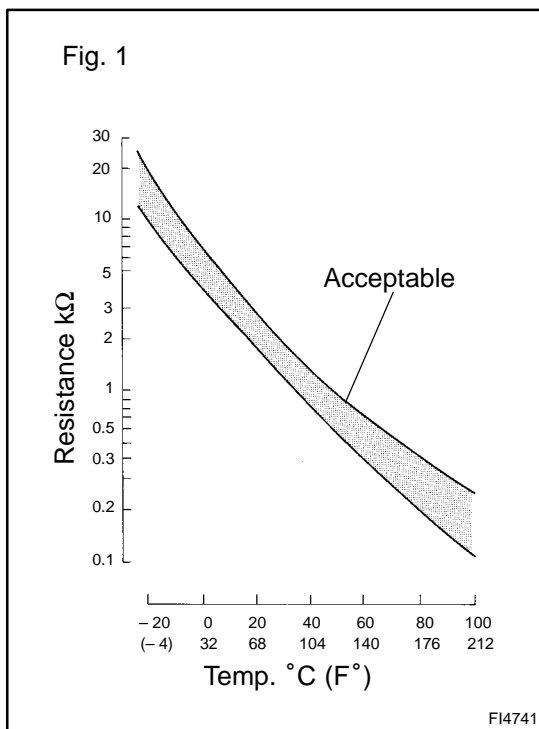


DTC	P0110	Intake Air Temperature Circuit
DTC	P0112	Intake Air Temperature Circuit Low Input
DTC	P0113	Intake Air Temperature Circuit High Input

CIRCUIT DESCRIPTION



The intake air temperature sensor is built in 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 is, the greater the thermistor resistance value becomes, and the higher the intake air temperature is, the lower the thermistor resistance value becomes (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 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. 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).

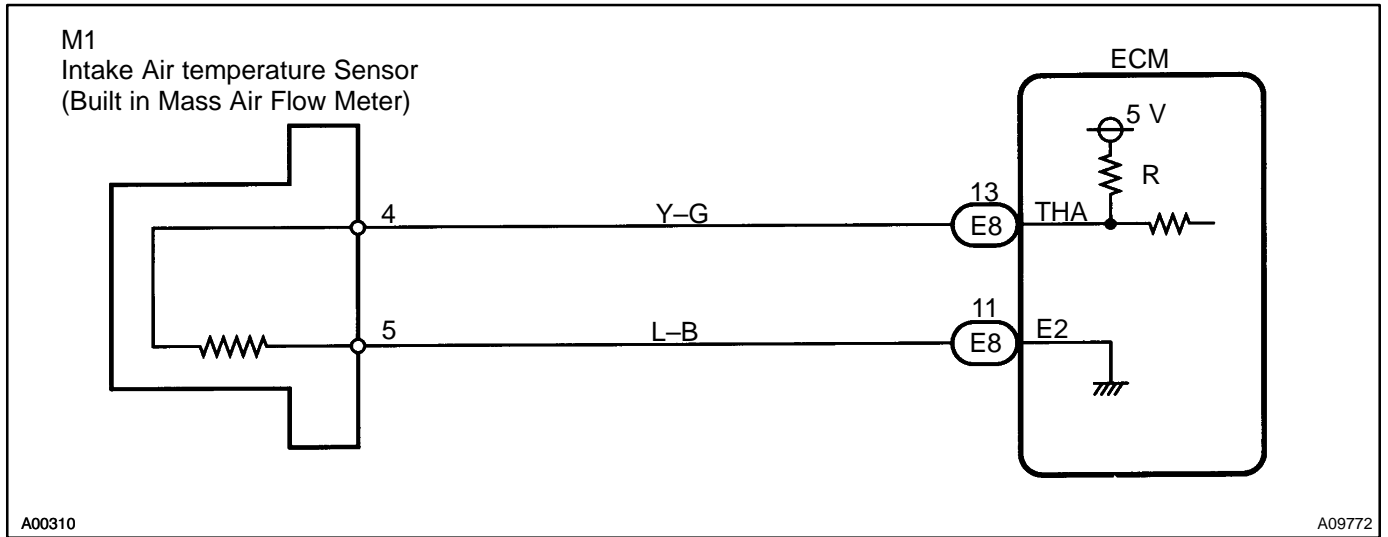
DTC No.	Proceed to	DTC Detection Condition	Trouble Area
P0110	Step 1	Open or short in intake air temp. sensor circuit for 0.5 sec.	<ul style="list-style-type: none"> • Intake air temp. sensor circuit • Intake air temp. sensor (built in mass air flow meter) • ECM
P0112	Step 4	Short in intake air temp. sensor circuit for 0.5 sec.	
P0113	Step 2	Open in intake air temp. sensor circuit for 0.5 sec.	

HINT:

After confirming DTC P0110, P0112 and P0113, use the OBD II scan tool or the hand-held tester to confirm the intake air temperature from the "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL".

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

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If different DTCs that are related to different systems are output simultaneously while terminal E2 is used as a ground terminal, terminal E2 may be open.
- Read freeze frame data using the hand-held tester or the OBD II scan tool, as freeze frame data records the engine conditions when a 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	Connector OBD II scan tool or hand-held tester, and read value of intake air temperature
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PREPARATION:

- Connect the OBD II scan tool or hand-held tester to the DLC3.
- Turn the ignition switch ON and push the OBD II scan tool or hand-held tester main switch ON.
- Select the item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/INTAKE AIR".

CHECK:

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

OK:

Same value as actual intake air temperature

HINT:

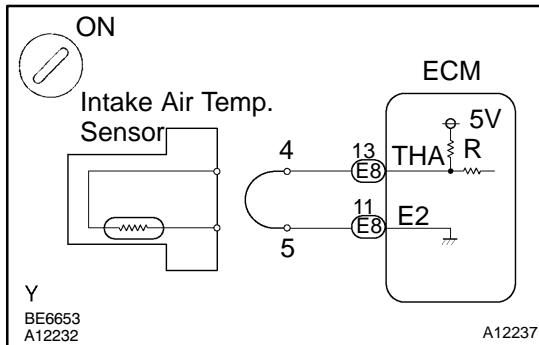
- If there is open circuit, OBD II scan tool or hand-held tester indicates -40°C (-40°F).
- If there is short circuit, OBD II scan tool or hand-held tester indicates 140°C (284°F) or more.

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

<p>Check for intermittent problems (See page DI-218).</p>
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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.
- Select the Item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/INTAKE AIR".

CHECK:

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

OK:

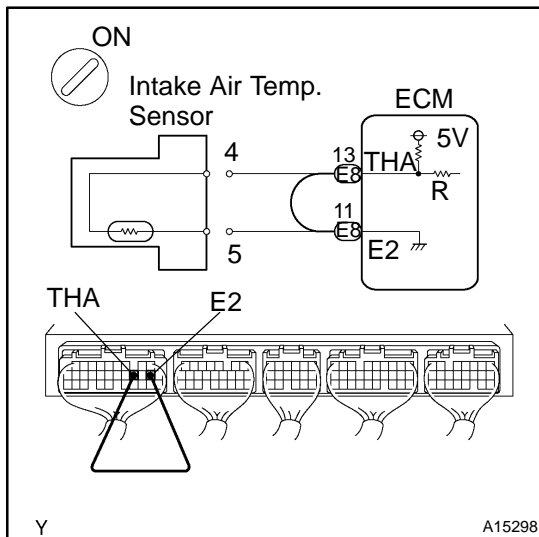
Temperature value: 140°C (284°F) or more

OK

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

NG

3 Check for open in harness or ECM.



PREPARATION:

- Disconnect the mass air flow meter connector.
- Remove the glove compartment (See page SF-63).
- Connect terminals THA and E2 of the ECM connector together.
- Turn the ignition switch ON.
- Select the Item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/INTAKE AIR".

HINT:

The mass air flow meter connector is disconnected. Before checking, do a visual and contact check of the pressure of the ECM connector (See page IN-28).

CHECK:

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

OK:

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

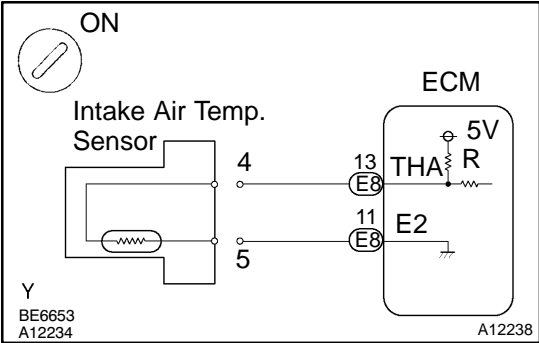
OK

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

NG

Confirm good connection at ECM. If OK, check and replace ECM (See page IN-28).

4 Check for short in harness and ECM.



PREPARATION:

- (a) Disconnect the mass air flow meter connector.
- (b) Turn the ignition switch ON.
- (c) Select the Item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/INTAKE AIR".

CHECK:

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

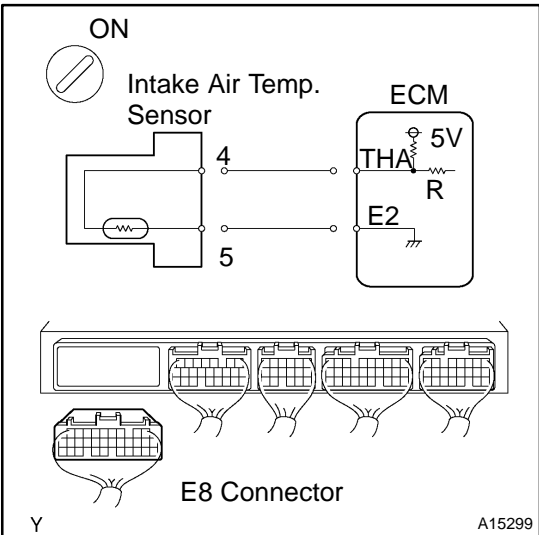
OK:

Temperature value: - 40°C (-40°F)

OK → Replace mass air flow meter.

NG

5 Check for short in harness or ECM.



PREPARATION:

- (a) Remove the glove compartment (See page SF-63).
- (b) Disconnect the E8 ECM connector.

HINT:

The mass air flow meter connector is disconnected.

- (c) Turn the ignition switch ON.
- (d) Select the Item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/INTAKE AIR".

CHECK:

Read the temperature value on the OBD II scan tool or the 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-28).