2012 - Mazda6 - Engine

DTC P0053:00, P0059:00 [MZI 3.7 V6]

DTC P0053:00 DTC P0059:00	P0053:00: A/F sensor (RH) heater resistance P0059:00: A/F sensor (LH) heater resistance
DETECTION CONDITION	• P0053:00 indicates A/F sensor (RH) heater resistance. • P0059:00 indicates A/F sensor (LH) heater resistance. • Heater current requirements too low or high in the A/F sensor heater control circuit.
POSSIBLE CAUSE	• Open circuit between A/F sensor terminal C and main relay terminal D • Damaged ENGINE fuse • Short to ground between A/F sensor (RH/LH) terminal C and ENGINE fuse • DTC P0053:00: Open circuit between A/F sensor (RH) terminal E and PCM terminal 2J • DTC P0059:00: Open circuit between A/F sensor (LH) terminal E and PCM terminal 2E • DTC P0053:00: Short to ground circuit between A/F sensor (RH) terminal E and PCM terminal 2J • DTC P0059:00: Short to ground circuit between A/F sensor (LH) terminal E and PCM terminal 2E • A/F sensor heater circuits are shorted to each other • A/F sensor heater malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the

	recorded?		repair order, then 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 Service Bulletins available?	Yes	Perform repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FOR POWER SUPPLY IN WIRING HARNESS** • Switch the ignition to off. • Disconnect the A/F sensor connector. • Switch the ignition to ON (Engine off). • Measure the voltage between suspect A/F sensor wiring harness-side connector terminal C and ground. • Is the voltage greater than 10 V?	Yes	Switch the ignition to off. Go to the next step.
		No	Inspect the ENGINE fuse. • If there is fuse deterioration, replace the fuse. • If the fuse has melted, repair for short to ground and replace the fuse. • If the fuse is normal, repair an open circuit. Go to Step 9.
4	**INSPECT A/ F SENSOR HEATER CIRCUIT FOR OPEN CIRCUIT IN WIRING HARNESS** • A/F sensor connector disconnected. • Disconnect the PCM connector. • For DTC P0053:00: Measure the resistance between A/F sensor (RH) wiring harness-side connector terminal E and PCM harness-side connector terminal 2J • For DTC P0059:00: Measure the resistance between A/F sensor (LH) wiring harness-side connector terminal E and PCM harness-side connector terminal 2E • Is the resistance less than 5 ohm?	Yes	Go to the next step.
		No	Repair for an open circuit, then go to Step 9.
5	**INSPECT A/ F SENSOR HEATER CIRCUIT FOR SHORT CIRCUIT TO GROUND**	Yes	Go to the next step.

	• A/F sensor and PCM connectors are disconnected. • Measure the resistance between suspect A/F sensor wiring harness-side connector terminal E and ground • Is the resistance greater than 10 kilohms?	No	Repair a short to the ground circuit, then go to Step 9.
6	**INSPECT A/F SENSOR HEATER CIRCUIT FOR SHORT CIRCUIT IN WIRING HARNESS** • A/F sensor and PCM connectors are disconnected. • Measure the resistance between suspect A/F sensor wiring harness-side connector terminal E and the following terminals: ▪ A/F sensor wiring harness-side connector terminal D ▪ A/F sensor wiring harness-side connector terminal C ▪ A/F sensor wiring harness-side connector terminal F ▪ A/F sensor wiring harness-side connector terminal H ▪ A/F sensor wiring harness-side connector terminal G • Is the resistance greater than 10 kilohms?	Yes	Go to the next step.
		No	Repair for a short circuit, then go to Step 9.
7	**INSPECT A/F SENSOR INTERNAL RESISTANCE OF A/F SENSOR HEATER** • A/F sensor and PCM connectors are disconnected. • Measure the resistance between suspect A/F sensor connector terminal C and E on the component side. • Is the resistance between 1—10 ohms?	Yes	Go to the next step.
		No	Replace the suspect A/F sensor. (See **AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [MZI 3.7 V6]**.) Go to Step 9.

8	**INSPECT A/F SENSOR HEATER CIRCUIT FOR INTERNAL SHORT CIRCUIT TO GROUND** • A/F sensor and PCM connectors are disconnected. • Measure the resistance between suspect A/F sensor component side connector terminal E and ground. • Is the resistance greater than 10 kilohms?	Yes	Go to the next step. (The system is operating normally at this time. The concern may have been caused by a loose or corroded connector.)
		No	Replace the suspect A/F sensor. (See **AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [MZI 3.7 V6]**.) Go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0053:00, P0059:00 HAS BEEN COMPLETED** • Verify that all disconnected connectors are reconnected. • Switch the ignition to ON (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See **KOEO/KOER SELF TEST [MZI 3.7 V6]**.) • 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 [MZI 3.7 V6]**.) 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 [MZI 3.7 V6]**.) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZI 3.7 V6]**.)
		No	Troubleshooting completed.

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2012 - Mazda6 - Engine

DTC P0053:00, P0059:00 [MZI 3.7 V6]

DTC P0053:00 DTC P0059:00	P0053:00: A/F sensor (RH) heater resistance P0059:00: A/F sensor (LH) heater resistance
DETECTION CONDITION	• P0053:00 indicates A/F sensor (RH) heater resistance. • P0059:00 indicates A/F sensor (LH) heater resistance. • Heater current requirements too low or high in the A/F sensor heater control circuit.
POSSIBLE CAUSE	• Open circuit between A/F sensor terminal C and main relay terminal D • Damaged ENGINE fuse • Short to ground between A/F sensor (RH/LH) terminal C and ENGINE fuse • DTC P0053:00: Open circuit between A/F sensor (RH) terminal E and PCM terminal 2J • DTC P0059:00: Open circuit between A/F sensor (LH) terminal E and PCM terminal 2E • DTC P0053:00: Short to ground circuit between A/F sensor (RH) terminal E and PCM terminal 2J • DTC P0059:00: Short to ground circuit between A/F sensor (LH) terminal E and PCM terminal 2E • A/F sensor heater circuits are shorted to each other • A/F sensor heater malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the

	recorded?		repair order, then 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 Service Bulletins available?	Yes	Perform repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FOR POWER SUPPLY IN WIRING HARNESS** • Switch the ignition to off. • Disconnect the A/F sensor connector. • Switch the ignition to ON (Engine off). • Measure the voltage between suspect A/F sensor wiring harness-side connector terminal C and ground. • Is the voltage greater than 10 V?	Yes	Switch the ignition to off. Go to the next step.
		No	Inspect the ENGINE fuse. • If there is fuse deterioration, replace the fuse. • If the fuse has melted, repair for short to ground and replace the fuse. • If the fuse is normal, repair an open circuit. Go to Step 9.
4	**INSPECT A/ F SENSOR HEATER CIRCUIT FOR OPEN CIRCUIT IN WIRING HARNESS** • A/F sensor connector disconnected. • Disconnect the PCM connector. • For DTC P0053:00: Measure the resistance between A/F sensor (RH) wiring harness-side connector terminal E and PCM harness-side connector terminal 2J • For DTC P0059:00: Measure the resistance between A/F sensor (LH) wiring harness-side connector terminal E and PCM harness-side connector terminal 2E • Is the resistance less than 5 ohm?	Yes	Go to the next step.
		No	Repair for an open circuit, then go to Step 9.
5	**INSPECT A/ F SENSOR HEATER CIRCUIT FOR SHORT CIRCUIT TO GROUND**	Yes	Go to the next step.

	• A/F sensor and PCM connectors are disconnected. • Measure the resistance between suspect A/F sensor wiring harness-side connector terminal E and ground • Is the resistance greater than 10 kilohms?	No	Repair a short to the ground circuit, then go to Step 9.
6	**INSPECT A/F SENSOR HEATER CIRCUIT FOR SHORT CIRCUIT IN WIRING HARNESS** • A/F sensor and PCM connectors are disconnected. • Measure the resistance between suspect A/F sensor wiring harness-side connector terminal E and the following terminals: ▪ A/F sensor wiring harness-side connector terminal D ▪ A/F sensor wiring harness-side connector terminal C ▪ A/F sensor wiring harness-side connector terminal F ▪ A/F sensor wiring harness-side connector terminal H ▪ A/F sensor wiring harness-side connector terminal G • Is the resistance greater than 10 kilohms?	Yes	Go to the next step.
		No	Repair for a short circuit, then go to Step 9.
7	**INSPECT A/F SENSOR INTERNAL RESISTANCE OF A/F SENSOR HEATER** • A/F sensor and PCM connectors are disconnected. • Measure the resistance between suspect A/F sensor connector terminal C and E on the component side. • Is the resistance between 1—10 ohms?	Yes	Go to the next step.
		No	Replace the suspect A/F sensor. (See **AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [MZI 3.7 V6]**.) Go to Step 9.

8	**INSPECT A/F SENSOR HEATER CIRCUIT FOR INTERNAL SHORT CIRCUIT TO GROUND** • A/F sensor and PCM connectors are disconnected. • Measure the resistance between suspect A/F sensor component side connector terminal E and ground. • Is the resistance greater than 10 kilohms?	Yes	Go to the next step. (The system is operating normally at this time. The concern may have been caused by a loose or corroded connector.)
		No	Replace the suspect A/F sensor. (See **AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [MZI 3.7 V6]**.) Go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0053:00, P0059:00 HAS BEEN COMPLETED** • Verify that all disconnected connectors are reconnected. • Switch the ignition to ON (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See **KOEO/KOER SELF TEST [MZI 3.7 V6]**.) • 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 [MZI 3.7 V6]**.) 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 [MZI 3.7 V6]**.) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZI 3.7 V6]**.)
		No	Troubleshooting completed.

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