

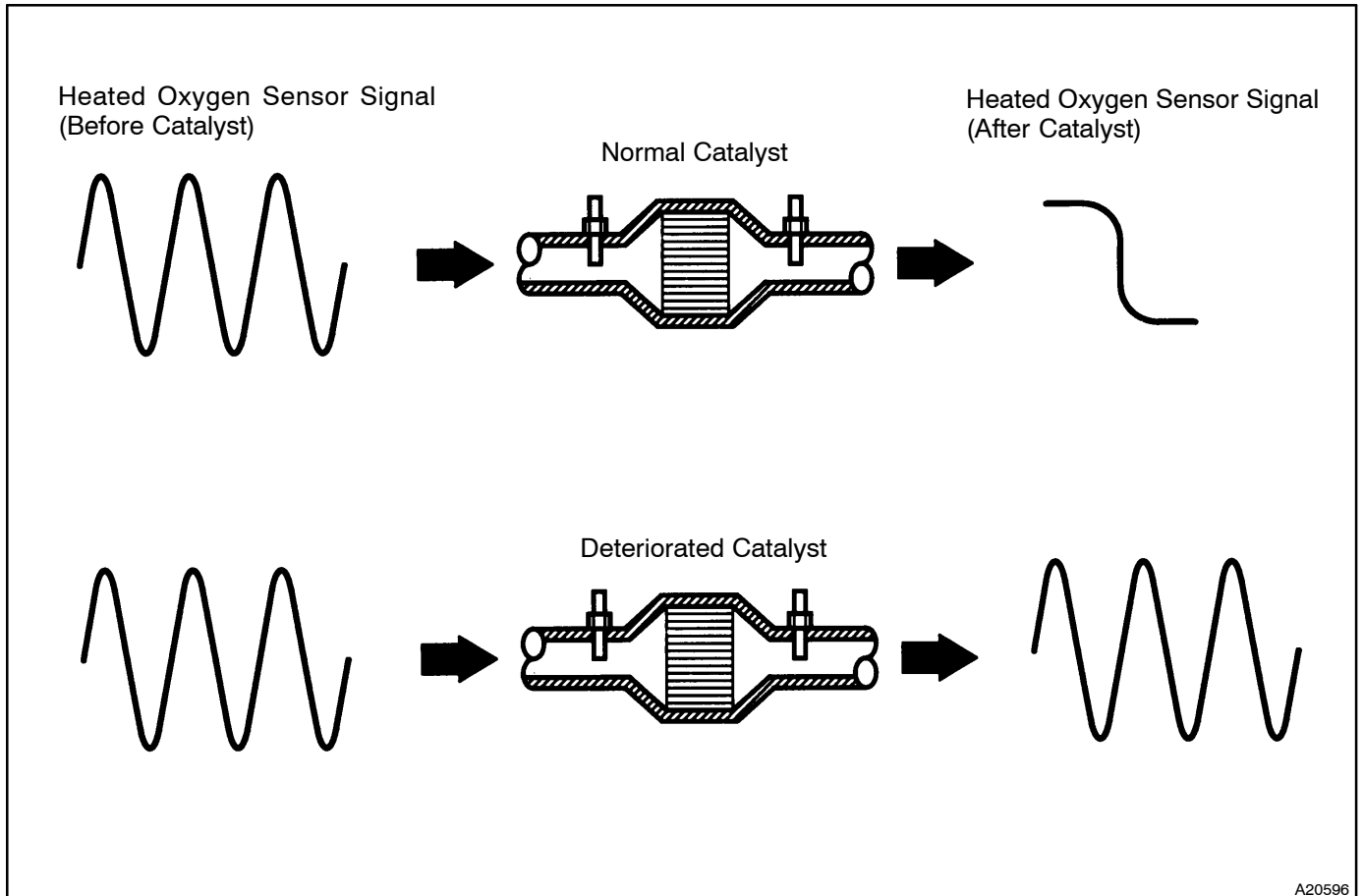
DTC	P0420	Catalyst System Efficiency Below Threshold (Bank 1)
------------	--------------	--

DTC	P0430	Catalyst System Efficiency Below Threshold (Bank 2)
------------	--------------	--

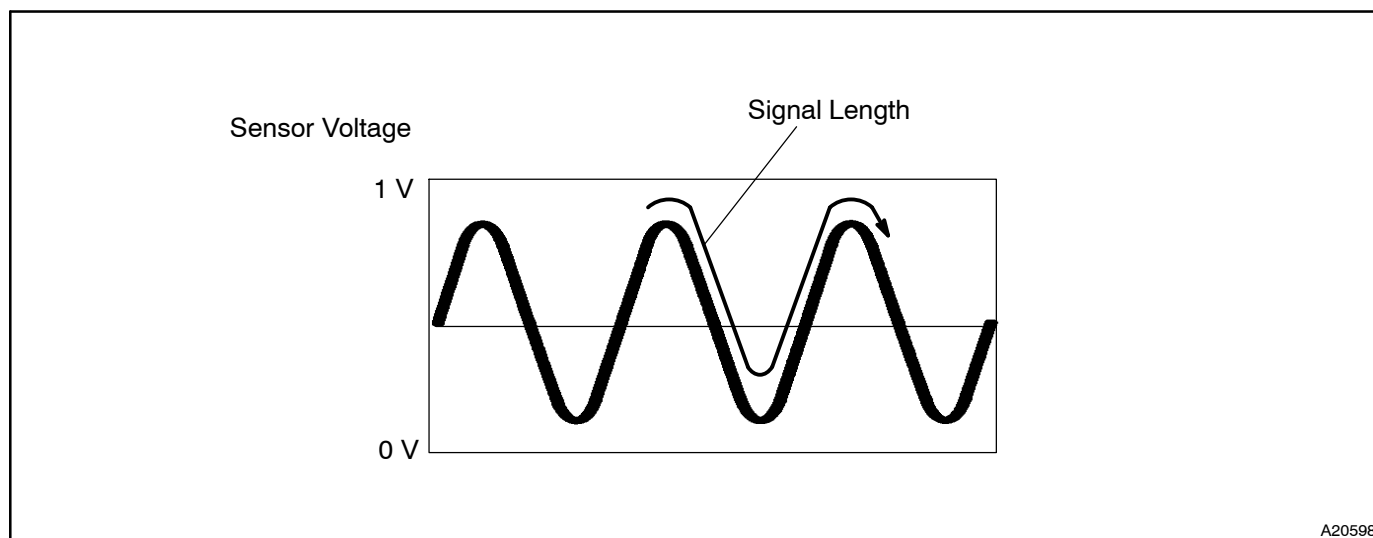
MONITOR DESCRIPTION

The catalyst monitor runs while driving the vehicle under specified conditions. During this monitor, the catalyst deterioration level is checked. The catalyst deterioration level is a ratio of signal lengths between rear and front heated oxygen sensors (HO2S). The number of rear HO2S signal fluctuations increases with the catalyst deteriorating. Therefore, when the catalyst deteriorated, the rear HO2S signal length is near to the front HO2S signal length. If the catalyst deterioration level exceeds a malfunction threshold, the ECM sets a DTC and illuminates the MIL.

DTC	Detecting Condition	Trouble Area
P0420	Catalyst deterioration level (bank 1) based on front and rear heated oxygen sensor signals exceeds malfunction threshold while driving vehicle under specified conditions (2 trip detection logic).	• Front exhaust pipe LH (front and rear catalysts) • Gas leakage on exhaust system • Heated oxygen sensor (bank 1 sensor 1) • Heated oxygen sensor (bank 1 sensor 2)
P0430	Catalyst deterioration level (bank 2) based on front and rear heated oxygen sensor signals exceeds malfunction threshold while driving vehicle under specified conditions (2 trip detection logic).	• Front exhaust pipe RH (front and rear catalysts) • Gas leakage on exhaust system • Heated oxygen sensor (bank 2 sensor 1) • Heated oxygen sensor (bank 2 sensor 2)



A20596



A20598

MONITOR STRATEGY

Required sensors/components (main)	Catalyst
Required sensors/components (related)	Front heated oxygen sensors and rear heated oxygen sensors
Frequency of operation	Once per driving cycle
Duration	160 sec (20 sec x 8 times)
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The following DTCs are not present	See page DI-3	
Battery voltage	11 V	–
Intake air temperature	–10°C (14°F)	–
Idle	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)	830°C (1526°F)
Downstream catalyst temperature	450°C (842°F)	830°C (1526°F)
Fuel system status	Closed loop	

TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
Catalyst deterioration level	0.5 or more
Number of times detection	8 times

MONITOR RESULT (MODE 6)

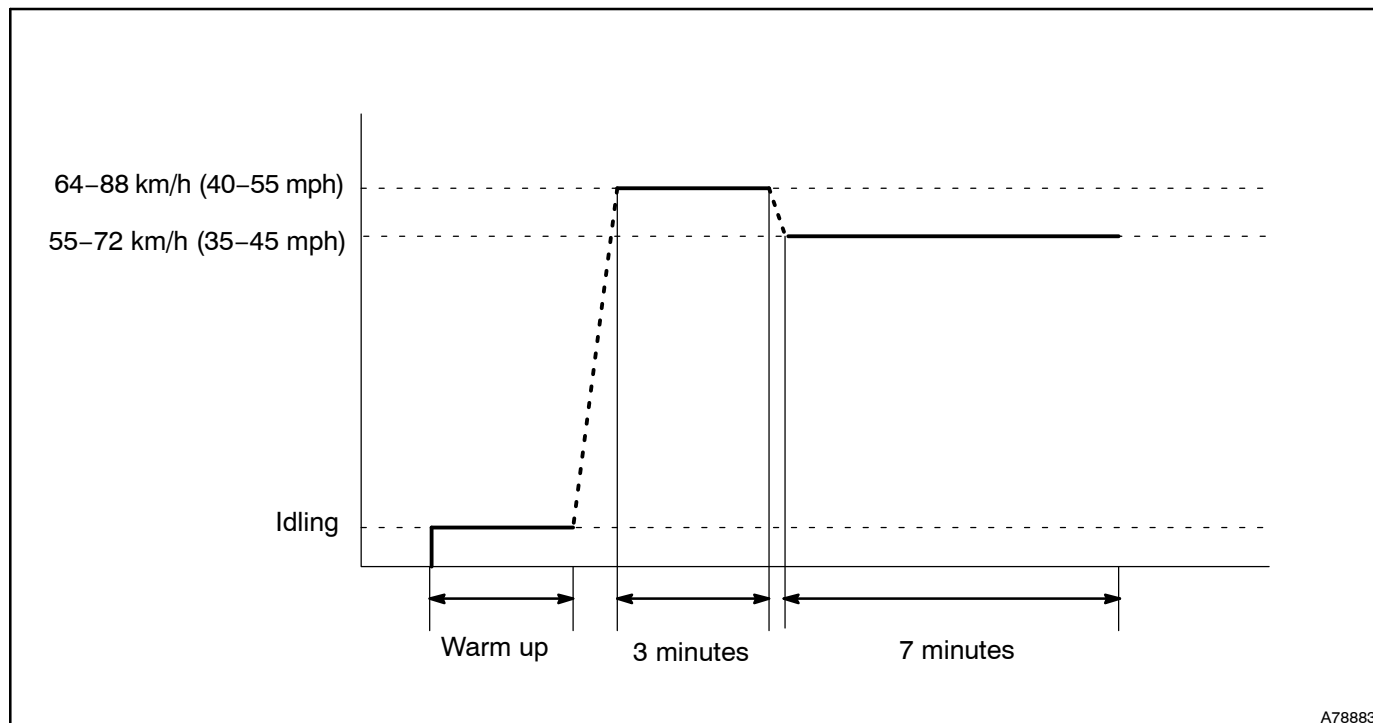
TID \$01: Catalyst

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 criteria for catalyst deterioration
0	\$02	Multiply by 0.0078 [no dimension]	Catalyst deterioration level bank 2	Malfunction criteria for catalyst deterioration

Refer to page [DI-3](#) for detailed information.

Check the monitor result and test values after performing the confirmation drive pattern below.

CONFIRMATION DRIVING PATTERN



A78883

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

NOTICE:

Drive with smooth throttle operation and avoid sudden closure of the throttle.

INSPECTION PROCEDURE

HINT:

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	Are there any other codes (besides DTC P0420 or P0430) being output?
----------	---

If any other codes besides P0420 and/or P0430 are set, troubleshoot for those DTCs first.

RESULT:

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

B

Go to relevant DTC chart (See page [DI-43](#)).

A

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

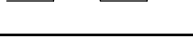
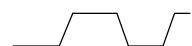
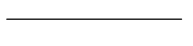
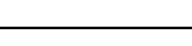
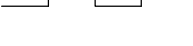
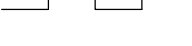
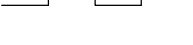
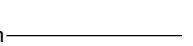
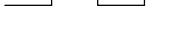
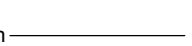
NG

Repair or replace exhaust gas leakage point.

OK

3	Perform A/F control active test
----------	--

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

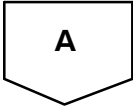
Go to	Front heated oxygen sensor (sensor 1)	Rear heated oxygen sensor (sensor 2)	Suspected Trouble Area
A	Injection volume +25 %  -12.5%  Output voltage More than 0.55 V  Less than 0.4 V 	Injection volume +25 %  -12.5%  Output voltage More than 0.5 V  Less than 0.4 V 	Catalysts
B	Injection volume +25 %  -12.5%  Output voltage Almost no reaction 	Injection volume +25 %  -12.5%  Output voltage More than 0.5 V  Less than 0.4 V 	Front heated oxygen sensor (sensor 1)
C	Injection volume +25 %  -12.5%  Output voltage More than 0.55 V  Less than 0.4 V 	Injection volume +25 %  -12.5%  Output voltage Almost no reaction 	Rear heated oxygen sensor (sensor 2)
D	Injection volume +25 %  -12.5%  Output voltage Almost no reaction 	Injection volume +25 %  -12.5%  Output voltage Almost no reaction 	Extremely rich or lean fuel-trim etc.

NOTICE:

The front heated oxygen sensor has an output delay of a few seconds.

The rear heated oxygen sensor has a maximum output delay of approximately 20 seconds.

B	Replace heated oxygen sensor (bank 1, 2 sensor 1).
C	Replace heated oxygen sensor (bank 1, 2 sensor 2).
D	Check fuel trim (See page DI-153).

A

Replace catalysts (TWC) (See page [EM-115](#)).

If DTC P0420 is present, replace the front exhaust pipe LH.

If DTC P0430 is present, replace the front exhaust pipe RH.

-MEMO-