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1992 MAZDA 121/ Revue (Mk.2) OEM Service and Repair Workshop Manual

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STEP	INSPECTION	RESULTS	ACTION
7	**INSPECT SCR1 20 A FUSE** • Remove the SCR1 20 A fuse. • Inspect the SCR1 20 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: — Selected catalytic relay No.1 terminal E –Dosing control unit terminal BV — Selected catalytic relay No.1 terminal C –Dosing control unit terminal B — Selected catalytic relay No.1 terminal C –Dosing control unit terminal C **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 SCR1 20 A fuse, then go to the next step.
8	**INSPECT SELECTED CATALYTIC RELAY NO.1 POWER SUPPLY CIRCUIT FOR SHORT TO GROUND** • Disconnect the dosing control unit connector. • Verify that the selected catalytic relay No.1 is removed. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — Selected catalytic relay No.1 terminal E — Selected catalytic relay No.1 terminal C • 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: — Selected catalytic relay No.1 terminal E –Dosing control unit terminal BV — Selected catalytic relay No.1 terminal C –Dosing control unit terminal B — Selected catalytic relay No.1 terminal C –Dosing control unit terminal C **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 dosing control unit (short to ground in the dosing control unit internal circuit). (See DOSING CONTROL UNIT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to Step 10.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
4	**INSPECT SELECTED CATALYTIC RELAY NO.1** • Switch the ignition off. • Remove the selected catalytic relay No.1. • Inspect the selected catalytic relay No.1. (See RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace the selected catalytic relay No.1, then go to Step 5.
		No	Go to the next step.
5	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the dosing control unit memory using the M-MDS. (See CLEARING DTC [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Leave for 1 min while idling. • Display the DTCs using the M-MDS. (See CLEARING DTC [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Retrieve the dosing control unit DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the dosing control unit. (See DOSING CONTROL UNIT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
6	**VERIFY IF OTHER DTCs DISPLAYED** • Are any other DTCs displayed?	Yes	Repair or replace the malfunctioning part according to the applicable DTC troubleshooting. (See DTC TABLE [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

DESCRIPTION	SCR converter efficiency below threshold	
	Preconditions	• Switch the ignition ON • Battery voltage: 10.9–16 V • Average value of NOx flow amount: 0.0005–1.0000 g/sec {0.01–0.03 oz/sec} • Period of time in which NOx sensor No.1 detects NOx value: 0–1,000 s • SCR converter purification rate estimated by dosing control unit: 40–100 % • The following DTCs are not detected for a continuous 50 s. — Boost air temperature sensor: P007B:00, P007C:00, P007D:00 — IAT sensor No.3: P00E9:00, P00EA:00, P00EB:00 — MAP sensor No.2: P0106:00, P0107:00, P0108:00 — IAT sensor No.1: P0111:00, P0112:00, P0113:00 — ECT sensor No.1: P0116:00, P0117:00, P0118:00, P011A:00 — EGR valve position sensor: P0405:00, P0406:00 — Exhaust gas pressure sensor No.1: P0471:00, P0472:00, P0473:00 — Exhaust gas temperature sensor No.1: P0545:00, P0546:00 — NOx Sensor No.1: P06EA:00 — NOx Sensor No.2: P06EB:00 — PCM: P161D:00, P166E:00 — Urea injector: P202E:00, P2047:00, P2048:00, P2049:00 — Diesel exhaust fluid (DEF) pump: P204F:00 — Exhaust gas temperature sensor No.1: P2080:00 — Diesel exhaust fluid (DEF) pump: P208A:00, P208B:00, P208C:00, P208D:00, P20E8:00, P20E9:00 — APP sensor: P2122:00, P2123:00, P2127:00, P2128:00, P2138:00 — NOx Sensor No.1: P2200:00, P2201:00, P2202:00, P2203:00, P2204:00, P220A:00, P220E:00, P225C:00, P225D:00 — NOx Sensor No.2: P220B:00, P220F:00, P225E:00, P225F:00, P229E:00, P229F:00, P22A0:00, P22A1:00, P22A2:00 — BARO sensor: P2227:00, P2228:00, P2229:00 — Exhaust gas temperature sensor No.5: P2481:00, P2482:00, P2483:00 — EGR cooler bypass valve position sensor: P2494:00, P2495:00 — CAN: U0100:00, U029D:00, U029E:00, U02A2:00 • CAN communication condition is normal • Release of dosing strategy for 20 s or more • Difference in diesel exhaust fluid (DEF) injection volume before and after completion of diesel particulate filter regeneration control continues to be within specified value for more than 120 s • Average NOx flow amount detected by NOx sensor No.1 continues to be 0.75 g/s {0.026 oz/sec} or more for more than 0.1 s • When any of the following conditions is met: — SCR converter temperature fluctuation less than 49.960 °C {121.93 °F} for more than 100 s — SCR converter temperature between 194.96 and 399.96 °C {382.93 and 750 °F} for more than 5 s — SCR converter temperature less than 189.96 °C {373.93 °F} or more than 399.96 °C {750 °F} for more than 15 s • SCR converter HC purification rate: above 76 % • Concentration or flow amount of ammonia generated by SCR control calculated based on NOx sensor No.1 or NOx sensor No.2 measured value exceeds specified value for more than 15 s • Actual supply amount of urea relative to required amount of urea by SCR control: 65–135% • Estimated supply amount of urea calculated based on SCR converter temperature is within specified range • 500 s or more have elapsed since DCU detected ammonia leak • DENOx control is not operating for continue for 10 s or more • Cumulative NOx mass detected by NOx sensor No.1: 0.10–4.33 g {0.0035–0.153 oz} • Average SCR converter temperature: 224.96–399.96 °C {436.93–751.93 °F}

STEP	INSPECTION	RESULTS	ACTION
6	PURPOSE: VERIFY CONNECTOR CONNECTIONS • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) — NOX_C_B2S1 — NOX_C_B2S2 • When the following parts are shaken, does the PID value include a PID item which has changed? — NOx sensor No.1 — NOx sensor No.2 — Dosing control unit	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 2.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

• Step 1

— Verify if there is no wiring harness malfunction in sensor system used for diagnosis

• Step 2

— Perform inspection of piping and hoses in exhaust system.

• Step 5–6

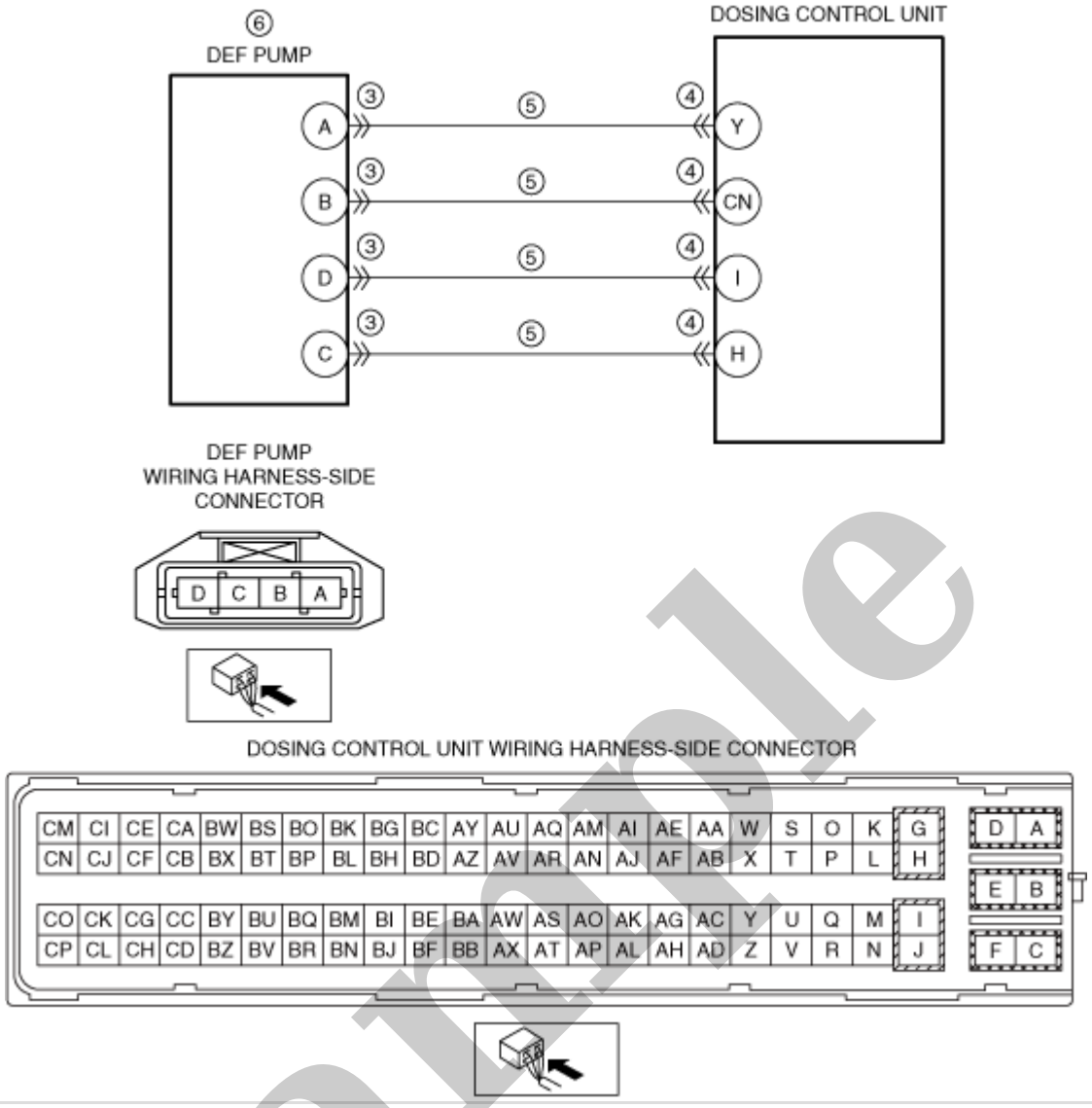
— Perform inspection of each separate part.

• Step 8–9

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

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: VERIFY IF THERE IS NO WIRING HARNESS MALFUNCTION IN SENSOR SYSTEM USED FOR DIAGNOSIS • Perform the KOEO self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)].) • Retrieve the dosing control unit DTCs using the M-MDS. • Are following DTCs present? — U029D:00 — U029E:00	Yes	Go to the applicable DTC inspection. (See DTC TABLE [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].)
		No	Go to the next step.
2	PURPOSE: INSPECT EXHAUST SYSTEM FOR AIR SUCTION OR LEAKAGE • Visually inspect for exhaust gas air suction and 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 8.
		No	Go to the next step.
3	PURPOSE: INSPECT NOx SENSOR NO.1 INSTALLATION CONDITION • Inspect for NOx sensor No.1 looseness. • Is the CKP sensor loosen?	Yes	Install the NOx sensor No.1 properly, then go to Step 8. (See NOx SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
4	PURPOSE: INSPECT NOx SENSOR NO.2 INSTALLATION CONDITION • Inspect for NOx sensor No.2 looseness. • Is the CKP sensor loosen?	Yes	Install the NOx sensor No.2 properly, then go to Step 8. (See NOx SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.

DTC P20FD:00	DEF pump circuit high input



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 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.

DTC P20FA:00 [DOSING CONTROL UNIT (SKYACTIV-D 2.2)]

SM2896358

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DTC P20FA:00	Open circuit in DEF pump circuit
DETECTION CONDITION	• The dosing control unit detects an open circuit for 2 s in the control circuit of the DEF pump. — Output voltage from DEF pump control circuit to dosing control unit: 2.6–3.4 V MONITORING CONDITIONS — Ignition switched ON — Dosing control unit initialization is not performed — Battery voltage: 10.9–16 V Note • DTC P2BAF:00 is also stored in the PCM and the vehicle speed is restricted. • DTC P1640:00 is also stored in the PCM. Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the dosing control unit detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the dosing control unit memory.
FAIL-SAFE FUNCTION	• Restricts the maximum remaining distance to empty. • Limits the upper limit of the engine speed.
POSSIBLE CAUSE	• DEF pump connector or terminals malfunction • Dosing control unit connector or terminals malfunction • Deterioration in wiring harness between the following terminals: — DEF pump terminal A–Dosing control unit terminal Y — DEF pump terminal B–Dosing control unit terminal CN — DEF pump terminal D–Dosing control unit terminal I — DEF pump terminal C–Dosing control unit terminal H • Open circuit in wiring harness between the following terminals: — DEF pump terminal A–Dosing control unit terminal Y — DEF pump terminal B–Dosing control unit terminal CN • DEF pump malfunction • Dosing control unit malfunction

STEP	INSPECTION	RESULTS	ACTION
8	VERIFY DTC TROUBLESHOOTING COMPLETED • Always reconnect all disconnected connectors. • Clear the DTC from the dosing control unit memory using the M-MDS. (See CLEARING DTC [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Idle the engine for 10 s. • Retrieve the dosing control unit DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the dosing control unit. (See DOSING CONTROL UNIT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
9	VERIFY IF OTHER DTCs DISPLAYED • Are any other DTCs displayed?	Yes	Repair or replace the malfunctioning part according to the applicable DTC troubleshooting. (See DTC TABLE [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
8	VERIFY IF OTHER DTCs DISPLAYED • Are any other DTCs displayed?	Yes	Repair or replace the malfunctioning part according to the applicable DTC troubleshooting. (See DTC TABLE [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
3	**INSPECT DEF PUMP CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the DEF pump 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.
4	**INSPECT DOSING CONTROL UNIT CONNECTOR CONDITION** • Disconnect the dosing control unit 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 DEF PUMP CIRCUIT FOR SHORT TO GROUND** • Verify that the DEF pump and dosing control unit connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — DEF pump terminal A — DEF pump terminal B — DEF pump terminal D — DEF pump 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: • DEF pump terminal A—Dosing control unit terminal Y • DEF pump terminal B—Dosing control unit terminal CN • DEF pump terminal D—Dosing control unit terminal H • DEF pump terminal C—Dosing control unit terminal H **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 7.
		No	Go to the next step.
6	**INSPECT DEF PUMP** • Inspect the DEF pump. (See DEF PUMP INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the DEF pump, then go to the next step. (See DEF PUMP REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
7	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the dosing control unit memory using the M-MDS. (See CLEARING DTC [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Start the engine and leave it idling for 30 s. • Retrieve the dosing control unit DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the dosing control unit. (See DOSING CONTROL UNIT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
8	**VERIFY IF OTHER DTCs DISPLAYED** • Are any other DTCs displayed?	Yes	Repair or replace the malfunctioning part according to the applicable DTC troubleshooting. (See DTC TABLE [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.