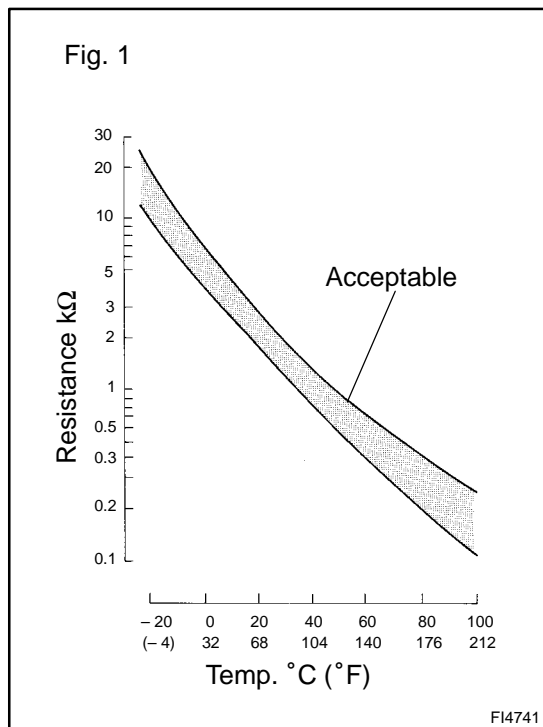


<b>DTC</b>	<b>P0110</b>	<b>Intake Air Temp. Circuit Malfunction</b>
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## CIRCUIT DESCRIPTION



The intake air temperature sensor is built into the mass 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 (See below ). The 5 V power source voltage in the ECM is applied to the intake air temperature sensor from the terminal THA via resistor R.

That is, 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.

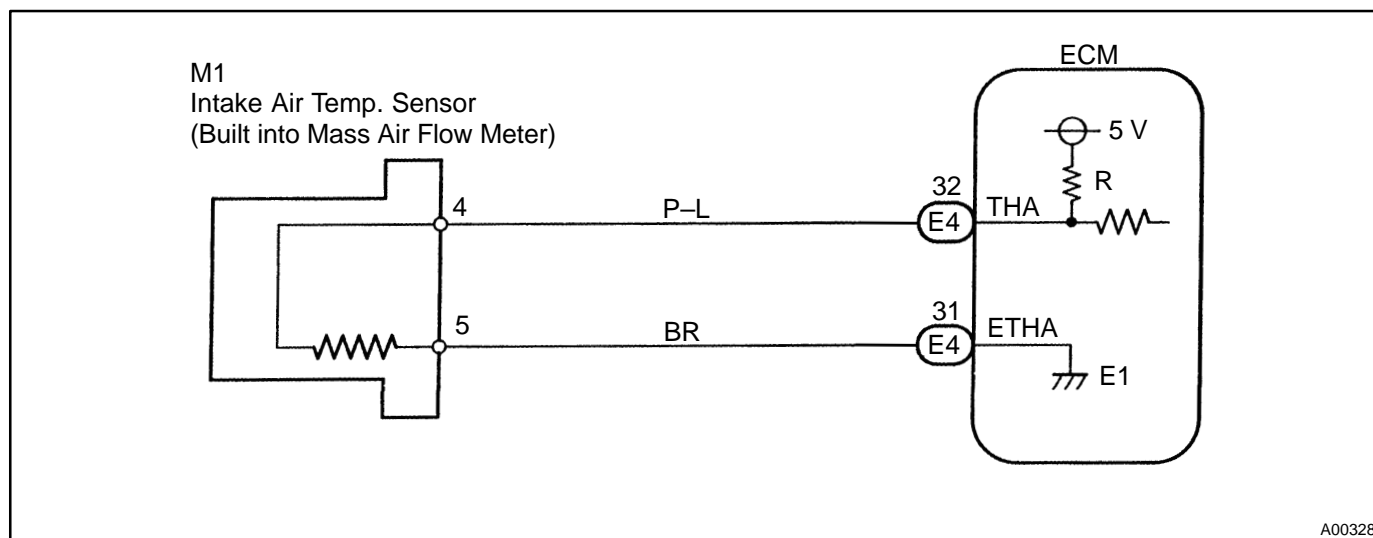
DTC No.	DTC Detecting Condition	Trouble Area
P0110	Open or short in intake air temp. sensor circuit	<ul style="list-style-type: none"> <li>• Open or short in intake air temp. sensor circuit</li> <li>• Intake air temp. sensor (built into mass air flow meter)</li> <li>• ECM</li> </ul>

### HINT:

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

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

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### HINT:

Read freeze frame data using LEXUS hand-held tester or OBD II scan tool. 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 was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

- |   |  |
|---|--|
| 1 | <b>Connect OBD II scan tool or LEXUS hand-held tester, and read value of intake air temperature.</b> |
|---|--|

### PREPARATION:

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

### CHECK:

Read the 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  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ).
- If there is short circuit, OBD II scan tool or LEXUS hand-held tester indicates  $140^{\circ}\text{C}$  ( $284^{\circ}\text{F}$ ) or more.

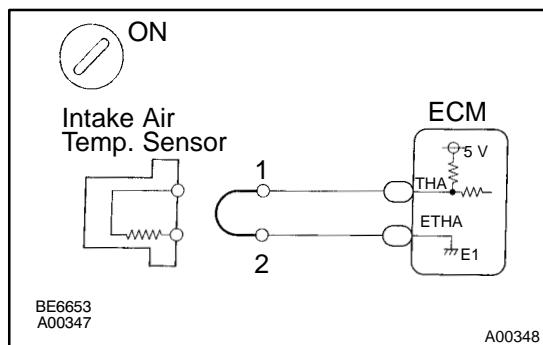
**NG**

**$-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) ... Go to step 2.  
 $140^{\circ}\text{C}$  ( $284^{\circ}\text{F}$ ) or more ... Go to step 4.**

**OK**

**Check for intermittent problems  
(See page DI-173).**

## 2 Check for open in harness or ECM.



### PREPARATION:

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

### CHECK:

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

### OK:

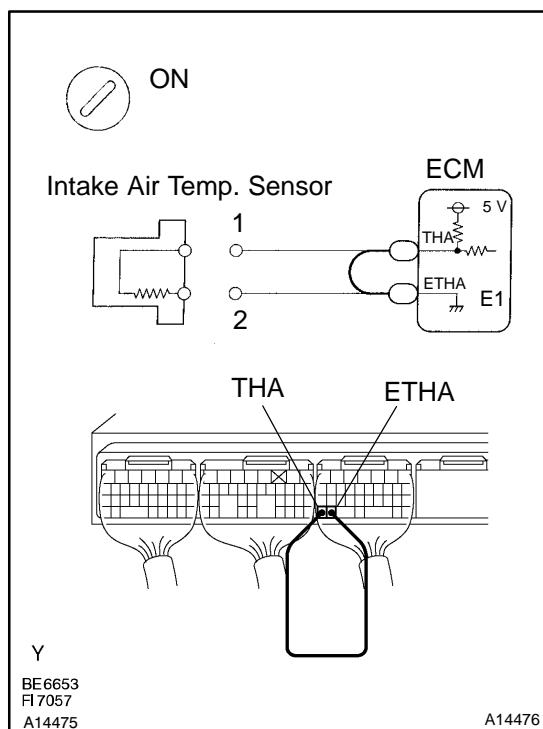
Temperature value: 140°C (284°F) or more

OK

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

NG

## 3 Check for open in harness or ECM.



### PREPARATION:

- Remove the engine room ECU cover (See page SF-81).
- Connect between terminals THA and ETHA of the ECM connector.

### HINT:

The mass air flow meter connector is disconnected. Before checking, do a visual and contact pressure check for the ECM connector (See page IN-32).

### CHECK:

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

### OK:

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

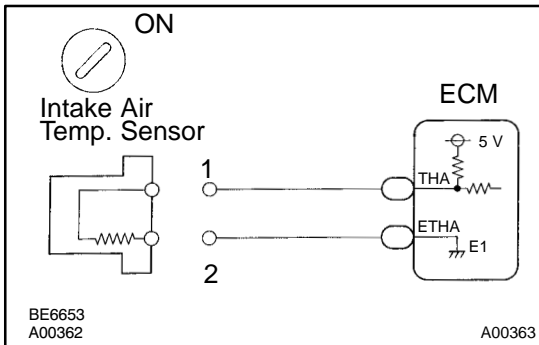
OK

Open in harness between terminals ETHA and THA, repair or replace harness.

NG

Confirm good connection at ECM. If OK, check and replace ECM (See page IN-32).

#### 4 Check for short in harness and ECM.



##### PREPARATION:

- Disconnect the mass air flow meter connector.
- Turn the ignition switch ON.

##### CHECK:

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

##### OK:

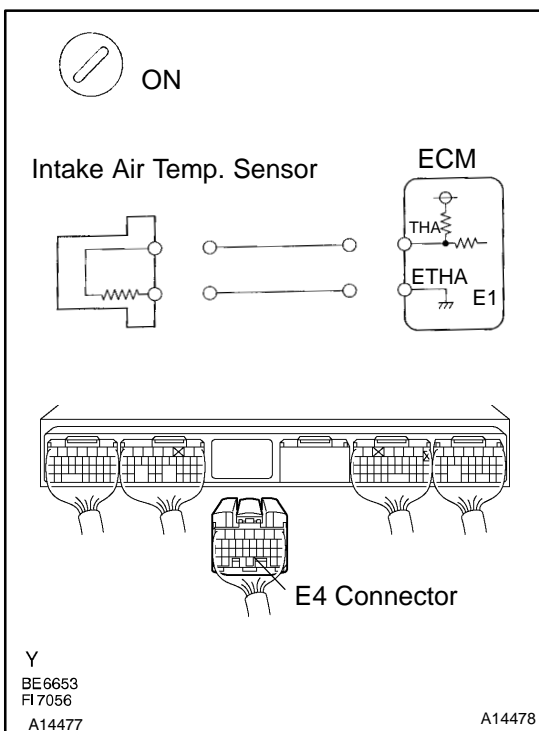
Temperature value:  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ )

OK

Replace mass air flow meter.

NG

#### 5 Check for short in harness or ECM.



##### PREPARATION:

- Remove the engine room ECU cover (See page SF-81).
- Disconnect the E4 connector from the ECM.

##### HINT:

The mass air flow meter connector is disconnected.

- Turn the ignition switch ON.

##### CHECK:

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

##### OK:

Temperature value:  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ )

OK

Repair or replace harness or connector.

NG

Check and replace ECM (See page [IN-32](#)).