

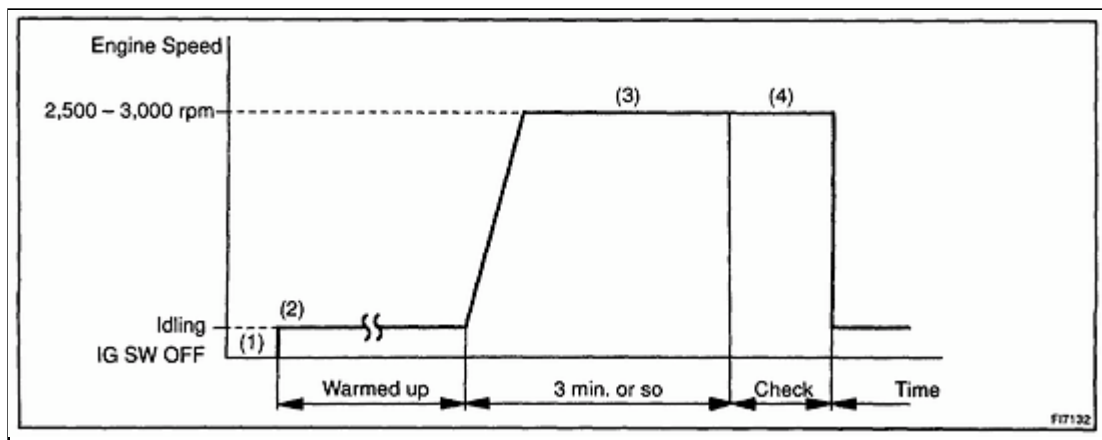
CIRCUIT DESCRIPTION

The ECM 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 waveforms change at a similar rate, it indicates that catalyst performance has deteriorated.

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 heated oxygen sensors (bank 1 sensor 1) have same amplitude (2 trip detection logic)	• Gas leakage on exhaust system • Heated oxygen sensor • Three-way catalytic converter

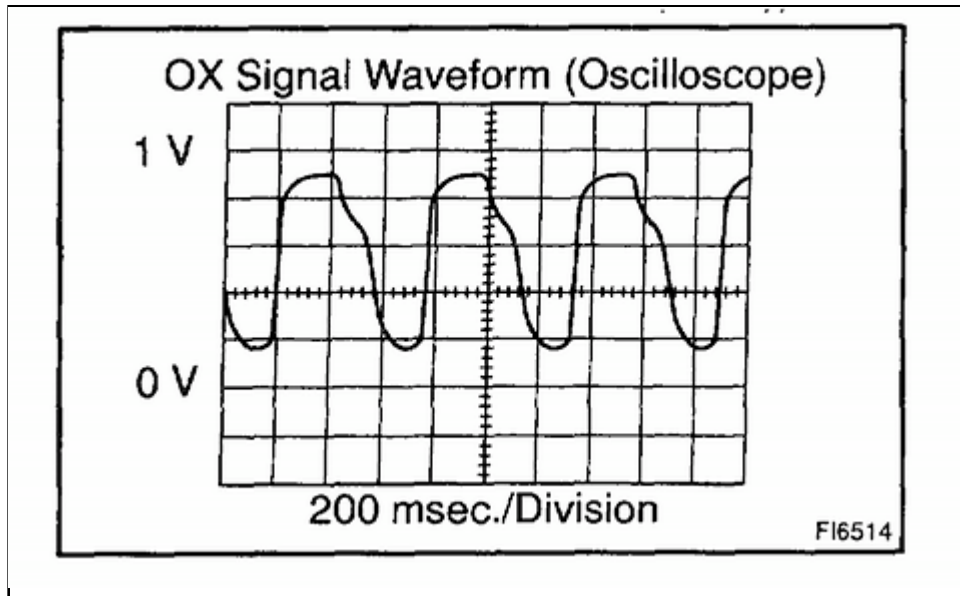
DETECTING CONDITIONS



CONFIRMATION ENGINE RACING PATTERN

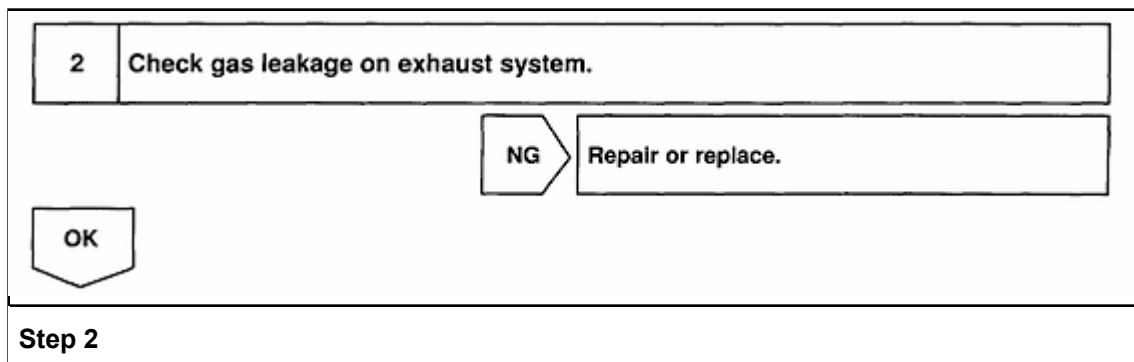
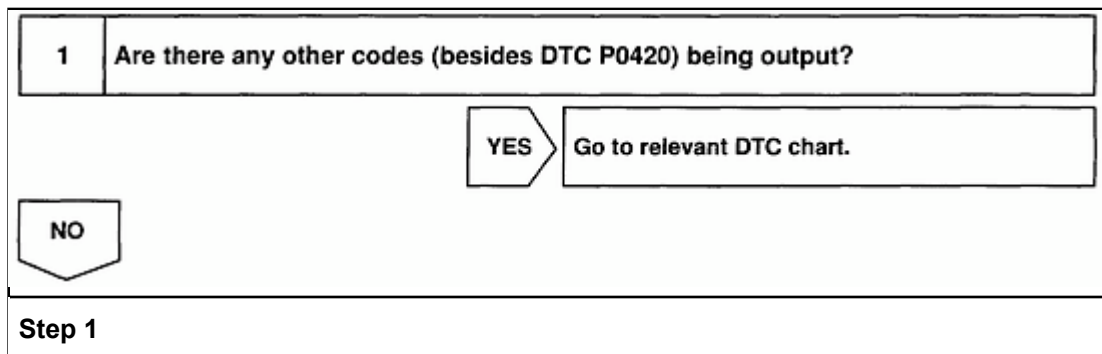
1. Connect the TOYOTA hand-held tester to the DLC3, or connect the probe to the oscilloscope between terminals OX1, OXS and E1 of the ECM connector.
2. Start the engine and warm it up with all the accessories switched **OFF** until the water temperature is stable.
3. Race the engine at **2,500 - 3,000 rpm** for about **3 min.**
4. After confirming that the waveform of the heated oxygen sensor (bank 1 sensor 1 (OX1)), oscillate around **0.5**

V during feedback to the ECM, check the waveform of the heated oxygen sensor (bank 1 sensor 2 (OXS)).



HINT: If there is a malfunction in the system, the waveform of the heated oxygen sensor (bank 1 sensor 2 (OXS)), 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 MIL may either light up or not light up.



3	Check heated oxygen sensor (bank 1 sensor 1).
OK NG Repair or replace.	
Step 3	

4	Check heated oxygen sensor (bank 1 sensor 2) .
OK NG Repair or replace.	
Replace three-way catalytic converter.	
Step 4	

INSPECTION PROCEDURE

HINT: Read freeze frame data using TOYOTA hand-held theater or OBD II scan tool. 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 was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

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