Service Bulletin

Mazda North American Operations
Irvine, CA 92618-2922

Subject:	**Bulletin No:** 01-010/16
CHECK ENGINE LIGHT ON WITH DTC P0421	**Last Issued:** 04/07/2016

BULLETIN NOTE

This bulletin supersedes the previously issued bulletin(s) listed below. The changes are noted below in Red beside the change bars.

Previously Issued TSBs:	Date(s) Issued
01-016/15	08/04/15

APPLICABLE MODEL(S)/VINS

2014-15 Mazda3 (Japan built) vehicles with VINs lower than JM1BM******267077 (produced before March 30, 2015)

2014-15 Mazda3 (Mexico built) vehicles with VINs lower than 3MZBM******207478 (produced before April 1, 2015)

2014-16 Mazda6 vehicles with VINs lower than JM1GJ******425952 (produced before April 8, 2015)

2014-15 CX-5 (2.5L A/T only)

2016 CX-5 vehicles with VINs lower than JM3KE******656820 (produced before April 8, 2015)

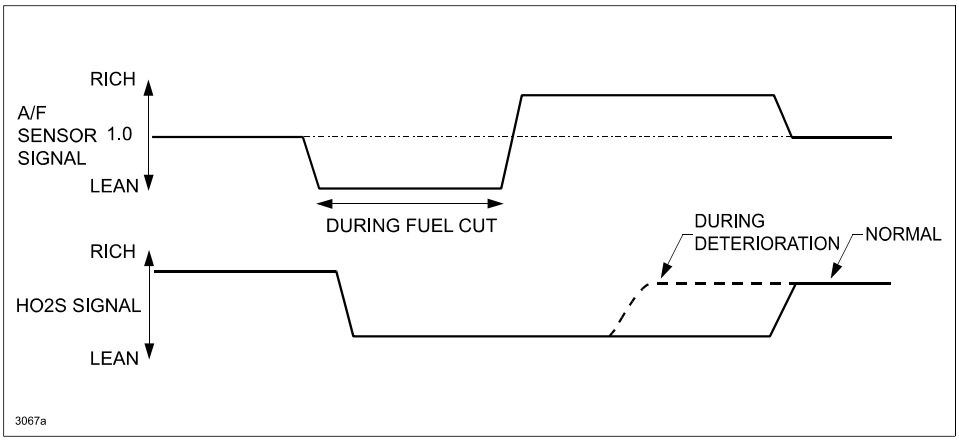
DESCRIPTION

Some vehicles may experience the check engine light on with DTC P0421:00 (Catalytic converter system) without experiencing poor engine performance or misfire (Mitsubishi PCM only).

This is caused by improper control logic of the PCM that may detect false error of the A/F sensor, resulting in false detection of P0421. To correct the problem, the control logic of the PCM has been changed.Catalyst monitor function explanation

- The PCM monitors the oxygen storage amount proportional to catalytic converter purification characteristic.
- The PCM starts to monitor after recovery (fuel injection starts) from fuel cut control.
- The PCM temporarily changes the target air/fuel ratio to rich at fuel cut recovery, and detects the response time until the HO2S output signal outputs the voltage on the rich side.

- If the catalytic converter purification characteristic deteriorates, the amount of the time until the HO2S detects the voltage on the rich side is shorter compared to the normal purification characteristic as shown. The PCM detects a catalytic converter malfunction using this characteristic.

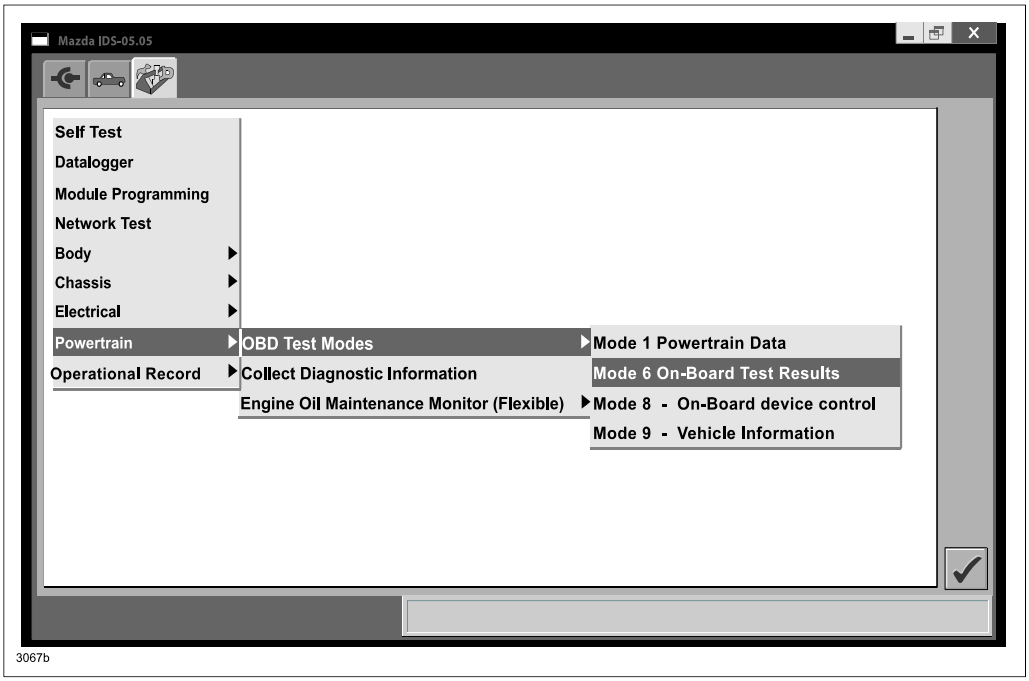


Customers having this concern should have their vehicle repaired using the following repair procedure.

REPAIR PROCEDURE

Verification of Condition of Warm Up Three-Way Catalytic Converter (WU-TWC)

1. Verify the condition of the Warm Up Three-Way Catalytic Converter (WU-TWC) by checking the value “Catalyst monitor bank 1” on MODE6 with M-MDS.
   a. Go to Powertrain => OBD Test Modes => Mode6 On Board Test Results



b. Go to Catalyst monitor bank 1 => Equivalence Oxygen Storage Component (OBDMID: 21, Test ID: 82)

Description	OBDMID	Test ID	Min	Max	Value
Oxygen Sensor Monitor Bank 1 - Sensor 1	1				
Response Lean to Rich	1	80	0	0.999	0
Response Rich to Lean	1	81	0	0.999	0.089
Response Lean to Rich	1	82	0	0.999	0.027
Response Rich to Lean	1	83	0	0.999	0.332
HO2SB1S2 Monitor	2				
Low sensor voltage for switch time calculation (constant).	2	3	0.299V	0.299V	0.299V
High sensor voltage for switch time calculation (constant).	2	4	0.549V	0.549V	0.549V
Rich to lean sensor switch time (calculated).	2	5	0s	1.000s	0.080s
Lean - to - Rich Threshold Voltage (Calculated)	2	6	0s	1.000s	0.030s
Response timeout	2	80	0s	4.000s	1.450s
Catalyst monitor bank 1	21				
Equivalence Oxygen Storage Component	21	82	1.16g	655.35g	2.86g
Variable Valve Timing Monitor Bank 1	35				
Intake Variable Valve Timing over - retarded	35	80	-327.68-	15.00-	-0.33-
Intake Variable Valve Timing over - advanced	35	81	-15.00-	327.67-	-0.10-
Exhaust Variable Valve Timing over - retarded	35	82	-20.00-	327.67-	-0.54-
Exhaust Variable Valve Timing over - advanced	35	83	-327.68-	20.00-	-1.86-
Intake VVT retard response time	35	84	0s	9.000s	0.020s
Intake VVT advance response time	35	85	0s	9.000s	0.020s
EVAP monitor (large)	3A				
Evap Monitor Large Leak Check (mA): Phase 0 Excessive Vacuum Limit (Pa)	3A	80	-1942Pa	8191Pa	-1942Pa
Phase 4 Purge Valve Stuck Open Limit	3A	81	0Pa	0Pa	0Pa
Phase 0 Gross Leak Limit	3A	82	-8192Pa	-1942Pa	-1942Pa
EVAP monitor (0.040 inch)	3B				
Evap Monitor 0.040 inch Leak Check (mA); Phase 2 0.040 inch Leak Check Vacuum Bleedup and Maximum 0.040 inch Leak Threshold (Pa)	3B	80	-8192Pa	852Pa	183Pa
EVAP monitor (0.020 inch)	3C				
3067c Natural Vacuum 0.020 inch Leak Test Positive Pressure Build	3C	81	700a	8191Pa	100Pa

- If the value is “equal to 0”, clear the DTC and go to PCM Reprogramming.
- If the value is “equal to 2 or higher”, clear the DTC and go to PCM Reprogramming.
- If the value is “between 0 and 2”, follow these steps:
  1. Clear the DTC and reprogram the PCM.
  2. Disconnect the negative battery cable to clear the PCM memory (at least 1 min.)
  3. Go into the “DRIVE MODE”:
     a. Drive the vehicle at about 50 mph for 15min.
     b. Decelerate to 25 mph, and shift into M-Mode, 3rd gear.
     c. Accelerate to 40 mph while holding the transmission in 3rd gear.
     d. Stay at 40 mph for 3 seconds, then release the accelerator pedal and decelerate to 25 mph.
     e. Accelerate to 40 mph again while holding the transmission in 3rd gear.
     f. Stay at 40 mph for 3 seconds, then release the accelerator pedal and decelerate to 25 mph again.
     g. Repeat steps b-f (acceleration and deceleration) at least 10 times.
  4. Check the value “Catalyst monitor bank 1” on MODE6 with M-MDS.
     - If the value is “equal to 1 or higher than 1”, WU-TWC can be judged as OK.
     - If the value is “less than 1”, WU-TWC should be deteriorated. Refer to MS3 online instructions for DTC P0421:00 or Workshop manual section 01-01.

PCM Reprogramming

1. Using IDS 99.05 or later software, reprogram the PCM to the latest calibration (refer to “Calibration Information” table) by following the “Module Reprogramming” procedure.

   NOTE:
   - Verify the current PCM file name in the vehicle by the log view screen. If it is the same as found in the chart below (or later), it is not necessary to reprogram the PCM.
   - Always update the IDS tool first, then follow the on-screen instructions to download the calibration file for PCM reprogramming.
   - Refer to “Service Caution for reprogramming” on MS3 IDS Page.
   - After reprogramming, verify the file name matches with the chart below.

NOTE:

- Always update the IDS tool first, then follow on-screen instructions to download the needed calibration file for PCM reprogramming.
- It is not necessary to remove any fuses or relays during PCM reprogramming when the IDS screen prompts you to do so. You may accidentally stop power to one of the PCM terminals and cause the PCM to be blanked, or you may receive error messages during the IDS reprogramming procedure.
- IDS shows the calibration part numbers after programming the PCM.
- Please be aware that PCM calibration part numbers and file names listed in any Service Bulletin may change due to future releases of IDS software, and additional revisions made to those calibrations for service related concerns.
- When reprogramming a PCM, IDS will always display the “latest” calibration P/N available for that vehicle. If any calibration has been revised/updated to contain new information for a new service concern/issue, it will also contain all previously released calibrations.
- **Start/Stop button vehicles only: DO NOT press the start/stop button during the reprogramming process.**
- **When performing this procedure, we recommend using the “Power Supply” mode in the Battery Management System to keep the vehicle battery up to capacity. If a different charger is used, make sure it does not exceed 20 AMPS. If it exceeds 20 AMPS, it could damage the VCM.**

2. After performing the PCM reprogramming procedure, clear DTCs.
3. After clearing DTCs, start the engine and confirm that no warning lights stay on.

NOTE:

- If any DTCs should remain after performing DTC erase, diagnose the DTCs using MS3 online instructions or Workshop Manual section 01-02.
- After PCM reprogramming, it is no longer necessary to road test the vehicle to “relearn” KAM (Keep Alive Memory).

CALIBRATION INFORMATION

2014-15 Mazda3 (Japan built) for VINs starting with JM1

Engine	Emissions	Transmission	File Name	Note
2.0L	Calif (PZEV)	M/T	PELC-188K2-C	
		A/T	PELA-188K2-C	
	Calif (ULEV)	M/T	PE18-188K2-E	
		A/T	PE19-188K2-D	
	Fed	M/T	PE5J-188K2-E	
		A/T	PE5K-188K2-D	
2.5L	Calif (PZEV)	M/T	PYBE-188K2-C	Improved from B-level
		A/T	PY08-188K2-D	w/out i-ELOOP
			PY2P-188K2-F	w/ i-ELOOP (to Feb 1, 2015)
			PYFG-188K2-A	w/ i-ELOOP (from Feb 1, 2015)
	Fed	M/T	PYBG-188K2-B	
		A/T	PY2J-188K2-D	w/out i-ELOOP
			PY2R-188K2-F	w/ i-ELOOP (to Feb 1, 2015)
			PYFH-188K2-A	w/ i-ELOOP (from Feb 1, 2015)
	Mexico	M/T	PYBJ-188K2-B	
		A/T	PY8E-188K2-C	

2014-15 Mazda3 (Mexico built) for VINs starting with 3MZ

Emissions	Transmission	File Name	Note
Calif (PZEV)	M/T	PELG-188K2-C	Improved from B level
	A/T	PELE-188K2-C	Improved from B level
Calif (ULEV)	M/T	PEDG-188K2-D	Improved from C level
	A/T	PEDH-188K2-C	Improved from B level
Fed	M/T	PEDJ-188K2-D	Improved from C level
	A/T	PEDK-188K2-C	Improved from B level
Mexico	M/T	PEGN-188K2-B	
	A/T	PEGR-188K2-B	

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Emissions	Transmission	File Name	Note
Calif (PZEV)	M/T	PYXS-188K2-	Old file name: PY1D-188K2-*
	A/T	PYXT-188K2-	Old file name: PY1E-188K2-*
		PYXW-188K2-	w/ i-ELOOP Old file name: PY8G-188K2-*
Calif (ULEV)	M/T	PY8A-188K2-D	
	A/T	PY8B-188K2-D	
		PY1G-188K2-H	w/ i-ELOOP
Fed	M/T	PYXX-188K2-	Old file name: PY1H-188K2-*
	A/T	PYXZ-188K2-	Old file name: PY1J-188K2-*
		PZY1-188K2-	w/ i-ELOOP Old file name: PY2E-188K2-*
Mexico	M/T	PZZ4-188K2-	Old file name: PY4J-188K2-*
	A/T	PZZ5-188K2-	Old file name: PY4K-188K2-*

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Emissions	Transmission	File Name	Note
Calif (PZEV)	M/T	PY9S-188K2-C	
	A/T	PY9V-188K2-C	
		PY9X-188K2-C	w/ i-ELOOP
Fed	M/T	PYAB-188K2-B	
	A/T	PYAD-188K2-B	
		PYAF-188K2-B	w/ i-ELOOP
Mexico	M/T	PYBA-188K2-B	
	A/T	PYBC-188K2-B	w/ i-ELOOP

2014-15 CX-5

Engine	Emissions	Transmission	Drive	File Name	Notes
2.0L	Mexico	A/T	2WD	PEBG-188K2-D	
2.5L	Calif	A/T	2WD	PYXH-188K2-	Old file name: PY09-188K2-*
			4WD	PYXJ-188K2-	Old file name: PY2W-188K2-*
	Fed	A/T	2WD	PYXK-188K2-	Old file name: PY2V-188K2-*
			4WD	PYXL-188K2-	Old file name: PY2X-188K2-*
	Mexico	A/T	2WD	PY5L-188K2-D	
			4WD	PY5M-188K2-D	

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Engine	Emissions	Transmission	Drive	File Name
2.0L	Calif	M/T	2WD	PS32-188K2-C
		A/T	2WD	PS33-188K2-C
			4WD	PS34-188K2-C
	Fed	M/T	2WD	PS35-188K2-C
		A/T	2WD	PS36-188K2-C
			4WD	PS37-188K2-C
	Mexico	A/T	2WD	PS38-188K2-C
2.5L	Calif	A/T	2WD	PYAJ-188K2-C
			4WD	PYAK-188K2-B
	Fed	A/T	2WD	PYAL-188K2-B
			4WD	PYAM-188K2-C
	Mexico	A/T	2WD	PYAN-188K2-B
			4WD	PYAP-188K2-B

NOTE: It is not necessary to order a PCM part for this repair procedure.

WARRANTY INFORMATION

NOTE:

- This warranty information applies only to verified customer complaints on vehicles eligible for warranty repair.
- This repair will be covered under Mazda's Federal Emission Warranty (long term) or Calif. PZEV Emission Warranty.
- Additional diagnostic time cannot be claimed for this repair.
- Keep a copy of Mode 6 report on file for as required documentation purposes.

Warranty Type	A
Symptom Code	6X
Damage Code	9W
DTC	P0421
Part Number Main Cause	5555-RP-PCM
Quantity	0
Operation Number / Labor Hours	XXL4PXFX / 0.3 Hrs. (Reprogramming) XXL4PAFX / 0.8 Hrs. (Reprogramming and DRIVE MODE)