

2012 - Mazda6 - Engine

DTC P0421:00 [MZR 2.5]

DTC P0421:00	Warm up catalyst system efficiency below threshold
DETECTION CONDITION	• The PCM compares the number of A/F sensor and HO2S inversions for a predetermined time. The PCM monitors the HO2S inversion counts when the following conditions are met: The PCM detects inversion ratio. If the inversion ratio is below threshold, the PCM determine that catalyst system has deteriorated. ▪ The A/F sensor inversion counts is as prescribed when the following monitoring conditions are met: ▪ The accumulated occurrence time of the following monitoring conditions has exceeded the prescribed time limit: MONITORING CONDITIONS ▪ Catalyst converter temperature: more than 400 °C { 752 °F} ▪ Engine speed: 1,300—3,000 rpm (MTX), 1,200—3,000 rpm (ATX) ▪ LOAD: 16—48 % (engine speed: 2,000 rpm) Diagnostic support note • This is an intermittent monitor (catalyst). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if 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 system leakage • A/F sensor loose • HO2S loose

- TWC deterioration or malfunction
- PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	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 (catalyst 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.
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	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].) • Are any other DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [MZR 2.5] .)
		No	Go to the next step.
4	INSPECT FOR LEAKAGE FROM EXHAUST SYSTEM • Visually inspect the exhaust gas system. • Is there any leakage?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 8.
		No	Go to the next step.
5	INSPECT INSTALLATION OF A/ F SENSOR • Inspect the A/F sensor for looseness. • Is there any malfunction?	Yes	Retighten the A/F sensor, then go to Step 8. (See AIR FUEL RATIO (A/ F) SENSOR REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.

6	INSPECT INSTALLATION OF HO2S - Inspect the HO2S for looseness. - Is there any malfunction?	Yes	Retighten the HO2S, then go to Step 8. (See HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.
7	INSPECT TWC - Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [MZR 2.5].) - Switch the ignition to off, then to ON. - Inspect the TWC. - Is there any malfunction?	Yes	Replace the TWC, then go to the next step. (See EXHAUST SYSTEM REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.
8	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.
9	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.

2012 - Mazda6 - Engine

DTC P0421:00 [MZR 2.5]

DTC P0421:00	Warm up catalyst system efficiency below threshold
DETECTION CONDITION	• The PCM compares the number of A/F sensor and HO2S inversions for a predetermined time. The PCM monitors the HO2S inversion counts when the following conditions are met: The PCM detects inversion ratio. If the inversion ratio is below threshold, the PCM determine that catalyst system has deteriorated. ▪ The A/F sensor inversion counts is as prescribed when the following monitoring conditions are met: ▪ The accumulated occurrence time of the following monitoring conditions has exceeded the prescribed time limit: MONITORING CONDITIONS ▪ Catalyst converter temperature: more than 400 °C { 752 °F} ▪ Engine speed: 1,300—3,000 rpm (MTX), 1,200—3,000 rpm (ATX) ▪ LOAD: 16—48 % (engine speed: 2,000 rpm) Diagnostic support note • This is an intermittent monitor (catalyst). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if 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 system leakage • A/F sensor loose • HO2S loose

- TWC deterioration or malfunction
- PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	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 (catalyst 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.
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	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].) • Are any other DTCs present?	Yes Go to the applicable DTC inspection. (See DTC TABLE [MZR 2.5] .)
		No Go to the next step.
4	INSPECT FOR LEAKAGE FROM EXHAUST SYSTEM • Visually inspect the exhaust gas system. • Is there any leakage?	Yes Repair or replace the malfunctioning part according to the inspection results, then go to Step 8.
		No Go to the next step.
5	INSPECT INSTALLATION OF A/ F SENSOR • Inspect the A/F sensor for looseness. • Is there any malfunction?	Yes Retighten the A/F sensor, then go to Step 8. (See AIR FUEL RATIO (A/ F) SENSOR REMOVAL/ INSTALLATION [MZR 2.5] .)
		No Go to the next step.

6	INSPECT INSTALLATION OF HO2S - Inspect the HO2S for looseness. - Is there any malfunction?		Yes Retighten the HO2S, then go to Step 8. (See HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION [MZR 2.5] .)
7	INSPECT TWC - Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [MZR 2.5].) - Switch the ignition to off, then to ON. - Inspect the TWC. - Is there any malfunction?		Yes Replace the TWC, then go to the next step. (See EXHAUST SYSTEM REMOVAL/ INSTALLATION [MZR 2.5] .)
8	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.
9	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.

