

DTC	P0110	Intake Air Temp. Circuit Malfunction
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CIRCUIT DESCRIPTION

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

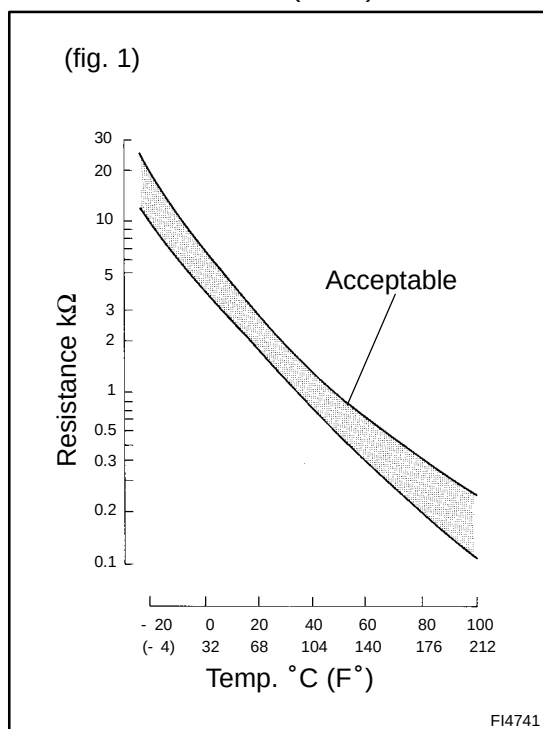
A thermistor built in the sensor changes the resistance value according to the intake air temperature.

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 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).



<Reference>

Intake air temp. °C (°F)	Resistance (kΩ)	Voltage (V)
-20 (-4)	16.0 ± 2.4	4.3
20 (68)	2.45 ± 0.24	2.4
60 (140)	0.58 ± 0.087	0.9

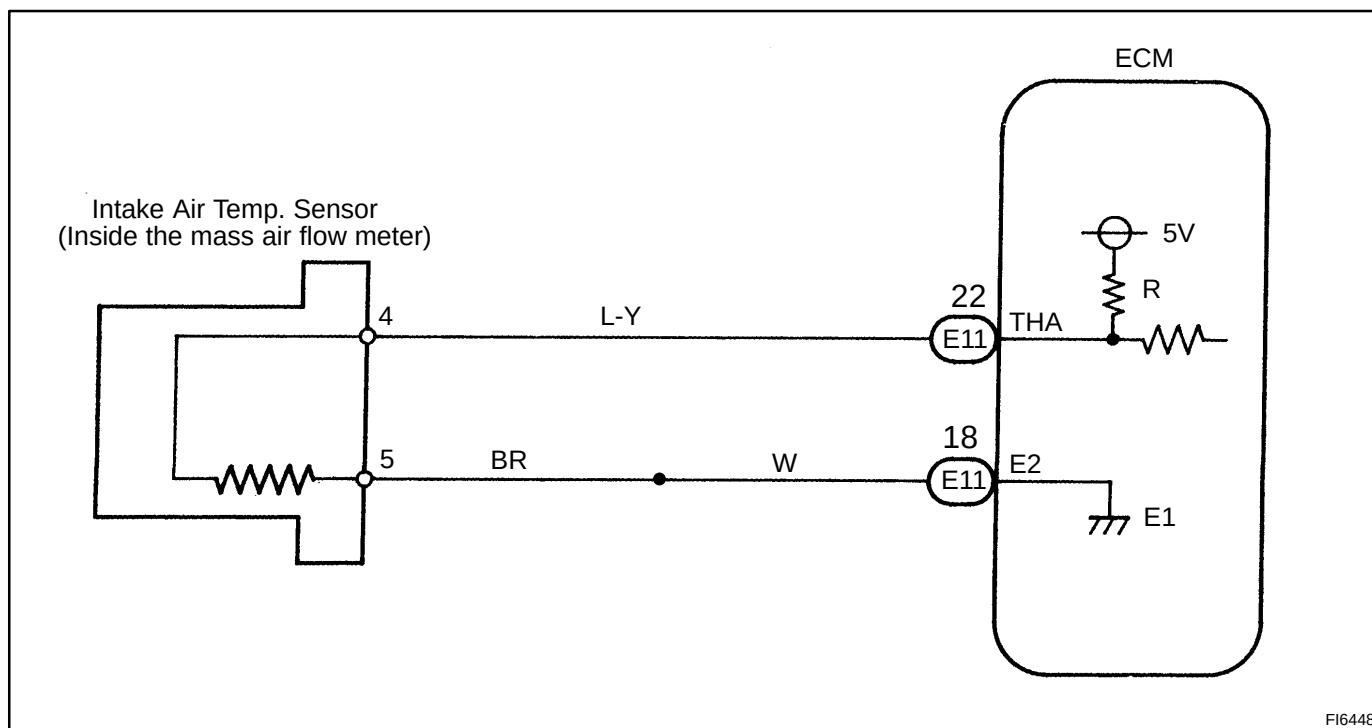
DTC No.	DTC Detecting Condition	Trouble Area
P0110	Open or short in intake air temp. sensor circuit	• Open or short in intake air temp. sensor circuit • Intake air temp. sensor (built into mass air flow meter) • ECM

HINT:

After confirming DTC P0110, 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 DTCs P0110, P0115 and P0120 are output simultaneously, E2 (Sensor Ground) may be open.
- Read freeze frame data using TOYOTA 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 warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

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

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

CHECK:

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

OK:

Same as actual intake air temp.

HINT:

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

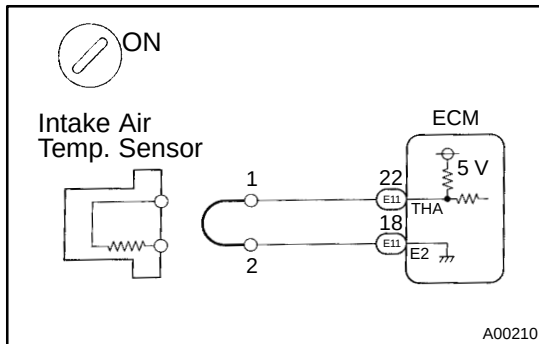
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**-40°C (-40°F) ... Go to step 2.
 140°C (284°F) or more ... Go to step 4.**

OK

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

2 Check for open in harness or ECM.



PREPARATION:

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

CHECK:

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

OK:

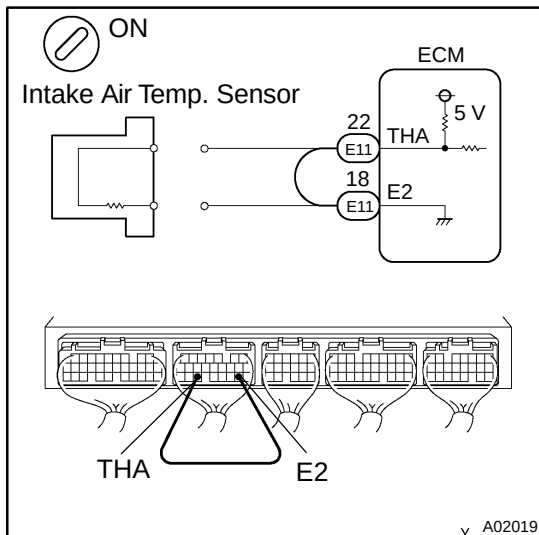
Temp. value: 140°C (284°F) or more

OK

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

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3 Check for open in harness or ECM.



PREPARATION:

- Remove the glove compartment (See page [SF-83](#)).
- 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-31](#)).

CHECK:

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

OK:

Temp. value: 140°C (284°F) or more

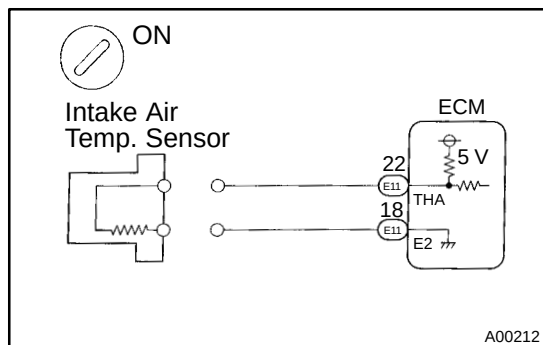
OK

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

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

4 Check for short in harness and ECM.



PREPARATION:

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

CHECK:

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

OK:

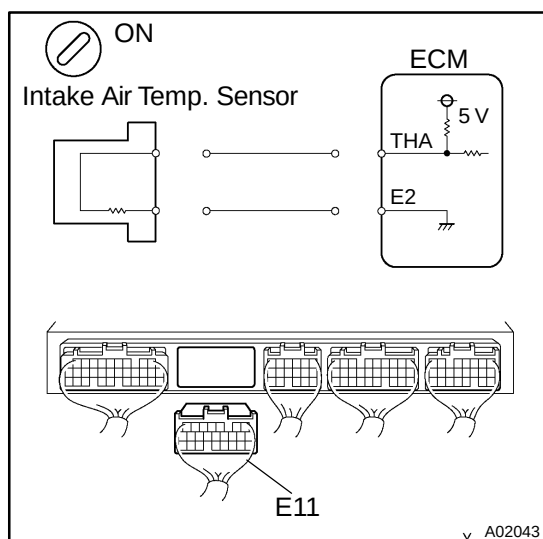
Temp. value: -40°C (-40°F)

OK

Replace mass air flow meter.

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5 Check for short in harness or ECM.



PREPARATION:

- Remove the glove compartment (See page [SF-83](#)).
- Disconnect the E11 connector of ECM.

HINT:

Mass air flow meter connector is disconnected.

- Turn the ignition switch ON.

CHECK:

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

OK:

Temp. value: -40°C (-40°F)

OK

Repair or replace harness or connector.

NG

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