Your Ultimate Source for OEM Repair Manuals

FactoryManuals.net is a great resource for anyone who wants to save money on repairs by doing their own work. The manuals provide detailed instructions and diagrams that make it easy to understand how to fix a vehicle.

1987 MAZDA 323 (BF) Station Wagon OEM Service and Repair Workshop Manual

Go to manual page

Function Inspection Using M-MDS

STEP	INSPECTION		ACTION
1	**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.
2	**PURPOSE: IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P0299:00 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)].)
3	**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.
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-D 2.2)].) • Is the other PENDING CODE/DTC also present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
5	**PURPOSE: VERIFY IF THERE IS PID ITEM CAUSING DRASTIC CHANGES OF ACCELERATION FLUCTUATION BY INPUT SIGNAL TO PCM** • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) — MAP_DSD — INTK_MAPA • Is there any signal that is far out of specification?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure to perform the procedure from Step 1.
6	**PURPOSE: VERIFY CONNECTOR CONNECTIONS** • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) — MAP_DSD — INTK_MAPA • When the following parts are shaken, does the PID value include a PID item which has changed? — MAP sensor No.2 — PCM	Yes	Inspect the related wiring harness and connector. • Repair or replace the malfunctioning part. Go to the troubleshooting procedure to perform the procedure from Step 11.
		No	Go to the troubleshooting procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

• Step 1

— Verify whether malfunction is related wiring harness or other.

DTC P2564:00 [PCM (SKYACTIV-D 2.2)]

SM2896099

id0102j526860

DTC P2564:00	Regulating valve position sensor circuit low input
DETECTION CONDITION	• If the input voltage at the PCM terminal 1BP is below 0.17 V for 5 s, the PCM determines that the regulating valve position sensor circuit has a malfunction. MONITORING CONDITIONS — Battery voltage: 8 V or more 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	• Inhibits the automatic diesel particulate filter regeneration control and compulsory diesel particulate filter regeneration control. • Inhibits the DENOx/DESOx control. • Inhibits the EGR control. • PCM restricts engine-transaxle integration control.
POSSIBLE CAUSE	• Regulating valve position sensor connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — Regulating valve position sensor terminal C—PCM terminal 1BO — Regulating valve position sensor terminal B—PCM terminal 1BP • Regulating valve position sensor signal circuit and ground circuit are shorted to each other • Open circuit in wiring harness between regulating valve position sensor terminal C and PCM terminal 1BO • Regulating valve position sensor malfunction • PCM malfunction

STEP	INSPECTION	RESULTS	ACTION
8	INSPECT REGULATING VALVE POSITION SENSOR • Reconnect all disconnected connectors. • Inspect the regulating valve position sensor. (See REGULATING VALVE POSITION SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the regulating valve actuator, then go to the next step. (See TURBOCHARGER REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		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-D 2.2)].) • Perform the KOEO or 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.
10	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	RESULTS	ACTION
3	**INSPECT REGULATING VALVE POSITION SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the regulating valve position 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.
4	**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.
5	**INSPECT REGULATING VALVE POSITION SENSOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the regulating valve position sensor 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 regulating valve position sensor terminal B (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 regulating valve position sensor terminal B and PCM terminal 1BP. **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 9.
6	**INSPECT REGULATING VALVE POSITION SENSOR POWER SUPPLY CIRCUIT AND SIGNAL CIRCUIT FOR SHORT TO EACH OTHER** • Verify that the regulating valve position sensor and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between regulating valve position sensor terminals C 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: • Regulating valve position sensor terminal C—PCM terminal 1BO • Regulating valve position sensor terminal B—PCM terminal 1BP **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 Step 9.
		No	Go to the next step.

DTC P0126:00	Insufficient coolant temp for stable operation
DETECTION CONDITION	• If any of the following conditions is met for 6 s under condition A or condition B: **Condition A:** • The engine coolant temperature detected by ECT sensor No.1 is lower than the engine coolant temperature estimated from the ambient temperature by the PCM. MONITORING CONDITIONS — The engine coolant temperature detected by ECT sensor No.1 is higher than the engine coolant temperature estimated from the ambient temperature by the PCM. — ECT sensor No.1 value at engine start is within specified value — Ambient air temperature: -10–45 °C {14–113 °F}*2 — Within 25 s after engine start — Difference between ECT sensor No.2 value estimated by PCM when thermostat opening failed and actual ECT sensor No.2 temperature is less than 8 °C {46 °F} — Barometric pressure: 72 kPa {0.73 kgf/cm^2, 10.4 psi} or more — Percentage of idling time for total engine operation time is 50% or less — Vehicle speed: less than 140 km/h {87 mph}*2 — Engine speed: less than 5,200 rpm *2 — The following DTCs are not detected: • BARO sensor: P2227:00, P2228:00, P2229:00 • Engine off timer performance problem: P2610:00 • ECT sensor No.1: P0116:00, P0117:00, P0118:00, P011A:00 • ECT sensor No.2: P2184:00, P2185:00 • Engine oil temperature sensor: P0196:00, P0197:00, P0198:00 • IAT sensor No.1: P0111:00, P0112:00, P0113:00 • IAT sensor No.3: P00E9:00, P00EA:00, P00EB:00 • MAP sensor: P0106:00, P0107:00, P0108:00 • MAF sensor: P0101:00, P0102:00, P0103:00 • VSS: P0500:00 **Condition B:** • ECT sensor No.1 value is less than 60 °C {140 °F} MONITORING CONDITIONS — Difference between ECT sensor No.2 value estimated by PCM and ECT sensor No.2 temperature is 175 °C {347 °F} or less for the specified period of time until ECT sensor No.1 value reaches 60 °C {140 °F} — ECT sensor No.1 value at engine start is -10–51.5 °C {14–124.7 °F} *2 — Ambient air temperature: -10–45 °C {14–113 °F}*2 — ECT sensor No.1 value from engine start has reached 71 °C {160 °F} or more — Barometric pressure: 72 kPa {0.73 kgf/cm^2, 10.4 psi} or more — Vehicle speed: less than 140 km/h {87 mph}*2 — Engine speed: less than 5,200 rpm *2 — The following DTCs are not detected: • ECT sensor No.1: P0116:00, P0117:00, P0118:00, P011A:00 • IAT sensor No.1: P0111:00, P0112:00, P0113:00 • MAP sensor: P0106:00, P0107:00, P0108:00 • MAF sensor: P0101:00, P0102:00, P0103:00 • VSS: P0500:00 • ECT sensor No.2: P2184:00, P2185:00 • BARO sensor: P2227:00, P2228:00, P2229:00 *2: Standard can be verified by displaying PIDs using M-MDS **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • 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.

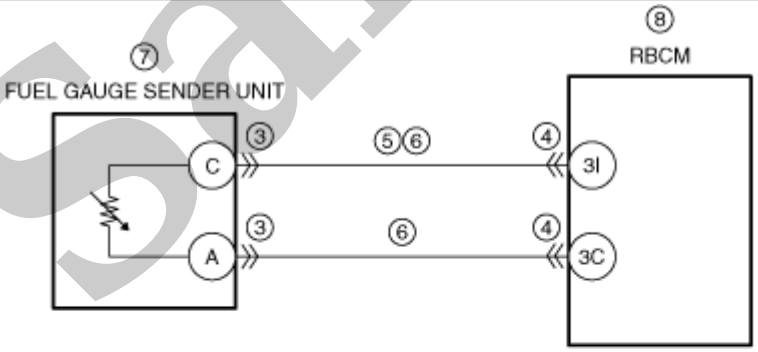
STEP	INSPECTION		ACTION
11	PURPOSE: VERIFY IF THERE IS ANY OTHER MALFUNCTION • Is any other DTC or pending code stored?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

DTC P0462:00 [PCM (SKYACTIV-D 2.2)]

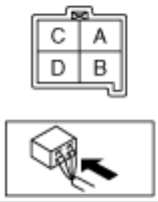
SM2896103

id0102j530160

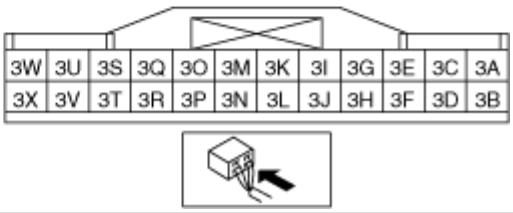
DTC P0462:00	Fuel gauge sender unit circuit low input
DETECTION CONDITION	• The output signal from the fuel gauge sender unit is less than 0.06 V for a continuous 30 s. MONITORING CONDITIONS • When all of the following conditions are met: — Battery voltage: 11 V or more — Ignition switched ON (engine off or on) — The following DTC is not detected: • CAN: U0155:00 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	• Fuel gauge sender unit connector or terminals malfunction • Rear body control module (RBCM) connector or terminals malfunction • Short to ground in wiring harness between fuel gauge sender unit terminal C and rear body control module (RBCM) terminal 3I • Fuel gauge sender unit signal circuit and ground circuit are shorted to each other • Fuel gauge sender unit malfunction • Rear body control module (RBCM) malfunction • Instrument cluster malfunction



FUEL GAUGE SENDER UNIT WIRING HARNESS-SIDE CONNECTOR



RBCM WIRING HARNESS-SIDE CONNECTOR



Diagnostic Procedure

DTC P026C:00 [PCM (SKYACTIV-D 2.2)]

SM2896178

id0102j541650

DTC P026C:00	Idle speed control system: fuel injector injection low
DETECTION CONDITION	• The PCM detects that the actual fuel injection amount is 50% or more lower relative to the target fuel injection amount for 13.5 s. MONITORING CONDITIONS • The following conditions are met: — Accelerator pedal position is 0% for 2.7 s or more. — Vehicle speed is 2 km/h {1 mph} or less for 1 s or more. — Ambient air temperature: −10 °C {14 °F} or more — Barometric pressure: 72.2 kPa {0.736 kgf/cm^2, 10.5 psi} or more — Idle speed control is activated. — Diesel particulate filter regeneration control is not performed. — 4.5 s or more have elapsed after selector lever is operated — DENOx control is not performed. — DESOx control is not performed. — Engine oil temperature estimated by oil pan: 3.8 °C {39 °F} or more — 3.2 s have elapsed since fuel injection pattern was switched — While post injection is being stopped — 5 s or more have elapsed with fuel injector protection function not performed — Target engine speed: 650 rpm or more — The following DTCs are not detected: • Fuel pressure sensor (integrated with fuel injector): P10C4:00, P10C5:00, P10C6:00, P10C7:00, P10C8:00, P10C9:00, P10CD:00 • Suction control valve: P062A:00 • Fuel injector: P0201:00, P0202:00, P0203:00, P0204:00, P1378:00, P1379:00, P2146:00, P2147:00, P2148:00, P2149:00, P2150:00, P2151:00, P2696:00, P268C:00, P268D:00, P268E:00, P268F:00 • PCM: P0606:00, P062B:00 • Common rail: P0089:00, P1282:00, P1329:00 • Fuel pressure control system: P0093:00 • Fuel system: P01CB:00, P01CC:00, P01CD:00, P01CE:00, P01CF:00, P01D0:00, P01D1:00, P01D2:00, P1051:00, P1053:00, P1055:00, P1057:00, P020A:00, P020B:00, P020C:00, P020D:00 • BARO sensor: P2228:00, P2229:00 • TCM: P0706:00, P0707:00, P0708:00, P0711:00, P0712:00, P0713:00, P0715:00, P0716:00, P0717:00, U0101:00 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

STEP	INSPECTION		ACTION
8	**INSPECT FUEL INJECTION RELATED PARTS** • Inspect the following parts: — Common rail (See COMMON RAIL INSPECTION [SKYACTIV-D 2.2].) — Supply pump (See SUPPLY PUMP INSPECTION [SKYACTIV-D 2.2].) — Suction control valve (See SUCTION CONTROL VALVE INSPECTION [SKYACTIV-D 2.2].) — Fuel pressure relief valve (See FUEL PRESSURE RELIEF VALVE INSPECTION [SKYACTIV-D 2.2].) — Fuel feed valve (See FUEL FEED VALVE INSPECTION [SKYACTIV-D 2.2].) — Fuel filter (clogged) (See FUEL FILTER REMOVAL/INSTALLATION [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 26.
9	**DETERMINE INTEGRITY OF FUEL INJECTOR No.1–No.4** • Inspect the fuel injector No.1–No.4. (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the suspected fuel injector, then go to Step 26. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
10	**INSPECT FUEL PRESSURE SENSOR No.1–No.4** • Inspect the fuel pressure sensor No.1–No.4. (See FUEL PRESSURE SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the suspected fuel injector, then go to Step 26. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
11	**INSPECT FUEL TEMPERATURE SENSOR No.1–No.4** • Inspect the fuel temperature sensor No.1–No.4. (See FUEL TEMPERATURE SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the suspected fuel injector, then go to Step 26. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
12	**INSPECT CKP SENSOR** • Inspect the CKP sensor. (See CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the CKP sensor, then go to Step 26. (See CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
13	**INSPECT EGR VALVE** • Inspect the EGR valve. (See EGR VALVE INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the EGR valve, then go to Step 26. (See EGR VALVE REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
14	**INSPECT EGR VALVE POSITION SENSOR** • Reconnect all disconnected connectors. • Inspect the EGR valve position sensor. (See EGR VALVE POSITION SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the EGR valve, then go to Step 26. (See EGR VALVE REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
15	**INSPECT EGR COOLER BYPASS VALVE** • Inspect the EGR cooler bypass valve. (See EGR COOLER BYPASS VALVE INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the EGR cooler bypass valve, then go to Step 26. (See EGR COOLER BYPASS VALVE REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.