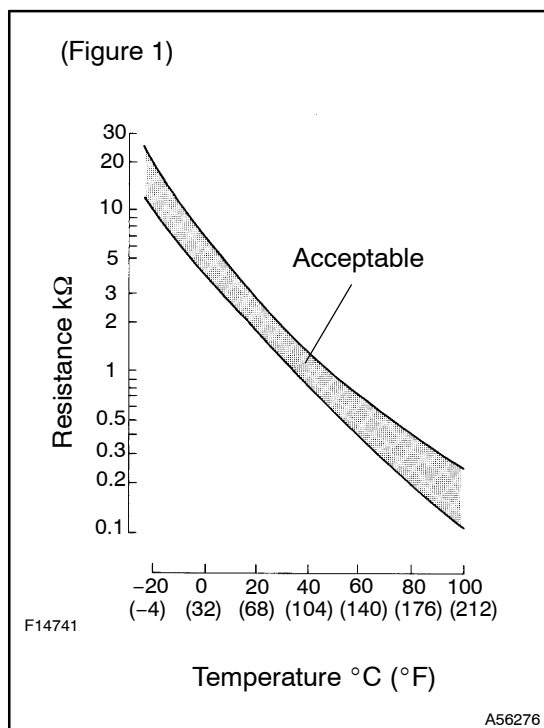


DTC**P0110****INTAKE AIR TEMPERATURE CIRCUIT****CIRCUIT DESCRIPTION**

The intake air temperature (IAT) sensor is built into the mass air flow (MAF) meter, and monitors the intake air temperature. The IAT sensor has a built-in thermistor that varies its resistance depending on the temperature of the intake air. When the air temperature is low, the resistance in the thermistor increases. When the temperature is high, the resistance drops. The variations in resistance are reflected as voltage changes to the ECM terminal (see figure 1).

The IAT sensor is connected to the ECM. The 5 V power source voltage in the ECM is applied to the IAT sensor from terminal THAF via resistor R.

That is, the resistor R and the IAT sensor are connected in series. When the resistance value of the IAT sensor changes in accordance with changes in the intake air temperature, the voltage at terminal THAF also changes. Based on this signal, the ECM increases the fuel injection volume to improve the driveability during cold engine operation.

DTC No.	DTC Detection Condition	Trouble Area
P0110	Open or short in intake air temperature sensor circuit for 0.5 seconds (1 trip detection logic)	<ul style="list-style-type: none"> • Open or short in intake air temperature sensor circuit • Intake air temperature sensor (built into mass air flow meter) • ECM

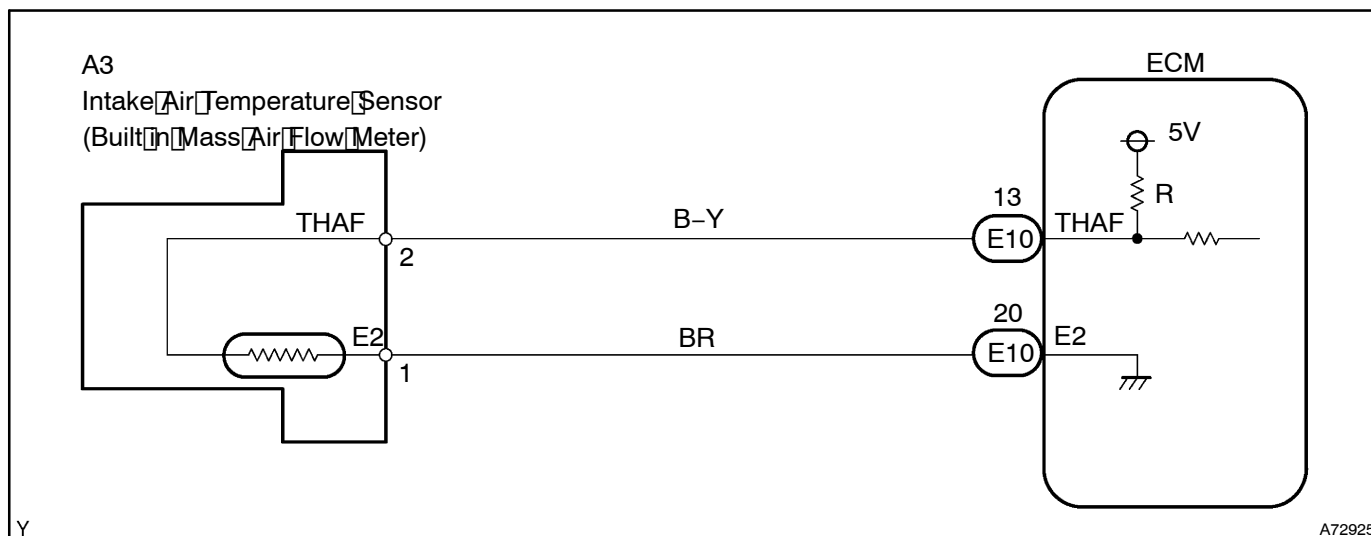
HINT:

When DTC P0110 is detected, check the intake air temperature by selecting Powertrain / Engine and ECT / Data List / Intake Air on the intelligent tester II.

Reference:

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 related to different systems that have terminal E2 as the ground terminal are output simultaneously, terminal E2 may have an open circuit.
- Read freeze frame data using the intelligent tester II. Freeze frame data record the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, if the engine was warmed up or not, and other data from the time the malfunction occurred.

1 READ VALUE OF INTELLIGENT TESTER II (INTAKE AIR TEMPERATURE)

- Connect the intelligent tester II to the DLC3.
- Turn the ignition switch to ON and turn the intelligent tester II ON.
- Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
- Read the value.

Temperature: Same value as the air temperature at the intake manifold.

Result:

Temperature Displayed	Proceed To
-40°C (-40°F)	A
140°C (284°F) or more	B
OK (Same as air temperature near to intake manifold)	C

HINT:

- If there is an open circuit, the intelligent tester II indicates -40°C (-40°F).
- If there is a short circuit, the intelligent tester II indicates 140°C (284°F) or more.

B

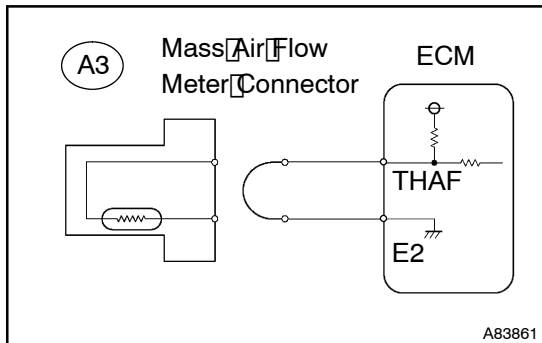
Go to step 4

C

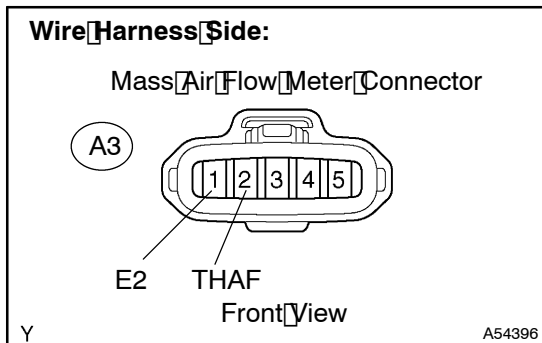
CHECK FOR INTERMITTENT PROBLEMS
(See page 05-440)

A

2 READ VALUE OF INTELLIGENT TESTER II (CHECK FOR OPEN IN WIRE HARNESS)



- Disconnect the A3 mass air flow meter connector.
 - Connect terminals 1 and 2 of the mass air flow meter wire harness side connector.
 - Connect the intelligent tester II to the DLC3.
 - Turn the ignition switch to ON and turn the intelligent tester ON.
 - Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
 - Read the value.
- Standard: 140°C (284°F) or more**
- Reconnect the mass air flow meter connector.

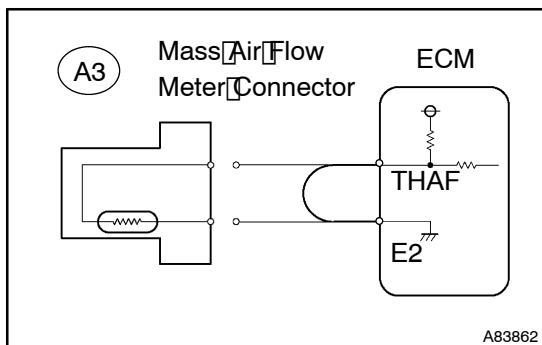


OK

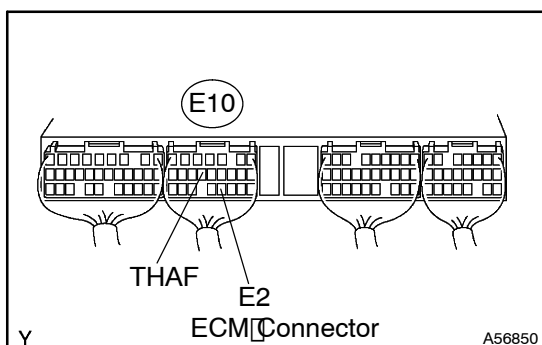
CONFIRM GOOD CONNECTION AT SENSOR. IF OK, REPLACE MASS AIR FLOW METER

NG

3 READ VALUE OF INTELLIGENT TESTER II (CHECK FOR OPEN IN ECM)



- Disconnect the A3 mass air flow meter connector.
 - Connect terminals THAF and E2 of the E10 ECM connector.
- HINT:**
Before checking, do a visual and contact pressure check on the ECM connector.
- Connect the intelligent tester II to the DLC3.
 - Turn the ignition switch to ON and turn the intelligent tester ON.
 - Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
 - Read the value.
- Standard: 140°C (284°F) or more**
- Reconnect the mass air flow meter connector.



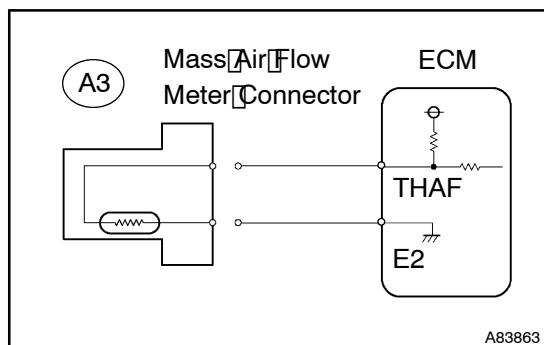
OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

NG

CONFIRM GOOD CONNECTION AT ECM. IF OK, REPLACE ECM (See page 10-30)

4 READ VALUE OF INTELLIGENT TESTER (CHECK FOR SHORT IN WIRE HARNESS)

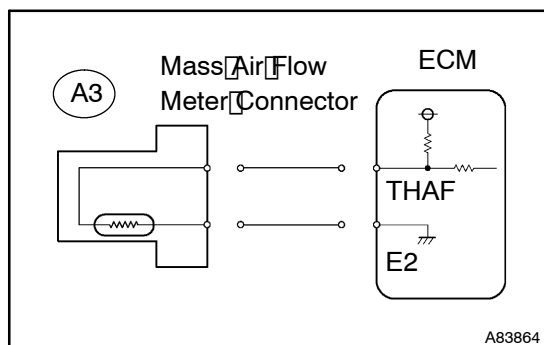


- Disconnect the A3 mass air flow meter connector.
 - Connect the Intelligent Tester II to the DLC3.
 - Turn the ignition switch to ON and turn the Intelligent Tester II ON.
 - Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
 - Read the value.
- Standard: -40°C (-40°F)**
- Reconnect the mass air flow meter connector.

OK **REPLACE MASS AIR FLOW METER**

NG

5 READ VALUE OF INTELLIGENT TESTER (CHECK FOR SHORT IN ECM)



- Disconnect the A3 mass air flow meter connector.
 - Disconnect the E10 ECM connector.
 - Connect the Intelligent Tester II to the DLC3.
 - Turn the ignition switch to ON and turn the Intelligent Tester II ON.
 - Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
 - Read the value.
- Standard: -40°C (-40°F)**
- Reconnect the ECM sensor connector.
 - Reconnect the mass air flow meter connector.

OK **REPAIR OR REPLACE HARNESS OR CONNECTOR**

NG

REPLACE ECM (See page 10-30)