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1988 MAZDA 121 (Mk.1) OEM Service and Repair Workshop Manual

Go to manual page

Sample

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STEP	INSPECTION		ACTION
8	**INSPECT EXHAUST GAS TEMPERATURE SENSOR NO.5** • Inspect the exhaust gas temperature sensor No.5. (See EXHAUST GAS TEMPERATURE SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the exhaust gas temperature sensor No.5, then go to the next step. (See EXHAUST GAS TEMPERATURE SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
9	**VERIFY DTC TROUBLESHOOTING COMPLETED** • 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. • Wait for 6 min (idle). • 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.
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.

Sample

DTC P2A02:00	A/F sensor circuit range/performance (NOx sensor No.2)
	• 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.2 and PCM • Open or short circuit in wiring harness between the following terminals: — A/F sensor–PCM — NOx sensor No.1–PCM — NOx sensor No.2–PCM • Erratic signal from NOx sensor No.2 — NOx sensor No.2 loose — Exhaust system leakage — NOx sensor No.2 connector or terminals malfunction • A/F sensor connector or terminals malfunction • NOx sensor No.1 connector or terminals malfunction • PCM connector or terminals malfunction • NOx sensor No.2 malfunction — NOx sensor No.2 deterioration — NOx sensor No.2 heater malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Sample

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	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 A/F sensor, NOx sensor No.1 and/or NOx sensor No.2 related DTC present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.

DTC P2BA9:00 [PCM (SKYACTIV-D 2.2)]

SM2896261

id0102j573000

DTC P2BA9:00	NOx exceedence - Insufficient reagent quality
DETECTION CONDITION	• With the following preconditions met, the average diesel exhaust fluid (DEF) concentration is less than 18.5% or a diesel exhaust fluid (DEF) quality sensor detection value error continues for 10 min. MONITORING CONDITIONS • Communication between dosing control unit and urea level sensor: Normal • Communication between dosing control unit and PCM: Normal • Urea temperature sensor: Normal • Temperature sensor in diesel exhaust fluid (DEF) quality sensor: Normal • Diesel exhaust fluid (DEF) amount detected by urea level sensor: Normal range • The following DTCs are not detected: — Urea temperature sensor/Urea level sensor: P203B:00, P203C:00, P203D:00 — Urea temperature sensor: P205A:00, P205B:00 — Diesel exhaust fluid (DEF) quality sensor: P206C:00, P206D:00, P207F:00, P21CE:00 — Diesel exhaust fluid (DEF) amount: P203F:00 — CAN: U02A2:00, U010E:00 Diagnostic support note • This is an intermittent monitor (Other). • The check engine light does not illuminate. • FREEZE FRAME DATA is not available. • Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE	• The instrument cluster warns the driver with the following functions. — Selective catalytic reduction (SCR) system warning light — Buzzer — Message Note • The remaining distance to empty is a maximum of 402 km {250 miles} until the malfunction targeted by inducement (laws and regulations requirement) is repaired. This distance is displayed in the instrument cluster and counts down until the targeted malfunction is repaired. • Perform the following restrictions while driving the vehicle according to the remaining distance to empty. — 201 to 402 km {125 to 250 miles}: No restriction — 0 to 201 km {0 to 125 miles}: Maximum vehicle speed 48 km/h {30 mph} is restricted — 0 km {0 miles}: Engine speed is fixed at idle speed
POSSIBLE CAUSE	• Communication error between the following: — DEF pump−PCM — Dosing control unit−PCM • Urea level sensor malfunction • Mistaken replenishment of liquid other than diesel exhaust fluid (DEF) such as water and diesel fuel • Diesel exhaust fluid (DEF) quality sensor malfunction • Diesel exhaust fluid (DEF) deterioration • PCM malfunction • Dosing control unit malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Sample

DTC P2BAF:00 [PCM (SKYACTIV-D 2.2)]

SM2896262

id0102j573020

DTC P2BAF:00	NOx system driver inducement active
DETECTION CONDITION	• The dosing control unit or the PCM detects the following malfunctions for which diagnosis is required by law with NOx reduction systems. Malfunctions detected by PCM — Exhaust gas temperature sensor No.4: P2471:00 — Exhaust gas temperature sensor No.5:P2482:00 — CAN: U010E:00 — Diesel exhaust fluid (DEF) quality sensor: P206C:00, P206D:00, P207F:00, P21CE:00 Malfunctions detected by dosing control unit — Diesel exhaust fluid (DEF) pump: P204F:00, P208A:00, P208B:00, P208C:00, P208D:00, P20E8:00, P20E9:00, P20FA:00, P20FC:00, P20FD:00 — Diesel exhaust fluid (DEF) quality sensor: P206C:00, P206D:00, U02A2:00 — NOx sensor No.1: P06EA:00, P2200:00, P2202:00, P2203:00, P2204:00, P2205:00, P220A:00, P220E:00, U029D:00 — NOx sensor No.2: U029E:00 — SCR system: P249C:00 — Urea hose heater: P20BD:00, P20BF:00, P20C0:00, P221C:00, P221D:00 — Urea injector: P202E:00, P2047:00, P2048:00, P2049:00 — Urea tank heater: P20B9:00, P20BB:00, P20BC:00, P214F:00, P21DD:00 — Urea temperature sensor: P205A:00, P205B:00 — Urea temperature sensor/Urea level sensor: P203B:00, P203C:00, P203D:00 — CAN: U0100:00 Diagnostic support note • This is an intermittent monitor (Other). • The check engine light does not illuminate. • FREEZE FRAME DATA is not available. • Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE	• The instrument cluster warns the driver with the following functions. — Selective catalytic reduction (SCR) system warning light — Buzzer — Message Note • The remaining distance to empty is a maximum of 402 km {250 miles} until the malfunction targeted by inducement (laws and regulations requirement) is repaired. This distance is displayed in the instrument cluster and counts down until the targeted malfunction is repaired. • Perform the following restrictions while driving the vehicle according to the remaining distance to empty. — 201 to 402 km {125 to 250 miles}: No restriction — 0 to 201 km {0 to 125 miles}: Maximum vehicle speed 48 km/h {30 mph} is restricted — 0 km {0 miles}: Engine speed is fixed at idle speed
POSSIBLE CAUSE	• Malfunction in SCR system detected by dosing control unit or PCM • Dosing control unit malfunction • PCM malfunction

Sample

DTC P2146:00 [PCM (SKYACTIV-D 2.2)]

SM2896028

id0102j515250

DTC P2146:00	Fuel injector No.1 and No.4 circuit abnormal operation
DETECTION CONDITION	• When the following condition is met, the PCM detects the control current at fuel injectors No.1 and No.4 as less than the specified value 6 times: MONITORING CONDITIONS — Battery voltage: more than 8 V — Fuel-cut control is not implemented 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	• Fuel injector No.1 connector or terminals malfunction • Fuel injector No.4 connector or terminals malfunction • PCM connector or terminals malfunction • Open circuit in wiring harness between the following terminals: — Fuel injector No.1 terminal E—PCM terminal 1EE — Fuel injector No.4 terminal E—PCM terminal 1EF • Fuel injector No.1 malfunction • Fuel injector No.4 malfunction • PCM malfunction

Sample

STEP	INSPECTION		ACTION
8	INSPECT FUEL INJECTOR NO.4 • Inspect the fuel injector No.4. (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the fuel injector No.4, then go to the next step. (See FUEL INJECTOR 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 AFTER REPAIR PROCEDURE [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.
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.

Sample

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 idle it. • Wait until the ECT PID value is above 80 °C {176 °F}. • Wait for 1 min (idle). • 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.

Sample

DTC P1379:00 [PCM (SKYACTIV-D 2.2)]

SM2896026

id0102j514940

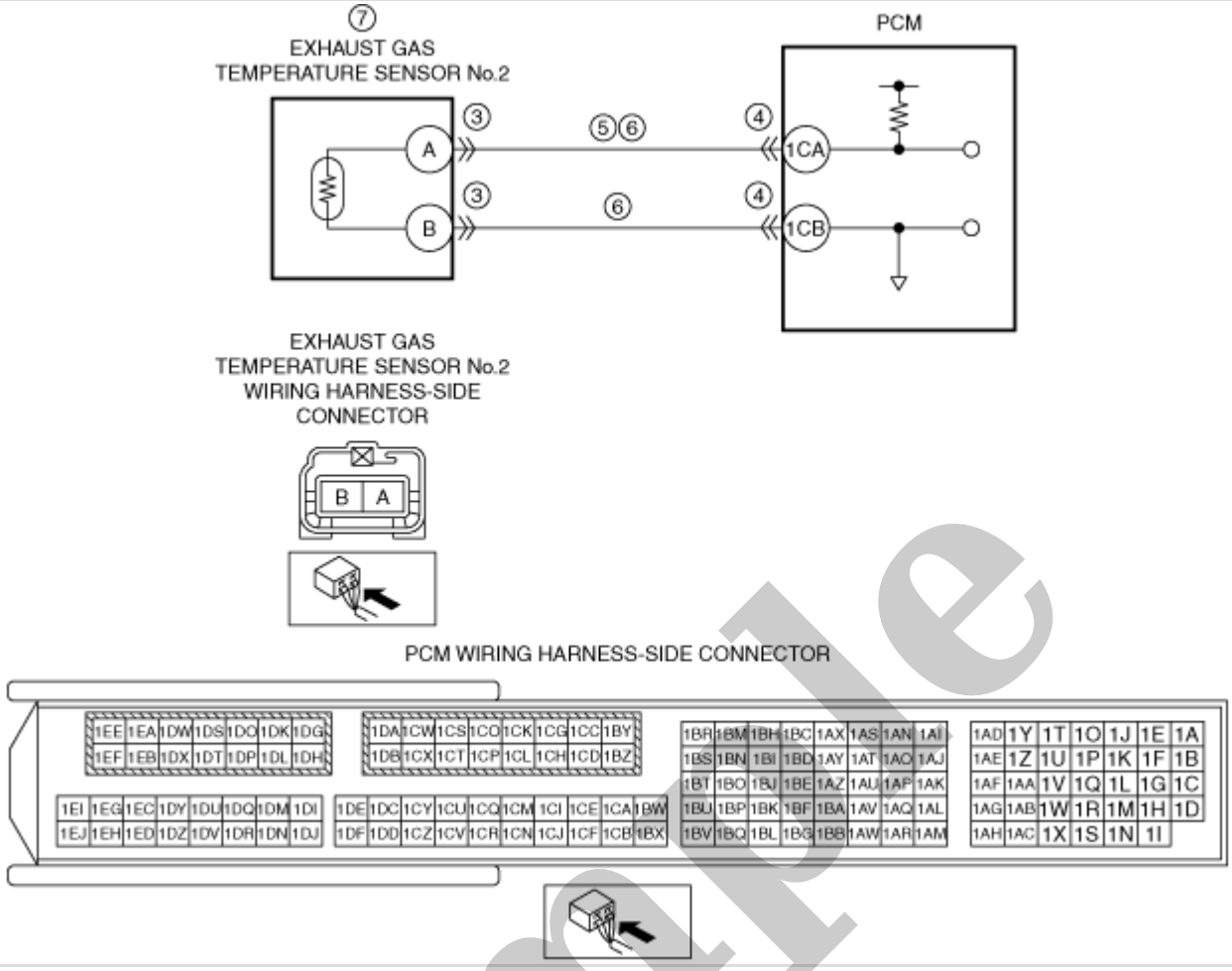
DTC P1379:00	Fuel injector circuit high input
DETECTION CONDITION	• The PCM detected that the voltage output from the boost circuit for the fuel injector control built into the PCM exceeds 250 V when all of the following conditions are met. MONITORING CONDITIONS — Battery voltage: above 8 V — Fuel-cut control is not implemented. — The following DTC is not detected: • PCM: P060A:00 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
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 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.

Sample

DTC P2032:00	Exhaust gas temperature sensor No.2 circuit low input



Sample

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.