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1985 MAZDA RX-7 (FC) OEM Service and Repair Workshop Manual

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DTC P06DE:00 [PCM (SKYACTIV-D 2.2)]

SM2896091

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DTC P06DE:00	Engine oil solenoid valve: Stuck ON
DETECTION CONDITION	• The engine oil pressure is lower than 250 kPa {2.55 kgf/cm^2, 36.3 psi} for a continuous 5 s. MONITORING CONDITIONS • When all of the following conditions are met: — Engine oil solenoid valve: close — Engine speed: Specified rotation or more according to engine oil temperature — The following DTCs are not detected: • Engine oil pressure sensor: P0522:00, P0523:00 • Engine oil temperature sensor: P0197:00, P0198:00 • Engine oil solenoid valve: P06DB:00, P06DC:00 Diagnostic support note • This is a continuous monitor (Other). • 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. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Engine oil leakage • Improper engine oil level • Engine oil solenoid valve connector or terminals malfunction • Engine oil temperature sensor/engine oil pressure sensor connector or terminals malfunction • Short to ground or open circuit in engine oil solenoid valve power supply circuit — Short to ground in wiring harness between ENGINE1 15 A fuse and engine oil solenoid valve terminal A — ENGINE1 15 A fuse malfunction — Open circuit in wiring harness between main relay terminal C and engine oil solenoid valve terminal A • Short to ground in wiring harness between the following terminals: — Engine oil solenoid valve terminal B—PCM terminal 1CH — Engine oil temperature sensor/engine oil pressure sensor terminal A—PCM terminal 1DN — Engine oil temperature sensor/engine oil pressure sensor terminal D—PCM terminal 1DM • PCM connector or terminals malfunction • Open circuit in wiring harness between the following terminals: — Engine oil solenoid valve terminal B—PCM terminal 1CH — Engine oil temperature sensor/engine oil pressure sensor terminal A—PCM terminal 1DN • Engine oil solenoid valve malfunction • Engine oil pressure sensor malfunction • Oil strainer clogging • Oil pump malfunction • PCM malfunction

STEP	INSPECTION		ACTION
8	INSPECT ENGINE OIL SOLENOID VALVE POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT • Verify that the engine oil solenoid valve and engine oil temperature sensor/engine oil pressure sensor 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 engine oil solenoid valve terminal A (wiring harness-side). • Is the voltage B+?	Yes	Go to the next step.
		No	Inspect the ENGINE1 15 A fuse. • If the fuse is blown: — Refer to the wiring diagram and verify whether or not there is a common connector between ENGINE1 15 A fuse and engine oil solenoid valve terminal A. **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. • If the fuse is normal: — Refer to the wiring diagram and verify whether or not there is a common connector between main relay terminal C and engine oil solenoid valve terminal A. **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 15.

DTC P24A0:00 [PCM (SKYACTIV-D 2.2)]

SM2896092

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Note

• To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

Details On DTCs

DESCRIPTION	**Temperature in catalytic converter during diesel particulate filter regeneration control is too low**	
DETECTION CONDITION	Determination conditions	• The exhaust gas temperature during diesel particulate filter regeneration detected by exhaust gas pressure sensor No.3 is 450 °C {842 °F} or less.
	Preconditions	• IAT (IAT sensor No.1): Above -10 °C {14 °F} or more • Barometric pressure: 72 kPa {0.73 kgf/cm^2, 10.4 psi} or more • DESOx control is not performed. • Diesel particulate filter regeneration: Auto regeneration control • Exhaust gas temperature upstream of diesel particulate filter and calculated from driving conditions: Above 0 °C {32 °F} • Post fuel injection amount of diesel particulate filter regeneration Upper limit • The following DTCs are not detected: — BARO sensor: P2227:00, P2228:00, P2229:00 — Exhaust gas temperature sensor No.1: P0545:00, P0546:00, P2080:00 — Exhaust gas temperature sensor No.2: P2031:00, P2032:00, P2033:00 — Exhaust gas temperature sensor No.3: P242B:00, P242C:00, P242D:00 — Exhaust gas pressure sensor No.1: P0471:00, P0472:00, P0473:00 — Fuel injection quantity: P1051:00, P1052:00, P1053:00, P1054:00, P1055:00, P1056:00, P1057:00, P1058:00 — Fuel pressure sensor (integrated with fuel injector): P10CB:00, P10CC:00, P10CD:00 — Fuel temperature sensor (built-into fuel injector): P10D1:00, P10D2:00, P10D3:00, P10D4:00, P10D5:00 — IAT sensor No.1: P0111:00, P0112:00, P0113:00 — MAP sensor No.2: P0106:00, P0107:00, P0108:00 — Exhaust gas pressure sensor No.2: P2453:00, P2454:00, P2455:00
	Drive cycle	• 2
	Self test type	• CMDTC self test
	Sensor used	• Exhaust gas temperature sensor No.3
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.	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.	

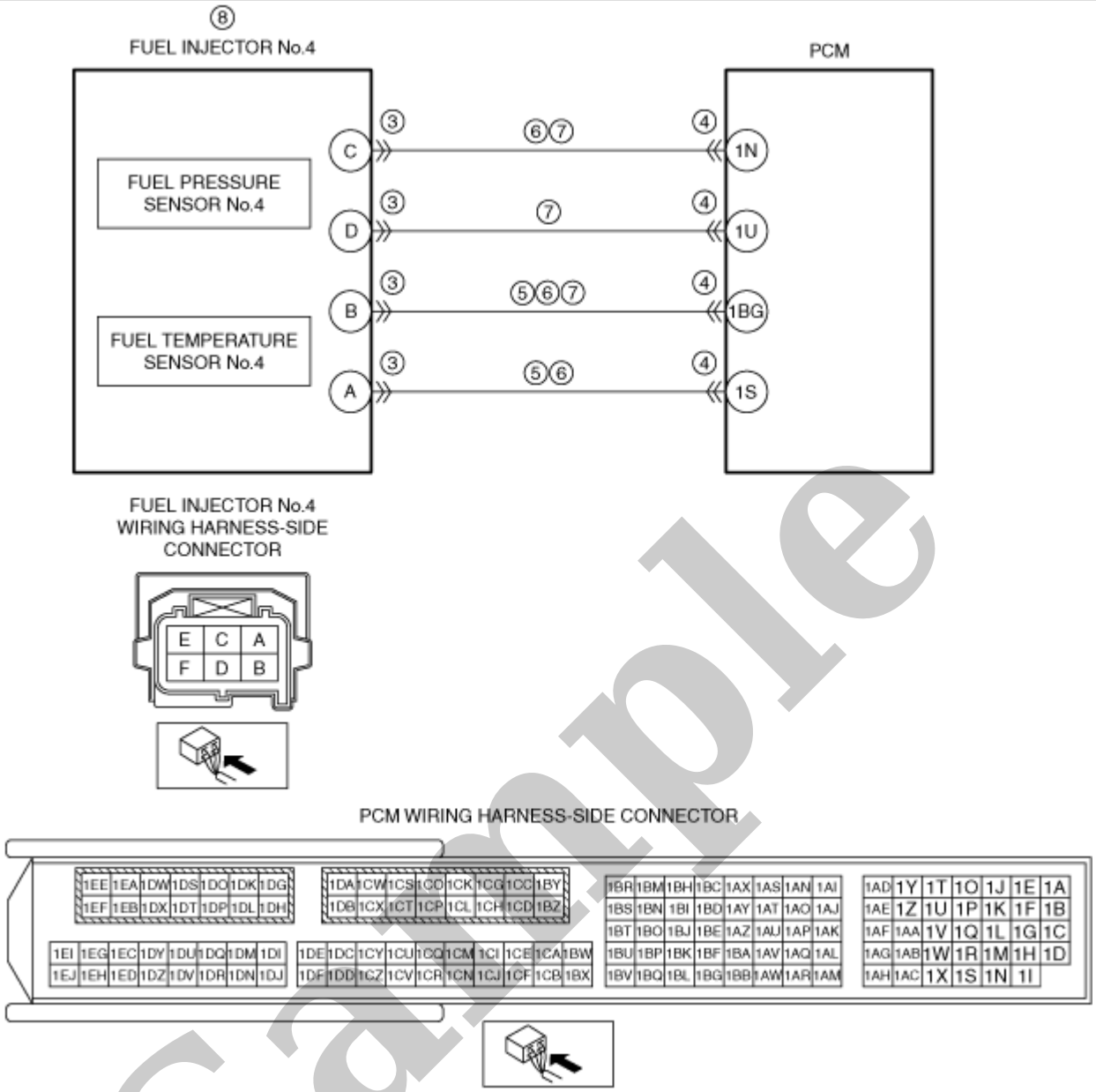
• Step 6–7

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

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: INSPECT A/F SENSOR • Inspect the A/F sensor. (See AIR FUEL RATIO (A/F) SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 4.
2	PURPOSE: INSPECT INSTALLATION OF A/F SENSOR • Inspect installation of A/F sensor. • Is the A/F sensor installed securely?	Yes	Go to the next step.
		No	Retighten the A/F sensor, then go to Step 6. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
3	PURPOSE: INSPECT EXHAUST SYSTEM FOR LEAKAGE • Visually inspect for exhaust gas leakage in the exhaust system. • Is there any leakage?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 6.
		No	Replace the A/F sensor, then go to Step 6. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
4	PURPOSE: INSPECT FUEL INJECTOR • Inspect the fuel injectors. (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the suspect fuel injector, then go to Step 6. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
5	PURPOSE: DETERMINE IF MALFUNCTION CAUSE IS DETERIORATION OF TURBOCHARGER SYSTEM OR CATALYTIC CONVERTER • Inspect the turbocharger. (See TURBOCHARGER INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the turbocharger, then go to the next step. (See TURBOCHARGER REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Replace the catalytic converter, then go to the next step. (See EXHAUST SYSTEM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
6	PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-D 2.2)].) • Implement the repeatability verification procedure. (See Repeatability Verification Procedure.) • 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.
7	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.

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 (Mode 2)/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 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 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 FUEL PRESSURE SENSOR No.4 CIRCUIT FOR OPEN CIRCUIT • Verify that the fuel injector No.4 and PCM connectors are disconnected. • Inspect for continuity between fuel injector No.4 terminal C (wiring harness-side) and PCM terminal 1N (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 fuel injector No.4 terminal C and PCM terminal 1N. 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.
6	INSPECT FUEL PRESSURE SENSOR No.4 CIRCUIT FOR SHORT TO GROUND • Verify that the fuel injector No.4 and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — Fuel injector No.4 terminal C — Fuel injector No.4 terminal B • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Fuel injector No.4 terminal C—PCM terminal 1N • Fuel injector No.4 terminal B—PCM terminal 1BG 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.

DTC P10CC:00	Fuel pressure sensor No.4 (built-into fuel injector No.4) circuit high input



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	RESULTS	ACTION
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
7	**INSPECT PCM CONNECTOR CONDITION** • Disconnect the PCM connector. • Inspect the connector engagement and connection condition, and inspect the terminals for damage, deformation, corrosion, or disconnection. • Is the connector normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 12.
8	**INSPECT FUEL PRESSURE SENSOR (INTEGRATED WITH FUEL INJECTOR NO.1)** • Inspect the fuel pressure sensor (integrated with fuel injector No.1). (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2]) • Is the fuel pressure sensor (integrated with fuel injector No.1) normal?	Yes	Go to the next step.
		No	Replace fuel injector No.1, then go to the next step. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2])
9	**INSPECT FUEL PRESSURE SENSOR (INTEGRATED WITH FUEL INJECTOR NO.2)** • Inspect the fuel pressure sensor (integrated with fuel injector No.2). (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2]) • Is the fuel pressure sensor (integrated with fuel injector No.2) normal?	Yes	Go to the next step.
		No	Replace fuel injector No.2, then go to the next step. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2])
10	**INSPECT FUEL PRESSURE SENSOR (INTEGRATED WITH FUEL INJECTOR NO.3)** • Inspect the fuel pressure sensor (integrated with fuel injector No.3). (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2]) • Is the fuel pressure sensor (integrated with fuel injector No.3) normal?	Yes	Go to the next step.
		No	Replace fuel injector No.3, then go to the next step. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2])
11	**INSPECT FUEL PRESSURE SENSOR (INTEGRATED WITH FUEL INJECTOR NO.4)** • Inspect the fuel pressure sensor (integrated with fuel injector No.4). (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2]) • Is the fuel pressure sensor (integrated with fuel injector No.4) normal?	Yes	Go to the next step.
		No	Replace fuel injector No.4, then go to the next step. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2])
12	**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)]) • 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, then go to the next step. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2])
		No	Go to the next step.
13	**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.

DTC P10D2:00 [PCM (SKYACTIV-D 2.2)]

SM2896172

id0102j538650

DTC P10D2:00	Fuel temperature sensor(integrated with fuel injector No.2) circuit range/performance problem
DETECTION CONDITION	• With all of the following conditions met, the PCM detects that the difference between the value of the fuel temperature sensor (integrated with fuel injector No.2) and the value of the fuel temperature sensor for each cylinder is 23.6 °C {74.5 °F} or more for 6 s. — Battery positive voltage: 10.5–18.0 V — The following DTCs are not detected • Fuel pressure sensor: P10C2:00, P10C3:00, P10C5:00, P10C6:00, P10C8:00, P10C9:00, P10CB:00, P10CC:00 • Fuel injector: P2696:00, P268C:00, P268D:00, P268E:00, P268F:00 • LIN communication system: U1201:00, U1202:00, U1203:00, U1204:00 **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	• Inhibits the DENOx/DESOx control.
POSSIBLE CAUSE	• Fuel injector No.2 connector or terminal malfunction • PCM connector or terminal malfunction • Fuel temperature sensor (integrated with fuel injector No.2) malfunction • 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