

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.

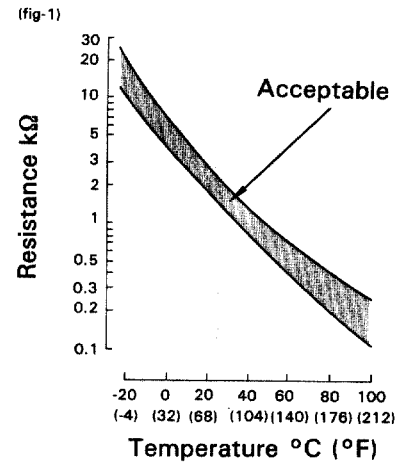
A thermistor built in the sensor changes the resistance value according to the intake air temperature.

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 (See next page). The 5V 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 temperature is assumed to be 20°C (68°F).



<Reference>

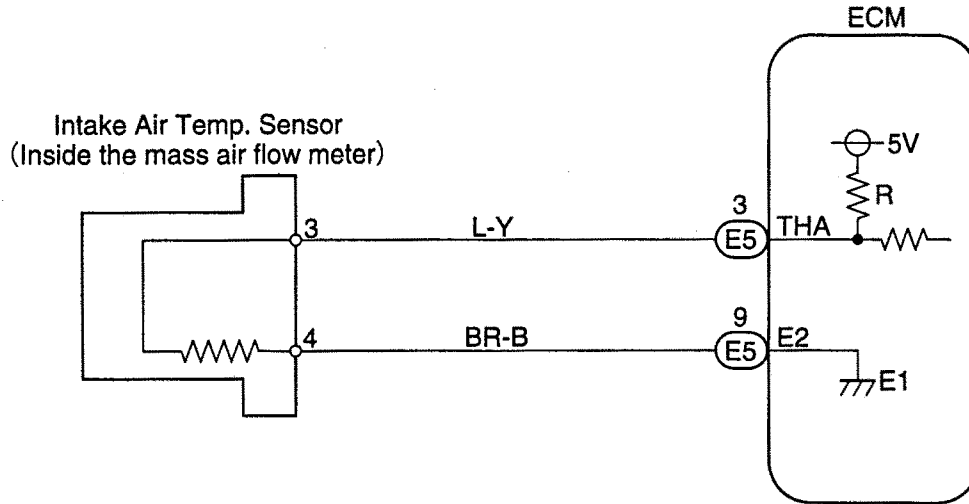
Intake Air Temp. °C (°F)	Resistance (kΩ)	Voltage (V)
-20 (-4)	16.2	4.3
0 (32)	5.9	3.4
20 (68)	2.5	2.4
40 (104)	1.1	1.4
60 (140)	0.6	0.9
80 (176)	0.3	0.5
100 (212)	0.1	0.2

DTC No.	Diagnostic Trouble Code 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 - ECM

Hint: After confirming DTC P0110 use the OBD II scan tool or TOYOTA 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

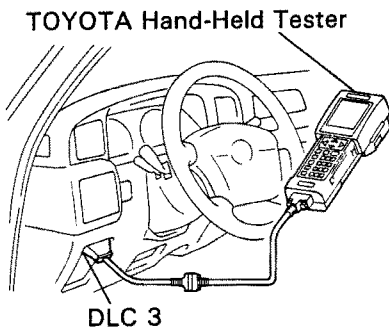


P22420

INSPECTION PROCEDURE

HINT: If diagnostic trouble codes "P0110" (intake air temp. circuit malfunction), "P0115" (engine coolant temp. circuit malfunction), "P0120" (throttle position circuit malfunction) are output simultaneously, E2 (sensor ground) may be open.

- 1** Connect the OBDII scan tool or TOYOTA hand-held tester, and read value of intake air temperature.



- P**
- (1) Remove the fuse cover on the instrument panel.
 - (2) Connect the OBD II scan tool or TOYOTA hand-held tester to the DLC 3.
 - (3) Turn ignition switch ON and OBD II scan tool or TOYOTA hand-held tester main switch ON.

- C** Read temperature value on the OBDII scan tool or TOYOTA hand-held tester.

- OK** Same as actual intake air temperature.

HINT: If there is open circuit, OBDII scan tool or TOYOTA hand-held tester indicates -40°C (-40°F).

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

BE6653
P22892

OK

NG

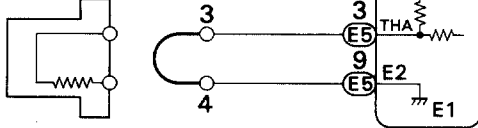
-40°C (-40°F) ... Go to step [2] .
 140°C (284°F) or more ... Go to step [4] .

Check for intermittent problems (See page EG-231).

2 Check for open in harness or ECM.



Intake Air
Temp. Sensor



BE6653
F17055

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- P** (1) Disconnect the mass air flow meter connector.
(2) Connect sensor wire harness terminals together.
(3) Turn ignition switch ON.

C Read temperature value on the OBDII scan tool or TOYOTA hand-held tester.

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

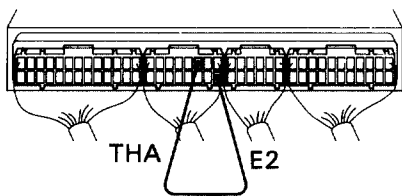
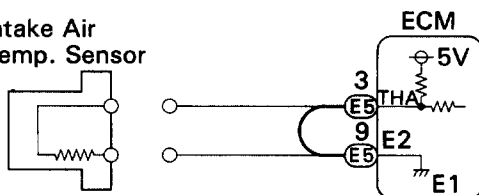
OK

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

3 Check for open in harness or ECM.



Intake Air
Temp. Sensor



BE6653
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P22161

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- P** (1) Remove instrument panel speaker No. 1 panel (See page [EG-173](#)).
(2) 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 [EG-233](#)).
(3) Turn ignition switch ON.

C Read temperature value on the OBDII scan tool or TOYOTA hand-held tester.

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

OK

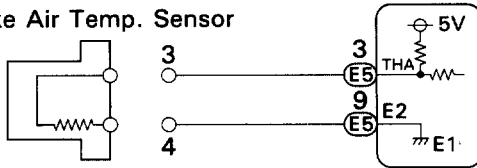
Open in harness between terminals E2 or THA, repair or replace harness.

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

4 Check for short in harness and ECM.



Intake Air Temp. Sensor

BE6653
FI7054

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- P** (1) Disconnect the mass air flow meter connector.
(2) Turn ignition switch ON.

- C** Read temperature value on the OBDII scan tool or TOYOTA hand-held tester.

- OK** Temperature value: -40°C (-40°F).

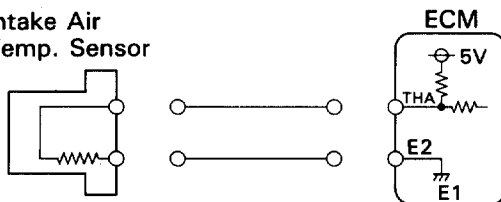
OK

Replace mass air flow meter.

5 Check for short in harness and ECM.



Intake Air Temp. Sensor

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P19798

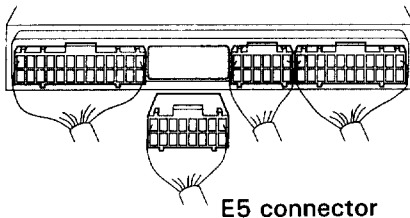
NG

- P** (1) Remove instrument panel speaker No. 1 panel (See page [EG-173](#)).
(2) Disconnect the E5 connector of ECM.

- HINT: Mass air flow meter connector is disconnected.
(3) Turn ignition switch ON.

- C** Read temperature value on the OBDII scan tool or TOYOTA hand-held tester.

- OK** Temperature value: -40°C (-40°F).



OK

Repair or replace harness or connector.

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