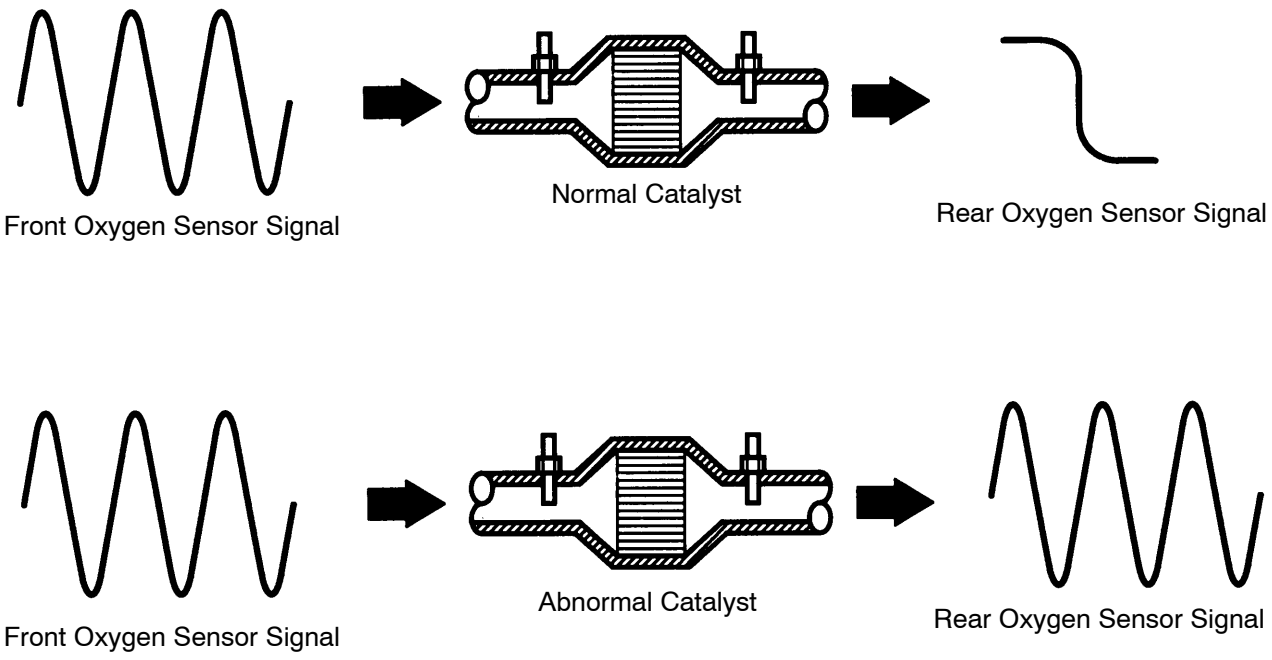
DTC	P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1)

DTC	P0430	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 2)

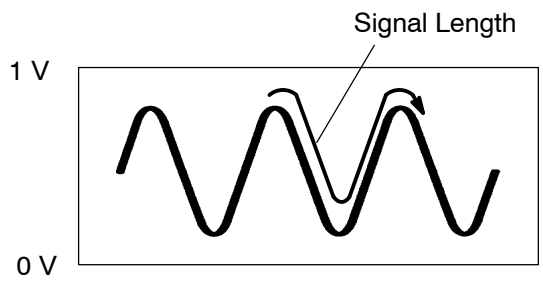
MONITOR DESCRIPTION

In order to monitor the catalyst deterioration, the engine control module (ECM) checks the catalyst deterioration level while the vehicle is running under the specified conditions. If this level exceeds the malfunction threshold several times, the ECM sets this DTC (2 trip detection logic).

The catalyst deterioration level is a ratio of the signal lengths (and areas) between rear oxygen sensor and front oxygen sensor. While the vehicle is running under closed loop, the rear sensor switches the signal much slower than the front sensor. This switching frequency becomes greater and the catalyst deterioration level increases with the catalyst deteriorating.



Sensor Signal Length



DTC	Detection Condition	Trouble Area
P0420	Bank 1 catalyst deterioration level exceeds malfunction threshold while vehicle is being driven under specified conditions (2 trip detection logic).	• Exhaust manifold sub–assy LH (front catalyst bank 1) • Exhaust pipe assy front (rear catalyst) • Gas leakage in exhaust system • Heated oxygen sensor (bank 1 sensor 2) • Heated oxygen sensor (bank 1 sensor 1)
P0430	Bank 2 catalyst deterioration level exceeds malfunction threshold while vehicle is being driven under specified conditions (2 trip detection logic).	• Exhaust manifold sub–assy RH (front catalyst bank 2) • Exhaust pipe assy front (rear catalyst) • Gas leakage in exhaust system • Heated oxygen sensor (bank 2 sensor 2) • Heated oxygen sensor (bank 2 sensor 1)

MONITOR STRATEGY

Required sensors/ components (Main)	Front and rear catalysts
Required sensors / components (Related)	Front and rear heated oxygen sensors
Frequency of operation	Once per driving cycle
Duration	20 sec x 8 times
MIL operation	2 driving cycles
Sequence operation	None

TYPICAL ENABLING CONDITIONS

These DTCs are not present	See page 05–13
Battery voltage	11 V or more
Intake air temperature	–10°C (14°F) or more
Idle	OFF
Intake air amount	8 to 50 g/sec
Engine RPM	Less than 4000 rpm
Engine coolant temperature	75°C (167°F) or more
Up stream catalyst temperature	450 to 830°C (842 to 1526°F)
Down stream catalyst temperature	450 to 830°C (842 to 1526°F)
Fuel system status	Closed Loop

TYPICAL MALFUNCTION THRESHOLDS

Catalyst deterioration level	0.6 or more
Number of times detection	8 times

MONITOR STATUS (MODE 6)

See page 05–21 for the detailed information.

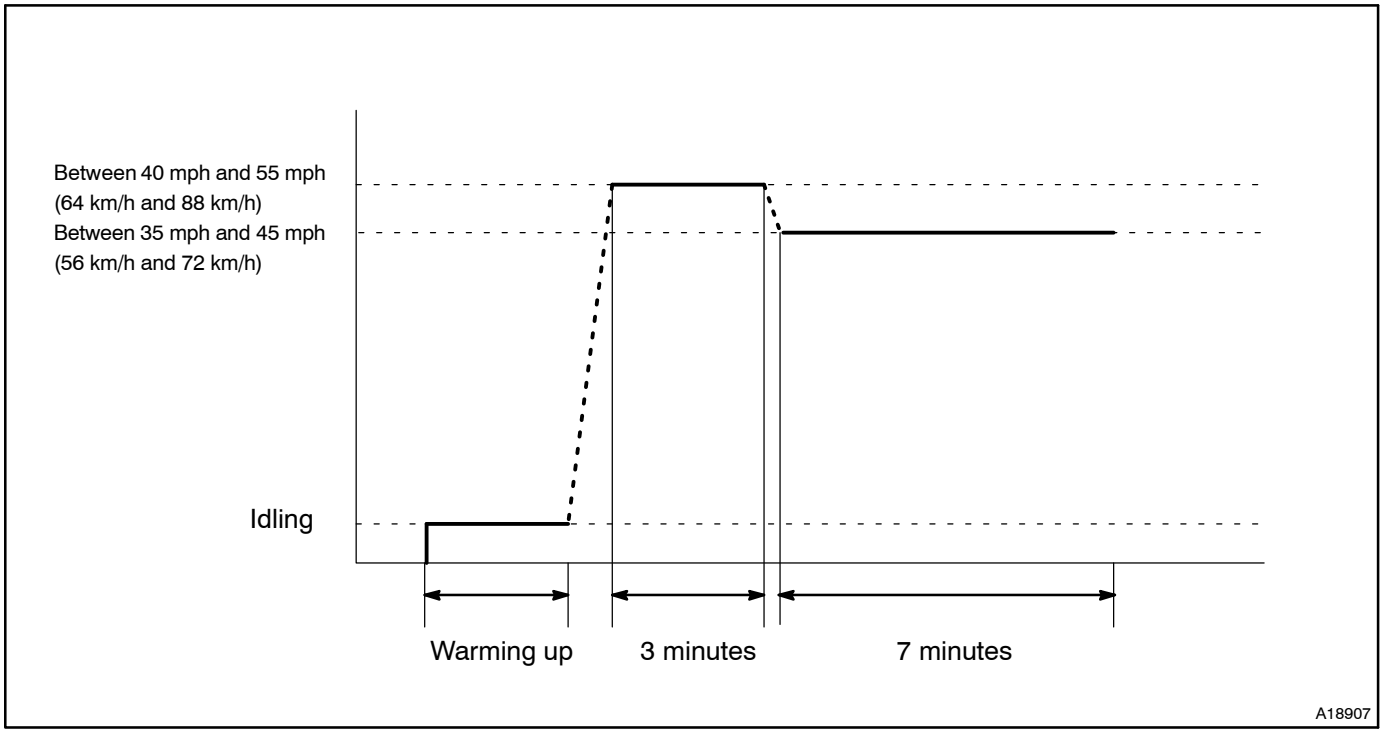
TID $01: Catalyst monitor

TLT	CID	Unit Conversion	Description of Test Value	Description of Test Limit
0	$01	Multiply by 0.0078 (no dimension)	Catalyst deterioration level bank 1	Malfunction criterion
0	$02	Multiply by 0.0078 (no dimension)	Catalyst deterioration level bank 2	Malfunction criterion

CONFIRMATION DRIVING PATTERN

(a) Connect the hand held tester to the DLC3.
(b) Clear the DTC.
(c) Warm up the engine until the engine coolant temperature reaches 75°C (167°F).
(d) Drive the vehicle at 40 to 55 mph (64 to 88 km/h) for at least 3 minutes.
(e) Drive the vehicle at 35 to 45 mph (56 to 72 km/h) for at least 7 minutes.

NOTICE:
Drive with smooth throttle operation and avoid sudden acceleration.



INSPECTION PROCEDURE

Read freeze frame data using the hand–held tester or the OBD II scan tool. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

1	CHECK DTC OTHER THAN P0420 AND P0430

If DTCs other than P0420 and P0430 are present, troubleshoot those DTCs first.

Result:

DTC	Proceed to
P0420 and/or P0430	A
P0420 or P0430 and others	B

B → GO TO DTC CHART (See page 05–47)

A

2	CHECK FOR EXHAUST GAS LEAKAGE

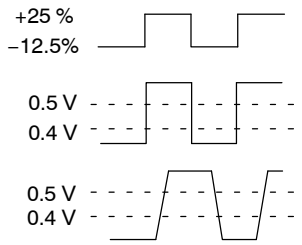
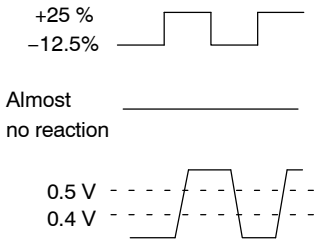
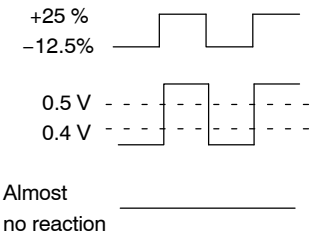
NG → **REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT**

OK

3	PERFORM A/F CONTROL ACTIVE TEST

This active test enables you to identify a malfunction in the heated oxygen sensors.

(a) Connect the hand–held tester to the DLC3.
(b) Run the engine at 2500 rpm for 90 seconds to warm–up the oxygen sensors.
(c) Allow the engine to idle.
(d) Select from the tester menus: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / A/F CONTROL.
(e) Switch the injection volume between +25% and –12.5%, then read the oxygen sensor voltages.

	A	B	C
Injection volume O2S B1S1 O2S B2S1 O2S B1S2 O2S B2S2			
Trouble area	Oxygen sensors are OK.	Heated oxygen sensor (bank 1 sensor 1) (bank 2 sensor 1)	Heated oxygen sensor (bank 1 sensor 2) (bank 2 sensor 2)

NOTICE:
The rear heated oxygen sensor (O2S B1S2, O2S B2S2) output has 20 seconds of delay at maximum.

B → **REPLACE HEATED OXYGEN SENSOR (BANK 1, 2 SENSOR 1)**

C → **REPLACE HEATED OXYGEN SENSOR (BANK 1, 2 SENSOR 2)**

A

REPLACE FRONT AND REAR CATALYSTS (See page 14–14 and 15–1)

If DTC P0420 is present, replace both of the exhaust manifold sub–assy LH (TWC: front catalyst) and the exhaust pipe assy front (TWC: rear catalyst).
If DTC P0430 is present, replace both of the exhaust manifold sub–assy RH (TWC: front catalyst) and the exhaust pipe assy front (TWC: rear catalyst).

–MEMO–

–MEMO–

–MEMO–