DI1EE–19

DTC	P0420/94	Catalyst System Efficiency Below Threshold (Bank 1)

DTC	P0430/94	Catalyst System Efficiency Below Threshold (Bank 2)

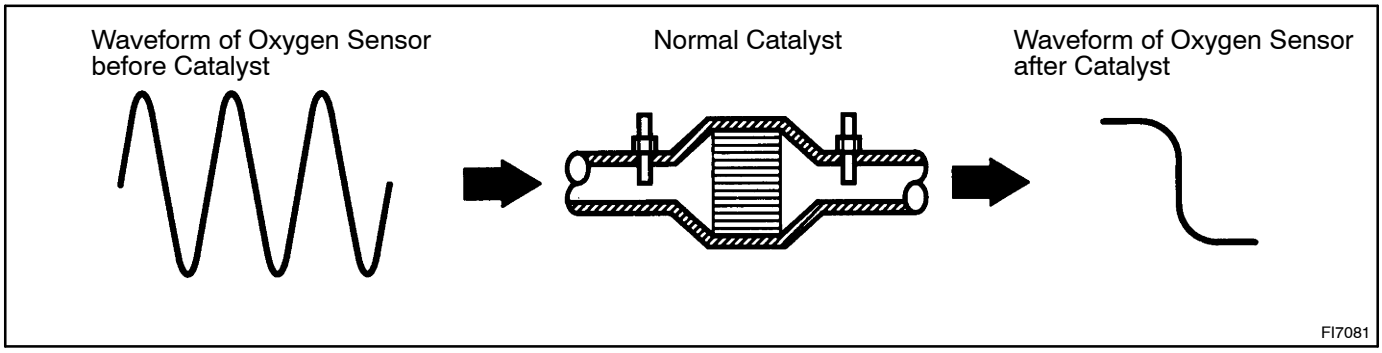
CIRCUIT DESCRIPTION

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

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

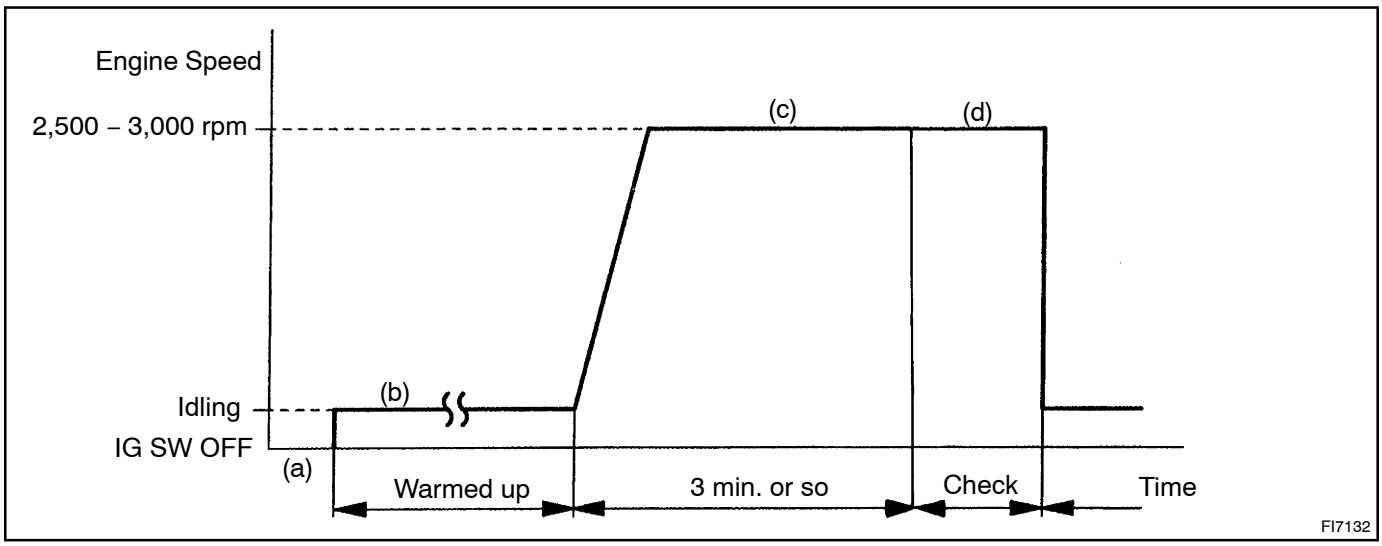
If the catalyst is functioning normally, the waveform of the oxygen sensor after the catalyst switches back and forth between rich and lean much more slowly than the waveform of the oxygen sensor before the catalyst.

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

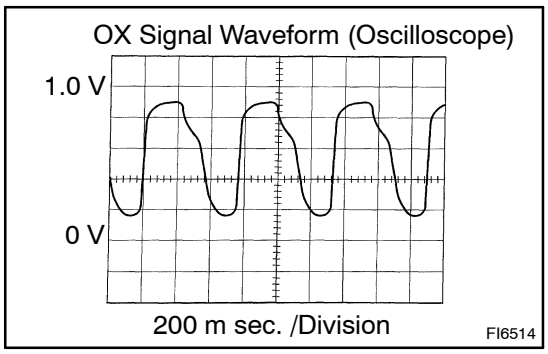


DTC No.	DTC Detecting Condition	Trouble Area
P0420/94 P0430/94	After the engine and the catalyst are warmed up, and while the vehicle is driven within the set vehicle and engine speed range, the waveforms of the A/F sensors (bank1, 2 sensor 1) and oxygen sensors (bank 1, 2 sensor 2) have the same amplitude (2 trip detection logic)	• Three–way catalytic converter • Open or short in oxygen sensor (bank1, 2 sensor2) circuit • Oxygen sensor (bank1, 2 sensor2)

CONFIRMATION ENGINE RACING PATTERN



(a) Connect the hand–held tester to the DLC3, or connect the probe of the oscilloscope between terminals OXL1, OXL2, OXR1, OXR2 and E1 of the engine ECU.
(b) Start engine and warm it up with all accessories switched OFF until water temp. 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, 2 sensor 1 (OXL1, OXR1)), oscillate around 0.5 V during feedback to the engine ECU, check the waveform of the oxygen sensor, bank 1, 2 sensor 2 (OXL2, OXR2).



HINT:
If there is a malfunction in the system, the waveform of the oxygen sensor (bank 1, 2 sensor 2 (OXL1, OXL2)), is almost the same as that of the oxygen sensor (bank 1, 2 sensor 1 (OXL2, OXR2)), on the left.
There are some cases where, even though a malfunction exists, the check engine warning light may either light up or not light up.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using a 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 P0420/94, P0430/94) 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 oxygen sensor (bank 1, 2 sensor 1) (See Pub. No. RM630E on page DI –51).

NG → Repair or replace.

OK

4	Check oxygen sensor (bank 1, 2 sensor 2) (See Pub. No. RM630E on page DI –59).

NG → Repair or replace.

OK

Replace three –way catalytic converter.