

DTC	P0420/94	Catalyst System Efficiency Below Threshold
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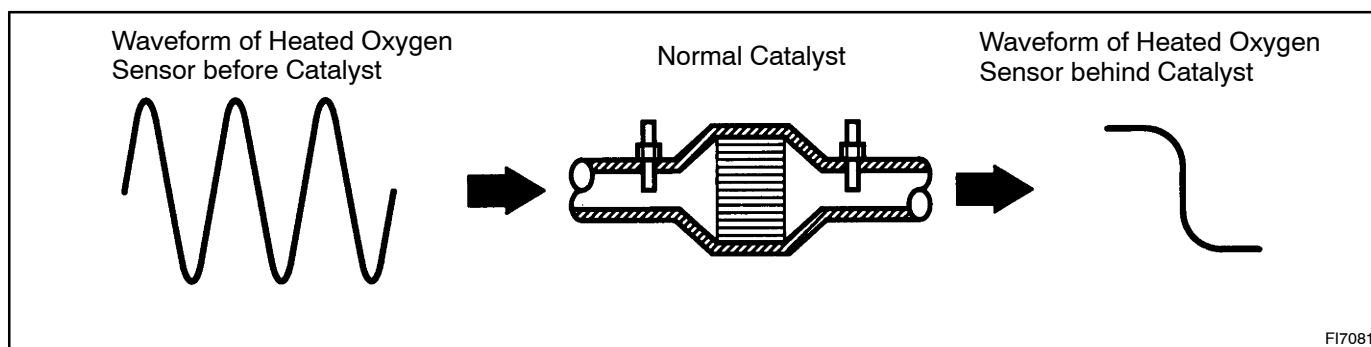
CIRCUIT DESCRIPTION

The engine ECU compares the waveform of the heated oxygen sensor located before the catalyst with the waveform of the heated oxygen sensor located behind the catalyst to determine whether or not catalyst performance has deteriorated.

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

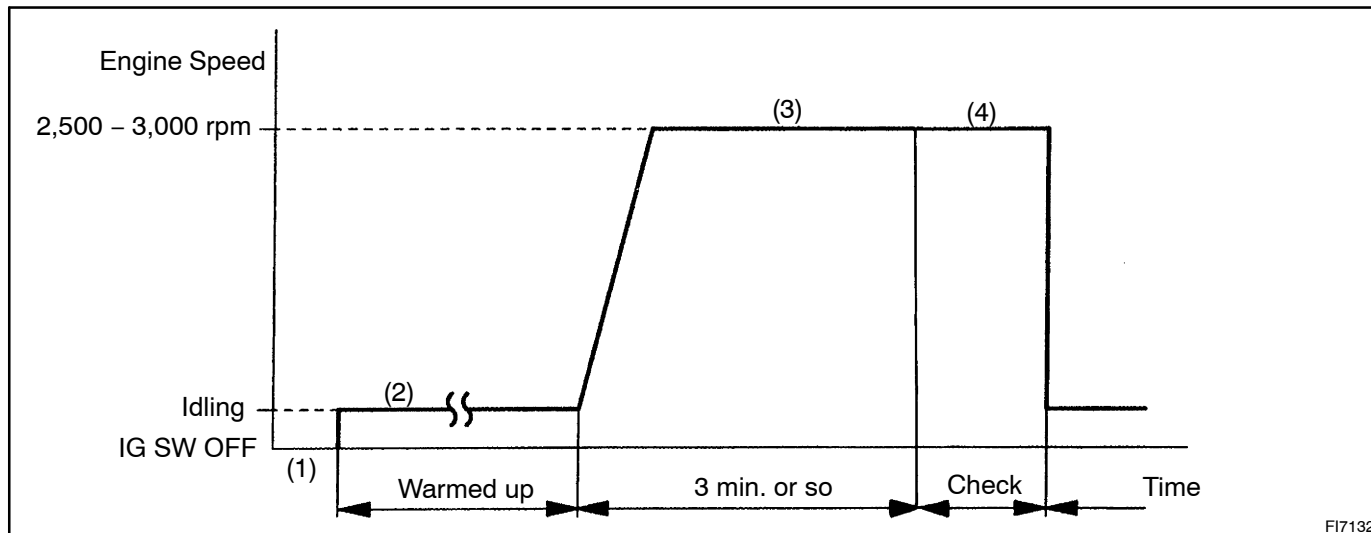
If the catalyst is functioning normally, the waveform of the heated oxygen sensor behind the catalyst switches back and forth between rich and lean much more slowly than the waveform of the heated oxygen sensor before the catalyst.

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

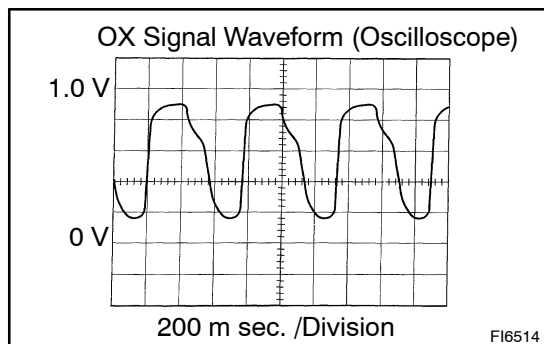


DTC No.	DTC Detecting Condition	Trouble Area
P0420/94	After the engine and the catalyst are warmed up, and while the vehicle is driven within the set vehicle and engine speed range, the waveforms of the heated oxygen sensors (bank 1 sensor 1 and bank 1 sensor 2) have the same amplitude (2 trip detection logic)	• Three-way catalytic converter • Open or short in heated oxygen sensor (bank1 sensor2) circuit • Heated oxygen sensor (bank1 sensor2)

CONFIRMATION ENGINE RACING PATTERN



- (1) Connect the hand-held tester to the DLC3, or connect the probe of the oscilloscope between terminals OX1, OX2 and E1 of engine ECU.
- (2) Start engine and warm it up with all accessories switched OFF until water temp. is stable.
- (3) Race the engine at 2,500 - 3,000 rpm for about 3 min.
- (4) After confirming that the waveforms of the heated oxygen sensor, bank 1 sensor 1 (OX1), oscillate around 0.5 V during feedback to the engine ECU, 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 heated oxygen sensor, bank 1 sensor 1 (OX1), on the left.

There are some cases where, even though a malfunction exists, the CEN indicator light may either light up or not light up.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester. Because freeze frame 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 warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1 Are there any other codes (besides DTC P0420) being output?

YES

Go to relevant DTC chart ([See page DI-18](#)).

NO

2 Check gas leakage on exhaust system.

NG

Repair or replace.

OK

3 Check heated oxygen sensor (bank 1 sensor 1) ([See page FI-60](#)).

NG

Repair or replace.

OK

4 Check heated oxygen sensor (bank 1 sensor 2) ([See page FI-60](#)).

NG

Repair or replace.

OK

Replace three-way catalytic converter.