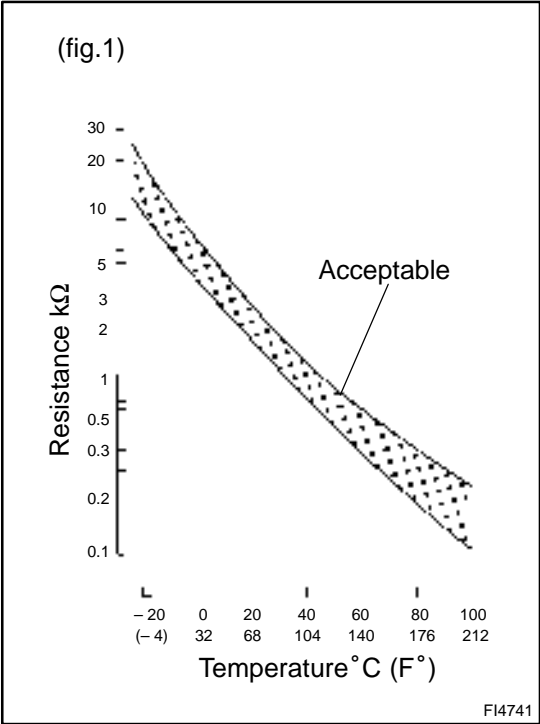


DTC	P0110	Intake Air Temp. Circuit Malfunction
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# CIRCUIT DESCRIPTION



The intake air temp. sensor is built into the air cleaner cap 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 next page). 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 DTC "P0110", it operates the fail-safe function in which the intake air temperature is assumed to be 20°C (68°F).

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	1.5
60 (140)	0.6	0.9
80 (176)	0.3	0.5
100 (212)	0.2	0.3

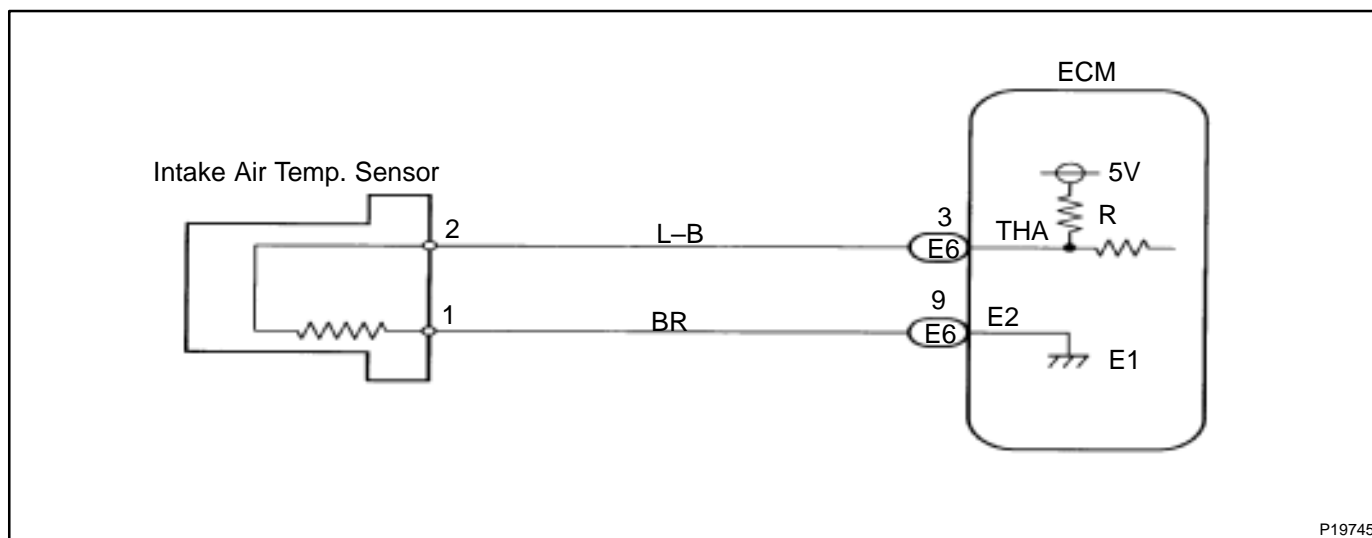
DTC No.	DTC Detecting Condition	Trouble Area
P0110	Open or short in intake air temp. sensor circuit	<ul style="list-style-type: none"> <li>• Open or short in intake air temp. sensor circuit</li> <li>• Intake air temp. sensor</li> <li>• ECM</li> </ul>

## HINT:

After confirming DTC P110, use the OBD II scan tool or TOYOTA hand-held tester to confirm the intake air temp. from "CURRENT DATA".

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

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### HINT:

If DTC "P0105" (Manifold Absolute Pressure/Barometric Pressure Circuit Malfunction), "P0106" (Manifold Absolute Pressure /Barometric Pressure Circuit Range/Performance Problem), "P0110" (Intake Air Temp. Circuit Malfunction), "P0115" (Engine Coolant Temp. Circuit Malfunction), "P0120" (Throttle/Pedal Position Sensor/Switch "A" Circuit Malfunction) are output simultaneously, E2 (sensor ground) may be open.

1	<b>Connect the OBD II scan tool or TOYOTA hand-held tester, and read value of intake air temp.</b>
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### PREPARATION:

- Remove the fuse cover on the instrument panel.
- Connect the OBD II scan tool or TOYOTA hand-held tester to DLC3.
- Turn ignition switch ON and OBD II scan tool or TOYOTA hand-held tester main switch ON.

### CHECK:

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

### OK:

**Same as actual intake temperature.**

### HINT:

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

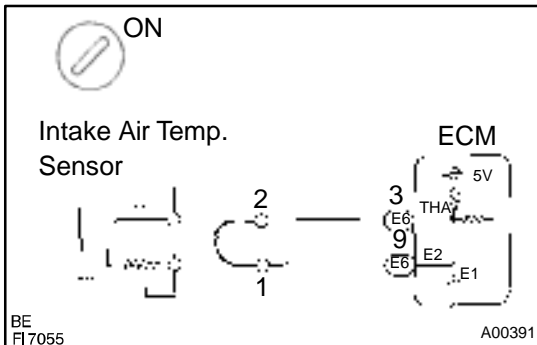
**NG**

**$-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) ....Go to step 2.  
 $140^{\circ}\text{C}$  ( $284^{\circ}\text{F}$ ) or more ....Go to step NO TAG.**

**OK**

**Check for intermittent problems  
 (See page DI-3).**

## 2 Check for open in harness or ECM.



### PREPARATION:

- Disconnect the intake temp. sensor connector.
- Connect sensor wire harness terminals together.
- Turn ignition switch ON.

### CHECK:

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

### OK:

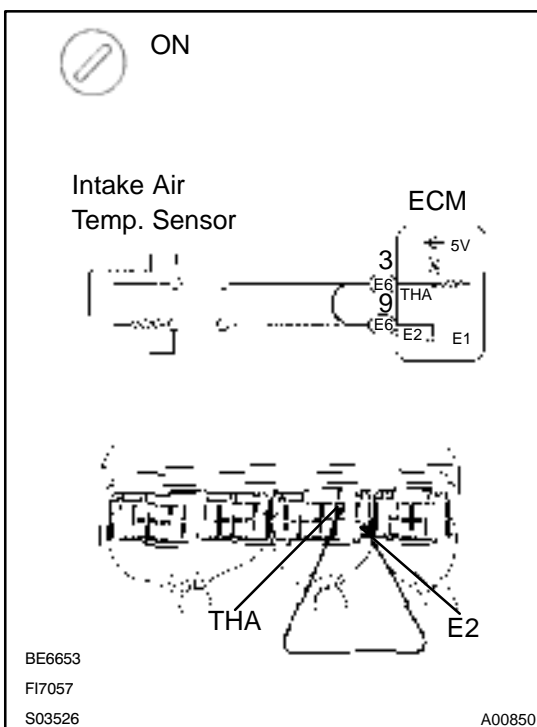
Temperature value: 140°C (284°F) or more

OK

Confirm good connection at sensor. If OK, replace intake air temp. sensor.

NG

## 3 Check for open in harness or ECM.



### PREPARATION:

- Remove the lower finish panel.
- Connect between terminals THA and E2 of ECM connector.

### HINT:

Intake air temp. sensor connector is disconnected.

Before checking, do a visual and contact pressure check for the ECM connector (See page [IN-27](#)).

- Turn ignition switch ON.

### CHECK:

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

### OK:

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

OK

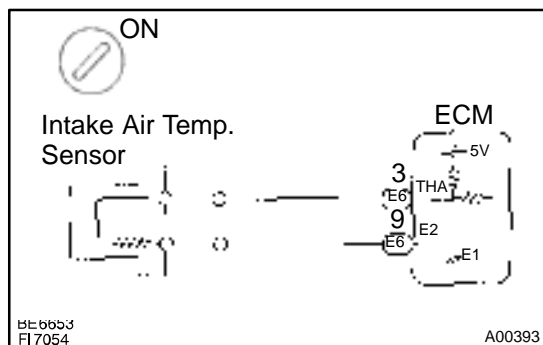
Open in harness between terminal E2 or THA, repair or replace harness.

NG

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

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



##### **PREPARATION:**

- Disconnect the intake air temp. sensor connector.
- Turn ignition switch ON.

##### **CHECK:**

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

##### **OK:**

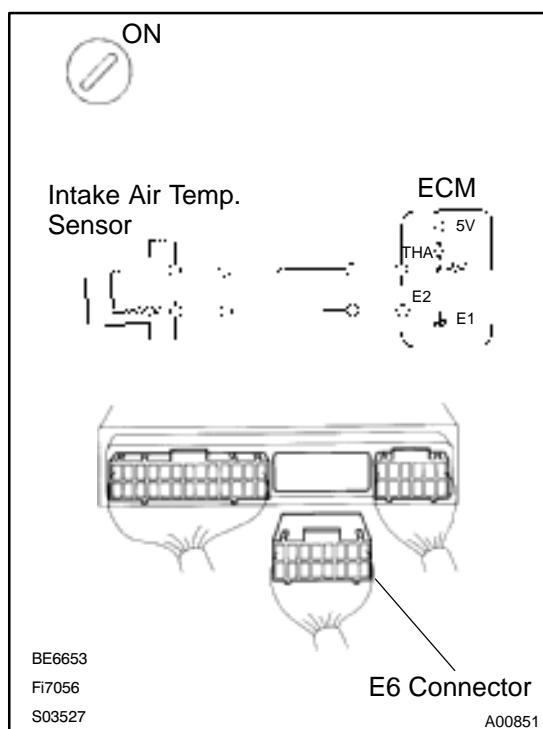
Temperature value: – 40°C (– 40°F)

OK

Replace intake air temp. sensor.

NG

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



##### **PREPARATION:**

- Remove the lower finish panel.
- Disconnect the "E6" connector of ECM.

##### **HINT:**

Intake air temp. sensor connector is disconnected.

- Turn ignition switch ON.

##### **CHECK:**

Read temperature value on the OBD II scan tool or TOYOTA 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-27](#)).