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1994 MAZDA RX-7 (FD) OEM Service and Repair Workshop Manual

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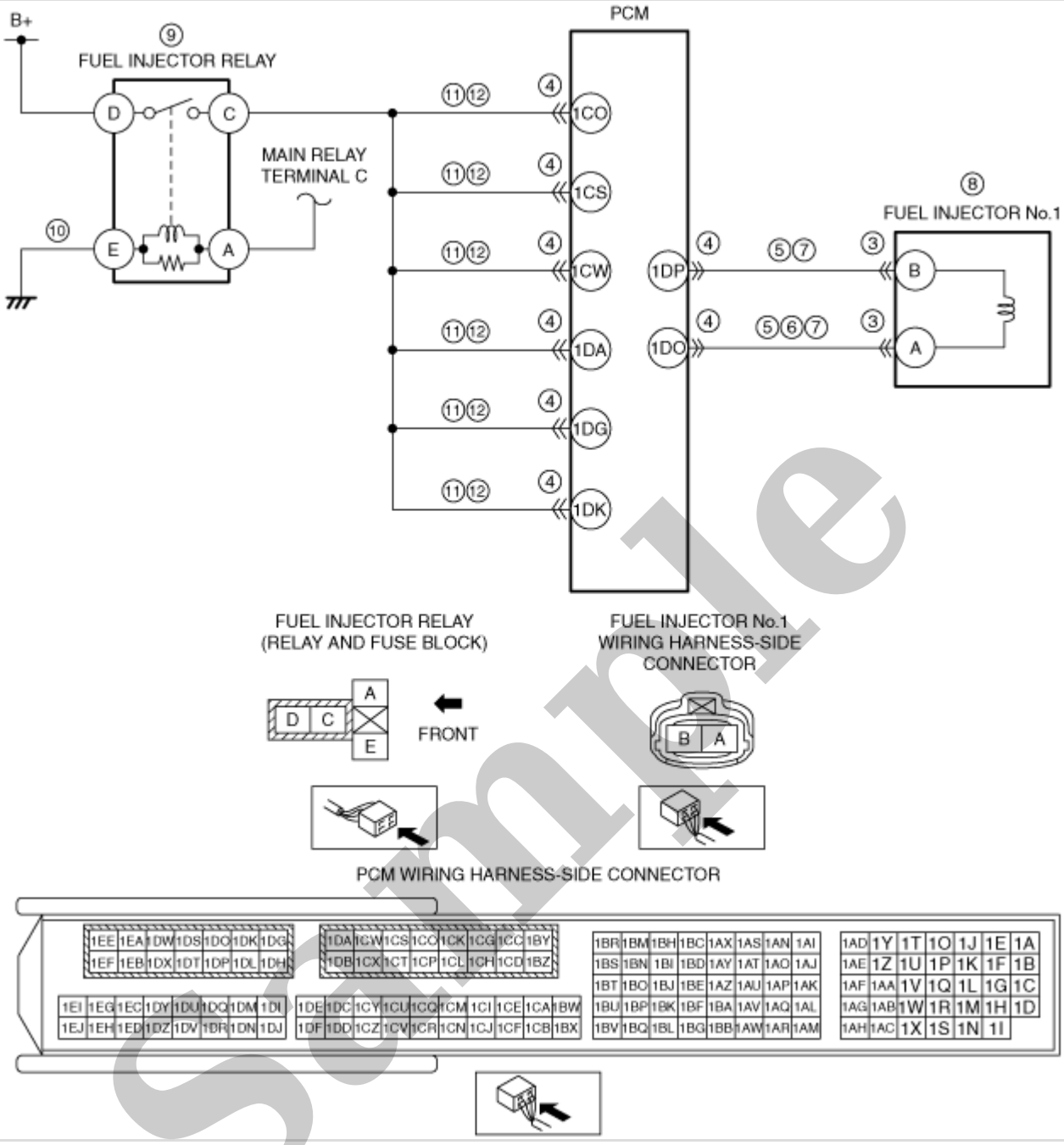
DTC P0201:00	Fuel injector circuit/open cylinder No.1



Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
10	**INSPECT FUEL INJECTOR RELAY GROUND CIRCUIT FOR OPEN CIRCUIT** • Verify that fuel injector relay is removed. • Verify that the fuel injector No.1 and PCM connectors are disconnected. • Inspect for continuity between fuel injector relay terminal E (wiring harness-side) and body ground. • 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 relay terminal E and body ground. **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:** • Inspect for the following: — Open circuit between fuel injector relay and body ground — Loose or lifting ground point • Repair or replace the malfunctioning part. Go to Step 13.
11	**INSPECT FUEL INJECTOR RELAY CIRCUIT FOR SHORT TO GROUND** • Verify that fuel injector relay is removed. • Verify that the fuel injector No.1 and PCM connectors are disconnected. • Inspect for continuity between fuel injector relay terminal C (wiring harness-side) and body ground. • 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 relay terminal C—PCM terminal 1CO • Fuel injector relay terminal C—PCM terminal 1CS • Fuel injector relay terminal C—PCM terminal 1CW • Fuel injector relay terminal C—PCM terminal 1DA • Fuel injector relay terminal C—PCM terminal 1DG • Fuel injector relay terminal C—PCM terminal 1DK **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 13.
		No	Go to the next step.

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	**RECORD FREEZE FRAME DATA/SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS 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 and DIAGNOSTIC MONITORING TEST RESULTS (A/F sensor heater, HO2S heater related) 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 A/F SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the A/F 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 9.
		No	Go to the next step.

DTC P0101:00 [PCM (SKYACTIV-G 2.5T)]

SM2896530

id0102s870080

DTC P0101:00	MAF sensor circuit range/performance problem
DETECTION CONDITION	• The difference between the intake air amount measured by the MAF sensor and the estimated intake air amount estimated by the MAP sensor is outside of the specified value. 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	• MAP sensor/IAT sensor No.2 connector or terminals malfunction • MAF sensor/IAT sensor No.1 connector or terminals malfunction • MAP sensor/IAT sensor No.2 loose • MAF sensor/IAT sensor No.1 loose • PCM connector or terminals malfunction • MAP sensor malfunction • MAF sensor malfunction • Air leakage from intake-air system • EGR control valve malfunction (stuck open) • Purge solenoid valve malfunction • PCV valve malfunction • A non-genuine air cleaner or air cleaner cover installed • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Caution

• Verify the malfunction symptom according to not only the PID value but also the symptom troubleshooting.

Related PIDs

Item (definition)	Unit/Condition	Definition	Condition/Specification (Reference)
ECT	°C, °F	Engine coolant temperature input from ECT sensor	• Displays ECT
	V	ECT sensor voltage	Ignition switched ON (engine off) • ECT is 29 °C {84 °F}: Approx. 2.65 V Idle (after warm up) • ECT is 88 °C {190 °F}: Approx. 0.71 V
MAF	g/Sec	Mass air flow input from MAF sensor	• Displays MAF
	V	MAF sensor voltage	• Ignition switched ON (engine off) (MAF: 0.65 g/s {0.086 lb/min}): Approx. 0.72 V • Idle (after warm up) (MAF: 2.78 g/s {0.368 lb/min}): Approx. 0.86 V • Racing (engine speed is 2,000 rpm) (MAF: 7.74 g/s {1.02 lb/min}): Approx. 1.14 V

STEP	INSPECTION	RESULTS	ACTION
8	**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 15.
		No	Go to the next step.
9	**INSPECT MAP SENSOR** • Reconnect all disconnected connectors. • Inspect the MAP sensor. (See MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the MAP sensor/IAT sensor No.2, then go to Step 15. (See MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/INTAKE AIR TEMPERATURE (IAT) SENSOR NO.2 REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.
10	**INSPECT MAF SENSOR** • Inspect the MAF sensor. (See MASS AIR FLOW (MAF) SENSOR INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the MAF sensor/IAT sensor No.1, then go to Step 15. (See MASS AIR FLOW (MAF) SENSOR/INTAKE AIR TEMPERATURE (IAT) SENSOR NO.1 REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.
11	**INSPECT INTAKE-AIR SYSTEM FOR AIR LEAKAGE** • Inspect for leakage in intake-air system. • Is there any leakage?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 15.
		No	Go to the next step.
12	**INSPECT EGR VALVE CONTROL SYSTEM OPERATION** • Perform the EGR valve operation inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 15.
		No	Go to the next step.
13	**INSPECT PURGE SOLENOID VALVE** • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 15. (See PURGE SOLENOID VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.
14	**INSPECT PCV VALVE OPERATION** • Inspect the PCV valve operation. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the PCV valve, then go to the next step. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Replace with a genuine air cleaner or air cleaner cover if a non-genuine part is installed. Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
1	**RECORD FREEZE FRAME DATA/SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS 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 and DIAGNOSTIC MONITORING TEST RESULTS (A/F sensor heater, HO2S heater related) 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 A/F SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the A/F 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.
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 7.
		No	Go to the next step.
5	**INSPECT A/F SENSOR HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the A/F sensor and PCM 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 A/F sensor terminal E (wiring harness-side). • Is the voltage 0 V?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between A/F sensor terminal E and PCM terminal 1BY. **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 power supply. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to power supply. Go to Step 7.
6	**INSPECT A/F SENSOR HEATER** • Inspect the A/F sensor heater. (See AIR FUEL RATIO (A/F) SENSOR INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the A/F sensor, then go to the next step. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	**RECORD FREEZE FRAME DATA/SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS 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 and DIAGNOSTIC MONITORING TEST RESULTS (A/F sensor heater, HO2S heater related) 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 HO2S CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the HO2S 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.

DTC P0038:00 [PCM (SKYACTIV-G 2.5T)]

SM2896529

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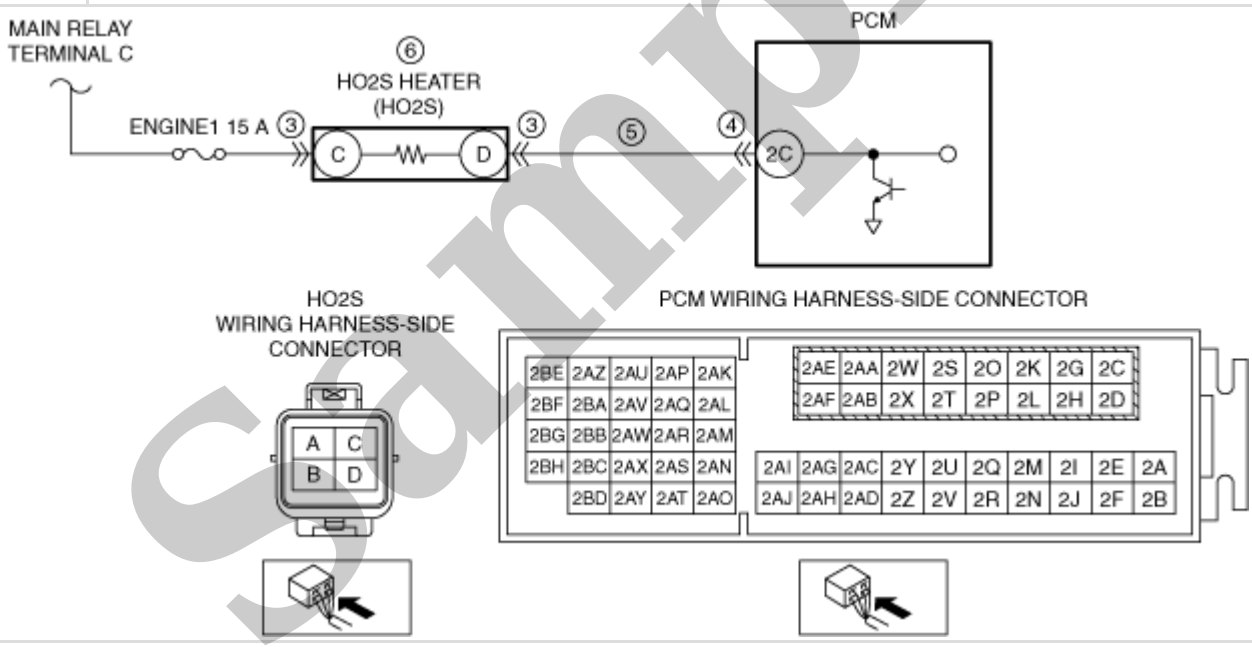
DTC P0038:00	HO2S heater control circuit high input
DETECTION CONDITION	• When the PCM controls the HO2S heater, the voltage input to the PCM is too high. Diagnostic support note • This is a continuous monitor (A/F sensor heater, HO2S heater). • The check engine light illuminates if the PCM detects the 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	• Stops fuel feedback control
POSSIBLE CAUSE	• HO2S connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between HO2S terminal D and PCM terminal 2C • HO2S heater malfunction • PCM malfunction



Diagnostic Procedure

DTC P0203:00 [PCM (SKYACTIV-G 2.5T)]

SM2896454

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DTC P0203:00	Fuel injector circuit/open cylinder No.3
DETECTION CONDITION	• If the fuel injection verification signal is not input at 25 times continuously even though the PCM drives the fuel injector No.3, the PCM determines that there is an open circuit in the fuel injector No.3 control circuit. MONITORING CONDITIONS — The following conditions are met: • Battery voltage: 10.5 V or more • Fuel injection control: except during fuel cut 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	• Not applicable
POSSIBLE CAUSE	• Fuel injector No.3 connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — Fuel injector No.3 terminal B—PCM terminal 1EB — Fuel injector No.3 terminal A—PCM terminal 1EA • Short to power supply in wiring harness between fuel injector No.3 terminal A and PCM terminal 1EA • Open circuit in wiring harness between the following terminals: — Fuel injector No.3 terminal B—PCM terminal 1EB — Fuel injector No.3 terminal A—PCM terminal 1EA • Fuel injector No.3 malfunction • Fuel injector relay malfunction • Open circuit in wiring harness between fuel injector relay terminal E and body ground • Short to ground in wiring harness between the following terminals: — Fuel injector relay terminal C—PCM terminal 1CO — Fuel injector relay terminal C—PCM terminal 1CS — Fuel injector relay terminal C—PCM terminal 1CW — Fuel injector relay terminal C—PCM terminal 1DA — Fuel injector relay terminal C—PCM terminal 1DG — Fuel injector relay terminal C—PCM terminal 1DK • Open circuit in wiring harness between the following terminals: — Fuel injector relay terminal C—PCM terminal 1CO — Fuel injector relay terminal C—PCM terminal 1CS — Fuel injector relay terminal C—PCM terminal 1CW — Fuel injector relay terminal C—PCM terminal 1DA — Fuel injector relay terminal C—PCM terminal 1DG — Fuel injector relay terminal C—PCM terminal 1DK • PCM malfunction