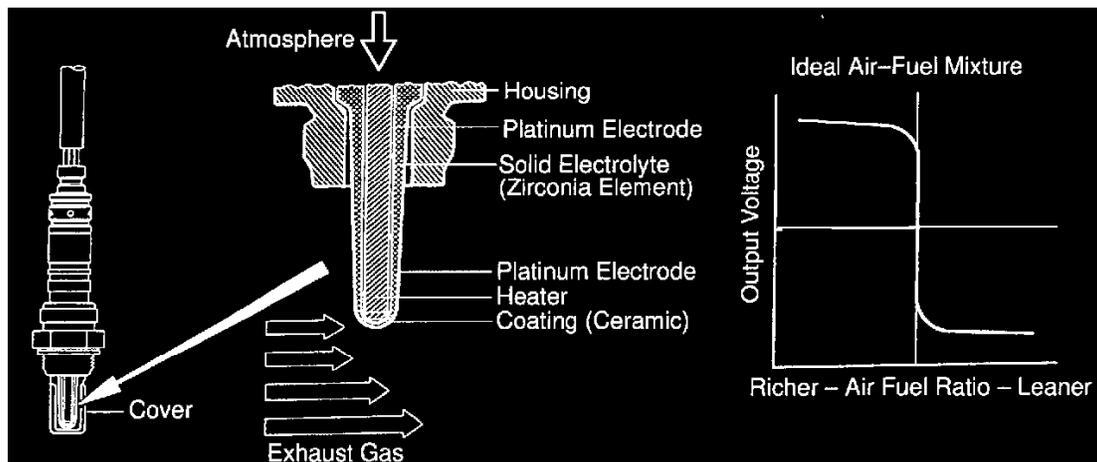


Computers and Control Systems: Testing and Inspection

P0125

CIRCUIT DESCRIPTION



To obtain a high purification rate for the CO, HC and NO_x components of the exhaust gas, a three-way catalytic converter is used, but for the most efficient use of the three-way catalytic converter, the air-fuel ratio must be precisely controlled so that it is always close to the stoichiometric air-fuel ratio.

The heated oxygen sensor (bank 1, 2 sensor 1) has the characteristic whereby its output voltage changes suddenly in the vicinity of the stoichiometric air-fuel ratio. This characteristic is used to detect the oxygen concentration in the exhaust gas and provide feedback to the computer for control of the air-fuel ratio.

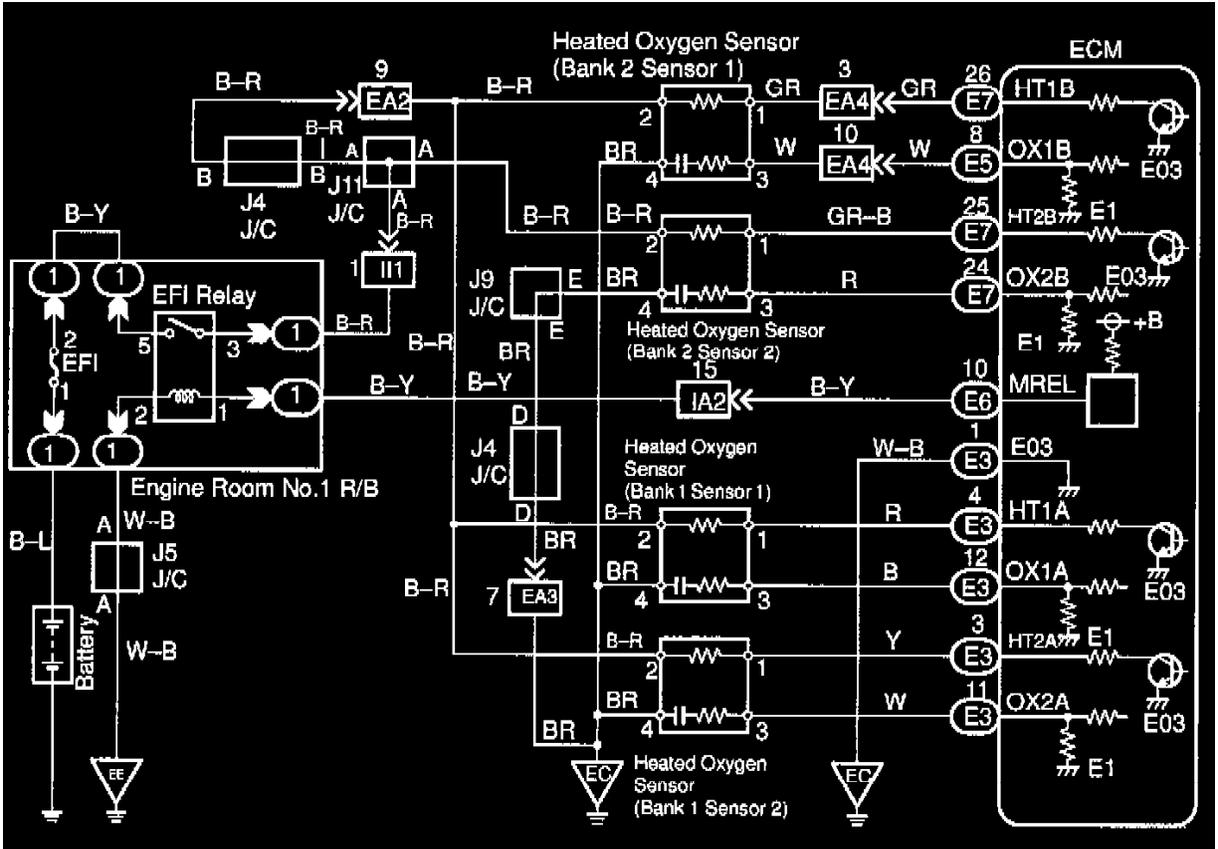
When the air-fuel ratio becomes **LEAN**, the oxygen concentration in the exhaust increases and the heated oxygen sensor (bank 1, 2 sensor 1) informs the ECM of the **LEAN** condition (small electromotive force: **< 0.45 V**).

When the air-fuel ratio is **RICHER** than the stoichiometric air-fuel ratio the oxygen concentration in the exhaust gas is reduced and the heated oxygen sensor (bank 1, 2 sensor 1) informs the ECM of the **RICH** condition (large electromotive force: **> 0.45 V**). The ECM judges by the electromotive force from the heated oxygen sensor (bank 1, 2 sensor 1) whether the air-fuel ratio is **RICH** or **LEAN** and controls the injection time accordingly. However, if malfunction of the heated oxygen sensor (bank 1, 2 sensor 1) causes output of abnormal electromotive force, the ECM is unable to perform accurate air-fuel ratio control. The heated oxygen sensors (bank 1, 2 sensor 1) include a heater which heats the zirconia element. The heater is controlled by the ECM. When the intake air volume is low (the temperature of the exhaust gas is low) current flows to the heater to heat the sensor for accurate oxygen concentration detection.

| DTC No. | DTC Detecting Condition | Trouble Area |
|---------|--|--|
| P0125 | <p>After engine is warmed up, heated oxygen sensors (bank 1, 2 sensor 1) output does not indicate RICH (≥ 0.45 V) even once when conditions (a), (b), (c) and (d) continue for at least 90 sec.:</p> <p>(a) Engine speed: 1,400 rpm or more (b) Vehicle speed: 40 ~ 100 km/h (25 ~ 62 mph) (c) Throttle valve does not fully closed (d) 180 sec. or more after starting engine</p> | <ul style="list-style-type: none">• Air induction system• Injector• Fuel pressure• Gas leakage on exhaust system• Open or short in heated oxygen sensor (bank 1, 2 sensor 1) circuit• Heated oxygen sensor (bank 1, 2 sensor 1) |

DETECTING CONDITIONS

HINT: After confirming DTC P0125, use the OBD II scan tool or LEXUS hand-held tester to confirm voltage output of the heated oxygen sensor (bank 1, 2 sensor 1) from the **CURRENT DATA**. If voltage output of the heated oxygen sensor (bank 1, 2 sensor 1) is less than **0.1 V**, heated oxygen sensor (bank 1, 2 sensor 1) circuit may be open or short.



WIRING DIAGRAM

| | |
|------------|--|
| 1 | Are there any other codes (besides DTC P0125) being output? |
| YES | Go to relevant DTC chart. |
| NO | |

Step 1

2 Connect the OBD II scan tool or LEXUS hand-held tester, and read value for voltage output of heated oxygen sensors (bank 1, 2 sensor 1).

PREPARATION:

- (a) Connect the OBD II scan tool or LEXUS hand-held tester to the DLC3.
- (b) Warm up the engine to normal operating temperature (above 75°C (169°F)).

CHECK:

Read voltage output of the heated oxygen sensors (bank 1, 2 sensor 1) when the engine is suddenly raced.

HINT:

Perform quick racing to 4,000 rpm 3 times using the accelerator pedal.

OK:

Heated oxygen sensors (bank 1, 2 sensor 1) output a RICH signal (0.45 V or more) at least once.

OK

Go to step 9

NG

Step 2

3 Check for open and short in harness and connector between ECM and heated oxygen sensors (bank 1, 2 sensor 1).

NG

Repair or replace harness or connector.

OK

Step 3

4 Check whether misfire is occurred or not by monitoring DTC and data list.

NG

Perform troubleshooting for misfire.

OK

Step 4

5 Check air induction system.

NG

Repair or replace.

OK

Step 5

| | |
|----|---|
| 6 | Check fuel pressure. |
| OK | NG → Check and repair fuel pump, pressure regulator, fuel pipe line and filter. |

Step 6

| | |
|----|---------------------------|
| 7 | Check injector injection. |
| OK | NG → Replace injector. |

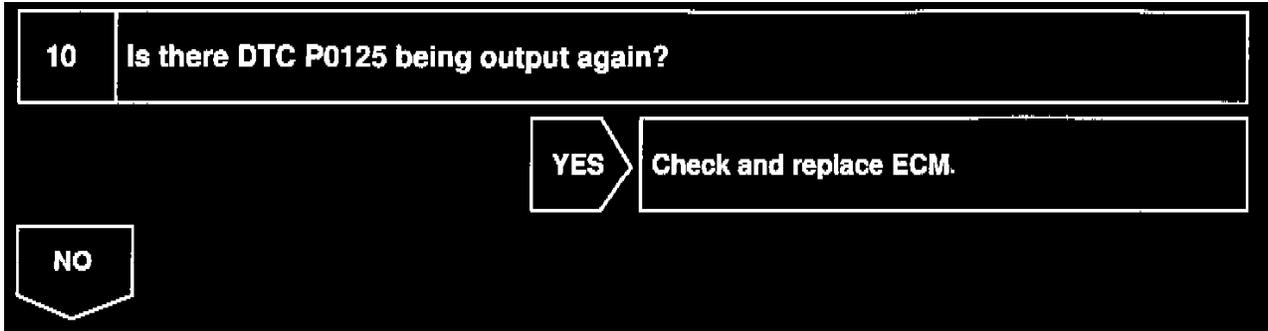
Step 7

| | |
|--|--------------------------------------|
| 8 | Check gas leakage on exhaust system. |
| OK | NG → Repair or replace. |
| Replace heated oxygen sensor (bank 1, 2 sensor 1). | |

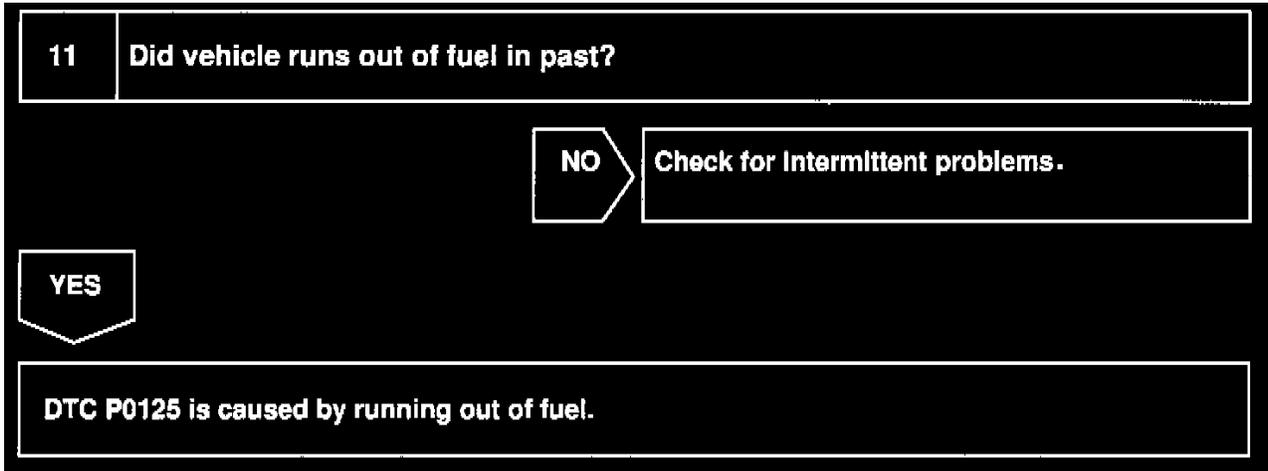
Step 8

| | |
|----|---------------------------------------|
| 9 | Perform confirmation driving pattern. |
| GO | |

Step 9



Step 10



Step 11

INSPECTION PROCEDURE

HINT:

- Read freeze frame data using LEXUS hand-held tester or OBD II scan tool. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.
- If the vehicle runs out of fuel, the air-fuel ratio is LEAN and DTC P0125 will be recorded. The MIL then comes on.