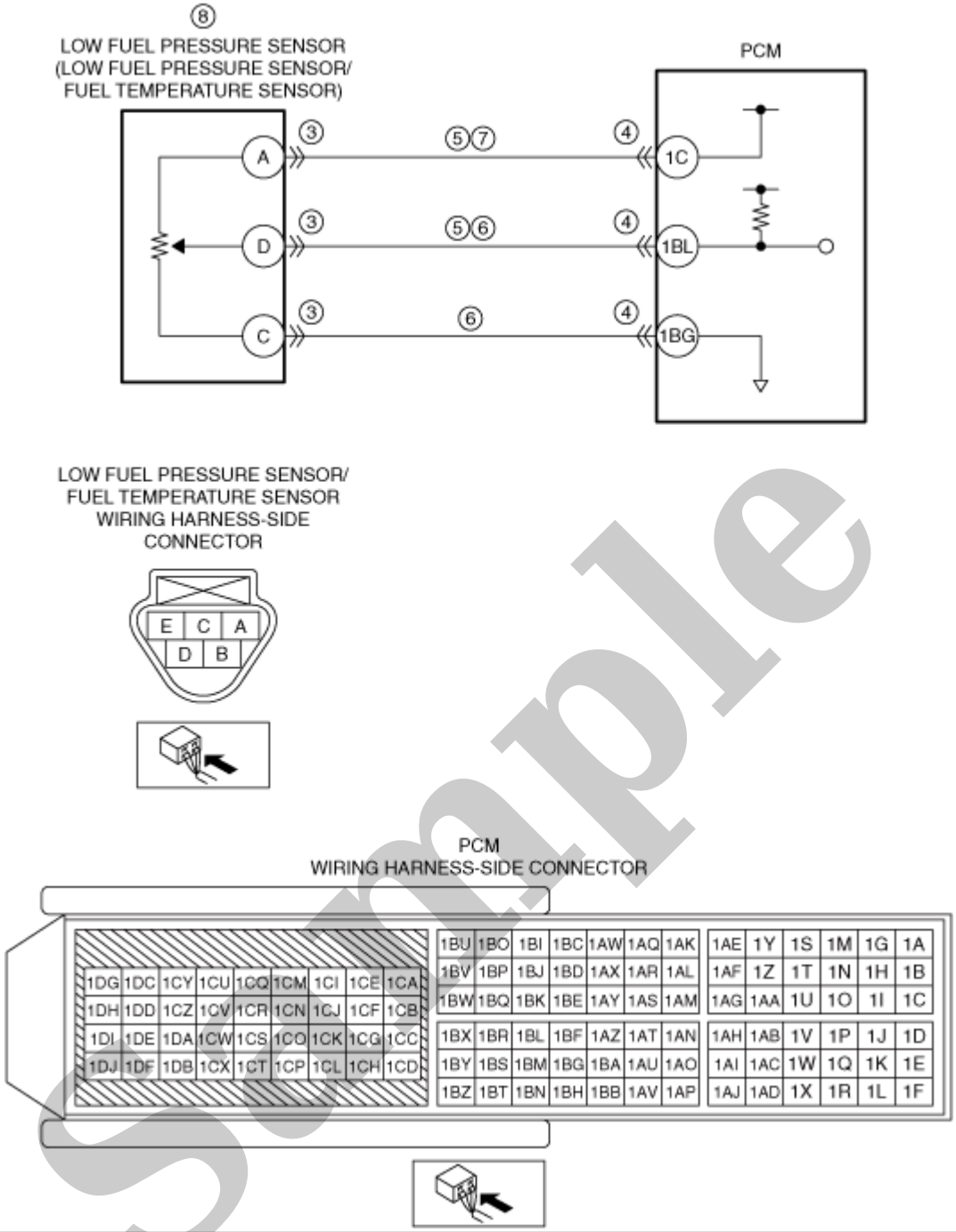
DTC P0069:00	Manifold absolute pressure/atmospheric pressure correlation problem
DETECTION CONDITION	• The PCM monitors the difference between the intake manifold vacuum and the atmospheric pressure. If the difference is below −12 kPa {−0.12 kgf/cm^2, −1.7 psi} or above 12 kPa {0.12 kgf/cm^2, 1.7 psi} when the following conditions are met, the PCM determines that there is a MAP sensor performance problem. MONITORING CONDITIONS — 12−15 s from when ignition is switched off. 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 malfunction • BARO sensor (built-into PCM) malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Perform the Freeze Frame PID Data Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the DTC P0069:00 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure for DTC on FREEZE FRAME DATA. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
2	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	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 P2541:00	Low fuel pressure sensor circuit low input



Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	RECORD VEHICLE STATUS WHEN DTC WAS DETECTED TO UTILIZE WITH REPEATABILITY VERIFICATION • Record the freeze frame data/snapshot data. Note • Recording can be facilitated using the screen capture function of the PC.	–	Go to the next step.

DTC P2542:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

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DTC P2542:00	Low fuel pressure sensor circuit high input
DETECTION CONDITION	• If the input voltage at the PCM terminal 1BL is more than 4.755 V for 5 s, the PCM determines that the low fue pressure sensor circuit is high. Precondition • Battery voltage: 8 V or more
FAIL-SAFE FUNCTION	• Limits the engine torque or the upper limit of the engine speed.
POSSIBLE CAUSE	• Low fuel pressure sensor/fuel temperature sensor connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between low fuel pressure sensor/fuel temperature sensor terminal A and PCM terminal 1C • Low fuel pressure sensor power supply circuit and signal circuit are shorted to each other • Open circuit in wiring harness between the following terminals: — Low fuel pressure sensor/fuel temperature sensor terminal D—PCM terminal 1BL — Low fuel pressure sensor/fuel temperature sensor terminal C—PCM terminal 1BG • Low fuel pressure sensor malfunction • PCM malfunction