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1998 MAZDA 626 (Mk.5) Sedan OEM Service and Repair Workshop Manual

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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 snapshot data on the repair order.	–	Go to the next step.
2	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.
3	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 P1260:00 also present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC P1260:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	Go to the next step.
4	INSPECT FOR A MALFUNCTION RELATED INABILITY TO START ENGINE • Start the engine. • Does the engine start normally?	Yes	Go to the next step.
		No	Perform the applicable symptom troubleshooting. (See NO.3 WILL NOT CRANK [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See NO.6 CRANKS NORMALLY BUT WILL NOT START [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
5	DETERMINE IF MALFUNCTION IS CAUSED BY ROUGH IDLING OR A PISTON-STOP POSITION CONTROL MALFUNCTION • Start the engine and warm it up completely. • Is the idle speed stabilized?	Yes	Go to the next step.
		No	Go to Step 11.
6	INSPECT GENERATOR CONTROL SYSTEM OPERATION • Start the engine and let it idle. • Access the ALTT V PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Does the PID value increase when the rear window defogger, headlights, and blower motor are operated simultaneously?	Yes	Go to the next step.
		No	Inspect the following: • Wiring harness between generator terminal 2A and PCM terminal 1AG • Wiring harness between generator terminal 2B and PCM terminal 1BP • Generator (See GENERATOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) — If there is any malfunction: • Repair or replace the malfunctioning part according to the inspection results, then go to Step 18. (See GENERATOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

STEP	INSPECTION	RESULTS	ACTION
19	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	RESULTS	ACTION
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** • Start the engine. • Access the ECT2_V PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Does the PID value fluctuate when the PCM and ECT sensor No.2 connectors are shaken?	Yes	Repair or replace the applicable connector parts. Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 9.
		No	Go to the next step.
4	**PURPOSE: VERIFY ECT SENSOR No.2 INPUT SIGNAL** • Access the ECT2_V PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PID value within specification?	Yes	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 3.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

• Step 1–2

— Perform an ECT sensor No.2-related inspection.

• Step 3–5

— Perform an engine coolant-related inspection.

• Step 6

— Perform a unit inspection of the coolant control valve.

• Step 7

— Perform a thermostat inspection.

• Step 8–9

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

STEP	INSPECTION	RESULTS	ACTION
1	**PURPOSE: INSPECT INSTALLATION OF ECT SENSOR No.2** • Inspect installation of ECT sensor No.2. • Is the ECT sensor No.2 installed securely?	Yes	Go to the next step.
		No	Retighten the ECT sensor No.2, then go to Step 8. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

DTC P0555:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

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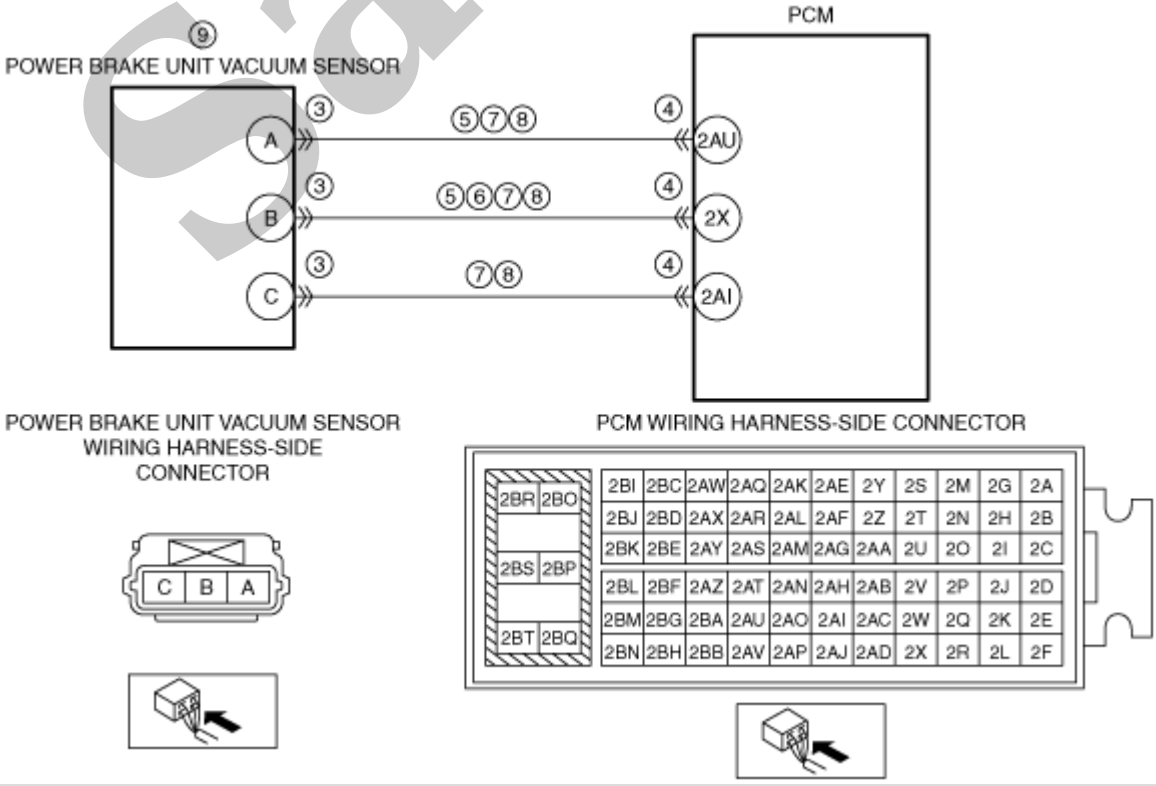
DTC P0555:00	Power brake unit vacuum sensor circuit problem
DETECTION CONDITION	• The PCM monitors the power brake unit vacuum sensor signal voltage while the ignition is switched ON. If the PCM detects the power brake unit vacuum sensor voltage is below 0.15 V or above 4.8 V for 5 s, the PCM determines that the power brake unit vacuum sensor circuit has problem. **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	• Flashes the i-stop warning light (amber) and inhibits engine-stop by operating the i-stop function.
POSSIBLE CAUSE	• Power brake unit vacuum sensor connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — Power brake unit vacuum sensor terminal A–PCM terminal 2AU — Power brake unit vacuum sensor terminal B–PCM terminal 2X • Short to power supply in wiring harness between power brake unit vacuum sensor terminal B and PCM terminal 2X • Power brake unit vacuum sensor circuits are shorted to each other • Open circuit in wiring harness between the following terminals: — Power brake unit vacuum sensor terminal A–PCM terminal 2AU — Power brake unit vacuum sensor terminal B–PCM terminal 2X — Power brake unit vacuum sensor terminal C–PCM terminal 2AI • Power brake unit vacuum sensor malfunction • PCM malfunction



STEP	INSPECTION	RESULTS	ACTION
10	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.
11	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
6	**INSPECT ECT SENSOR No.2 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that the PCM connector is disconnected. • Disconnect the ECT sensor No.2 connector. • Inspect for continuity between ECT sensor No.2 terminal A (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 ECT sensor No.2 terminal A and PCM terminal 1AM. **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.
7	**INSPECT ECT SENSOR No.2 SIGNAL CIRCUIT AND GROUND CIRCUIT FOR SHORT TO EACH OTHER** • Verify that the ECT sensor No.2 and PCM connectors are disconnected. • Inspect for continuity between ECT sensor No.2 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: • ECT sensor No.2 terminal A—PCM terminal 1AM • ECT sensor No.2 terminal B—PCM terminal 1AB **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 the next step.
		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 PENDING CODE for this 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.

STEP	INSPECTION		ACTION
5	**INSPECT PCM CONNECTOR CONDITION** • Switch the ignition off. • 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.
6	**INSPECT ECT SENSOR No.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the ECT sensor No.2 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 ECT sensor No.2 terminal A (wiring harness-side). • 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 ECT sensor No.2 terminal A and PCM terminal 1AM. **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.
7	**INSPECT ECT SENSOR No.2 CIRCUIT FOR OPEN CIRCUIT** • Verify that the ECT sensor No.2 and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between the following terminals (wiring harness-side): — ECT sensor No.2 terminal A–PCM terminal 1AM — ECT sensor No.2 terminal B–PCM terminal 1AB • 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: • ECT sensor No.2 terminal A–PCM terminal 1AM • ECT sensor No.2 terminal B–PCM terminal 1AB **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.
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 PENDING CODE for this 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 P0134:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

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Note

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

Details On DTCs

DESCRIPTION	**A/F sensor circuit no activity detected**	
DETECTION CONDITION	Determination conditions	• The condition in which the A/F sensor element impedance is the specified value or more continues for specified period.
	Preconditions	• Battery voltage: 11−18 V [*1] • The following DTCs are not detected: — A/F sensor heater: P0031:00, P0032:00 — A/F sensor: P0131:00, P0132:00 [*1]: Standard can be verified by displaying PIDs using M-MDS
	Drive cycle	• 2
	Self test type	• CMDTC 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 malfunction — A/F sensor connector or terminals malfunction — A/F sensor related wiring harness malfunction — A/F sensor loose — A/F sensor deterioration • PCM connector or terminals malfunction • PCM malfunction	

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• The PCM performs verification as to whether a condition in which A/F (air/fuel ratio) detection is not implemented due to poor A/F sensor activation by a decrease in A/F sensor performance or other malfunction has occurred. A DTC is stored if the A/F sensor cannot implement feedback (non-active condition (resistance value is specified value or more)) for a continuous specified period unde the condition in which the A/F sensor heater control has been normally implemented. However, under a condition prior to the A/F sensor performing activation (such as ignition switched off), and if there is an open/short circuit (P2251:00) between the A/F sensor terminal D and PCM terminal 1S (COM terminal), or an open/short circuit (P2243:00) between A/F sensor terminal F and PCM terminal 1T (B+ terminal), A/F sensor activation determination is not performed and A/F sensor non-activation (P0134:00) is determined. In addition, if a temporary malfunction is determined in the previous drive cycle because poor A/F sensor activation was

STEP	INSPECTION	RESULTS	ACTION
7	PURPOSE: INSPECT RELATED SENSOR WIRING HARNESS AND CONNECTOR • Access the O2S11 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Does the PID value fluctuate when the PCM and A/F sensor connectors are shaken?	Yes	Inspect the related wiring harness and connector. • Repair or replace the malfunctioning part. Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 3.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

- Step 1–2
  - — Perform inspection of A/F sensor signal related parts.
- Step 3–4
  - — Verify that the primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: INSPECT INSTALLATION OF A/F SENSOR • Inspect installation of A/F sensor. • Is the A/F sensor installed securely?	Yes	Replace the A/F sensor, then go to Step 3. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Retighten the A/F sensor, then go to Step 3. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
2	PURPOSE: INSPECT INSTALLATION OF A/F SENSOR • Inspect installation of A/F sensor. • Is the A/F sensor installed securely?	Yes	Go to the next step.
		No	Retighten the A/F sensor, then go to the next step. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
3	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 (WITHOUT CYLINDER DEACTIVATION))].) • Implement the repeatability verification procedure. (See Repeatability Verification Procedure.) • Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Is the PENDING CODE for this DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.
4	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 (WITHOUT CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.