DTC	P0125	Insufficient Coolant Temp. for Closed Loop Fuel Control

CIRCUIT DESCRIPTION

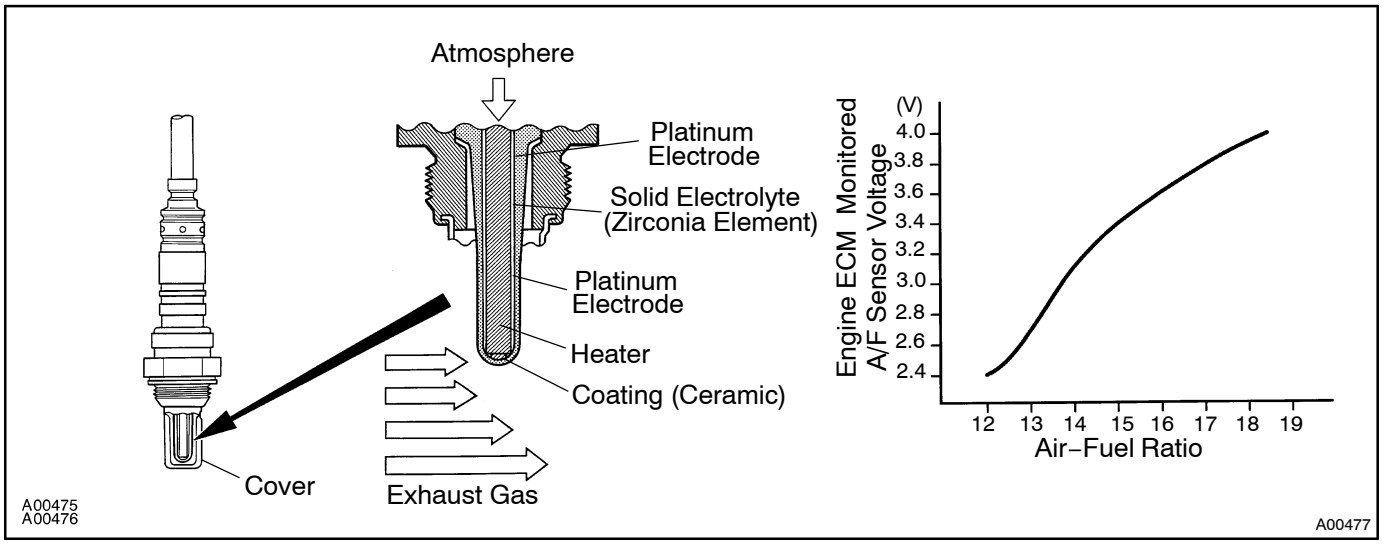
To obtain a high purification rate for the CO, HC and NOx components of the exhaust gas, a three–way catalytic converter is used. For the most efficient use of the three–way catalytic converter, the air–fuel ratio is precisely controlled so that it is always close to the stoichiometric air–fuel ratio.

The A/F sensor has a characteristic to provide output voltage* approximately proportional to the existing air–fuel ratio. The A/F sensor output voltage* is used to provide feedback for the engine ECU to control the air–fuel ratio.

By the A/F sensor output, the engine ECU 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 engine ECU is unable to perform 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 engine ECU. 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.

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

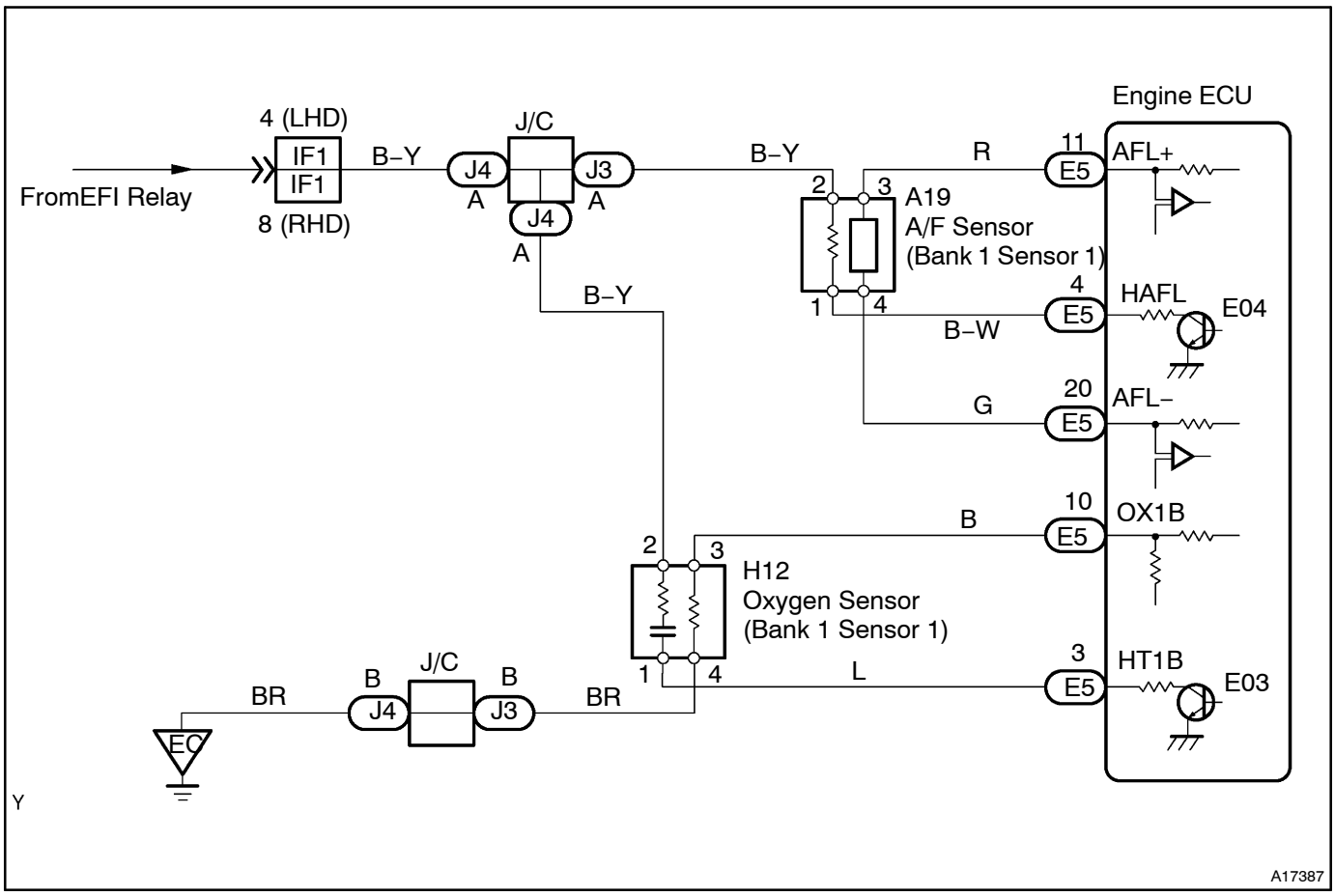


DTC No.	DTC Detection Condition	Trouble Area
P0125/91	After engine is warmed up, A/F sensor output* does not change when conditions (a), (b) and (c) continue for at least 1.5 min.: (1 trip detection logic) *: Output value changes at inside of engine ECU only (a) Engine speed: 1,500 rpm or more (b) Vehicle speed: 40 – 100 km/h (25 – 62 mph) (c) Throttle valve does not fully closed (d) After starting engine ≧ 140 sec.	• 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 leakage on exhaust system • Engine ECU

HINT:

- After confirming DTC P0125, use the hand–held tester to confirm voltage output of the oxygen sensor (bank 1 sensor 1) from the CURRENT DATA.
- The engine ECU controls the voltage of the AFL+ and AFL– terminals of the engine ECU to the fixed voltage. Therefore, it is impossible to confirm the A/F sensor output voltage without the 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. Check the engine warning light (CHE ENG) then comes on.
- Read freeze frame data using hand–held tester. Because 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?**

YES → **Go to relevant DTC chart (See page DI–13).**

NO

2	**Connect hand–held tester, and read value for output voltage of A/F sensor (bank 1 sensor 1).**

PREPARATION:

(a) Connect the hand–held tester to the DLC3.

(b) 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 hand–held tester when you performing all the following conditions.

HINT:

The voltage of AFL+ terminal of the engine ECU is fixed at 3.3 V and the AFL– terminal is fixed at 3.0 V. Therefore, it is impossible to check the A/F sensor output voltage at the terminals (AFL+/AFL–) of the engine ECU.

OK:

Condition	A/F Sensor Voltage value
Engine idling	• Not remains at 3.3. V • Not remains at 3.8 V or more • Not remains at 2.8 V or less
Engine racing	
Driving at engine speed 1,500 rpm or more and vehicle speed 40 km/h (25 mph) or move, and operate throttle valve open and close	

HINT:

- When the fuel is abundant, there is a case that the output voltage of the A/F sensor is below 2.8 V. This is considered normal.
- When the fuel is abundant,, there is a case that the output voltage of the A/F sensor is above 3.8 V. This is considered normal.
- If the output voltage of the A/F sensor remains at 3.30 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 or more, or 2.8 V or less even after performing all the above conditions, the A/F sensor circuit may be short.

OK → **Go to step 10.**

NG

3	**Check for open and short in harness and connector between engine ECU and A/F sensor (bank 1 sensor 1) (See page IN–19).**

NG → **Repair or replace harness or connector.**

OK

4	Check resistance of A/F sensor heater (bank 1 sensor 1) (See page FI–2).

NG → Replace A/F sensor.

OK

5	Check air induction system.

NG → Repair or replace.

OK

6	Check EGR system (See page DI–80).

NG → Repair EGR system.

OK

7	Check fuel pressure (See page FI–1 of Pub. No. RM652E).

NG → Check and repair fuel pump, fuel pipe line and filter (See page FI–1 of Pub. No. RM652E).

OK

8	Check injector injection.

NG → Replace injector.

OK

9	Check gas leakage on exhaust system.

NG → Repair or replace.

OK →

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

10	Perform confirmation driving pattern (See page DI–106).

Go →

11	Is there DTC P0125 being output again?

YES → Check and replace engine ECU (See page IN–19).

NO →

12	Did vehicle run out of fuel in past?

NO → Check for intermittent problems (See page DI–3).

YES →

DTC P0125 is caused by shortage of fuel.