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2000 MAZDA 626 (Mk.5) Hatchback OEM Service and Repair Workshop Manual

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Sample

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STEP	INSPECTION	RESULTS	ACTION
5	**INSPECT ION SENSOR No.4 POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Verify that the ignition coil/ion sensor No.4 connector is 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 ignition coil/ion sensor No.4 terminal A (wiring harness-side). • Is the voltage B+?	Yes	Go to the next step.
		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 ignition coil/ion sensor No.4 terminal A. **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 ignition coil/ion sensor No.4 terminal A. **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 12.

Sample

DTC P00FE:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM3065989

id0102t377600

Note

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

Details On DTCs

DESCRIPTION	Evaporator system: clogging between fuel tank and fuel tank pressure sensor	
DETECTION CONDITION	Determination conditions	• The following conditions are all met while the vehicle is being driven: — If negative pressure is inducted to the fuel tank via the intake manifold by the operation of the purge solenoid valve with the fuel tank in a sealed condition and the target negative pressure is reached within a shorter period of time than the estimated time. — When the barometric pressure in the fuel tank is fixed and the purge solenoid valve is opened/closed, the negative pressure fluctuation in the fuel tank generates negative pressure exceeding the threshold.
	Preconditions	• Evaporative gas flow amount: Exceeds 10,000 cm^3/min or fuel tank vacuum is high • Fuel tank pressure: −4,340.2−4,030.1 Pa {−442.57−410.95 kgf/m^2, −0.62949−0.58452 psi} *1 • IAT sensor No.1: 4.44−43.33 °C {40.0−109.9 °F} *1 • Vehicle speed: 64−145 km/h {40.0−90.0 mph} *1 • Barometric pressure: above 72.23 kPa {0.7365 kgf/cm^2, 10.48 psi} *1 • Period ignition is switched off before engine starts: 210 min or more • Fuel level in fuel tank: 15−85 % *1 • Minimum value of intake manifold vacuum: 4 kPa {0.04 kgf/cm^2, 0.6 psi} or more • Minimum value of intake air amount: above 2 g/sec • Battery voltage: above 11 V *1 • The following DTCs are not detected: — ECT sensor: P0117:00, P0118:00 — TP sensor No.1: P0122:00, P0123:00 — TP sensor No.2: P0222:00, P0223:00 — Purge solenoid valve: P0443:00 — CV solenoid valve: P0446:00 — MAF sensor: P0100:00 — Fuel tank pressure sensor: P0451:00, P0452:00, P0453:00 — IAT sensor No.1: P0110:00 — MAP sensor: P0069:00, P0107:00, P0108:00 — BARO sensor: P2226:00, P2228:00, P2229:00 — VSS signal: P0500:00 — Fuel gauge sender unit: P0460:00, P0461:00, P0462:00, P0463:00 *1: Standard can be verified by displaying PIDs using M-MDS
	Malfunction determination period	• 75 s period
	Drive cycle	• 2
	Self test type	• CMDTC self test
	Sensor used	• Fuel tank pressure sensor
FAIL-SAFE FUNCTION	• Not applicable	

Sample

Item	Definition	Unit	Condition/Specification
FTP	Fuel tank pressure input from fuel tank	Pa {KPA}, mBar {BAR}, psi, in H20	• Ignition switched ON (engine off): Approx. −23 Pa {−2.3 kgf/m ^{2}, −0.0033 psi} • Idle (after warm up): −282− −46 Pa {−28.7− −4.7 kgf/m ^{2}, −0.0409− −0.0067 psi} • Racing (Engine speed 2,000 rpm): −1.47− −0.869 kPa {−0.0149− −0.0089 kgf/cm ^{2}, −0.213− −0.127 psi} • Racing (Engine speed 4,000 rpm): −1.69− −1.07 kPa {−0.0172− −0.0110 kgf/cm ^{2}, −0.245− −0.156 psi}
	Fuel tank pressure sensor voltage	V	• Ignition switched ON (engine off): Approx. 2.6 V • Idle (after warm up): 2.2−2.62 V • Racing (Engine speed 2,000 rpm): 1.9−1.91 V • Racing (Engine speed 4,000 rpm): 1.73−1.76 V

Simulation item table

Item	Applicable component	Operation	Operation condition	
			Engine condition	Other condition
EVAPCP	Purge solenoid valve	Changes % and forcibly drives/stops purge solenoid valve.	• Under the following conditions: — Ignition is switched ON (engine off) — Idle (no load)	Not applicable
EVAPCV	CV solenoid valve	Select OFF/ON to forcibly drive/stop the CV solenoid valve.	• Under the following conditions: — Ignition is switched ON (engine off) — Idle (no load)	Caution • Do not add fuel with the CV solenoid valve closed. Otherwise, it will result in air pollution because the evaporative gas in the fuel tank will escape directly into the atmosphere. Note • Override drive parameter: Off — CV solenoid valve: open • Override drive parameter: On — CV solenoid valve: close

Sample

Function Inspection Using M-MDS

— Inspect for clogging between fuel tank pressure sensor and fuel tank.

• Step 6–7

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

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: DETERMINE INTEGRITY OF FUEL TANK PRESSURE SENSOR • Inspect the fuel tank pressure sensor. (See FUEL TANK PRESSURE SENSOR INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the charcoal canister, then go to Step 6. (See CHARCOAL CANISTER REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Go to the next step.
2	PURPOSE: DETERMINE INTEGRITY OF PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 6. (See PURGE SOLENOID VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Go to the next step.
3	PURPOSE: VERIFY IF THERE IS CLOGGING BETWEEN FUEL TANK PRESSURE SENSOR AND FUEL TANK • Verify the following passage hoses, pipe connection condition, and that there is no clogging. — Between fuel tank pressure sensor and fuel shut-off valve • Is there any poor connection or clogging?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 6.
		No	Go to the next step.
4	PURPOSE: DETERMINE INTEGRITY OF FUEL SHUT-OFF VALVE • Inspect the fuel shut-off valve. (See FUEL TANK INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the fuel tank, then go to Step 6. (See FUEL TANK REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Go to the next step.
5	PURPOSE: DETERMINE INTEGRITY OF ROLLOVER VALVE • Inspect the rollover valve. (See FUEL TANK INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the fuel tank, then go to the next step. (See FUEL TANK REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Go to the next step.
6	PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION • Reconnect all the removed parts. • 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 of the troubleshooting diagnostic procedure. • 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.
7	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.

Sample

STEP	INSPECTION	RESULTS	ACTION
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 ENGINE OIL LEVEL SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the engine oil level 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 10.
		No	Go to the next step.
4	**INSPECT ENGINE OIL LEVEL SENSOR POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Verify that the engine oil level sensor connector is 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 engine oil level sensor terminal A (wiring harness-side). • Is the voltage B+?	Yes	Go to the next step.
		No	Inspect the ENGINE3 15 A fuse. • If the fuse is blown: — Refer to the wiring diagram and verify whether or not there is a common connector between ENGINE3 15 A fuse and engine oil level sensor terminal A. **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 engine oil level sensor terminal A. **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.

Sample

DTC P250A:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM2896994

id0102t378720

Note

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

Details On DTCs

DESCRIPTION	**Engine oil level signal: engine oil level sensor malfunction**	
DETECTION CONDITION	Determination conditions	• PCM receives abnormal signal from the engine oil level sensor.
	Preconditions	• Battery voltage: 10–16 V • The following DTC is not detected: — Communication error between engine oil level sensor and PCM: U1100:00 • Low-G (XY) sensor (built-into SAS control module) signal is normal
	Drive cycle	• 1
	Self test type	• CMDTC self test
	Sensor used	• Engine oil level sensor • Engine oil level sensor internal temperature sensor • Low-G (XY) sensor (built-into SAS control module)
FAIL-SAFE FUNCTION	• Not applicable	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates master warning light. (Without multi-information display) • The master warning indication is displayed on the multi-information display. (With multi-information display) • Illuminates engine oil level warning light. • The engine oil level warning indication is displayed on the multi-information display. (With multi-information display) • Displays a message related to a engine oil level malfunction in the display.	

Sample

Repeatability Verification Procedure

1. Start the engine and run it at idle.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

Item	Definition	Unit	Condition/Specification
EOL	Engine oil level	mm, in	• Displays engine oil level
EOT2	Engine oil temperature from engine oil level sensor	°C, °F	• Displays engine oil temperature

Function Inspection Using M-MDS

STEP	INSPECTION	RESULTS	ACTION
1	**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 snapshot data on the repair order.	–	Go to the next step.
2	**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.
3	**PURPOSE: 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 (WITHOUT CYLINDER DEACTIVATION))].) • Is the DTC P250A:00 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure for DTC or FREEZE FRAME DATA. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
4	**PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY OTHER RELATED DTCs OCCURRING** • 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 (WITHOUT CYLINDER DEACTIVATION))].) • Is the other PENDING CODE/DTC also present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	Go to the next step.

Sample

STEP	INSPECTION	RESULTS	ACTION
3	**INSPECT ENGINE OIL LEVEL SENSOR CIRCUIT FOR OPEN CIRCUIT** • Verify that the engine oil level sensor and PCM connectors are disconnected. • Inspect for continuity between engine oil level sensor terminal C (wiring harness-side) and PCM terminal 2Y (wiring harness-side). • Is there continuity?	Yes	Replace the engine oil level sensor, then go to the next step. (See ENGINE OIL LEVEL SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Refer to the wiring diagram and verify whether or not there is a common connector between engine oi level sensor terminal C and PCM terminal 2Y. **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.
4	**PURPOSE: PERFORM DTC INSPECTION AND VERIFY IF MALFUNCTIONING PART IS PCM** • 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 DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT 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 (WITHOUT CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.
5	**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.

Sample

STEP	INSPECTION	RESULTS	ACTION
4	**INSPECT HO2S HEATER POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Verify that the HO2S connector is 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 HO2S terminal C (wiring harness-side). • Is the voltage B+?	Yes	Go to the next step.
		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 HO2S 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 HO2S 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 9.
5	**INSPECT HO2S HEATER** • Switch the ignition off. • Inspect the HO2S heater. (See HEATED OXYGEN SENSOR (HO2S) INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the HO2S, then go to Step 9. (See HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		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 9.
		No	Go to the next step.

Sample