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| DTC | P1130 | A/F Sensor Circuit Range/Performance Mal-function (Bank 1 Sensor 1) |
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| DTC | P1150 | A/F Sensor Circuit Range/Performance Mal-function (Bank 2 Sensor 1) |
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CIRCUIT DESCRIPTION

Refer to DTC P0125 on page [DI-43](#).

| DTC No. | DTC Detecting Condition | Trouble Area |
|----------------|---|---|
| P1130 P1150 | Output voltage* of A/F sensor remains at 3.8 V or more, or 2.8 V or less, during engine running after the engine is warmed up (2 trip detection logic) *: Output value changes at inside of ECM only | <ul style="list-style-type: none"> ● Open or short in A/F sensor circuit ● A/F sensor ● Air induction system ● Fuel pressure ● Injector ● ECM |
| | Output voltage* of A/F sensor does not change from 3.30 V, during engine running after the engine is warmed up (2 trip detection logic) *: Output value changes at the inside of ECM only | |
| | Open or short in A/F sensor circuit (2 trip detection logic) | |

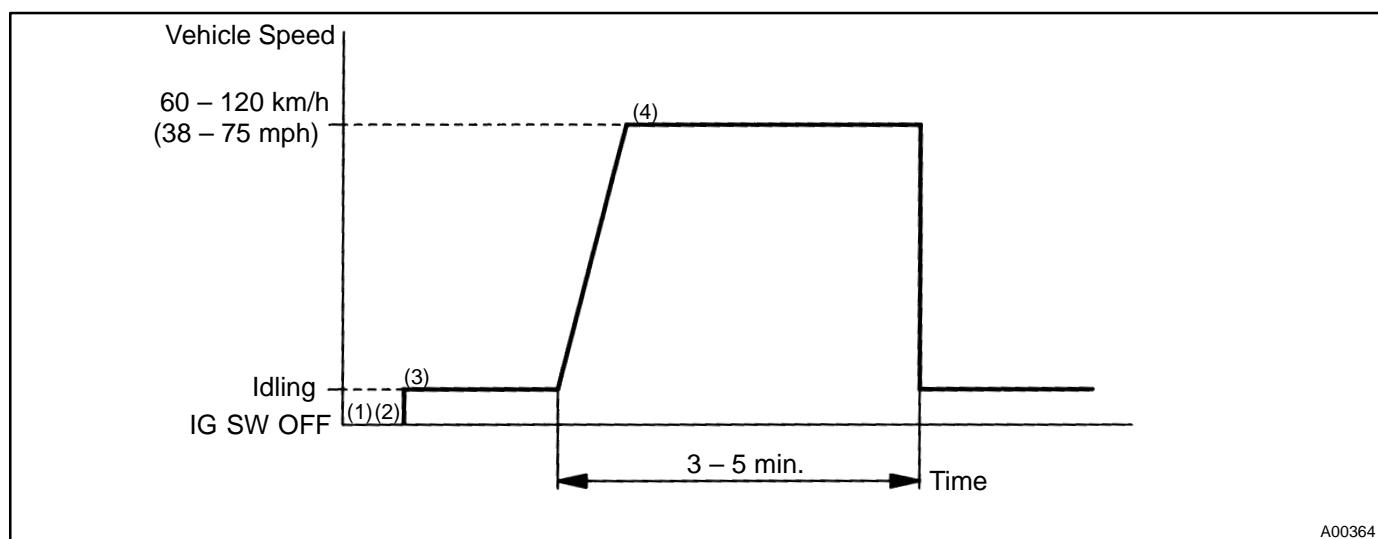
HINT:

- After confirming DTC P1130 and P1150, use the OBD II scan tool or LEXUS hand-held tester to confirm output voltage of A/F sensor (AFS B1 S1/O2S B1 S1) from the CURRENT DATA.
- The A/F sensor's output voltage and the short-term fuel trim value can be read by using the OBD II scan tool or LEXUS hand-held tester.
- The ECM controls the voltage of the AFR+, AFL+, AFR- and AFL- terminals of the ECM to the fixed voltage. Therefore, it is impossible to confirm the A/F sensor output voltage without the OBDII scan tool or LEXUS hand-held tester.
- OBD II scan tool (excluding LEXUS hand-held tester) displays the one fifth of the A/F sensor output voltage which is displayed on the LEXUS hand-held tester.

WIRING DIAGRAM

Refer to DTC P0125 on page [DI-43](#).

CONFIRMATION DRIVING PATTERN



- (1) Connect the LEXUS hand-held tester to the DLC3.
- (2) Switch the LEXUS hand-held tester from the normal mode to the check mode (See page DI-3).
- (3) Start the engine and warm it up with all the accessory switches OFF.
- (4) Drive the vehicle at 60 – 120 km/h (38 – 75 mph) and engine speed at 1,400 – 3,200 rpm for 3 – 5 minutes.

HINT:

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

NOTICE:

If the conditions in this test are not strictly followed, the detection of the malfunction is impossible. If you do not have a LEXUS hand-held tester, turn the ignition switch OFF after performing steps (c) and (d) once, then perform steps (c) and (d) again.

INSPECTION PROCEDURE

HINT:

- If DTC P1130 is displayed, check Bank 1 Sensor 1 circuit.
- If DTC P1150 is displayed, check Bank 2 Sensor 1 circuit.
- Read freeze frame data using LEXUS hand-held tester or OBD II scan tool, 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.

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| 1 | Are there any other codes (besides DTC P1130, P1150) being output? |
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| 2 | Check output voltage of A/F sensor. |
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PREPARATION:

(a) Connect the OBD II scan tool or LEXUS 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 A/F sensor on the screen of OBDII scan tool or LEXUS hand-held tester when performing all the following conditions.

HINT:

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

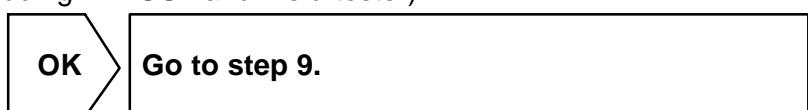
OK:

| Condition | A/F Sensor Voltage Value |
|---|--|
| Engine idling | |
| Engine racing | <ul style="list-style-type: none"> ● Not remains at 3.30 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 |
| 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 | <ul style="list-style-type: none"> ● Not remains at 3.30 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 <p style="margin-left: 20px;">*: When you use OBD II scan tool (excluding LEXUS hand-held tester)</p> |

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 normally.
- 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, the A/F sensor circuit may be short.

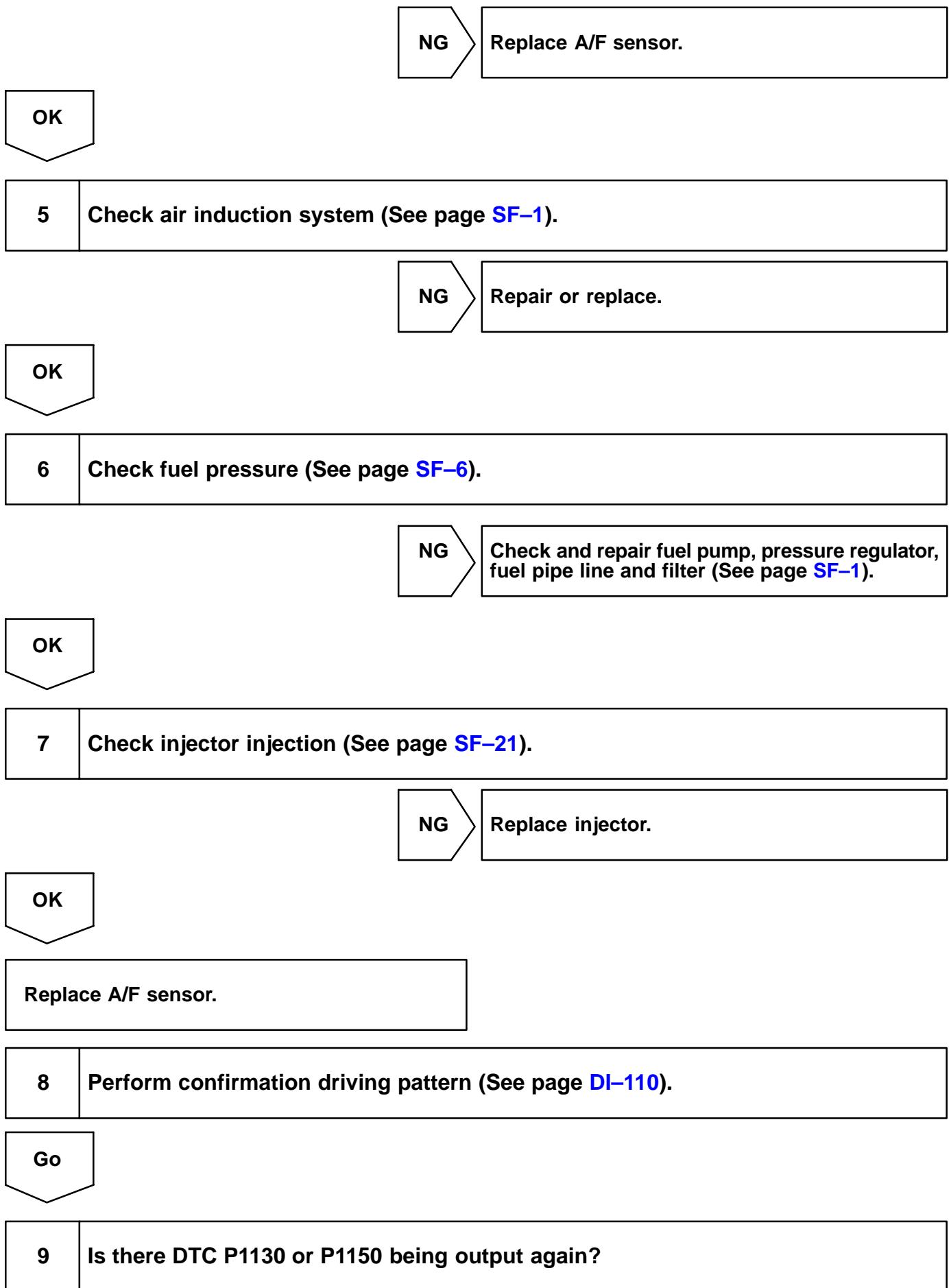
*: When you use the OBD II scan tool (excluding LEXUS hand-held tester).



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| 3 | Check for open and short in harness and connector between ECM and A/F sensor (See page IN-31). |
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| 4 | Check resistance of A/F sensor heater (See page SF-76). |
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YES

Check and replace ECM (See page [IN-31](#)).

NO

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Did vehicle runs out of fuel in past?

NO

Check for intermittent problems (See page [DI-3](#)).

YES

DTC P1130 or P1150 is caused by running out of fuel.