

DTC	P0125	Insufficient Coolant Temp. for Closed Loop Fuel Control
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CIRCUIT DESCRIPTION

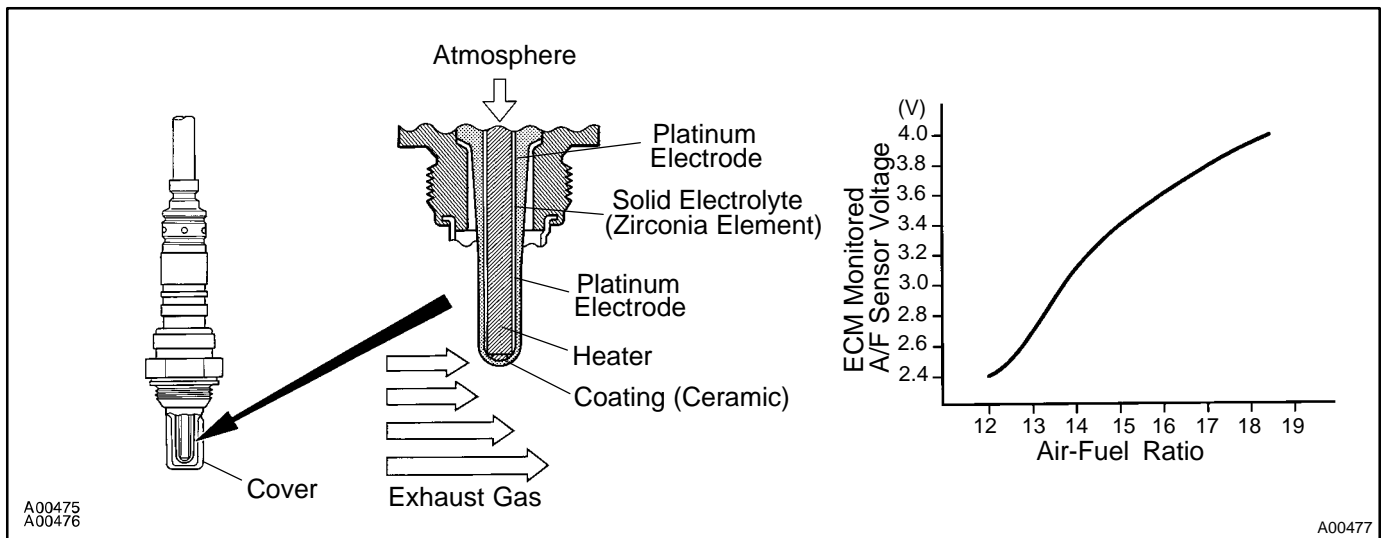
To obtain a high purification rate of the CO, HC and NOx components of the exhaust gas, a three-way catalytic converter is used. For the most efficient use of the three-way catalytic converter, the air-fuel ratio must be precisely controlled so that it is always close to the stoichiometric air-fuel ratio.

The A/F sensor has a characteristic of providing an output voltage* approximately proportional to the existing air-fuel ratio. The A/F sensor output voltage* is used to provide feedback for the ECM to control the air-fuel ratio.

By the A/F sensor output, the ECM can determine the deviation amount from the stoichiometric air-fuel ratio and control the proper injection time immediately. If the A/F sensor is malfunctioning, the ECM is unable to perform the accurate air-fuel ratio control.

The A/F sensor is equipped with 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 the accurate oxygen concentration detection.

*: The voltage value changes at the inside of the ECM only.



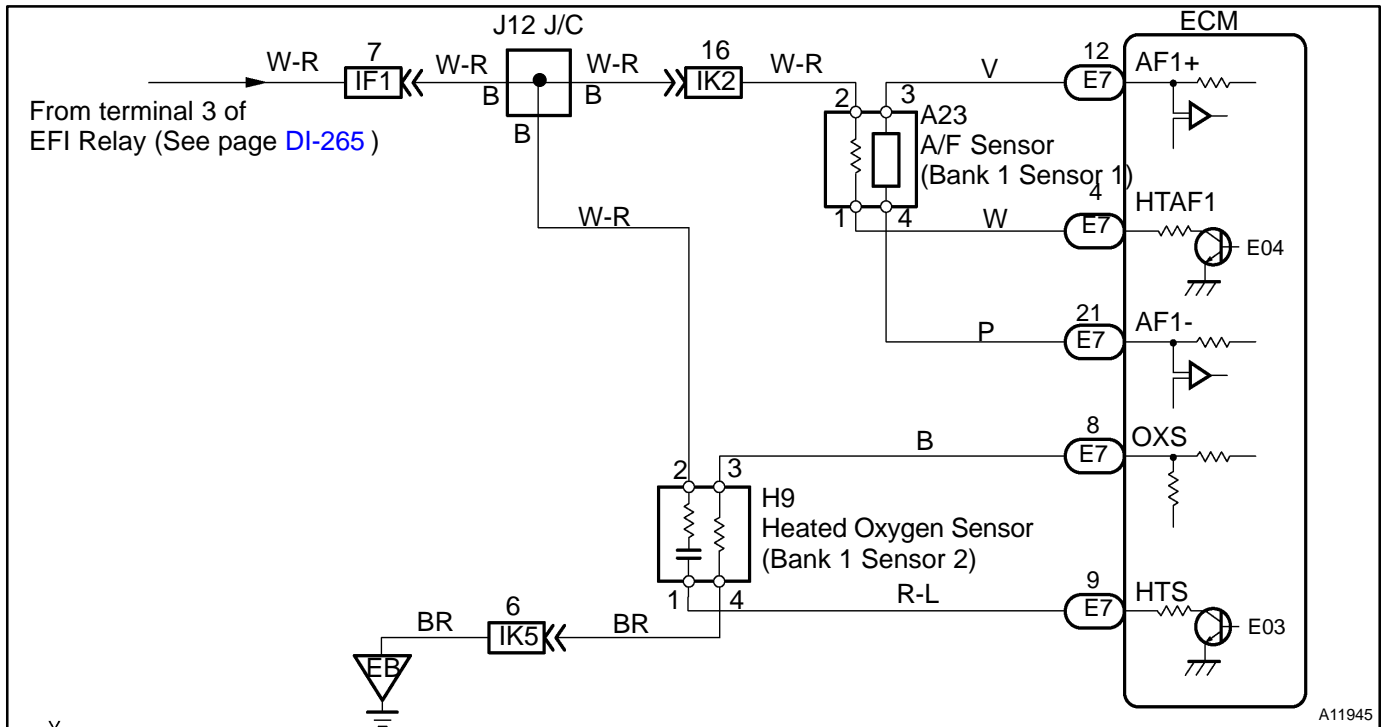
DTC No.	DTC Detection Condition	Trouble Area
P0125	After engine is warmed up, A/F sensor output* does not change when conditions (a), (b) and (c) continue for at least 1.5 min.: *: Output value changes at inside of ECM only (a) Engine speed: 1,500 rpm or more (b) Vehicle speed: 40 - 100 km/h (25 - 62 mph) (c) Throttle valve does not fully closed (d) After starting engine \geq 140 sec.	<ul style="list-style-type: none"> • Open or short in A/F sensor (bank 1 sensor 1) circuit • A/F sensor (bank 1 sensor 1) • Air induction system • Fuel pressure • Injector • Gas leak on exhaust system • ECM

HINT:

- After confirming DTC P0125, use the OBD II scan tool or TOYOTA hand-held tester to confirm output voltage of the heated oxygen sensor (bank 1 sensor 1) from the CURRENT DATA.
- The ECM controls the voltage of the AF1+ and AF1- terminals of the ECM to the fixed voltage. Therefore it is impossible to confirm the A/F sensor output voltage without OBD II scan tool or TOYOTA hand-held tester.

- OBD II scan tool (excluding TOYOTA hand-held tester) displays the one fifth of the A/F sensor output voltage which is displayed on the TOYOTA hand-held tester.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

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

1	Are there any other codes (besides DTC P0125) being output?
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YES	Go to relevant DTC chart (See page DI-156).
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NO

2	Connect OBD II scan tool or TOYOTA hand-held tester, and read value for output voltage of A/F sensor (bank 1 sensor 1).
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PREPARATION:

- Connect the OBD II scan tool or TOYOTA hand-held tester to the DLC3.
- Warm up the A/F sensor with the engine speed at 2,500 rpm for approximately 90 seconds.

CHECK:

Read the voltage value of the A/F sensor on the screen of the OBD II scan tool or TOYOTA hand-held tester when performing all the following conditions.

HINT:

The voltage of the AF1+ terminal of the ECM is fixed at 3.3 V and the AF1- terminal is fixed at 3.0 V. Therefore it is impossible to check the A/F sensor output voltage at the terminals (AF1+/AF1-) of the ECM.

OK:

Condition	A/F Sensor Voltage value
Engine idling	<ul style="list-style-type: none"> • Not remains at 3.3 V (0.660 V*) • Not remains at 3.8 V (0.76 V*) or more • Not remains at 2.8 V (0.56 V*) or less *: When using the OBD II scan tool (excluding TOYOTA hand-held tester)
Engine racing	
Driving at engine speed 1,500 rpm or more and vehicle speed 40 km/h (25 mph) or more, and operate throttle valve open and close	

HINT:

- Although there is a case that the output voltage of the A/F sensor is below 2.8 V (0.56 V*) during fuel enrichment, it is normal.
- Although there is a case that the output voltage of the A/F sensor is above 3.8 V (0.76 V*) during fuel cut, it is normal.
- If the output voltage of the A/F sensor remains at 3.30 V (0.660 V*) even after performing all the above conditions, the A/F sensor circuit may be open.
- If the output voltage of the A/F sensor remains at 3.8 V (0.76 V*) or more, or 2.8 V (0.56 V*) or less even after performing all the above conditions, A/F sensor circuit may be short.

*: When using the OBD II scan tool (excluding TOYOTA hand-held tester).

OK

Go to step 9.

NG

3

Check for open and short in harness and connector between ECM and A/F sensor (bank 1 sensor 1) (See page [IN-28](#)).

NG

Repair or replace harness or connector.

OK

4

Check resistance of A/F sensor heater (bank 1 sensor 1) (See page [SF-51](#)).

NG

Replace A/F sensor.

OK

5 Check air induction system (See page [SF-1](#)).

NG Repair or replace.

OK

6 Check fuel pressure (See page [SF-5](#)).

NG Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See page [SF-1](#)).

OK

7 Check injector injection (See page [SF-18](#)).

NG Replace injector.

OK

8 Check gas on exhaust system.

NG Repair or replace.

OK

Replace A/F sensor (bank 1 sensor 1).

9 Perform confirmation driving pattern (See page [DI-239](#)).

Go

10	Is there DTC P0125 being output again?
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YES

Check and replace ECM (See page [IN-28](#)).

NO

11	Did vehicle run out of fuel in past?
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NO

**Check for intermittent problems
(See page [DI-146](#)).**

YES

DTC P0125 is caused by shortage of fuel.