

2012 - Mazda6 - Engine

DTC P0139:00 [MZR 2.5]

DTC P0139:00	HO2S circuit slow response
DETECTION CONDITION	- The PCM monitors the rich (0.55 V) to lean (0.3 V) response time of the HO2S. The PCM measures the response time when the following conditions are met. The PCM determines a HO2S response deterioration malfunction when the measured response time is more than 120 ms for 2 of 3 times. MONITORING CONDITIONS - EGR System, A/F sensor heater, HO2S heater, A/F sensor, HO2S and TWC Repair Verification Drive Mode - Following conditions are met: - During deceleration fuel cut - Estimated temperature of the zirconia element inside the HO2S: above 450 °C { 842 °F} - The PCM monitors for a time-out malfunction (when HO2S remains above 0.2 V for longer than a specified period of time during fuel cut control). The PCM measures the amount of time from when the following conditions are met until the HO2S output voltage drops below 0.2 V. The PCM determines a HO2S time-out malfunction when the detected time is more than 4 s for 2 of 3 times. MONITORING CONDITIONS - EGR System, A/F sensor heater, HO2S heater, A/F sensor, HO2S and TWC Repair Verification Drive Mode - Following conditions are met: - During deceleration fuel cut - Estimated temperature of the zirconia element inside the HO2S: above 450 °C { 842 °F} Diagnostic support note - This is an intermittent monitor (A/F sensor, HO2S). - The MIL 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 the first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• HO2S loose • Exhaust system leakage • Purge solenoid valve malfunction • Fuel supply system malfunction or improper fuel line pressure ▪ Fuel leakage on fuel line from fuel distributor and fuel pump ▪ Clogged or restricted fuel filter ▪ Pressure regulator malfunction ▪ Fuel pump malfunction • Engine malfunction ▪ Insufficient engine compression ▪ Engine coolant leakage • HO2S malfunction ▪ HO2S deterioration • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA (MODE 2) • Is the DTC P0139:00 on FREEZE FRAME DATA (Mode 2)?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA (Mode 2). (See DTC TABLE [MZR 2.5] .)
2	VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED • Have the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (A/F sensor, HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

3	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.
4	VERIFY RELATED PENDING AND STORED DTC - Switch the ignition to off, then to ON (engine off). - Verify pending and stored DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) - Is the DTC P0443:00 also present?	Yes	Go to the applicable DTC inspection. (See DTC P0443:00 [MZR 2.5] .)
		No	Go to the next step.
5	INSPECT INSTALLATION OF HO2S - Inspect if the HO2S is loosely installed. - Is the HO2S installed securely?	Yes	Go to the next step.
		No	Retighten the HO2S, then go to Step 17. (See HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION [MZR 2.5] .)
6	INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM - Visually inspect if there is any gas leakage is found between the exhaust manifold and HO2S. - Is there gas leakage?	Yes	Repair or replace the malfunctioning part according to the inspection result, then go to Step 17.
		No	Go to the next step.
7	INSPECT PURGE SOLENOID VALVE - Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 17. (See PURGE SOLENOID VALVE REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.
8	INSPECT LONG TERM FUEL TRIM - Access the LONGFT1 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) - Compare the LONGFT1 PID with recorded FREEZE FRAME DATA	Yes	Engine is driven under rich condition: Go to the next step.
		No	Engine is driven under lean condition: Go to Step 11.

	(Mode 2) at Step 2. Is the LONGFT1 PID below FREEZE FRAME DATA (Mode 2)?		
9	INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE) - Switch the ignition to off. - Inspect the fuel line pressure while the engine running. (See FUEL LINE PRESSURE INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes Go to the next step. No Go to Step 14.	
10	INSPECT FUEL PUMP - Inspect the fuel pump maximum pressure and fuel return pipe for clogging. (See FUEL PUMP UNIT INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes Repair or replace the malfunctioning part according to the inspection result, then go to Step 17. No Replace the fuel pump unit, then go to Step 17. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZR 2.5].)	
11	INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE) - Switch the ignition to off. - Inspect the fuel line pressure while the engine running. (See FUEL LINE PRESSURE INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes Go to the next step. No Go to Step 14.	
12	INSPECT FUEL LINE LEAKAGE - Visually inspect the leakage from the fuel pump to fuel distributor. - Is there any leakage?	Yes Repair or replace the malfunctioning part according to the inspection result, then go to Step 17. No Go to the next step.	
13	INSPECT FUEL FILTER - Visually inspect the foreign materials or stain inside fuel filter (low-pressure side). - Is there any foreign material or stain?	Yes Repair or replace the malfunctioning part according to the inspection result, then go to Step 17. No Replace the fuel pump unit, then go to Step 17. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZR 2.5].)	

14	INSPECT ENGINE COMPRESSION - Inspect the engine compression. (See COMPRESSION INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes	Perform the engine overhaul for repairs, then go to Step 17.
		No	Go to the next step.
15	INSPECT SEALING OF ENGINE COOLANT PASSAGE - Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See ENGINE COOLANT LEAKAGE INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection result, then go to Step 17.
		No	Go to the next step.
16	INSPECT HO2S - Reconnect all disconnected connectors. - Inspect the HO2S. (See HEATED OXYGEN SENSOR (HO2S) INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes	Replace the HO2S, then go to the next step. (See HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.
17	VERIFY DTC TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [MZR 2.5].) - Perform the Drive Mode 03 (EGR System, A/F sensor heater, HO2S heater, A/F sensor, HO2S and TWC Repair Verification Drive Mode). (See OBD-II DRIVE MODE [MZR 2.5].) - 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 [MZR 2.5].) Go to the next step.
		No	Go to the next step.
18	VERIFY AFTER REPAIR PROCEDURE Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [MZR 2.5].)	Yes	Go to the applicable DTC inspection. (See DTC TABLE [MZR 2.5] .)
		No	DTC troubleshooting completed.

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| | <ul style="list-style-type: none">• Are any DTCs present? | | |
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		No	Go to the next step.
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