

DTC	P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1)
------------	--------------	--

DTC	P0430	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 2)
------------	--------------	--

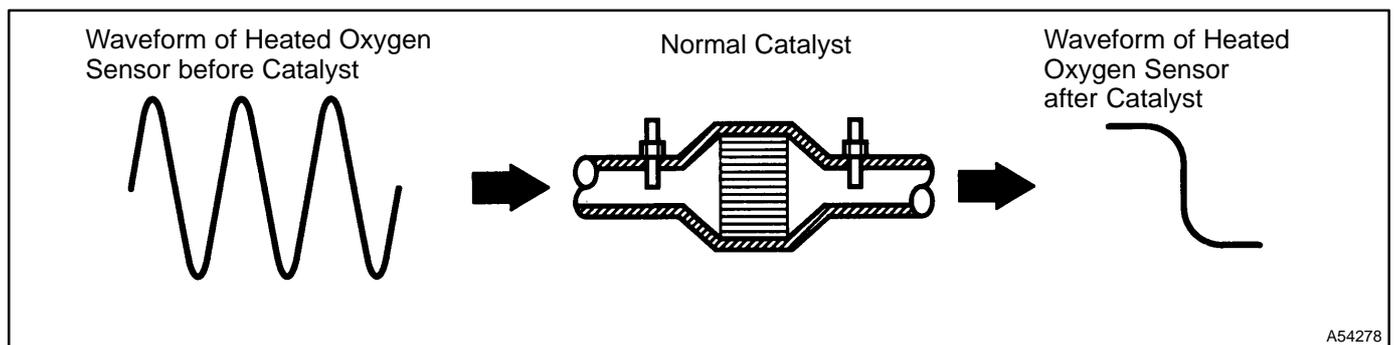
CIRCUIT DESCRIPTION

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

The 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 after 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 the catalyst performance has deteriorated.

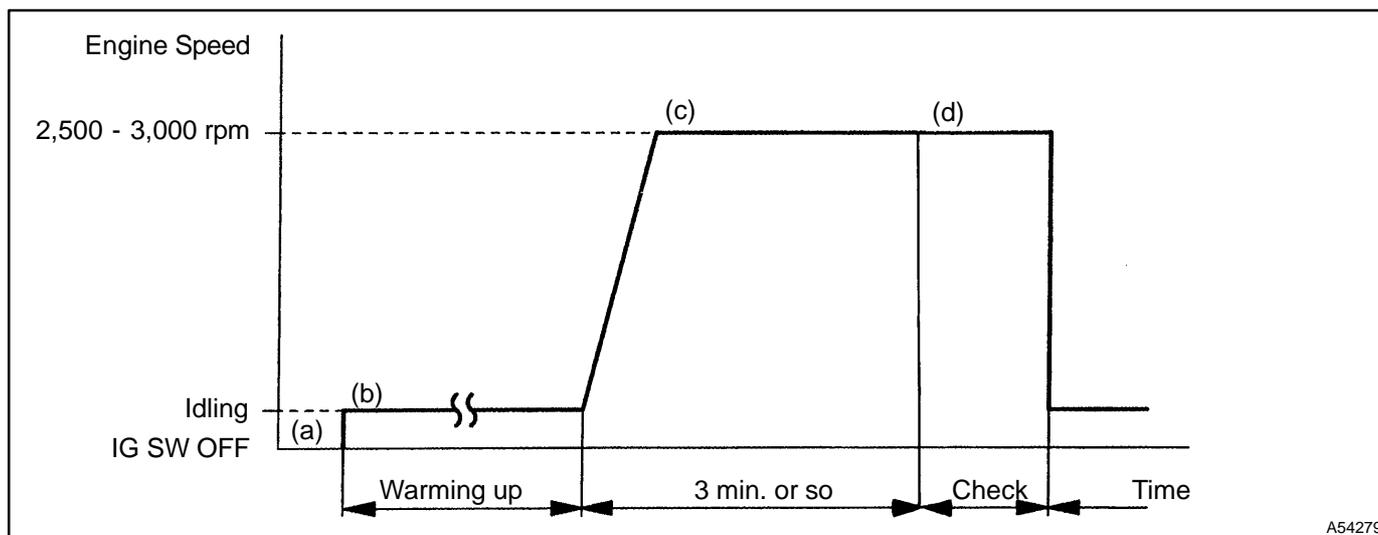


DTC No.	DTC Detection Condition	Trouble Area
P0420 P0430	After engine and catalyst are warmed up, and while vehicle is driven within set value and engine speed range, waveforms of heated oxygen sensors have the same amplitude (2 trip detection logic)	<ul style="list-style-type: none"> • Gas leakage in exhaust system • Heated oxygen sensor • Three-way catalytic converter (inside exhaust manifold)

HINT:

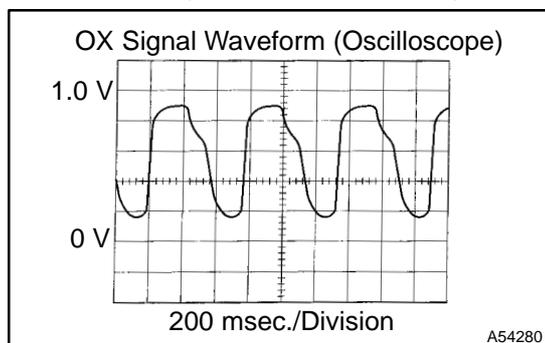
- Bank 1 refers to the bank that includes cylinder No.1.
- Bank 2 refers to the bank that does not include cylinder No.1.
- Sensor 1 refers to the sensor closest to the engine body.
- Sensor 2 refers to the sensor farthest away from the engine body.

CONFIRMATION ENGINE RACING PATTERN



A54279

- Connect the hand-held tester to the DLC3, or connect the probe of the oscilloscope between terminals OX1A, OX2A, OX1B, OX2B and E2 of the ECM connectors.
- Start the engine and warm it up with all the accessories switched OFF until the engine coolant temperature is stable.
- Race the engine at 2,500 - 3,000 rpm for about 3 minutes.
- After confirming that the waveforms of the heated oxygen sensor (bank 1, 2 sensor 1 (OX1A, OX2A)) which oscillates around 0.5 V during feedback to the ECM, check the waveform of the heated oxygen sensor (bank 1, 2 sensor 2 (OX1B, OX2B)).



A54280

HINT:

If there is a malfunction in the system, the waveform of the heated oxygen sensor (bank 1, 2 sensor 2 (OX1B, OX2B)) is almost the same as that of the heated oxygen sensor (bank 1, 2 sensor 1 (OX1A, OX2A)) on the left.

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

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester or the OBD II scan tool, as freeze frame data records the engine conditions when a 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 CHECK OTHER DTC OUTPUT(BESIDES DTC P0420 AND/OR P0430)

(a) Read the DTC using the hand-held tester or the OBD II scan tool.

Result:

Display (DTC output)	Proceed to
Only "P0420 and/or P0430" are output	A
"P0420 or P0430" and other DTCs are output	B

HINT:

If any other codes besides "P0420 and/or P0430" are output, perform the troubleshoot on that DTC before.

B → **GO TO RELEVANT DTC CHART (See page 05-18)**

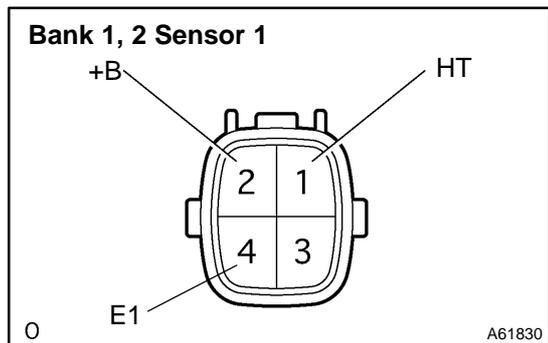
A

2 CHECK FOR EXHAUST GAS LEAKAGE

NG → **REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT**

OK

3 INSPECT HEATED OXYGEN SENSOR(BANK 1, 2 SENSOR 1)



(a) Measure the resistance between the terminals of the heated oxygen sensor connector.

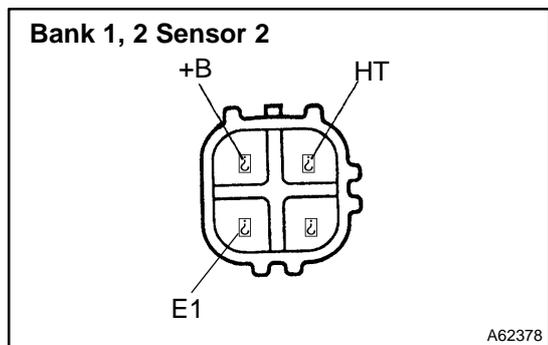
Standard (Bank 1, 2 sensor 1):

Terminal No.	Resistance
1 (HT) ↔ 2 (+B)	11 - 16 Ω at 20 °C (68 °F)
1 (HT) ↔ 4 (E1)	No Continuity

NG → **REPLACE HEATED OXYGEN SENSOR**

OK

4 INSPECT HEATED OXYGEN SENSOR(BANK 1, 2 SENSOR 2)



(a) Measure the resistance between the terminals of the heated oxygen sensor connector.

Standard (Bank 1, 2 sensor 2):

Terminal No.	Resistance
1 (HT) ↔ 2 (+B)	11 - 16 Ω at 20 °C (68 °F)
1 (HT) ↔ 4 (E1)	No Continuity

NG → **REPLACE HEATED OXYGEN SENSOR**

OK

REPLACE TWC (EXHAUST MANIFOLD LH OR RH)