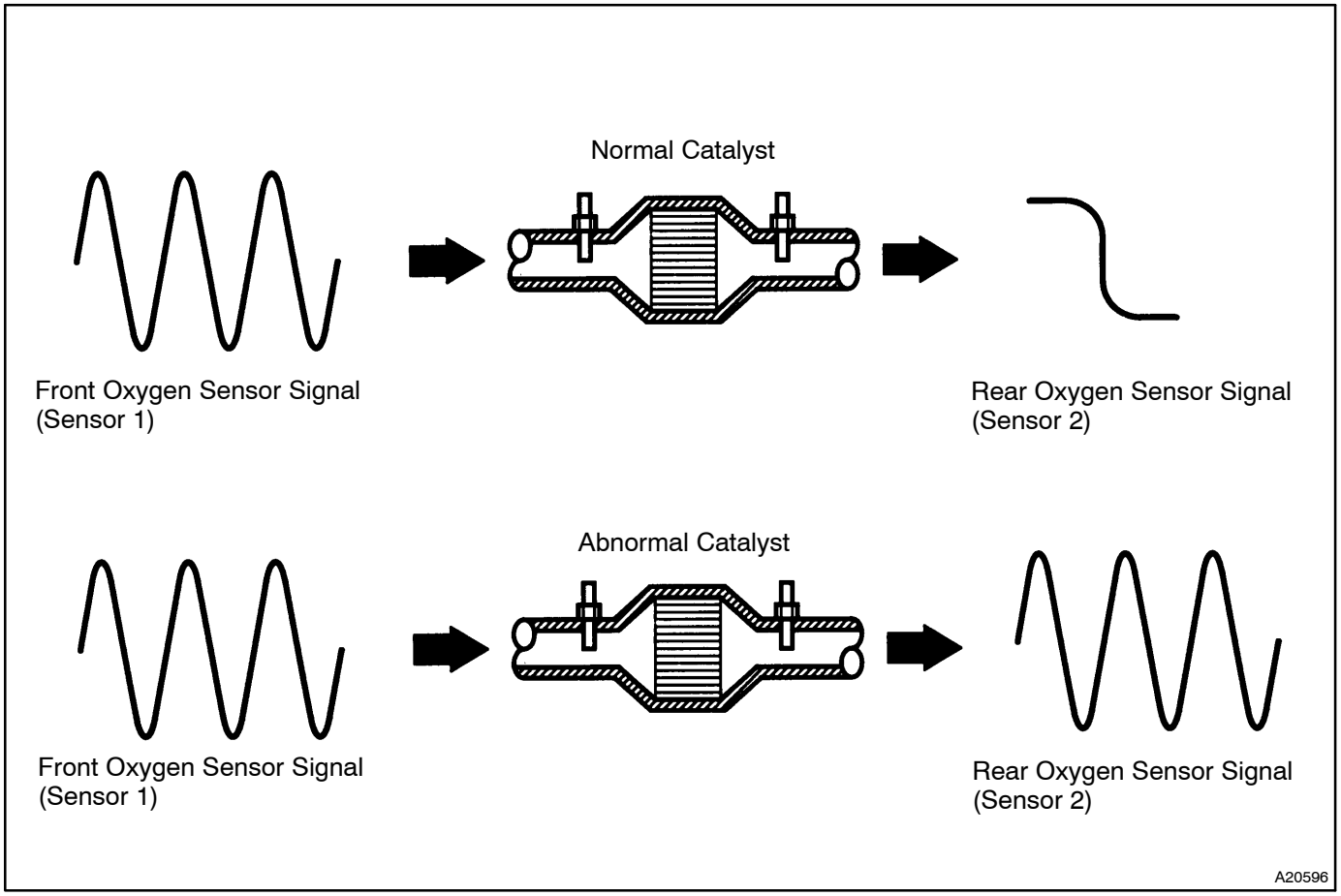
DTC	P0420	Catalyst System Efficiency Below Threshold (Bank 1)

DTC	P0430	Catalyst System Efficiency Below Threshold (Bank 2)

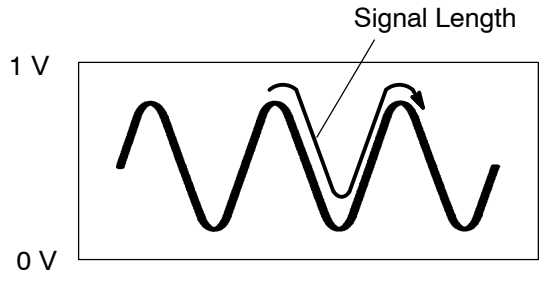
MONITOR DESCRIPTION

The vehicle is equipped with two heated oxygen sensors. One is mounted upstream from the TWC (Three–Way Catalytic) converter (Front Oxygen Sensor, ”sensor 1”), the second is mounted downstream (Rear Oxygen Sensor ”sensor 2”). The catalyst efficiency monitor compares the sensor 1 and sensor 2 signals in order to calculate TWC ability to store the oxygen.

During normal operation, the TWC stores and releases oxygen as needed. This results in low oxygen variations in the post TWC exhaust stream as shown below.



Sensor Signal Length



DTC	Detecting Condition	Trouble Area
P0420	Bank 1 catalyst deterioration level exceeds malfunction threshold several times while vehicle is being driven under specified conditions (2 trip detection logic).	• LH front exhaust pipe (front and rear catalysts bank 1) • Gas leakage on 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 several times while vehicle is being driven under specified conditions (2 trip detection logic).	• RH front exhaust pipe (front and rear catalysts bank 2) • Gas leakage on 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 (sub)	Heated oxygen sensors
Frequency of operation	Once per driving cycle
Duration	160 sec
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

Item	Minimum	Maximum
DTCs are not present	See "List of disable a monitor" (on page DI–3)	
Battery voltage	11 V	–
Intake air temperature	–10°C (14°F)	–
Idle switch	OFF	
Intake air amount	8 g/sec	50 g/sec
Engine speed	–	4000 rpm
Engine coolant temperature	75°C (167°F)	
Upstream catalyst temperature	450°C (842°F)	820°C (1508°F)
Downstream catalyst temperature	450°C (842°F)	820°C (1508°F)
Fuel system status	Closed loop	

TYPICAL MALFUNCTION THRESHOLDS

Catalyst deterioration level	0.6 or more
Number of detections	8 times

MONITOR RESULT (Mode 6)

See page DI–3 for the detailed information.

TID $01: Catalyst monitor

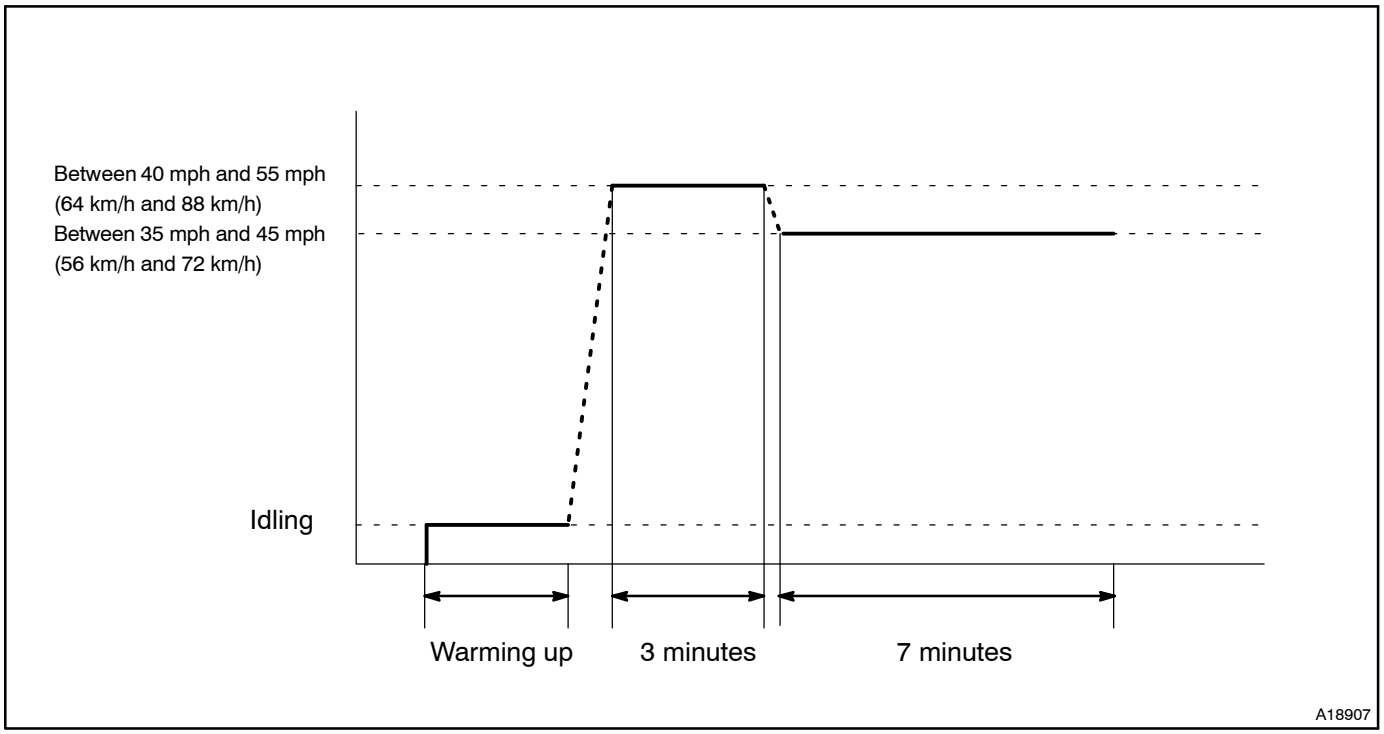
TLT	CID	Unit Conversion	Description of Test Value	Description of Test Limit
0	$01	Multiply by 0.0078 (no dimension)	Catalyst deterioration level bank 1	Malfunction criterion
0	$02	Multiply by 0.0078 (no dimension)	Catalyst deterioration level bank 2	Malfunction criterion

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, as well as other data from the time when a malfunction occurred.

1	**Check DTC other than P0420 and P0430.**

If DTC other than P0420 or P0430 is present, troubleshoot the DTC first.

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

B → **Go to relevant DTC chart (See page DI–36).**

A

2	**Check gas leakage on exhaust system.**

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	+25 % –12.5%	+25 % –12.5%	+25 % –12.5%
Front oxygen sensor (sensor 1)	0.5 V 0.4 V	Almost no reaction	0.5 V 0.4 V
Rear oxygen sensor (sensor 2)	0.5 V 0.4 V	0.5 V 0.4 V	Almost no reaction
Trouble area	Oxygen sensors are OK.	Front heated oxygen sensor (sensor 1)	Rear heated oxygen sensor (sensor 2)

NOTICE:
The rear oxygen sensor (sensor 2) output has 20 seconds of delay at maximum.

B → **Replace heated oxygen sensor (bank 1 sensor 1 or bank 2 sensor 1).**

C → **Replace heated oxygen sensor (bank 1 sensor 2 or bank 2 sensor 2).**

A

Replace front and rear catalyst (See page EC–10).

NOTICE:

- **If DTC P0420 is present, replace the LH front exhaust pipe (TWC: front and rear catalyst).**
- **If DTC P0430 is present, replace the RH front exhaust pipe (TWC: front and rear catalyst).**

–MEMO–

–MEMO–