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1991 MAZDA 121 (Mk.1) OEM Service and Repair Workshop Manual

Go to manual page

STEP	INSPECTION		ACTION
10	VERIFY THAT REPAIRS HAVE BEEN COMPLETED • Reconnect all the disconnected connectors. • Refer to the "MEMORY CLEARING PROCEDURE" and clear the DTC. (See CLEARING DTC [PCM (SKYACTIV-D 2.2)].) • Switch the ignition ON (engine off) and leave for 10 s. • Display the DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Has DTC U1203:00 been recorded?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
11	VERIFY OTHER DTCs • Has any other DTC or pending code been stored?	Yes	Repair the malfunctioning location according to the applicable DTC troubleshooting. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

devices away from it.

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 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 OTHER RELATED DTCs • Switch the ignition OFF, and then switch it ON (engine off). • Display the DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Has any DTC other than U1204:00 been stored?	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 FUEL INJECTOR No.4 CONNECTOR CONDITION • Switch the ignition off. • Disconnect the fuel injector No.4 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.
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 10.
		No	Go to the next step.

DTC P062B:00 [PCM (SKYACTIV-D 2.2)]

SM2896301

id0102j586870

DTC P062B:00	PCM internal malfunction
DETECTION CONDITION	• When any of the following conditions is met: — PCM detects malfunction in internal fuel injector control processor with the following conditions met: MONITORING CONDITIONS • Battery voltage: above 8 V • If the PCM detects that the fuel pressure relief valve control circuit voltage is half or less of the battery voltage for 1 s with the following condition met: • The fuel pressure relief valve: Off Diagnostic support note • This is an intermittent 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/compulsory diesel particulate filter regeneration control. • Inhibits the DENOx/DESOx control. • Fully opens the intake shutter valve opening angle. • Inhibits the EGR control. • PCM restricts engine-transaxle integration control.
POSSIBLE CAUSE	• PCM malfunction — Fuel injector control driver internal processor error (built-into PCM) — Fuel pressure relief valve control circuit malfunction (build-into PCM)
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 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.

STEP	INSPECTION		ACTION
3	INSPECT FUEL PRESSURE SENSOR • Inspect the fuel pressure sensor No.2 and fuel pressure sensor No.3. (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the fuel pressure sensor No.2 and/or fuel pressure sensor No.3, then go to Step 9. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
4	INSPECT FUEL FILTER • Inspect the fuel filter for clogging. (See FUEL FILTER 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 9. (See FUEL FILTER REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
5	INSPECT FUEL PIPE • Inspect the fuel pipe installation condition. (See FUEL SYSTEM LOCATION INDEX [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Install the fuel pipe properly, then go to Step 9.
		No	Go to the next step.
6	INSPECT SUCTION CONTROL VALVE • Inspect the suction control valve. (See SUCTION CONTROL VALVE INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the suction control valve, then go to Step 9. (See SUCTION CONTROL VALVE REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
7	INSPECT SUPPLY PUMP • Inspect the supply pump. (See SUPPLY PUMP INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the supply pump, then go to Step 9. (See SUPPLY PUMP REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
8	INSPECT FUEL PRESSURE RELIEF VALVE • Inspect the fuel pressure relief valve. (See FUEL PRESSURE RELIEF VALVE INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the common rail, then go to the next step. (See COMMON RAIL 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 Drive Mode. (See OBD-II DRIVE MODE [PCM (SKYACTIV-D 2.2)].) • 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.

STEP	INSPECTION	RESULTS	ACTION
3	**INSPECT MAP SENSOR No.1 CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the MAP 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 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 MAP SENSOR No.1 CIRCUIT FOR SHORT TO GROUND** • Verify that the MAP sensor No.1 and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — MAP sensor No.1 terminal A — MAP sensor No.1 terminal C • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • MAP sensor No.1 terminal A—PCM terminal 1BJ • MAP sensor No.1 terminal C—PCM terminal 1BK **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 9.
		No	Go to the next step.
6	**INSPECT MAP SENSOR No.1 SIGNAL CIRCUIT AND GROUND CIRCUIT FOR SHORT TO EACH OTHER** • Verify that the MAP sensor No.1 and PCM connectors are disconnected. • Inspect for continuity between MAP sensor No.1 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: • MAP sensor No.1 terminal C—PCM terminal 1BK • MAP sensor No.1 terminal B—PCM terminal 1BI **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.
7	**INSPECT MAP SENSOR No.1 POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Verify that the MAP sensor No.1 and PCM connectors are disconnected. • Inspect for continuity between MAP sensor No.1 terminal A (wiring harness-side) and PCM terminal 1BJ (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 MAP sensor No.1 terminal A and PCM terminal 1BJ. **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.

DTC P0238:00 [PCM (SKYACTIV-D 2.2)]

SM2895988

id0102j502380

DTC P0238:00	MAP sensor No.1 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the MAP sensor No.1. If the input voltage at the PCM terminal 1BK is above 4.78 V for 5 s, the PCM determines that the MAP sensor No.1 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	• Turbocharger malfunction • MAP sensor No.1 connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between MAP sensor No.1 terminal C and PCM terminal 1BK • MAP sensor No.1 power supply circuit and signal circuit are shorted to each other • Open circuit in wiring harness between the following terminals: — MAP sensor No.1 terminal C—PCM terminal 1BK — MAP sensor No.1 terminal B—PCM terminal 1BI • MAP sensor No.1 malfunction • PCM malfunction

STEP	INSPECTION	RESULTS	ACTION
8	**INSPECT MAP SENSOR No.1 CIRCUIT FOR OPEN CIRCUIT** • Verify that the MAP sensor No.1 and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — MAP sensor No.1 terminal C–PCM terminal 1BK — MAP sensor No.1 terminal B–PCM terminal 1BI • 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: • MAP sensor No.1 terminal C–PCM terminal 1BK • MAP sensor No.1 terminal B–PCM terminal 1BI **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.
9	**INSPECT MAP SENSOR No.1** • Reconnect all disconnected connectors. • Inspect the MAP sensor No.1. (See MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the MAP sensor No.1, then go to the next step. (See MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		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)].) • 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.
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.

DTC P0196:00 [PCM (SKYACTIV-D 2.2)]

SM2896065

id0102j521190

DTC P0196:00	Engine oil temperature sensor circuit range/performance problem
DETECTION CONDITION	• When the following conditions are met, the difference between the engine oil temperature and ECT sensor No.1 is more than 7.6 °C {46 °F} or less than -9.8 °C {14 °F}. MONITORING CONDITIONS • Period vehicle being left: 6 h or more • Battery voltage: 8 V or more • Switch the ignition ON. • Block heater is not being used • The following DTCs are not detected: — Engine oil temperature sensor: P0197:00, P0198:00 — ECT sensor No.1: P0116:00, P0117:00, P0118:00, P011A: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	• Open or short circuit in wiring harness between the following terminals: — ECT sensor No.1—PCM — Engine oil temperature sensor/engine oil pressure sensor—PCM • ECT sensor No.1 connector or terminals malfunction • Engine oil temperature sensor/engine oil pressure sensor connector or terminals malfunction • PCM connector or terminals malfunction • Engine oil temperature sensor malfunction • ECT sensor No.1 malfunction • PCM malfunction
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.