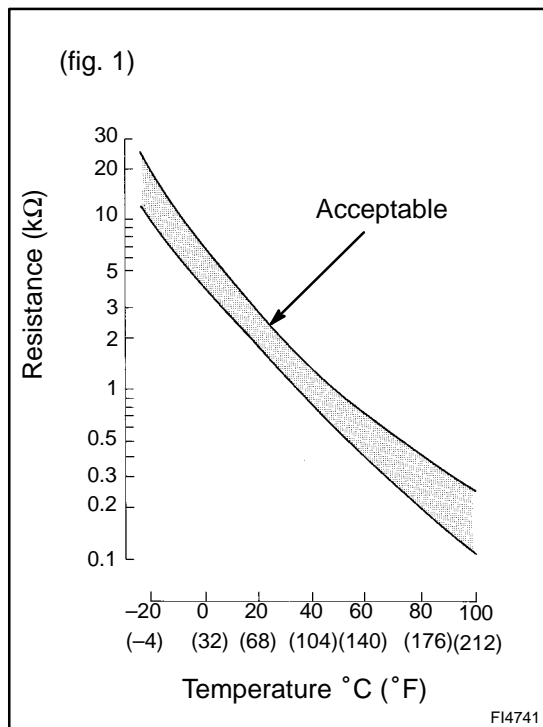


DTC**P0110****Intake Air Temp. Circuit Malfunction****CIRCUIT DESCRIPTION**

The intake air temp. sensor is built into the air flow meter and senses the intake air temperature.

A thermistor built in the sensor changes the resistance value according to the intake air temperature.

The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See Fig. 1).

The intake air temperature sensor is connected to the ECM. The 5 V power source voltage in the ECM is applied to the intake air temperature sensor from the terminal THA via a resistor R.

That is, the resistor R and the intake air temperature sensor are connected in series. When the resistance value of the intake air temperature sensor changes in accordance with changes in the intake air temperature, the potential at terminal THA also changes. Based on this signal, the ECM increases the fuel injection volume to improve driveability during cold engine operation.

If the ECM detects the diagnostic trouble code "P0110", it operates the fail safe function in which the intake air temperature is assumed to be 20°C (68°F).

<Reference>

Intake Air Temp. °C (°F)	Resistance (kΩ)	Voltage (V)
-20 (-4)	16.2	4.3
0 (32)	5.9	3.4
20 (68)	2.5	2.4
40 (104)	1.1	1.4
60 (140)	0.6	0.9
80 (176)	0.3	0.5
100 (212)	0.1	0.2

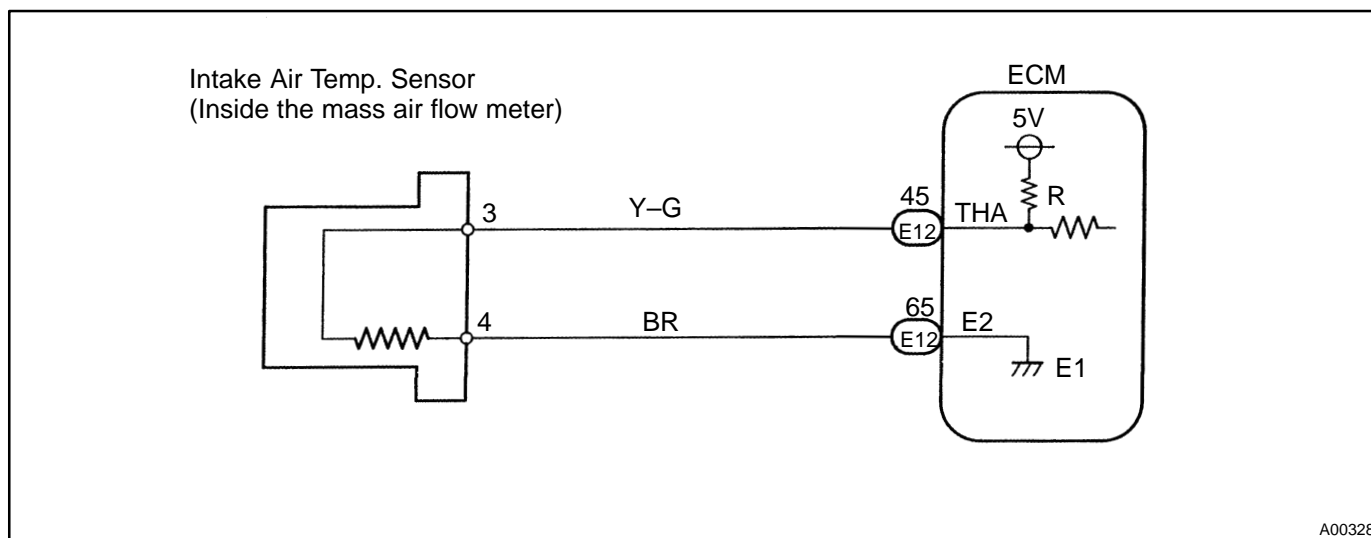
DTC No.	DTC Detecting Condition	Trouble Area
P0110	Open or short in intake air temp. sensor circuit	<ul style="list-style-type: none"> • Open or short in intake air temp. sensor circuit • Intake air temp. sensor • ECM

HINT:

After confirming DTC P0110 use the OBD II scan tool or LEXUS hand-held tester to confirm the intake air temperature from "CURRENT DATA".

Temperature Displayed	Malfunction
- 40°C (- 40°F)	Open circuit
140°C (284°F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

If DTCs "P0110" (Intake Air Temp. Circuit Malfunction), "P0105" (Engine Coolant Temp. Circuit Malfunction), "P0120" (Throttle/Pedal Position Sensor/Switch "A" Circuit Malfunction), are output simultaneously, E2 (sensor ground) may be open.

1	Connect the OBD II scan tool or LEXUS hand-held tester, and read value of intake air temperature.
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PREPARATION:

- Connect the OBD II scan tool or LEXUS hand-held tester to the DLC3.
- Turn ignition switch ON and OBD II scan tool or LEXUS hand-held tester main switch ON.

CHECK:

Read temperature value on the OBD II scan tool or LEXUS hand-held tester.

OK:

Same as actual intake air temperature.

HINT:

- If there is open circuit, OBD II scan tool or LEXUS hand-held tester indicates -40°C (-40°F).
- If there is short circuit, OBD II scan tool or LEXUS hand-held tester indicates 140°C (284°F) or more.

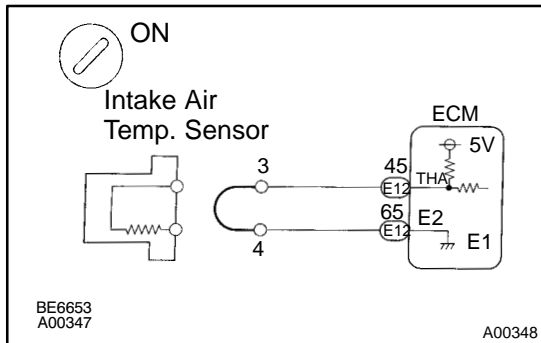
NG

-40°C (-40°F) Go to step 2.
 140°C (284°F) or more .. Go to step 4.

OK

Check for intermittent problems.
 (See page [DI-150](#))

2 Check for open in harness or ECM.



PREPARATION:

- Disconnect the mass air flow meter connector.
- Connect sensor wire harness terminals together.
- Turn ignition switch ON.

CHECK:

Read temperature value on the OBD II scan tool or LEXUS hand-held tester.

OK:

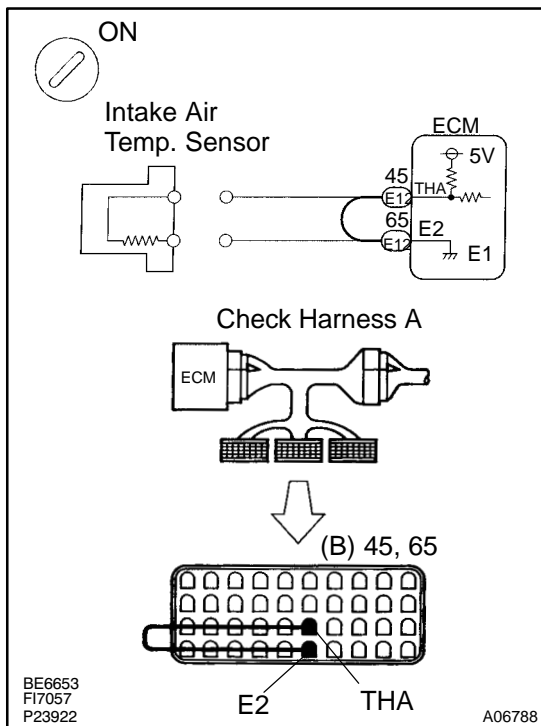
Temperature value: 140°C (284°F) or more

OK

Confirm good connection at sensor.
If OK, replace mass air flow meter.

NG

3 Check for open in harness or ECM.



PREPARATION:

- Connect Check Harness A.
- Connect between terminals THA and E2 of ECM connector.

HINT:

Mass air flow meter connector is disconnected. Before checking, do a visual and contact pressure check for the ECM connector (See page [IN-29](#)).

- Turn ignition switch ON.

CHECK:

Read temperature value on the OBD II scan tool or LEXUS hand-held tester.

OK:

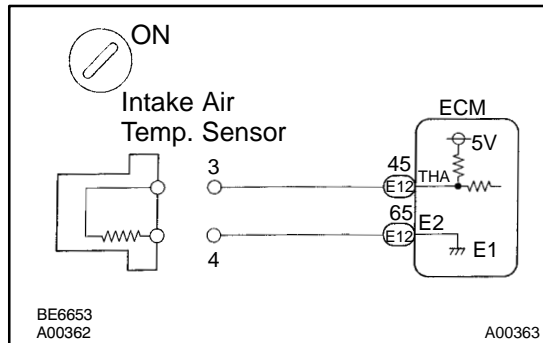
Temperature value: 140°C (284°F) or more

OK

Open in harness between terminals E2 or THA,
repair or replace harness.

NG

Confirm good connection at ECM.
If OK, replace ECM.

4 Check for short in harness and ECM.**PREPARATION:**

- (a) Disconnect the mass air flow meter connector.
- (b) Turn ignition switch ON.

CHECK:

Read temperature value on the OBD II scan tool or LEXUS hand-held tester.

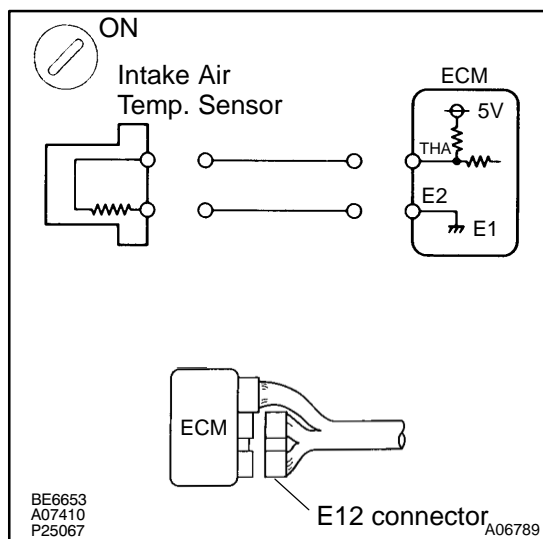
OK:

Temperature value: -40°C (-40°F).

OK

Replace mass air flow meter.

NG

5 Check for short in harness or ECM.**PREPARATION:**

- (a) Disconnect the E12 connector from ECM.

HINT:

Mass air flow meter connector is disconnected.

- (b) Turn ignition switch ON.

CHECK:

Read temperature value on the OBD II scan tool or LEXUS hand-held tester.

OK:

Temperature value: -40°C (-40°F)

OK

Repair or replace harness or connector.

NG

Check and replace ECM (See page [IN-29](#)).