

2012 - Mazda6 - Engine

DTC P2096:00 [MZR 2.5]

DTC P2096:00	Target A/F feedback system too lean
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is more than the specification, the PCM determines that the target A/F feedback system is too lean. Diagnostic support note • This is a continuous monitor (fuel system). • The MIL illuminates if the PCM detects the above malfunctioning 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 (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Exhaust gas leakage (between A/F sensor and HO2S) • HO2S malfunction • IAT sensor malfunction • Erratic signal to PCM ▪ ECT sensor signal malfunction ▪ MAF sensor signal malfunction ▪ TP sensor signal malfunction ▪ VSS signal malfunction • A/F sensor malfunction • Exhaust gas leakage (between exhaust manifold and A/F sensor) • Air suction in intake air system • MAF sensor malfunction • Insufficient fuel line pressure

- Leakage fuel
- Fuel pump unit malfunction
- Ignition system malfunction
 - Ignition coil related wiring harness malfunction
- Fuel injector malfunction
- Insufficient engine compression
- ECT sensor malfunction
- PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA (MODE 2) • Is the DTC P2096:00 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 HAS BEEN RECORDED • Has the FREEZE FRAME DATA (Mode 2)/snapshot data been recorded?	Yes Go to the next step.
		No Record the FREEZE FRAME DATA (Mode 2)/snapshot data 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.	Yes Go to the applicable DTC inspection. (See DTC TABLE [MZR 2.5] .)
		No Go to the next step.

	(See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) • Are any other DTCs present?		
5	VERIFY CURRENT INPUT SIGNAL STATUS OF HO2S • Inspect the HO2S. (See HEATED OXYGEN SENSOR (HO2S) INSPECTION [MZR 2.5].) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 7.
6	INSPECT EXHAUST GAS LEAKAGE • Visually inspect for the exhaust gas leakage between the A/F sensor and HO2S. • Is there any leakage?	Yes	Repair or replace the malfunctioning parts according to the inspection results, then go to Step 21.
		No	Replace the HO2S, then go to Step 21. (See HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION [MZR 2.5] .)
7	INSPECT IAT SENSOR • Inspect the IAT sensor. (See INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [MZR 2.5].) • Is there any malfunction?	Yes	Replace the IAT sensor, then go to Step 21. (See INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.
8	VERIFY CURRENT INPUT SIGNAL STATUS • Access the following PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) ▪ ECT ▪ MAF ▪ TP REL ▪ VSS • Is there any signal that is far out of specification when the	Yes	Inspect the suspected sensor and related wiring harness. Repair or replace the malfunctioning part according to the inspection results, then go to Step 21.
		No	Go to the next step.

	ignition is switched to ON and the engine runs? (See PCM INSPECTION [MZR 2.5] .)		
9	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA (MODE 2) CONDITION CAUTION: • While performing this step, always operate the vehicle in a safe and lawful manner. • When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later. • Access the following PIDs using the M-MDS under the FREEZE FRAME DATA (Mode 2) condition. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) ▪ ECT ▪ MAF ▪ TP REL ▪ VSS • Is there any signal which causes drastic changes?	Yes	Inspect the suspected sensor and related wiring harness. Repair or replace the malfunctioning part according to the inspection results, then go to Step 21.
		No	Go to the next step.
10	VERIFY CURRENT INPUT SIGNAL STATUS OF A/ F SENSOR • Inspect the A/F sensor. (See AIR FUEL RATIO (A/ F) SENSOR	Yes	Go to the next step.
		No	Go to Step 12.

	INSPECTION [MZR 2.5].) Is there any malfunction?		
11	INSPECT EXHAUST GAS LEAKAGE - Visually inspect for the exhaust gas leakage between the exhaust manifold and A/F sensor. - Is there any leakage?	Yes Repair or replace the malfunctioning parts according to the inspection results, then go to Step 21.	
		No Replace the A/F sensor, then go to Step 21. (See AIR FUEL RATIO (A/ F) SENSOR REMOVAL/ INSTALLATION [MZR 2.5].)	
12	VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR - Start the engine. - Access the MAF PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) - Verify that the MAF PID changes quickly according to engine speed. - Is the PID normal? (See PCM INSPECTION [MZR 2.5].)	Yes Go to Step 14.	
		No Go to the next step.	
13	INSPECT INTAKE AIR SYSTEM FOR EXCESSIVE AIR SUCTION - Visually inspect the hose in intake air system for looseness, cracks or damages. NOTE: - Engine speed may change when rust penetrating agent is sprayed on the air suction area. - Is there any malfunction?	Yes Repair or replace the malfunctioning parts according to the inspection results, then go to Step 21.	
		No Replace the MAF/IAT sensor, then go to Step 21. (See INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZR 2.5].)	
14	INSPECT FUEL LINE PRESSURE Switch the ignition to off.	Yes If the fuel line pressure is too low: Go to the next step.	

	NOTE: • If engine will not start, inspect fuel line pressure with ignition switches to ON. • Inspect the fuel line pressure with engine is running. (See FUEL LINE PRESSURE INSPECTION [MZR 2.5].) • Is there any malfunction?	If the fuel line pressure is too high: • Replace the fuel pump unit, then go to Step 21. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZR 2.5].)
		No Go to Step 16.
15	INSPECT FUEL SYSTEM FOR FUEL LEAKAGE • Visually inspect the fuel leakage in the fuel system. • Is there any leakage?	Yes Repair or replace the malfunctioning parts according to the inspection results, then go to Step 21. No Inspect the low-pressure side fuel filter for foreign materials or stain inside fuel filter. • If foreign materials or stain is found inside fuel filter (low-pressure side): ▪ Clean of fuel tank and filter. • If foreign materials or stain is not found: ▪ Replace the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZR 2.5].) Go to Step 21.
16	INSPECT IGNITION SYSTEM OPERATION • Perform the Spark Test. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) • Is strong blue spark visible at each cylinder?	Yes Go to Step 18. No Go to the next step.
17	INSPECT IGNITION COIL RELATED WIRING HARNESS • Inspect the ignition coil related wiring harness condition (intermittent	Yes Repair or replace the malfunctioning wiring harness, then go to Step 21. No Repair or replace the malfunctioning parts according to

	open or short) for all cylinders. Is there any malfunction?		the inspection results, then go to Step 21.
18	INSPECT FUEL INJECTOR OPERATION - Inspect the fuel injector operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes	Repair or replace the malfunctioning parts according to the inspection results, then go to Step 21.
		No	Go to the next step.
19	INSPECT ENGINE COMPRESSION - Inspect the engine compression. (See COMPRESSION INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes	Overhaul the engine for repair, then go to Step 21.
		No	Go to the next step.
20	INSPECT ECT SENSOR - Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes	Replace the ECT sensor, then go to the next step.
			(See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.
21	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].) - After warming up the engine, maintain the idle status for 1 min or more.	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.

	• Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) • Is the PENDING CODE for this DTC present?		
22	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [MZR 2.5].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [MZR 2.5] .)
		No	DTC troubleshooting completed.

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		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA (Mode 2). (See DTC TABLE [MZR 2.5] .)
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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.	Yes Go to the applicable DTC inspection. (See DTC TABLE [MZR 2.5] .)
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	(See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) Are any other DTCs present?		
5	VERIFY CURRENT INPUT SIGNAL STATUS OF HO2S - Inspect the HO2S. (See HEATED OXYGEN SENSOR (HO2S) INSPECTION [MZR 2.5].) - Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 7.
6	INSPECT EXHAUST GAS LEAKAGE - Visually inspect for the exhaust gas leakage between the A/F sensor and HO2S. - Is there any leakage?	Yes	Repair or replace the malfunctioning parts according to the inspection results, then go to Step 21.
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		No	Go to the next step.
8	VERIFY CURRENT INPUT SIGNAL STATUS - Access the following PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) - ECT - MAF - TP REL - VSS - Is there any signal that is far out of specification when the	Yes	Inspect the suspected sensor and related wiring harness. Repair or replace the malfunctioning part according to the inspection results, then go to Step 21.
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	ignition is switched to ON and the engine runs? (See PCM INSPECTION [MZR 2.5] .)		
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		No	DTC troubleshooting completed.