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1989 MAZDA 323 (BG) Sedan OEM Service and Repair Workshop Manual

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STEP	INSPECTION		ACTION
2	**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 9.
		No	Go to the next step.
3	**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 main 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 9.
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 Step 9.
		No	Go to the next step.

DTC P250F:00 [PCM (SKYACTIV-D 2.2)]

SM2896277

id0102j578740

DTC P250F:00	**Engine oil level signal: engine oil level low**
DETECTION CONDITION	• The PCM detects that the output value from the engine oil level sensor is less than 70.5 mm {2.78 in}. **Diagnostic support note** • This is a continuous monitor (other). • The check engine light does not illuminate. • FREEZE FRAME DATA/Snapshot data is not available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Erratic signal to PCM — Engine oil level sensor connector or terminals malfunction — Open or short circuit in wiring harness between engine oil level sensor terminal B and PCM terminal 2G • Improper engine oil level (low) • Engine oil leakage • Engine oil data reset procedure does not perform in each engine oil replacements. • Engine oil level sensor malfunction — Clogging of oil passage to engine oil level sensor detection area — Engine oil level sensor internal application specific integrated circuit malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	**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	**VERIFY IF THERE IS PID ITEM CAUSING DRASTIC CHANGES OF ACCELERATION FLUCTUATION BY INPUT SIGNAL TO PCM** • Access the EOL PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is there any signal that is far out of specification? (See ENGINE OIL LEVEL SENSOR INSPECTION [SKYACTIV-D 2.2].)	Yes	Go to the next step.
		No	Go to Step 4.

STEP	INSPECTION		ACTION
4	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-D 2.2)].) • Has any DTC other than P24A4:00 or P2463:00 been stored?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].) **Note** **• When a DTC other than DTC P24A4:00 or P2463:00 is stored, compulsory diesel particulate filter regeneration may be restricted by the PCM control.** Perform applicable DTC troubleshooting, and then perform compulsory diesel particulate filter regeneration.
		No	Go to the next step.
5	INSPECT EXHAUST GAS PRESSURE SENSOR NO.2 RELATED PIPE • Visually inspect the exhaust gas pressure sensor No.2 related pipe for restriction and damaged. (See EXHAUST GAS PRESSURE SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 7.
		No	Go to the next step.
6	INSPECT EXHAUST GAS PRESSURE SENSOR NO.2 • Inspect the exhaust gas pressure sensor No.2. (See EXHAUST GAS PRESSURE SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the exhaust gas pressure sensor No.2, then go to the next step. (See EXHAUST GAS PRESSURE SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Diesel particulate filter restriction and/or damaged can be considered the cause. • Replace the catalytic converter, then go to the next step. (See EXHAUST SYSTEM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
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-D 2.2)].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)].) • Is the same DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) 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-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Referring to each adjustment procedure, perform fuel injector injection amount correction and then the diesel particulate filter data reset. (See FUEL INJECTOR INJECTION AMOUNT CORRECTION [SKYACTIV-D 2.2].) (See DIESEL PARTICULATE FILTER DATA RESET [SKYACTIV-D 2.2].) DTC troubleshooting completed.

DTC P252F:00 [PCM (SKYACTIV-D 2.2)]

SM2896040

id0102j515430

DTC P252F:00	Engine oil level too high
DETECTION CONDITION	• The PCM detects that the output value from the engine oil level sensor exceeds 95.8 mm {3.77 in}. **Diagnostic support note** • This is a continuous monitor (other). • The check engine light does not illuminate. • FREEZE FRAME DATA/Snapshot data is not available. • DTC is not stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Excessive amount of engine oil due to dilution or excessive refueling • Engine oil data reset procedure does not perform in each engine oil replacements. • Engine oil level sensor malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**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	**INSPECT ENGINE OIL LEVEL** • Inspect the engine oil level. (See ENGINE OIL LEVEL INSPECTION [SKYACTIV-D 2.2].) • Is the engine oil amount above X line on the dipstick?	Yes	Replace the engine oil. (See ENGINE OIL REPLACEMENT [SKYACTIV-D 2.2].) Perform the "ENGINE OIL DATA RESET", then go to Step 5. (See ENGINE OIL DATA RESET [SKYACTIV-D 2.2].)
		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-D 2.2)].) • Is the PENDING CODE/DTC P253F:00 also present?	Yes	Replace the engine oil. (See ENGINE OIL REPLACEMENT [SKYACTIV-D 2.2].) Perform the "ENGINE OIL DATA RESET", then go to Step 5. (See ENGINE OIL DATA RESET [SKYACTIV-D 2.2].)
		No	Go to the next step.
4	**INSPECT ENGINE OIL LEVEL SENSOR** • Inspect the engine oil level sensor. (See ENGINE OIL LEVEL SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the engine oil level sensor, then go to the next step. (See ENGINE OIL LEVEL SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ENGINE OIL TEMPERATURE SENSOR** • Inspect the engine oil temperature sensor. (See ENGINE OIL TEMPERATURE SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the engine oil temperature sensor/engine oil pressure sensor, then go to Step 5. (See ENGINE OIL TEMPERATURE SENSOR/ENGINE OIL PRESSURE SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
4	**REPLACE ENGINE OIL** • Replace the specified engine oil. (See ENGINE OIL REPLACEMENT [SKYACTIV-D 2.2].)	–	Perform the "ENGINE OIL DATA RESET", then go to the next step. (See ENGINE OIL DATA RESET [SKYACTIV-D 2.2].)
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-D 2.2)].) • Start the engine and warm it up completely. **Caution** **• While performing this step, always operate the vehicle in a safe and lawful manner.** **• 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.** • Drive the vehicle under the engine at engine speed 1,500 rpm. • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is the same DTC present?	Yes	Repeat the inspection from Step 1 • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

DTC P06BC:00 [PCM (SKYACTIV-D 2.2)]

SM2896119

id0102j530980

DTC P06BC:00	Glow plug No.4 control circuit range/performance problem
DETECTION CONDITION	• If the glow plug No.4 impedance is above 2.1 ohms for 5 s, the PCM determines that glow plug No.4 circuit has a malfunction. MONITORING CONDITIONS — Ignition switched ON (engine off or on) — Battery voltage: 8 V or more — 0.2 s have elapsed since power supply voltage of 6 V or more is supplied to glow plug — The following DTCs are not detected: • LIN communication system: U0106:00 • Glow plug control module: P052F:00 • Glow plug No.4: P0674:00 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. • 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	• Glow plug No.4 connector or terminals malfunction • Glow control module connector or terminals malfunction • Short to ground in wiring harness between glow plug No.4 terminal D and glow control module terminal A • Short to power supply in wiring harness between glow plug No.4 terminal D and glow control module terminal A • Open circuit in wiring harness between glow plug No.4 terminal D and glow control module terminal A • PCM connector or terminals malfunction • Short to ground in wiring harness between glow control module terminal C and PCM terminal 2G • Short to power supply in wiring harness between glow control module terminal C and PCM terminal 2G • Open circuit in wiring harness between glow control module terminal C and PCM terminal 2G • Glow plug No.4 malfunction • Glow control module malfunction • PCM malfunction

STEP	INSPECTION	RESULTS	ACTION
7	**INSPECT GLOW PLUG No.4 CONTROL CIRCUIT FOR OPEN CIRCUIT** • Verify that the glow plug No.4 and glow control module connectors are disconnected. • Switch the ignition off. • Inspect for continuity between glow plug No.4 terminal D (wiring harness-side) and glow control module terminal A (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 glow plug No.4 terminal D and glow control module 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 14.
8	**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 14.
		No	Go to the next step.
9	**INSPECT GLOW CONTROL MODULE SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that the glow plug No.4, glow control module and PCM connectors are disconnected. • Inspect for continuity between glow control module terminal C (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 glow control module terminal C and PCM terminal 2G. **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 14.
		No	Go to the next step.
10	**INSPECT GLOW CONTROL MODULE SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the glow plug No.4, glow control module 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 glow control module terminal C (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 glow control module terminal C and PCM terminal 2G. **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 14.

STEP	INSPECTION		ACTION
4	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-D 2.2)].) • Perform the KOEO self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)].) • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
5	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

STEP	INSPECTION		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	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-D 2.2)].) • Are any other PENDING CODEs and/or DTCs present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
4	INSPECT APP SENSOR CONNECTOR CONDITION • Switch the ignition off. • Disconnect the APP 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 13.
		No	Go to the next step.
5	INSPECT CKP SENSOR CONNECTOR CONDITION • Disconnect the CKP 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 13.
		No	Go to the next step.
6	INSPECT MAP SENSOR No.2 CONNECTOR CONDITION • Disconnect the MAP sensor No.2 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 13.
		No	Go to the next step.
7	INSPECT ENGINE OIL TEMPERATURE SENSOR/ENGINE OIL PRESSURE SENSOR CONNECTOR CONDITION • Disconnect the engine oil temperature sensor/engine oil pressure 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 13.
		No	Go to the next step.
8	INSPECT MAF SENSOR/IAT SENSOR No.1 CONNECTOR CONDITION • Disconnect the MAF sensor/IAT sensor No.1 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 13.
		No	Go to the next step.