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1988 MAZDA 323 (BF) Station Wagon OEM Service and Repair Workshop Manual

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Sample

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DTC P050A:00 [PCM (SKYACTIV-D 2.2)]

SM2896105

id0102j530180

Note

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

Details On DTCs

Sample

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	**PURPOSE: IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P050A: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-D 2.2)].)
4	**VERIFY CURRENT FUEL CONDITION** • Ask the customer what fuel is currently being used. • Is the specified fuel being used?	Yes	Drain the remaining fuel in the fuel tank and add the specified fuel, then go to Step 27. (See FUEL DRAINING PROCEDURE [SKYACTIV-D 2.2].)
		No	Go to the next step.
5	**INSPECT INTAKE AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect for loose, cracked or damaged hoses on intake air system. **Note** **• Engine speed may change when rust penetrating agent is sprayed on the air suction area.** • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results then go to Step 27.
		No	Go to the next step.
6	**INSPECT FOR RESTRICTION IN INTAKE AIR SYSTEM** • Verify if there is restriction into the intake air system (such as between MAF sensor and intake manifold). • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results then go to Step 27.
		No	Go to the next step.
7	**INSPECT FOR FUEL LEAKAGE FROM FUEL SYSTEM** • Visually inspect the following: — Fuel leakage from the fuel tank, fuel pump, hose, pipe, fuel injector, supply pump, common rail — Cracking and damage in fuel hose and pipe — Clamp installation condition for each hose and pipe — Fuel pipe securing condition due to deterioration such as rubber of clamp • Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results then go to Step 27.

Sample

STEP	INSPECTION		ACTION
23	INSPECT GENERATOR • Inspect the generator. (See GENERATOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the generator, then go to the next step. (See GENERATOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
24	INSPECT TO A/C SYSTEM RELATED PARTS • Inspect the following parts: — A/C RELAY (See RELAY INSPECTION.) — A/C compressor (See REFRIGERANT PRESSURE CHECK.) — Magnetic clutch (See MAGNETIC CLUTCH INSPECTION [SKYACTIV-D 2.2].) • Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results then go to Step 27.
25	VERIFY MALFUNCTION SYMPTOM RELATED TO ATX • Verify the malfunction symptom related to the ATX. (See SYMPTOM TROUBLESHOOTING ITEM TABLE [GW6A-EL, GW6AX-EL].) • Is a malfunction occurring which is applicable to the symptom diagnostic index?	Yes	Go to the applicable symptom troubleshooting. (See SYMPTOM TROUBLESHOOTING ITEM TABLE [GW6A-EL, GW6AX-EL].)
		No	Catalytic converter or diesel particulate filter can be considered the cause. • Replace the catalytic converter, then go to the next step. (See EXHAUST SYSTEM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
26	PURPOSE: VERIFY IF MISFIRE IS OCCURRING • Verify if a misfire is occurring referring to the troubleshooting procedure for DTC P0300:00. (See DTC P0300:00 [PCM (SKYACTIV-D 2.2)].) • Has a misfire occurred?	Yes	Specify the cause of the misfire and repair or replace the malfunctioning location referring to the troubleshooting procedure for DTC P0300:00. (See DTC P0300:00 [PCM (SKYACTIV-D 2.2)].) Go to the next step.
		No	Go to the next step.
27	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. • The following conditions are met, and wait for 30 s. — Ambient air temperature: 10 °C {50 °F} or more — Engine coolant temperature: 60 °C {140 °F} or more — Vehicle speed: 0 km/h {0 mph} — Selector lever position: D position — Release the accelerator pedal. — Depress the brake pedal. • 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.
28	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.

Sample

STEP	INSPECTION		ACTION
6	**INSPECT FUEL GAUGE SENDER UNIT CIRCUIT FOR OPEN CIRCUIT** • Verify that the fuel gauge sender unit and rear body control module (RBCM) connectors are disconnected. • Switch the ignition off. • Inspect for continuity between the following terminals (wiring harness-side): — Fuel gauge sender unit terminal C—Rear body control module (RBCM) terminal 3I — Fuel gauge sender unit terminal A—Rear body control module (RBCM) terminal 3C • 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: • Fuel gauge sender unit terminal C—Rear body control module (RBCM) terminal 3I • Fuel gauge sender unit terminal A—Rear body control module (RBCM) terminal 3C **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.
7	**INSPECT FUEL GAUGE SENDER UNIT** • Inspect the fuel gauge sender unit. (See FUEL GAUGE SENDER UNIT INSPECTION [2WD].) (See FUEL GAUGE SENDER UNIT INSPECTION [AWD].) • Is there any malfunction?	Yes	Replace the fuel gauge sender unit, then go to Step 10. (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION [2WD].) (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION [AWD].)
		No	Go to the next step.
8	**INSPECT REAR BODY CONTROL MODULE (RBCM)** • Inspect the rear body control module (RBCM). (See REAR BODY CONTROL MODULE (RBCM) INSPECTION.) • Is there any malfunction?	Yes	Replace the rear body control module (RBCM), then go to Step 10. (See REAR BODY CONTROL MODULE (RBCM) REMOVAL/INSTALLATION.)
		No	Go to the next step.
9	**INSPECT INSTRUMENT CLUSTER** • Inspect the instrument cluster. (See INSTRUMENT CLUSTER INSPECTION.) • Is there any malfunction?	Yes	Replace the instrument cluster, then go to the next step. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
		No	Go to the next step.
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-D 2.2)].) • Start the engine. • Idle the engine for 30 s. • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • 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-D 2.2].) 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-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.

Sample

DTC P0685:00 [PCM (SKYACTIV-D 2.2)]

SM2896107

id0102j530280

DTC P0685:00	Main relay control circuit open
DETECTION CONDITION	• The period of time in which the PCM maintains the PCM power supply on is less than 20 msec after the ignition is switched off MONITORING CONDITIONS • The following conditions are met 1 time or more — Engine speed: 650 rpm or more 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	• Main relay malfunction • Short to ground or open circuit in main relay power supply circuit: — Short to ground in wiring harness between MAIN 200 A fuse and main relay terminal D — MAIN 200 A fuse and/or ENG.MAIN 40 A fuse malfunction — Open circuit in wiring harness between battery positive terminal and main relay terminal D • ENGINE2 15 A fuse malfunction • Short to ground in wiring harness between the following terminals: — Main relay terminal C—PCM terminal 2S — Main relay terminal C—PCM terminal 2T • PCM connector or terminals malfunction • Open circuit in wiring harness between the following terminals: — PCM terminal 2X—Body ground — PCM terminal 2AD—Body ground — PCM terminal 2AE—Body ground — PCM terminal 2AF—Body ground • Open circuit in wiring harness between the following terminals: — Main relay terminal C—PCM terminal 2S — Main relay terminal C—PCM terminal 2T • PCM malfunction

Sample

STEP	INSPECTION		ACTION
5	**INSPECT ENGINE2 15 A FUSE** • Remove the ENGINE2 15 A fuse. • Inspect the ENGINE2 15 A fuse. • Is there any malfunction?	Yes	If the fuse is blown: • Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: — Main relay terminal C–PCM terminal 2S — Main relay terminal C–PCM terminal 2T **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. Go to Step 10.
		No	Reinstall the ENGINE2 15 A fuse, then go to the next step.
6	**INSPECT PCM POWER SUPPLY CIRCUIT FOR SHORT TO GROUND** • Main relay is removed. • Inspect for continuity between main relay terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	If the short to ground circuit could be detected in the wiring harness: • Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: — Main relay terminal C–PCM terminal 2S — Main relay terminal C–PCM terminal 2T **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. If the short to ground circuit could not be detected in the wiring harness: • Replace the PCM (short to ground in the PCM internal circuit). (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to Step 10.
		No	Go to the next step.
7	**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 10.
		No	Go to the next step.

Sample

DTC P2610:00	Instrument cluster internal engine off timer performance problem
SYSTEM WIRING DIAGRAM	Not applicable

Diagnostic Procedure

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 SERVICE INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related Service 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	VERIFY STORED DTC IN INSTRUMENT CLUSTER • Switch the ignition off, then ON (engine off). • Retrieve the instrument cluster DTC using the M-MDS. (See DTC INSPECTION [INSTRUMENT CLUSTER].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [INSTRUMENT CLUSTER].)
		No	Go to the next step.
5	INSPECT INSTRUMENT CLUSTER BACKUP VOLTAGE CIRCUIT • Switch the ignition off. • Remove the MAIN 200 A fuse and ROOM 15 A fuse. • Inspect the MAIN 200 A fuse and ROOM 15 A fuse. • Is there any malfunction?	Yes	Replace the malfunctioning fuse. Switch the ignition ON (engine on) and wait for 10 s or more. Switch the ignition off. Go to Step 9.
		No	CAN communication line can be considered the cause. • Reinstall the MAIN 200 A fuse and ROOM 15 A fuse. • Inspect the wiring harness between instrument cluster and PCM. If there is any malfunction: — Repair or replace the suspected wiring harness, then go to Step 9. If there is no malfunction: — Go to the next step.

Sample

STEP	INSPECTION		ACTION
3	**INSPECT BATTERY** • Switch the ignition off. • Inspect the battery. (See BATTERY INSPECTION.) • Is there any malfunction?	Yes	Recharge or replace the battery, then go to Step 5. (See BATTERY RECHARGING.) (See BATTERY REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
4	**INSPECT GLOW CONTROL MODULE** • Inspect the glow control module. (See GLOW PLUG CONTROL MODULE INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the glow control module, then go to the next step. (See GLOW PLUG CONTROL MODULE REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	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-D 2.2)].) • Perform the KOEO 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.
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.

Sample

DTC P2A01:00	A/F sensor circuit range/performance (NOx sensor No.1)
	• IAT sensor No.3: P00E9:00, P00EA:00, P00EB:00
DETECTION CONDITION	Diagnostic support note • This is an intermittent 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	• Communication error between NOx sensor No.1 and PCM — Open or short circuit in wiring harness between dosing control unit and PCM — Dosing control unit malfunction • NOx sensor No.1 connector or terminals malfunction • Erratic signal from NOx sensor No.1 — NOx sensor No.1 loose — Exhaust system leakage • PCM connector or terminals malfunction • Dosing control unit connector or terminals malfunction • NOx sensor No.1 protector clogging • NOx sensor No.1 malfunction — NOx sensor No.1 deterioration — NOx sensor No.1 heater malfunction • PCM 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 SERVICE INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related Service 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 OTHER RELATED DTCs • Switch the ignition OFF, and then switch it 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 DTC U029D:00 and/or U010E:00 also present?	Yes	Repair the malfunctioning location according to the applicable DTC troubleshooting first, then go to the next step. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.

Sample