DI9NF–01

DTC	P0125/91	Insufficient Coolant Temp. for Closed Loop Fuel Control

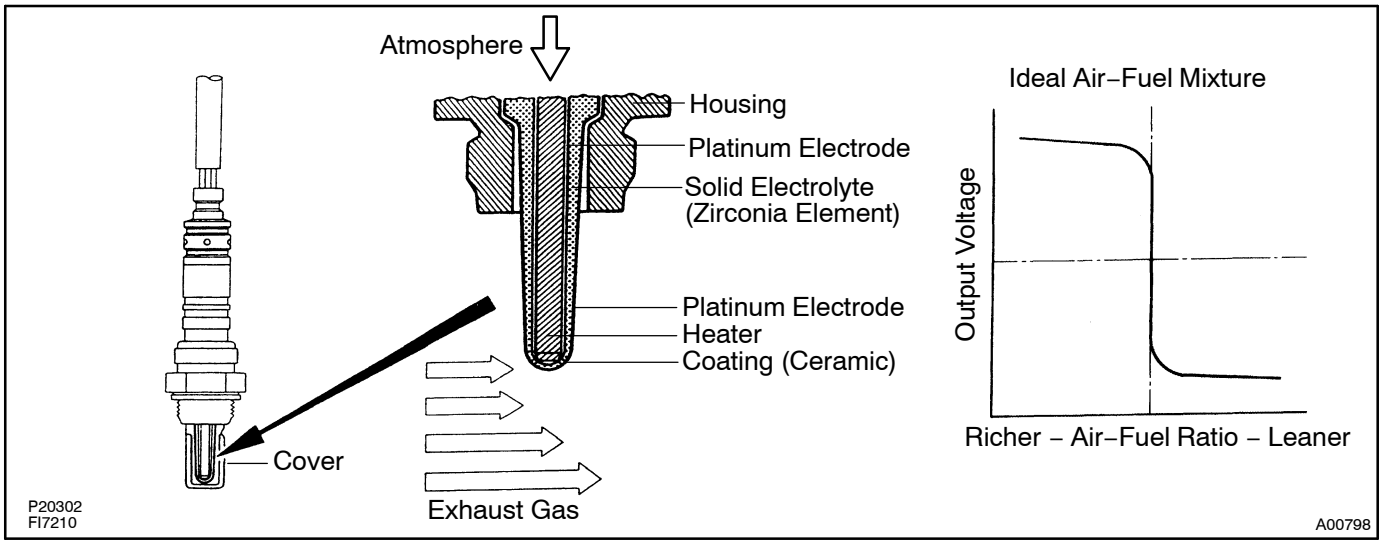
CIRCUIT DESCRIPTION

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 oxygen sensor (bank 1, 2 sensor 1) is characterized that its output voltage changes suddenly in the vicinity of the stoichiometric air–fuel ratio. This character is used to detect the oxygen concentration in the exhaust gas and provide the engine ECU with feedback to control the air–fuel ratio.

When the air–fuel ratio becomes LEAN, the oxygen concentration in the exhaust gas increases and the oxygen sensor informs the engine ECU of the LEAN condition (small electromotive force: < 0.45 V).

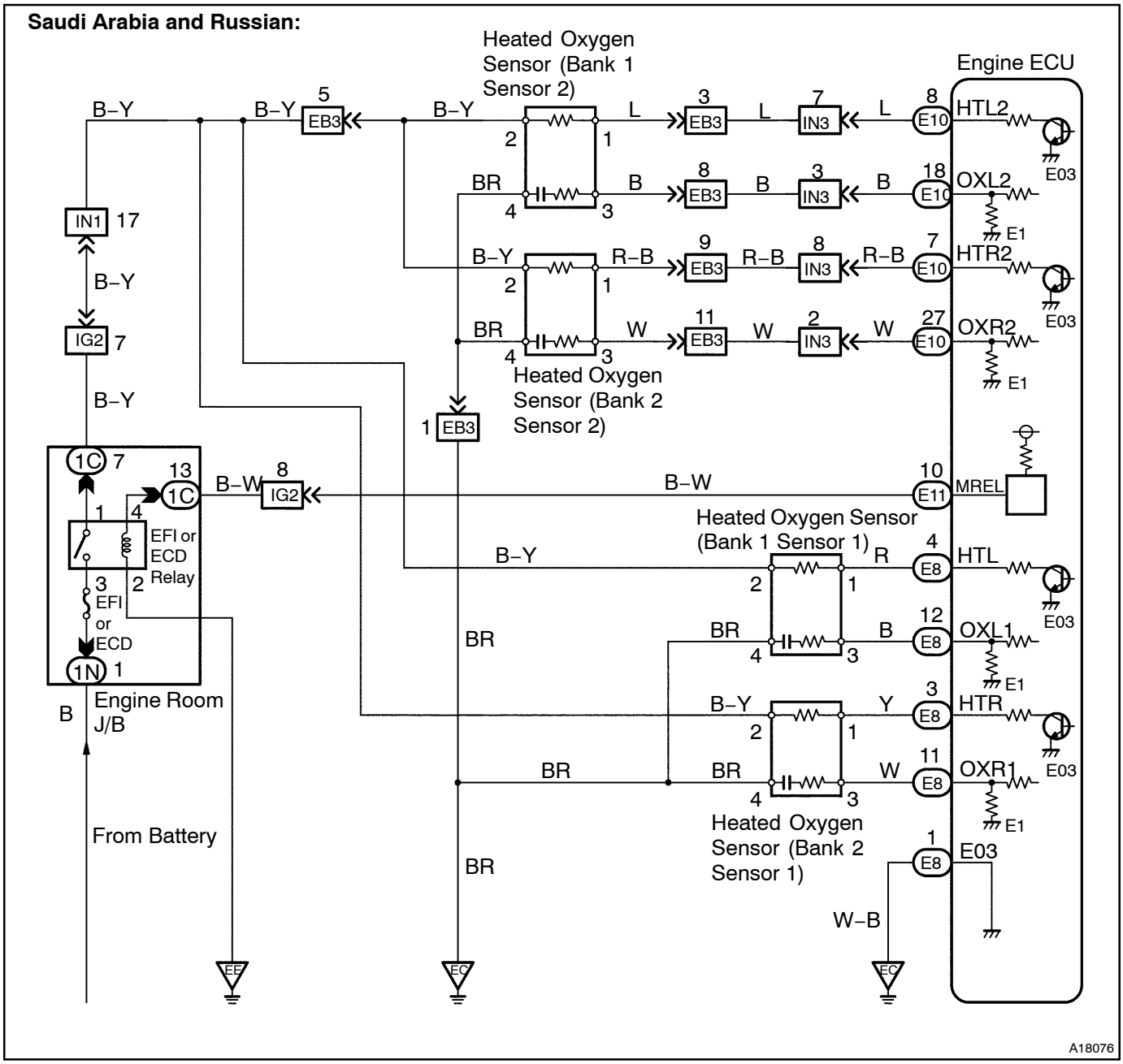
When the air–fuel ratio is RICHER than the stoichiometric air–fuel ratio, the oxygen concentration in the exhaust gas is reduced and the oxygen sensor informs the engine ECU of the RICH condition (large electromotive force: > 0.45 V). The engine ECU judges by the electromotive force from the oxygen sensor whether the air–fuel ratio is RICH or LEAN and controls the injection time accordingly. However, if malfunction of the oxygen sensor causes output of abnormal electromotive force, the engine ECU is unable to perform accurate air–fuel ratio control. The oxygen sensors include 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.



DTC No.	DTC Detection Condition	Trouble Area
P0125	After engine is warmed up, oxygen sensors (bank 1, 2 sensor 1) does not output RICH (≧0.45 V) even once when conditions (a), (b), (c) and (d) continue for at least 90 sec.: (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	• Open or short in oxygen sensor (bank 1, 2 sensor 1) circuit • Oxygen sensor (bank 1, 2 sensor 1) • Air induction system • Fuel pressure • Injector • Gas leakage on exhaust system • Engine ECU

HINT:
After confirming DTC P0125/91, use the hand–held tester to confirm voltage output of oxygen sensor (bank 1, 2 sensor 1) from the CURRENT DATA. If the output voltage of the oxygen sensor is less than 0.1 V, the oxygen sensor circuit may be open or short.

WIRING DIAGRAM



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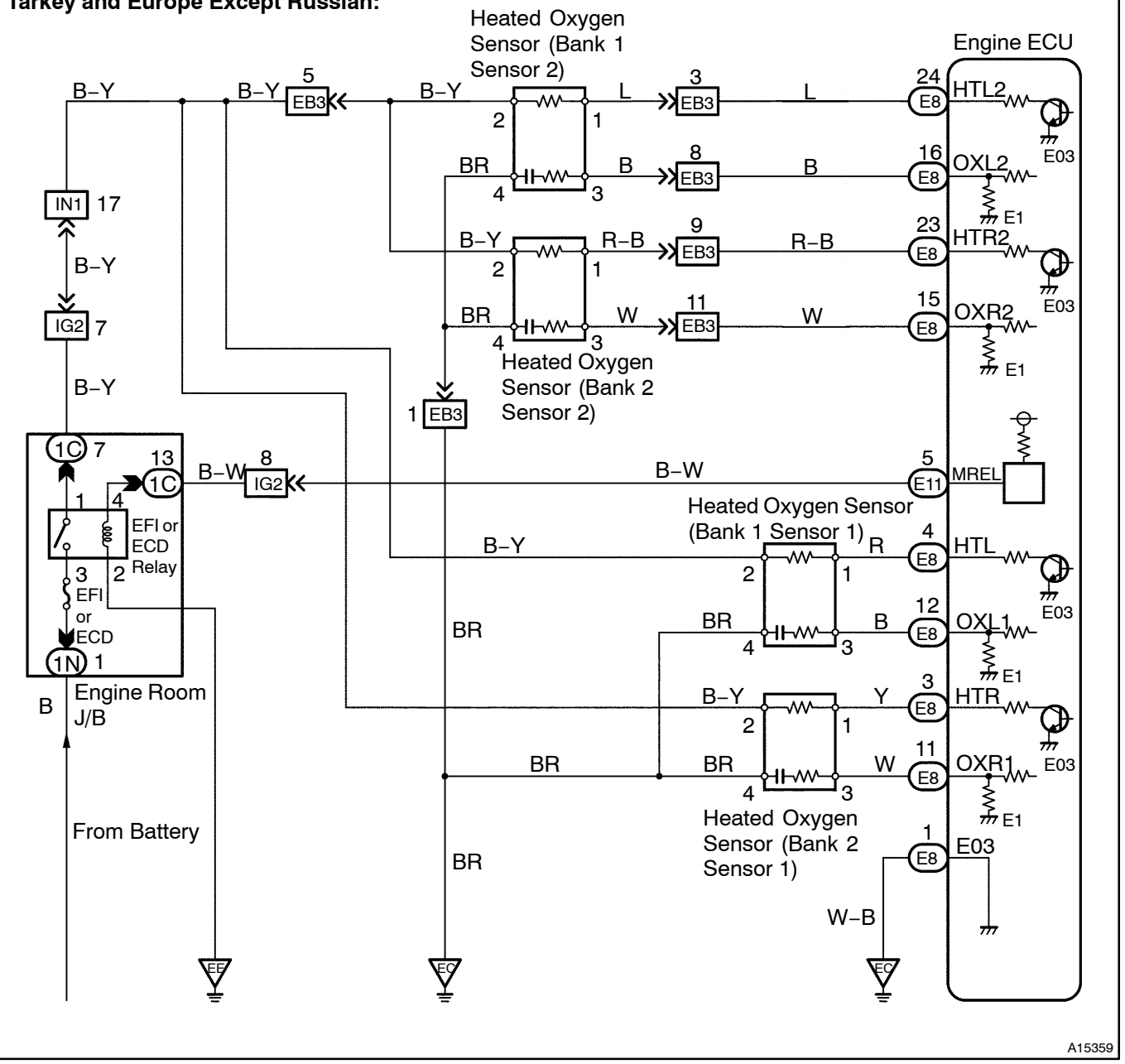

INSPECTION PROCEDURE

HINT:

- If the vehicle runs out of fuel, the air–fuel ratio is LEAN and DTC P0125 is recorded. The CHK ENG (MIL) then comes on.
- Read freeze frame data using the hand–held tester, as freeze frame data 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 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–18).**

NO

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

PREPARATION:

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

(b) Warm up the engine to the normal operating temperature (above 75°C (167°F)).

CHECK:

Read the output voltage of the oxygen sensors when the engine is suddenly raced.

HINT:

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

OK:

Oxygen sensor output a RICH signal (0.45 V or more) at least once.

OK → **Go to step 9.**

NG

3	**Check for open and short in harness and connector between engine ECU and oxygen sensor (bank 1, 2 sensor 1) (See page IN–19).**

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

OK

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

NG → Perform troubleshooting for misfire (See page DI–27).

OK

5	Check air induction system (See Pub. No. RM630E on page FI–1).

NG → Repair or replace.

OK

6	Check fuel pressure (See Pub. No. RM630E on page FI–1).

NG → Check and repair fuel pump, pressure regulator, fuel pipe line and filter.

OK

7	Check injector injection (See Pub. No. RM630E on page FI–29).

NG → Replace injector.

OK

8	Check gas leakage on exhaust system.

NG → Repair or replace.

OK

Replace oxygen sensor (bank 1, 2 sensor 1).

9	Perform confirmed driving pattern (See page DI–54).

GO

10	Is there DTC P0125 being output again?

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

NO

11	Did vehicle run out of fuel in past?

NO → Check for intermittent problems (See page DI–4).

YES

DTC P0125 is caused by shortage of fuel.