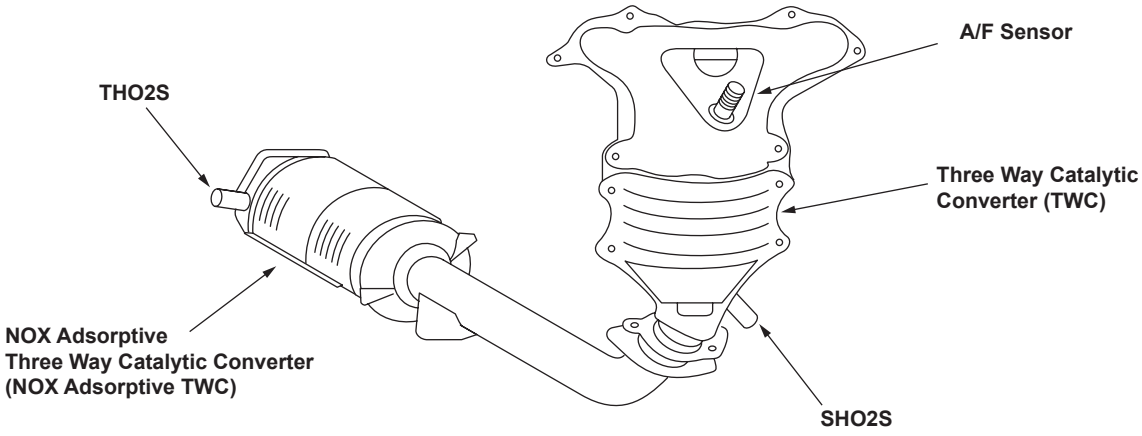
Advanced Diagnostics

DTC P1420: NOX Adsorptive Three Way Catalyst System Efficiency Below Threshold (M/T)



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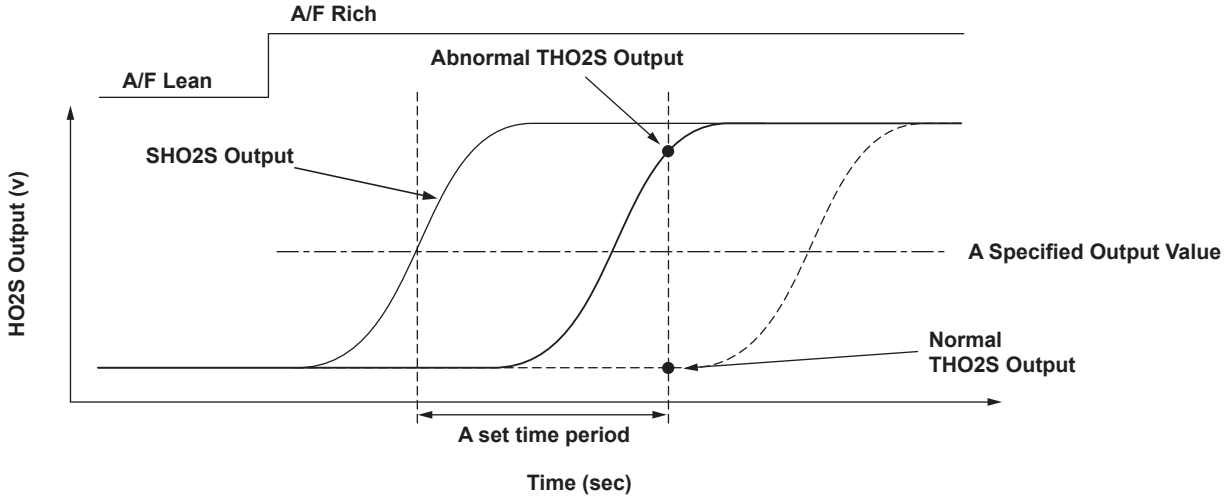

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General Description

The NOX adsorptive three way catalyst (TWC) absorbs NO2, when the oxygen concentration is high (lean) and releases absorbed NO2 to oxidize the reduced constituent (HC, CO and so on) in the exhaust gas when the oxygen concentration is low (rich). The NOX adsorptive TWC is considered faulty if the capacity of NOX adsorbent has deteriorated.
The NOX adsorptive TWC absorbs NO2 sufficiently during lean burn running. The absorbed NO2 is released when the air/fuel ratio becomes rich, then eventually, the air/fuel ratio downstream of the NOX adsorptive TWC is rich. Based on the third HO2S output after a set time period has elapsed since the secondary HO2S indicates “rich”, the engine control module (ECM) detects a malfunction and stores a DTC.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Once per driving cycle
Sequence	Secondary HO2S
Duration	50 seconds* or less
DTC Type	Two drive cycles, MIL ON

* : At 2,000 rpm

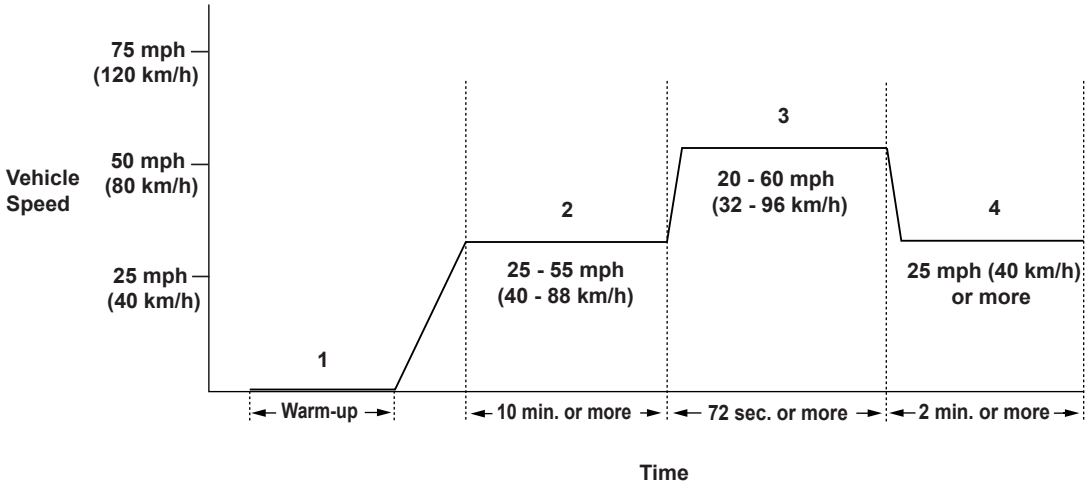
Enable Conditions

Condition		Minimum	Maximum
Elapsed time after starting the engine		605 seconds	—
Engine coolant temperature		168ºF (76ºC)	—
Engine speed		1,500 rpm	2,600 rpm
MAP value		35 kPa (260 mmHg, 10.3 in.Hg)	99 kPa (736 mmHg, 29.0 in.Hg)
The difference between atmospheric pressure and manifold pressure	1,500 rpm	8 kPa (54 mmHg, 2.2 in.Hg)	—
	2,600 rpm	11 kPa (81 mmHg, 3.2 in.Hg)	
Vehicle speed		25 mph (40 km/h)	—
Short term fuel trim		—	0.98
Secondary HO2S output		—	0.29 V
Fuel feedback		During lean burn running	
Monitoring priority		EVAP	
No active DTCs		ECM, A/F Sensor, A/F Sensor Heater, Secondary HO2S Heater, Third HO2S Heater, MAP, CKP, ECT, TP, EGR, BARO, VSS, VTEC System, Fuel System, EVAP	
Others		Must be in 3rd, 4th, or 5th gear	
		The duration of lean burn running must be sufficient (at least 1 minute)	
		The IMA battery indicates at least 25%	
		The Nox adsorptive TWC is not contaminated by sulfur in gasoline	

Malfunction Threshold

The third HO2S output is 0.60 V or more during a richer running mode for no more than 50 seconds.

Driving Pattern



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1. Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed between 25 - 55 mph (40 - 88 km/h) for at least 10 minutes to warm up the engine and the NOX adsorptive TWC.
3. Drive the vehicle at a speed between 20 - 60 mph (32 - 96 km/h) for at least 72 seconds.
4. Then, drive at a steady speed of 25 mph (40 km/h) or more in the lean burn running mode for at least 2 minutes.

- If the NOX adsorptive TWC is contaminated by sulfur in gasoline, the detection may be incorrect. Therefore, retest after driving with the engine in a richer running mode to counteract the effects of the sulfur (10 minutes) if the detection is not complete in the first driving cycle.
- If you have difficulty duplicating the DTC, retest after turning off electrical components such as the audio system and A/C, and try a different gear position.
- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.