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1999 MAZDA 626 (Mk.5) Hatchback OEM Service and Repair Workshop Manual

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STEP	INSPECTION	RESULTS	ACTION
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 (WITHOUT CYLINDER DEACTIVATION))].) • Are any other PENDING CODEs and/or DTCs present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	Go to the next step.
4	INSPECT VACUUM HOSES CONNECTION • Visually inspect the vacuum hose, evaporative hose and ventilation hose connection. (See VACUUM HOSE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See EMISSION SYSTEM LOCATION INDEX [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Reconnect the vacuum hoses correctly, then go to Step 6.
		No	Go to the next step.
5	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM MALFUNCTION • Perform the Drive-by-wire Control System Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to the next step.
		No	Go to the next step.
6	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 (WITHOUT CYLINDER DEACTIVATION))].) • Start the engine and warm it up completely. • Depress the brake pedal for 14 s or more. • 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.
7	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

DTC P0604:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM2896968

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DTC P0604:00	PCM RAM error
DETECTION CONDITION	• PCM internal RAM malfunction. Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Restricts the upper limit of the engine speed. • Stops the drive-by-wire control (throttle valve is open at approx. 8 ° by return spring force).
POSSIBLE CAUSE	• PCM connector or terminals malfunction • PCM malfunction — PCM internal RAM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

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.
3	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 the next step.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
4	**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 the next step.
		No	Perform the PCM configuration (using read/write function) again. (See PCM CONFIGURATION (USING READ/WRITE FUNCTION) [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • If the malfunction recurs, perform the PCM configuration (using as-built data). (See PCM CONFIGURATION (USING AS-BUILT DATA) [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) Go to the next step.
5	**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 (WITHOUT CYLINDER DEACTIVATION))].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITHOUT 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 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
12	**INSPECT EXHAUST CMP SENSOR FOR FOREIGN MATTER** • Visually inspect the exhaust CMP sensor for foreign matter. (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any foreign matter on the exhaust CMP sensor?	Yes	Remove the foreign matter from the exhaust CMP sensor, then go to Step 16.
		No	Go to the next step.
13	**INSPECT EXHAUST CMP SENSOR PULSE WHEEL** • Visually inspect the exhaust CMP sensor pulse wheel. • Is there any damage or scratching on the exhaust CMP sensor pulse wheel?	Yes	Replace the exhaust CMP sensor pulse wheel, then go to Step 16.
		No	Go to the next step.
14	**INSPECT EXHAUST CMP SENSOR** • Reconnect all disconnected connectors. • Inspect the exhaust CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the exhaust CMP sensor, then go to Step 16. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Go to the next step.
15	**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 the next step.
		No	Go to the next step.
16	**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 (WITHOUT CYLINDER DEACTIVATION))].) • Start the engine and warm it up completely. • 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.
17	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

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.

DTC U0104:00	CAN communication: communication error to radar unit
FAIL-SAFE FUNCTION	• The radar unit function is cancelled.
POSSIBLE CAUSE	• CAN communication line malfunction between PCM and radar unit • Radar unit malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

DTC U0121:00	CAN communication: communication error to DSC HU/CM
DETECTION CONDITION	• Communication error between the PCM and DSC HU/CM continues for 5 s or more. Diagnostic support note • This is a continuous monitor (other). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Inhibits the DSC control.
POSSIBLE CAUSE	• CAN communication line malfunction between PCM and DSC HU/CM • DSC HU/CM malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

DTC U0131:00	CAN communication: communication error to EPS control module
DETECTION CONDITION	• Communication error between the PCM and EPS control module continues for 5 s or more. 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	• CAN communication line malfunction between PCM and EPS control module • EPS control module malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

DTC U0140:00	CAN communication: communication error to front body control module (FBCM)
DETECTION CONDITION	• Communication error between the PCM and front body control module (FBCM) continues for 5 s or more. 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	• CAN communication line malfunction between PCM and front body control module (FBCM) • Front body control module (FBCM) malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

DTC P0053:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

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DTC P0053:00	A/F sensor heater resistance
DETECTION CONDITION	• When the PCM controls the A/F sensor heater, the A/F sensor element resistance input to the PCM is the specified value or more. Diagnostic support note • This is an intermittent monitor (A/F sensor heater, HO2S heater). • 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. • 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	• Stops fuel feedback control
POSSIBLE CAUSE	• A/F sensor connector or terminals malfunction • Short to ground or open circuit in A/F sensor heater power supply circuit: — Short to ground in wiring harness between ENGINE2 15 A fuse and A/F sensor terminal A — ENGINE2 15 A fuse malfunction — Open circuit in wiring harness between sub relay terminal C and A/F sensor terminal A • A/F sensor heater malfunction • PCM connector or terminals malfunction • Open circuit in wiring harness between A/F sensor terminal E and PCM terminal 1CB • Short to ground in wiring harness between A/F sensor terminal E and PCM terminal 1CB • PCM malfunction

STEP	INSPECTION	RESULTS	ACTION
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.
7	**INSPECT A/F SENSOR HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Verify that the A/F sensor and PCM connectors are disconnected. • Inspect for continuity between A/F sensor terminal E (wiring harness-side) and PCM terminal 1CB (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 A/F sensor terminal E and PCM terminal 1CB. **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 A/F SENSOR HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Verify that the A/F sensor and PCM connectors are disconnected. • Inspect for continuity between A/F sensor terminal E (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 A/F sensor terminal E and PCM terminal 1CB. **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 the next step.
		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 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Perform the KOER self test. (See KOEO/KOER SELF 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.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
4	INSPECT BRAKE SWITCH No.1 POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT • Verify that the brake switch connector is disconnected. • Measure the voltage at the brake switch terminal A (wiring harness-side). • Is the voltage B+?	Yes	Go to the next step.