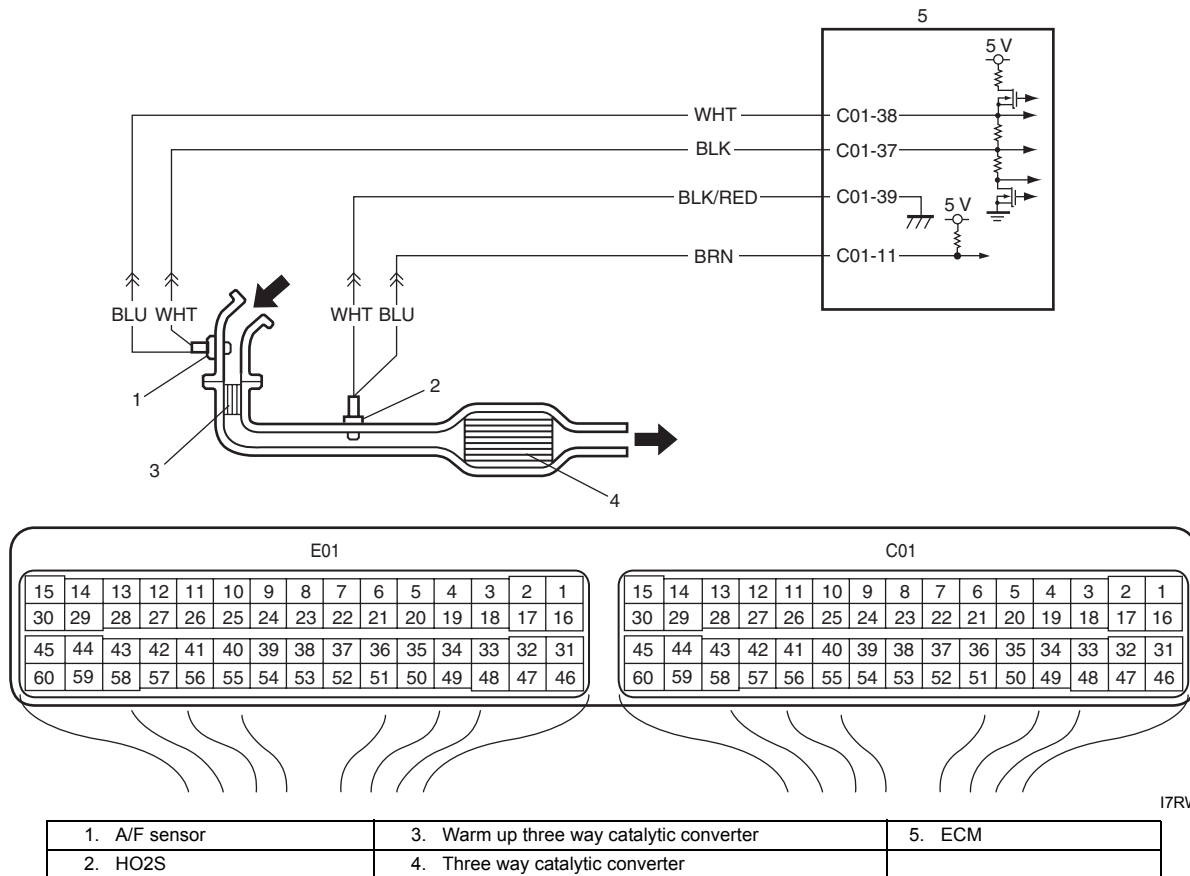


Step	Action	Yes	No
6	<b>CMP sensor check</b> 1) Check CMP sensor and sensor rotor referring to "Camshaft Position (CMP) Sensor Inspection in Section 1C".  <i>Are they in good condition?</i>	Substitute a known-good ECM and recheck.	Replace CMP sensor and/or sensor rotor.

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

S6RW0C1104039

**System and Wiring Diagram**



I7RW01110058-03

1. A/F sensor	3. Warm up three way catalytic converter	5. ECM
2. HO2S	4. Three way catalytic converter	

**System Description**

ECM monitors oxygen concentration in the exhaust gas which has passed the warm up three way catalytic converter by HO2S. When the catalyst is functioning properly, the variation cycle of HO2S output voltage (oxygen concentration) is slower than that of A/F sensor output signal because the amount of oxygen in the exhaust gas is stored in warm up three way catalytic converter.

**A/F Sensor Description**

Refer to "A/F Sensor Description".

**DTC Detecting Condition and Trouble Area**

DTC detecting condition	Trouble area
Ratio of integrated value of HO2S output variation per integrated value of A/F sensor output variation is more than specification while vehicle is running after warmed up. (2 driving cycle detection logic, monitoring once per driving cycle)	<ul style="list-style-type: none"> <li>Exhaust gas leak</li> <li>Warm up three way catalytic converter</li> <li>HO2S</li> <li>A/F sensor</li> </ul>

## DTC Confirmation Procedure

### **▲ WARNING**

- When performing a road test, select a place where there is no traffic or possibility of a traffic accident and very careful during testing to avoid occurrence of an accident.
- Road test should be carried out with 2 persons, a driver and a tester, on a level road.

### NOTE

Check to make sure that the following conditions are satisfied when using this “DTC Confirmation Procedure”.

- Intake air temperature at engine start:  $-10\text{ }^{\circ}\text{C}$  ( $14\text{ }^{\circ}\text{F}$ ) to  $80\text{ }^{\circ}\text{C}$  ( $176\text{ }^{\circ}\text{F}$ )
- Intake air temperature:  $-10\text{ }^{\circ}\text{C}$  ( $14\text{ }^{\circ}\text{F}$ ) to  $70\text{ }^{\circ}\text{C}$  ( $158\text{ }^{\circ}\text{F}$ )
- Engine coolant temperature:  $70\text{ }^{\circ}\text{C}$  ( $158\text{ }^{\circ}\text{F}$ ) to  $150\text{ }^{\circ}\text{C}$  ( $302\text{ }^{\circ}\text{F}$ )
- Altitude (barometric pressure): 2400 m, 8000 ft or less (560 mmHg, 75 kPa or more)
- The following DTCs are not detected: DTCs related to ECT sensor, IAT sensor, MAF sensor, barometric pressure sensor and VSS

- 1) Connect scan tool to DLC with ignition switch turned OFF.
- 2) Turn ON ignition switch and clear DTC using scan tool.
- 3) Start engine and warm up to normal operating temperature.
- 4) Increase vehicle speed to 50 – 60 mph (80 – 100 km/h).
- 5) Keep above vehicle speed for 10 min. or more.
- 6) Stop vehicle.
- 7) Check whether catalyst readiness/monitoring test has completed or not by using scan tool.  
If catalyst readiness/monitoring test has not completed, check vehicle conditions (environmental) and repeat Steps 4) through 6).
- 8) Check DTC and pending DTC.

## DTC Troubleshooting

Step	Action	Yes	No
1	Was “Engine and Emission Control System Check” performed?	Go to Step 2.	Go to “Engine and Emission Control System Check”.
2	<b>Exhaust system visual inspection</b> 1) Check exhaust system for leaks, damage and loose. <i>Is it in good condition?</i>	Go to Step 3.	Repair or replace.
3	<b>HO2S circuit check</b> 1) Check signal and ground circuits of HO2S for high resistance referring to step 3 of “DTC P0137 / P0138: O2 Sensor (HO2S) Circuit Low Voltage / High Voltage (Sensor-2, Bank-1)”. <i>Are they in good condition?</i>	Go to Step 4.	Repair or replace.
4	1) Replace exhaust manifold (built in warm up three way catalytic converter) and exhaust center pipe (built in three way catalytic converter). 2) Perform DTC confirmation procedure. <i>Is DTC P0420 still detected?</i>	Substitute a known-good ECM and recheck.	End.