

DTC	P0125/91	Insufficient Coolant Temp. for Closed Loop Fuel Control
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DTC	P0130/21	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 1)
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CIRCUIT DESCRIPTION

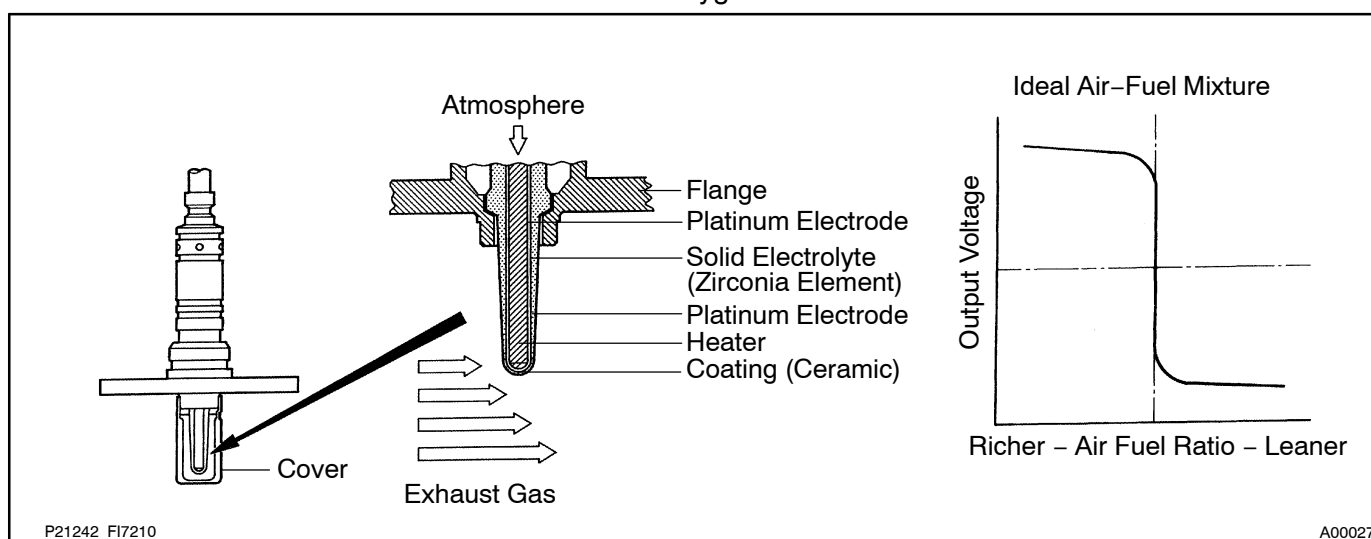
To obtain a high purification rate for the CO, HC and NO_x components of the exhaust gas, a three-way catalytic converter is used, but for the most efficient use of the three-way catalytic converter, the air-fuel ratio must be precisely controlled so that it is always close to the stoichiometric air-fuel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

The oxygen sensor has the characteristic whereby its output voltage changes suddenly in the vicinity of the stoichiometric air-fuel ratio. This 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 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.

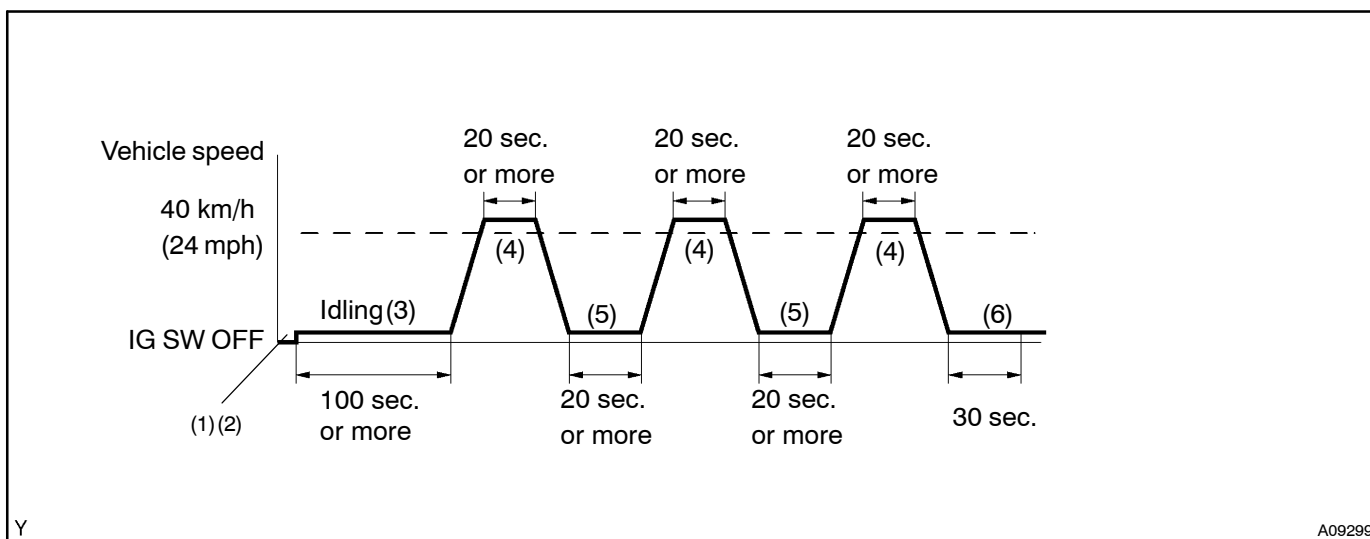
The main heated oxygen sensors include a heater which heats the zirconia element. The heater is controlled by the engine ECU. When the intake air volume is low (the temperature of the exhaust gas is low) current flows to the heater to heat the sensor for accurate oxygen concentration detection.



DTC No..	DTC Detecting Condition	Trouble Area
P0125/91	After engine is warmed up, oxygen sensor (bank 1 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.: (a) Engine speed: 1,400 rpm or more (b) Vehicle speed: 40 – 100 km/h (25 – 62 mph) (c) Closed throttle position switch: OFF (d) 180 sec. or more after starting engine	• Air induction system • Fuel pressure • Injector injection • Gas leakage on exhaust system • Open or short in heated oxygen sensor (bank 1 sensor 1) circuit • Oxygen sensor (bank 1 sensor 1)
P0130/21	Condition (a) and (b) continues for 60 secs. or more: (a) Voltage output of oxygen sensor remains at 0.35 V or more, or 0.55 V or less, during idling after engine is warmed up. (b) Oxygen sensor output voltage amplitude is less than 0.3 V.	• Oxygen sensor • Fuel trim malfunction

HINT:

- After confirming DTC P0125/91, use the hand – held tester to confirm voltage output of the heated oxygen sensor (bank 1 sensor 1) from the **CURRENT DATA**.
If voltage output of the oxygen sensor (bank 1 sensor 1) is less than 0.1 V, oxygen sensor (bank 1 sensor 1) circuit may be open or short.
- Sensor 1 refers to the sensor closer to the engine body.
The oxygen sensor's output voltage and the short – term fuel trim value can be read using the hand – held tester.

CONFIRMATION DRIVING PATTERN

- (1) Connect the hand – held tester to the DLC3.
- (2) Switch the hand – held tester from normal mode to check mode ([See page DI-4](#)).
- (3) Start the engine and let the engine idle for 100 seconds or more.
- (4) Drive the vehicle at 40 km/h (24 mph) or more for 20 seconds or more.
- (5) Let the engine idle for 20 seconds or more.
- (6) Let the engine idle for 30 seconds.

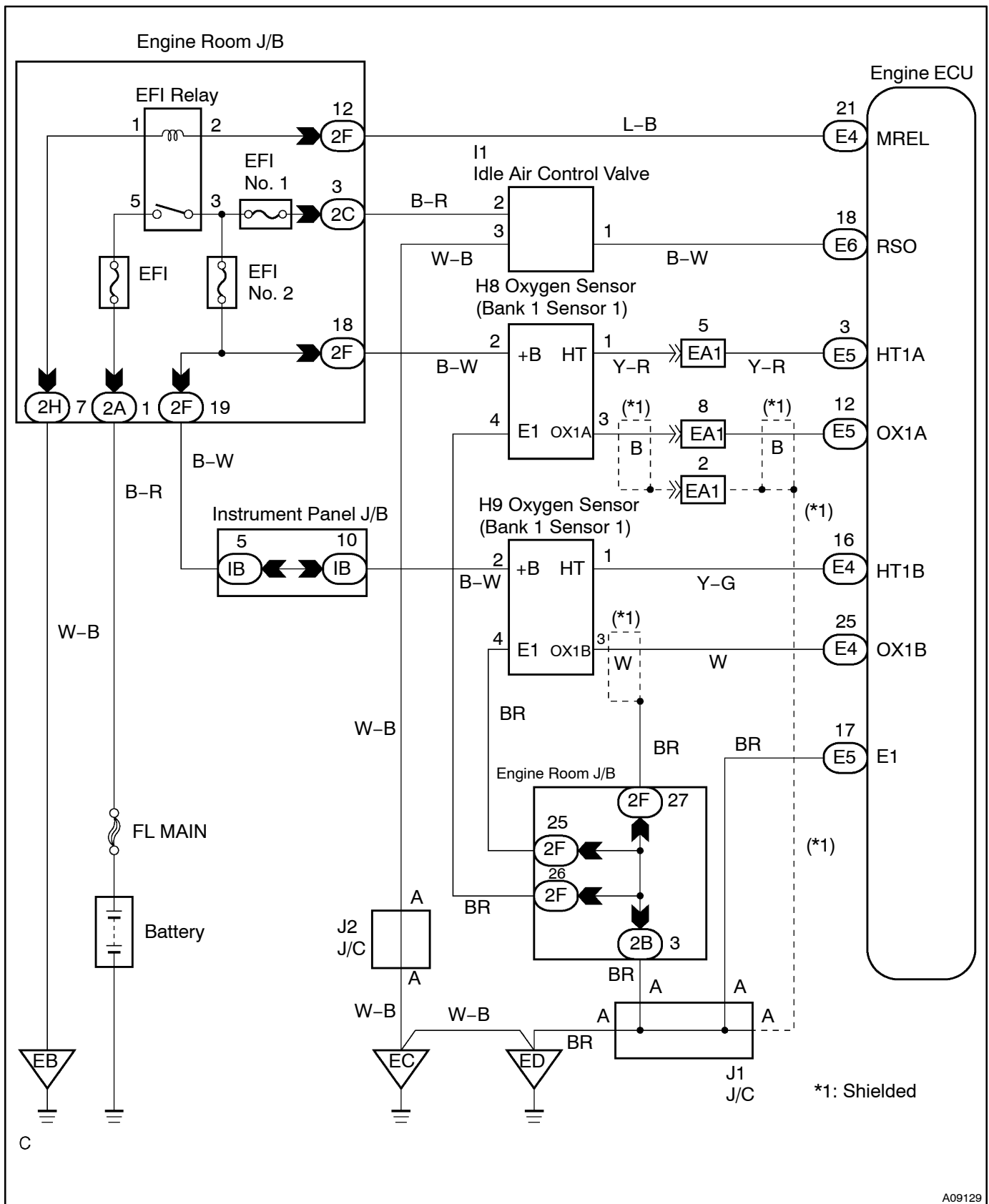
HINT:

If a malfunction exists, the MIL will light up during step (6).

NOTICE:

If the conditions in this test are not strictly followed, detection of the malfunction will not be possible. If you do not have a hand – held tester, turn the ignition switch OFF after performing steps (3) to (6), then perform steps (3) to (6) again.

WIRING DIAGRAM



A09129

INSPECTION PROCEDURE

HINT:

- If the vehicle run out of fuel, the air-fuel ratio is LEAN and DTC P0125/91 will be recorded. The check engine warning light then comes on.
- Read freeze frame data using hand-held tester. 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.

1 Are there any other codes (besides DTC P0125/91, P0130/21) being output?

YES

Go to relevant DTC chart.

NO

2 Check the output voltage of oxygen sensor during idling.

PREPARATION:

Warm up the oxygen sensor with the engine at 2,500 rpm for approx. 90 sec.

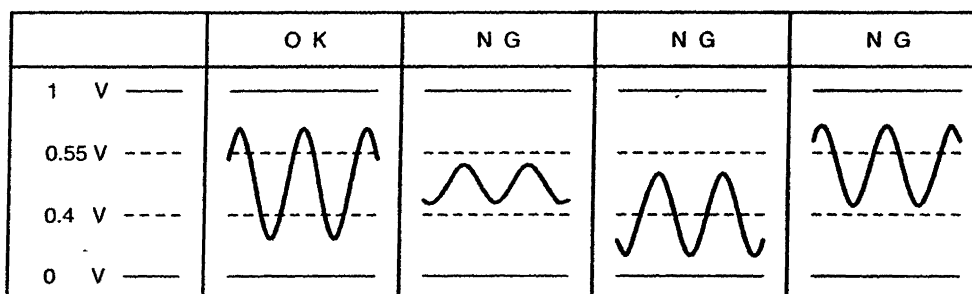
CHECK:

Use the hand-held tester read the output voltage of the oxygen sensor during idling.

OK:

Oxygen sensor output voltage:

Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table).



P18349

OK

Perform confirmation driving pattern.

NG

3	Check for open and short in harness and connector between engine ECU and oxygen sensor (bank 1 sensor 1) (See page IN-20).
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NG	Repair or replace harness or connector.
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OK

4	Check whether misfire is occurred or not by monitoring DTC and data list.
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NG	Perform troubleshooting for misfire (See page DI-24).
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OK

5	Check air induction system (See page FI-1).
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NG	Repair or replace induction system.
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OK

6	Check fuel pressure (See page FI-6).
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NG	Check and repair fuel pump, fuel pipe line and filter (See page FI-6).
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OK

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

NG

Replace injector.

OK

8 Check gas leakage on exhaust system.

NG

Repair or replace.

OK

Replace oxygen sensor (bank 1 sensor 1).

9 Perform confirmation driving pattern.

Go

10 Are there DTC P0125/91, P0130/21 being output again?

YES

Check for intermittent problems
([See page DI-4](#)).

No

