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.

1991 MAZDA 323 (BG) Hatchback OEM Service and Repair Workshop Manual

Go to manual page

DTC P151C:00	Idle speed control system: RPM higher than expected
POSSIBLE CAUSE	• Fuel freezing • Intake air system malfunction (air suction, leakage, perforation) • Fuel system malfunction — Fuel injector No.1–No.4 malfunction — Fuel injector No.1–No.4 connectors or terminals malfunction — Fuel leakage from fuel system or trapped air — Supply pump malfunction — Fuel feed valve malfunction — Fuel check valve malfunction — Fuel pressure relief valve malfunction — Fuel pipe improper routing (improper connection) — Fuel filter clogged • Erratic signal to PCM — CKP sensor malfunction — Engine oil temperature sensor malfunction • EGR valve malfunction • EGR cooler bypass valve malfunction • Refrigerant pressure sensor malfunction • Engine mechanical system malfunction — Large mechanical resistance — Insufficient engine compression — Improper valve timing — Engine oil malfunction (oil working up or down/poor engine oil quality/improper engine oil level/dilution) — Piston ring malfunction — Slippage of belts for engine accessories — Excessive load on generator • A/C relay malfunction • Magnetic clutch (A/C system) malfunction • A/C compressor malfunction • ATX malfunction • NSC (NOx Storage Catalyst) malfunction (deterioration) • PCM malfunction
SYSTEM WIRING DIAGRAM	Not applicable

Caution

• If a hand or tool touches a fuel injector terminal or fuel injector connector terminal, the fuel injector might be damaged. To prevent damage to a fuel injector, do not touch the terminals.
• If high-voltage generating parts or components and electronic devices come near a fuel injector, the fuel injector could be damaged. To prevent damage to a fuel injector, always keep high-voltage generating parts or components and electronic devices away from it.

Diagnostic Procedure

STEP	INSPECTION		ACTION
16	**INSPECT EGR COOLER BYPASS VALVE POSITION SENSOR** • Reconnect all disconnected connectors. • Inspect the EGR cooler bypass valve position sensor. (See EGR VALVE POSITION SENSOR 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.
17	**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 26. (See ENGINE OIL TEMPERATURE SENSOR/ENGINE OIL PRESSURE SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
18	**INSPECT REFRIGERANT PRESSURE SENSOR** • Inspect the refrigerant pressure sensor. (See REFRIGERANT PRESSURE SENSOR INSPECTION [MANUAL AIR CONDITIONER].) (See REFRIGERANT PRESSURE SENSOR INSPECTION [FULL-AUTO AIR CONDITIONER].) • Is there any malfunction?	Yes	Replace the refrigerant pressure sensor, then go to Step 26. (See REFRIGERANT PRESSURE SENSOR REMOVAL/INSTALLATION [MANUAL AIR CONDITIONER].) (See REFRIGERANT PRESSURE SENSOR REMOVAL/INSTALLATION [FULL-AUTO AIR CONDITIONER].)
		No	Go to the next step.
19	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See COMPRESSION INSPECTION [SKYACTIV-D 2.2].) • Are compression pressures within specification?	Yes	Go to Step 22.
		No	Go to the next step.
20	**INSPECT FOR MALFUNCTION DUE TO DEVIATED VALVE TIMING** • Inspect the valve timing (timing chain installation condition). (See TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) • Is the valve timing normal?	Yes	Go to the next step.
		No	Adjust the valve timing to the correct timing, then go to Step 26. (See TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
21	**INSPECT FOR MALFUNCTION DUE TO INTERNAL ENGINE WEAR, DAMAGE** • Inspect for the following engine internal parts: — Cylinder — Piston ring — Intake valve — Exhaust valve — Such as cylinder head gasket • 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.
22	**INSPECT DRIVE BELT** • Inspect the drive belt. (See DRIVE BELT INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the drive belt, then go to Step 26. (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
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.

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	**INSPECT WHETHER MALFUNCTION IS WIRING HARNESS OR OTHER** • Perform the KOEO self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)].) • Is the EGR temperature sensor, IAT sensor No.2 and/or Boost air temperature sensor related DTC present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
4	**INSPECT EGR TEMPERATURE SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the EGR temperature 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 7.
		No	Go to the next step.
5	**INSPECT EGR TEMPERATURE SENSOR** • Inspect the EGR temperature sensor. (See EGR TEMPERATURE SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the EGR temperature sensor, then go to Step 7. (See EGR TEMPERATURE SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		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 the next step.
		No	Go to the next step.
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)].) • Start the engine and leave it idling for 10 s. • Switch the ignition off. • Leave the vehicle for 6 hours or more. • Start the engine. • Access the ECT PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Leave the vehicle until the engine coolant temperature increases to approx. 3 °C {5 °F}. • Perform the Pending Trouble Code Access 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.

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 EGR TEMPERATURE SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the EGR temperature 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 8.
		No	Go to the next step.
4	**DETERMINE IF EGR TEMPERATURE SENSOR OR WIRING HARNESS MALFUNCTION** • Verify that the EGR temperature 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 EGR temperature sensor terminal A (wiring harness-side). • Is the voltage approx. 5 V?	Yes	Replace the EGR temperature sensor, then go to Step 8. (See EGR TEMPERATURE SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
5	**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 8.
		No	Go to the next step.

INAPPROPRIATE OPERATION AND CONTROL RECODE 0x51 (COLD CONDITION DAMAGE PREVENTION CONTROL) [PCM (SKYACTIV-D 2.2)]

SM2895991

id0102j504330

Outline

• If engine oil dilution continues, the engine oil freezes easily when the engine is extremely cold. If the engine oil freezes, the engine o supplied to each part in the engine may be insufficient resulting in engine burning. To prevent this, the fuel injection amount is controlled.

Operation Conditions

• The oil pressure does not increase even if the engine is started when the engine coolant temperature at engine start is -18 °C {-0.40 °F} or less and the PCM determines engine oil dilution.

Protection Control

• Controls engine speed to idle speed.

Diagnosis Procedure and Explanation to Customer

STEP	INSPECTION		ACTION
1	**PURPOSE: VERIFY DTCs** • Has any DTC been stored?	Yes	Repair the malfunctioning location according to the applicable DTC troubleshooting. (See DTC TABLE [PCM (SKYACTIV-D 2.2)])
		No	Explain to the customer that the vehicle is normal and the control was performed to protect the engine.

INAPPROPRIATE OPERATION AND CONTROL RECORD 0x43 (UNUSUAL VOLTAGE OF A BATTERY) [PCM (SKYACTIV-D 2.2)]

SM2895992

id0102j504360

Caution

Inappropriate operation and control code 0x43 is more likely to be recorded than DTC P2504:00. Inappropriate operation and control code 0x43 may be recorded when the operation conditions are met due to signal noise. Therefore, if there is no malfunction in the related part, do not replace the part.

Outline

• If there is a malfunction in the generator output control, the parts damage may occur inhibiting driving or compromising occupant safety. To prevent this, the PCM performs protection control when the following operation conditions are met.

Operation Conditions

• Almost same as detection condition for DTC P2504:00 (See DTC P2504:00 [PCM (SKYACTIV-D 2.2)].)

Protection Control

• Almost same as detection condition for DTC P2504:00 (See DTC P2504:00 [PCM (SKYACTIV-D 2.2)].)

Diagnosis Procedure and Explanation to Customer

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: VERIFY DTCs • Has any DTC been recorded?	Yes	Repair the malfunctioning location according to the applicable DTC troubleshooting. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
2	PURPOSE: VERIFY CONDITION OF BATTERY AND GENERATOR • Inspect the battery and generator referring to the troubleshooting procedure for DTC P2504:00. (See DTC P2504:00 [PCM (SKYACTIV-D 2.2)].) • Is there any malfunctioning location?	Yes	Repair the malfunctioning location.
		No	Explain to the customer that the vehicle is normal and the protection control was performed temporarily due to signal noise.

STEP	INSPECTION		ACTION
9	VERIFY DTC TROUBLESHOOTING COMPLETED • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Start the engine and warm it up completely. • Switch the ignition to off and wait for 10 s or more. • Perform the Pending Trouble Code Access 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.
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.

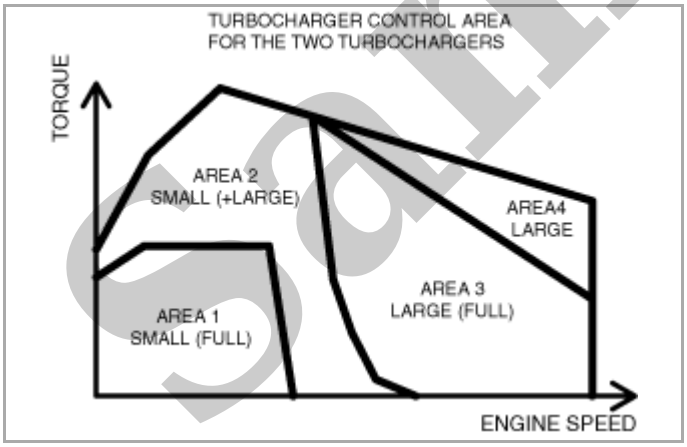
DESCRIPTION	Large-type turbocharger underboost condition
POSSIBLE CAUSE	• Open or short circuit in wiring harness between the following terminals: — Compressor bypass solenoid valve–PCM — Wastegate solenoid valve–PCM • Hood insulator incorrect installation (intake air of engine is blocked due to improper positioning of hood insulator) • Air cleaner element clogging or dirt • Exhaust gas leakage from exhaust system • Air leakage from intake air system • Vacuum piping or positive pressure piping of wastegate valve malfunction • Vacuum piping or positive pressure piping of compressor bypass valve malfunction • Compressor bypass solenoid valve malfunction • Wastegate solenoid valve malfunction • Compressor bypass valve malfunction • Wastegate valve malfunction • Turbocharger malfunction • Clogging in large-type turbocharger turbine induction passage • PCM malfunction • Misfire

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• The PCM diagnoses the large-type turbo system performance by comparing the target boost pressure with the actual in the large-type turbo operation range (the following figure AREA 3 (full boost of large-type turbocharger) and AREA 4 (feedback control range o large-type turbocharger).



ac5uuw00009676

• The PCM uses the manifold absolute pressure sensor to monitor the intake manifold pressure in the large-type turbo operation range as the actual boost pressure.
• When the monitoring conditions are met in the large-type turbo operation range, the PCM compares the target boost pressure with the actual. If the actual boost pressure is lower than the specification for the target boost pressure, the PCM determines a charging deficiency malfunction.
• The PCM performs diagnosis when each of the preconditions the during drive cycle is met. If a malfunction is detected, the malfunction detection counter begins counting up. If it is normal, the counter begins counting down. The value of the malfunction detection counter is maintained while the preconditions are not being met. If the cumulative value of the malfunction detection counter exceeds the threshold during the first drive cycle, a malfunction is determined and a pending code is stored.
• If the PCM determines that the malfunction recurs from the next drive cycle and thereafter, it stores a DTC and turns on the check engine light.

• Step 1

— Verify whether malfunction is related wiring harness or other.

• Step 2–7

— Perform inspection of piping and hoses in intake air system and exhaust system.

• Step 8–10

— Perform inspection of each separate part.

• Step 11–12

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

STEP	INSPECTION		ACTION
1	**PURPOSE: INSPECT WHETHER MALFUNCTION IS WIRING HARNESS OR OTHER** • Perform the KOEO self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)].) • Is the regulating solenoid valve and/or regulating valve position sensor related DTC present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
2	**PURPOSE: VERIFY HOOD INSULATOR INSTALLATION CONDITION** • Verify the hood insulator installation condition. • Is there looseness in the installation?	Yes	Repair the hood insulator installation, then go to Step 12. (Intake air of engine is blocked due to improper positioning of hood insulator.) (See HOOD DISASSEMBLY/ASSEMBLY.)
		No	Go to the next step.
3	**PURPOSE: INSPECT AIR CLEANER ELEMENT CONDITION** • Visually inspect the air cleaner element. • Is there any clogging or dirt?	Yes	Clean or replace the air cleaner element, then go to Step 12.
		No	Go to the next step.
4	**PURPOSE: INSPECT EXHAUST SYSTEM FOR LEAKAGE** • Visually inspect for exhaust gas leakage from the exhaust system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 12.
		No	Go to the next step.
5	**PURPOSE: INSPECT INTAKE AIR SYSTEM FOR AIR SUCTION** • Inspect for air leakage at the following: — Around connection of turbocharger and intake manifold **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 12.
		No	Go to the next step.
6	**PURPOSE: INSPECT VACUUM PIPING AND POSITIVE PRESSURE PIPING OF WASTEGATE VALVE** • Inspect vacuum piping and positive pressure piping of wastegate valve. (See TURBOCHARGER REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) • Is there hose leakage or damage in the vacuum piping and positive pressure piping?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 12.
		No	Go to the next step.