

DTC	P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1)
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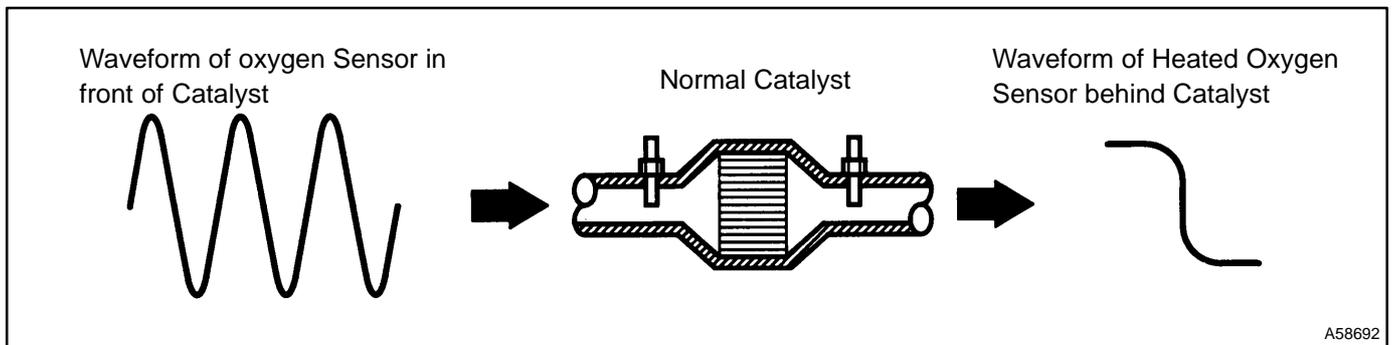
CIRCUIT DESCRIPTION

The ECM compares the waveform of the oxygen sensor located in front of the catalyst with the waveform of the heated oxygen sensor located behind the catalyst to determine whether or not the catalyst performance has deteriorated.

Air-fuel ratio feedback compensation keeps the waveform of the oxygen sensor in front of the catalyst repeatedly changing back and forth, from rich to lean.

If the catalyst is functioning normally, the waveform of the heated oxygen sensor behind the catalyst switches back and forth between rich and lean much more slowly than the waveform of the oxygen sensor in front of the catalyst.

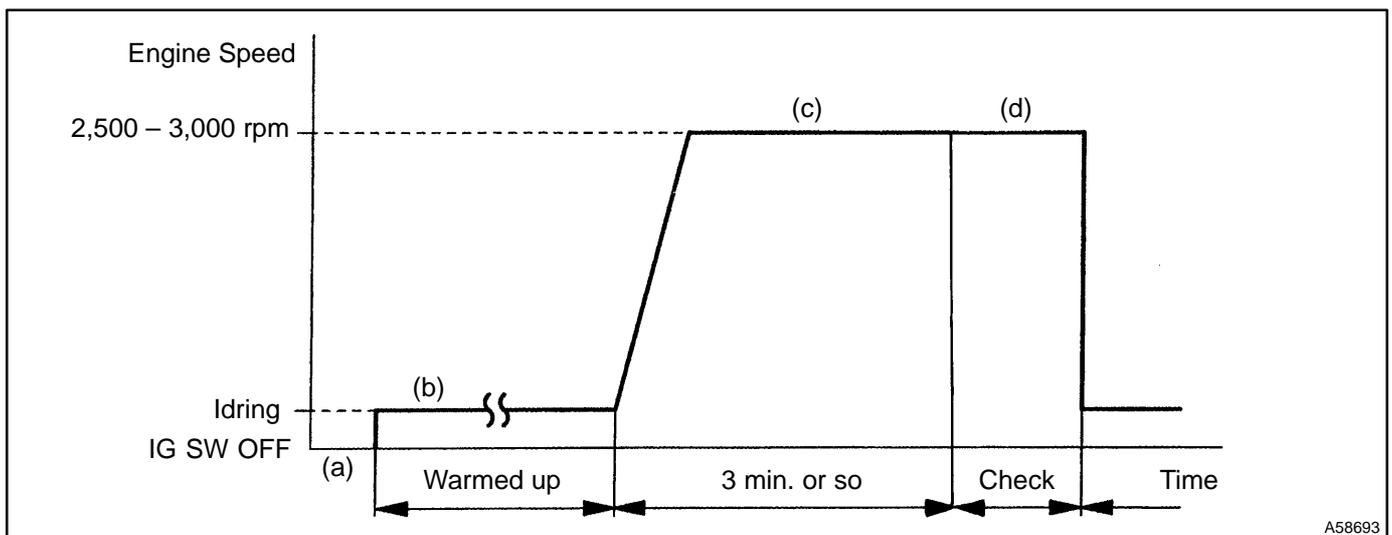
But when both waveforms change at a similar rate, it is indicated that the catalyst performance has deteriorated.



A58692

DTC No.	DTC Detecting Condition	Trouble Area
P0420	After engine and catalyst are warmed up, and while vehicle is driven within set vehicle and engine speed range, waveforms of oxygen sensors have same amplitude (2 trip detection logic)	<ul style="list-style-type: none"> • Gas leakage on exhaust system • Oxygen sensor • Heated oxygen sensor • Three-way catalytic converter

CONFIRMATION DRIVING PATTERN

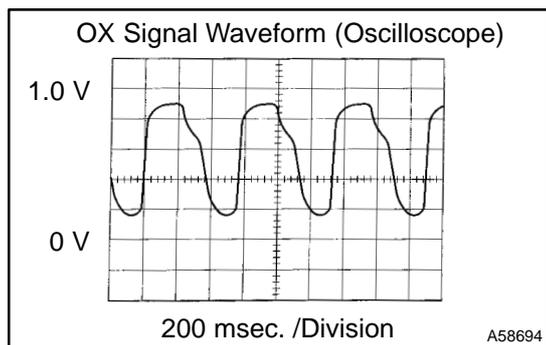


A58693

- (a) Connect the hand-held tester or OBD II scan tool to the DLC3, or connect the probe of the oscilloscope between terminals HAF1A, HAF2A, OX1B, OX2B and E1 of the ECM connector.
- (b) Start the engine and warm it up with all the accessories switched OFF until the water temperature is stable.
- (c) Race the engine at 2,500 – 3,000 rpm for about 3 min.
- (d) After confirming that the waveforms of the oxygen sensor (bank 1 sensor 1 (OX)) which oscillates around 0.5 V during feedback to the ECM, check the waveform of the heated oxygen sensor (bank 1 sensor 2 (OX2)).

HINT:

- If there is a malfunction in the system, the waveform of the heated oxygen sensor (bank 1 sensor 2 (OX2)) is almost the same as that of the oxygen sensor (bank 1 sensor 1 (OX)) on the left.
- There are some cases that, the MIL may either light up or not light up even though a malfunction exists.



INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester or OBD II scan tool, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1 READ OUTPUT DTC(BESIDES P0420)

- (a) Read the DTCs with the hand-held tester or OBD II scan tool.

Result:

	A	B
RESULT	P0420 is output	P0420 and other codes are output

B → **GO TO RELEVANT DTC CHART**

A

2 CHECK EXHAUST GAS LEAK

NG → **REPAIR OR REPLACE**

OK

3 | **CHECK OXYGEN SENSOR(BANK 1 SENSOR 1) (See page 05-203)**

NG 

REPAIR OR REPLACE OXYGEN SENSOR

OK 

4 | **CHECK OXYGEN NO.2 SENSOR(BANK 1 SENSOR 2) (See page 05-203)**

NG 

REPAIR OR REPLACE OXYGEN NO.2 SENSOR

OK 

REPLACE EXHAUST PIPE ASSY FRONT