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1987 MAZDA RX-7 (FC) OEM Service and Repair Workshop Manual

Go to manual page

DTC P062A:00 [PCM (SKYACTIV-D 2.2)]

SM2896182

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DTC P062A:00	Suction control valve circuit problem
DETECTION CONDITION	• Any of following conditions occurs: — With the following conditions met, a condition has continued for 3.2 s in which the suction control valve control current is 1.0 A or less and the control voltage is more than the specified value. MONITORING CONDITIONS • Battery voltage: 8 V or more — With the following conditions met, a condition has continued for 3.2 s in which the suction control valve control voltage is the below specified value and the control current is above 1.0 A. MONITORING CONDITIONS • Battery voltage: 8 V or more 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	• Limits the engine torque or the upper limit of the engine speed. • 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	• Suction control valve connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — Suction control valve terminal A—PCM terminal 1CC — Suction control valve terminal B—PCM terminal 1BY • Short to power supply in wiring harness between the following terminals: — Suction control valve terminal A—PCM terminal 1CC — Suction control valve terminal B—PCM terminal 1BY • Suction control valve circuits are shorted to each other • Open circuit in wiring harness between the following terminals: — Suction control valve terminal A—PCM terminal 1CC — Suction control valve terminal B—PCM terminal 1BY • Suction control valve malfunction • PCM malfunction

STEP	INSPECTION		ACTION
7	**INSPECT SUCTION CONTROL VALVE CIRCUIT FOR SHORT TO EACH OTHER** • Verify that the suction control valve and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between suction control valve terminals A 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: • Suction control valve terminal A—PCM terminal 1CC • Suction control valve terminal B—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 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 10.
		No	Go to the next step.
8	**INSPECT SUCTION CONTROL VALVE CIRCUIT FOR OPEN CIRCUIT** • Verify that the suction control valve and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Suction control valve terminal A—PCM terminal 1CC — Suction control valve terminal B—PCM terminal 1BY • 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: • Suction control valve terminal A—PCM terminal 1CC • Suction control valve terminal B—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 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 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 the next step. (See SUCTION CONTROL VALVE 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 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.

STEP	INSPECTION		ACTION
1	PURPOSE: 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.
2	PURPOSE: IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is the DTC P026A:00 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure for DTC on FREEZE FRAME DATA. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
3	PURPOSE: 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.
4	PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY OTHER RELATED DTCs OCCURRING • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is the other PENDING CODE/DTC also present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
5	PURPOSE: VERIFY IF THERE IS PID ITEM CAUSING DRASTIC CHANGES OF ACCELERATION FLUCTUATION BY INPUT SIGNAL TO PCM • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) — CACT12 — IAT — IAT13 • Is there any signal that is far out of specification?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure to perform the procedure from Step 1.
6	PURPOSE: VERIFY CONNECTOR CONNECTIONS • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) — CACT12 — IAT — IAT13 • When the following parts are shaken, does the PID value include a PID item which has changed? — Boost air temperature sensor — IAT sensor No.1 — IAT sensor No.3 — PCM	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 4.
		No	Go to the troubleshooting procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

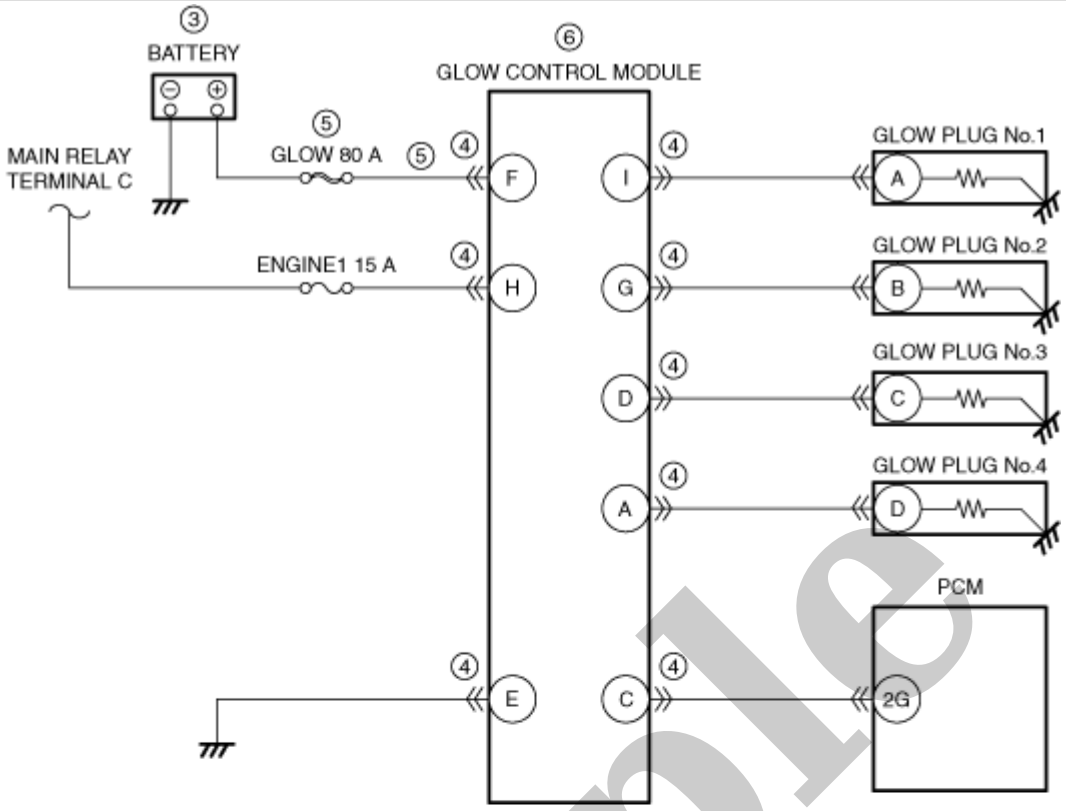
Intention of troubleshooting procedure

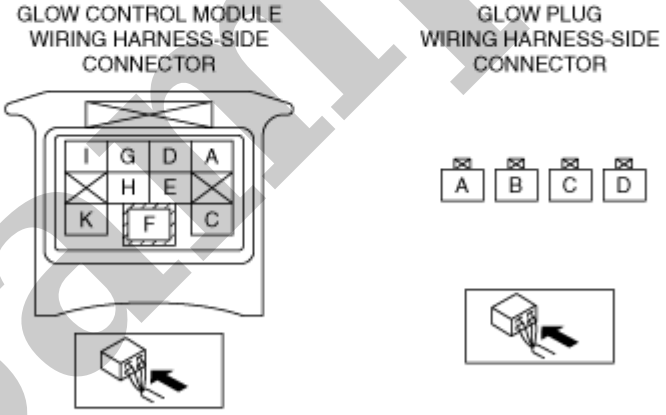
• Step 1

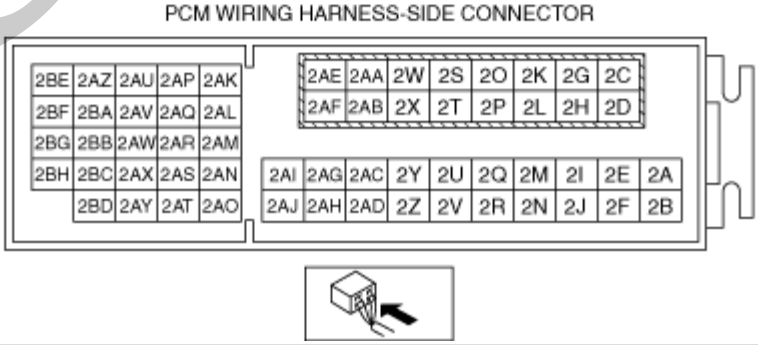
— Verify whether malfunction is related wiring harness or other

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.
3	**INSPECT REGULATING SOLENOID VALVE CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the regulating solenoid valve 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 REGULATING SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the regulating solenoid valve 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 regulating solenoid valve terminal B (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 regulating solenoid valve terminal B and PCM terminal 1CP. **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 REGULATING SOLENOID VALVE** • Inspect the regulating solenoid valve. (See REGULATING SOLENOID VALVE INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the regulating solenoid valve, then go to the next step. (See REGULATING SOLENOID VALVE REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.

DTC P052F:00	Glow control module system voltage problem







Diagnostic Procedure

STEP	INSPECTION		ACTION
8	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 EXHAUST GAS TEMPERATURE SENSOR No.5 CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the exhaust gas temperature sensor No.5 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, ther go to Step 8.
		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, ther go to Step 8.
		No	Go to the next step.
5	**INSPECT EXHAUST GAS TEMPERATURE SENSOR No.5 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the exhaust gas temperature sensor No.5 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 exhaust gas temperature sensor No.5 terminal A (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 exhaust gas temperature sensor No.5 terminal A and PCM termina 1DQ. **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 8.
6	**INSPECT EXHAUST GAS TEMPERATURE SENSOR No.5 CIRCUIT FOR OPEN CIRCUIT** • Verify that the exhaust gas temperature sensor No.5 and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between the following terminals (wiring harness-side): — Exhaust gas temperature sensor No.5 terminal A–PCM terminal 1DQ — Exhaust gas temperature sensor No.5 terminal B–PCM terminal 1DZ • 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: • Exhaust gas temperature sensor No.5 terminal A–PCM terminal 1DQ • Exhaust gas temperature sensor No.5 terminal B–PCM terminal 1DZ **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 8.
7	**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.

DTC P2483:00	Exhaust gas temperature sensor No.5 circuit range/performance problem
DETECTION CONDITION	• The PCM detects the following condition A or B. **Condition A:** • When the PCM detects that the difference in temperature of all of the following exceeds 44.4 °C {112 °F}: — Difference between temperatures detected by exhaust gas temperature sensors No.1 and No.5 — Difference between temperatures detected by exhaust gas temperature sensors No.2 and No.5 — Difference between temperatures detected by exhaust gas temperature sensors No.3 and No.5 — Difference between temperatures detected by exhaust gas temperature sensors No.4 and No.5 **MONITORING CONDITIONS** • When all of the following conditions are met: — Soak time: 360 min or more — Battery voltage: 8 V or more — Ignition switched ON (engine off or on) — Vehicle is not equipped with engine block heater (determined based on changed in engine coolant temperature) — The following DTCs are not detected: • ECT sensor No.1: P0116:00, P0117:00, P0118:00, P011A:00 • Exhaust gas temperature sensor No.1: P0545:00, P0546:00 • Exhaust gas temperature sensor No.2: P2032:00, P2033:00 • Exhaust gas temperature sensor No.3: P242C:00, P242D:00 • Exhaust gas temperature sensor No.4: P2470:00, P2471:00 • Exhaust gas temperature sensor No.5: P2481:00, P2482:00 **Condition B:** • Maximum exhaust gas temperature detected by exhaust gas temperature sensor No.5 is less than 170 °C {338 °F} for a continuous 0.1 s. **MONITORING CONDITIONS** • When all of the following conditions are met: — Soak time: 360 min or more — Less than 192 s after any one of the following conditions is met • Engine stalls after engine start • Fuel cut with engine speed of 700 rpm or more — Accumulated fuel injection amount for diesel particulate filter regeneration control: 0 mm^3/st — Automatic diesel particulate filter regeneration control: Stopped — Accumulated fuel injection amount from ignition switched ON: 10 mm^3/st–9600000 mm^3/st — Time from engine start: Less than 60 minutes — Intake air temperature: -10 °C {14 °F} or more — Battery voltage: 8 V or more — Vehicle is not equipped with engine block heater (determined based on changed in engine coolant temperature) — Exhaust gas temperature detected by exhaust gas temperature sensor No.4 increases to above 150 °C {302 °F} from 150 °C {302 °F} or less — The following DTCs are not detected: • Exhaust gas temperature sensor No.4: P2470:00, P2471:00 • Exhaust gas temperature sensor No.5: P2481:00, P2482:00 • ECT sensor No.1: P0116:00, P0117:00, P0118:00, P011A:00 • IAT sensor No.1: P0111:00, P0112:00, P0113:00 **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

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	INSPECT EXHAUST GAS TEMPERATURE SENSOR CONNECTOR CONDITION • Switch the ignition off. • Disconnect the exhaust gas temperature sensor No.1/exhaust gas temperature sensor No.2/exhaust gas temperature sensor No.3/exhaust gas temperature sensor No.4/exhaust gas temperature sensor No.5 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.