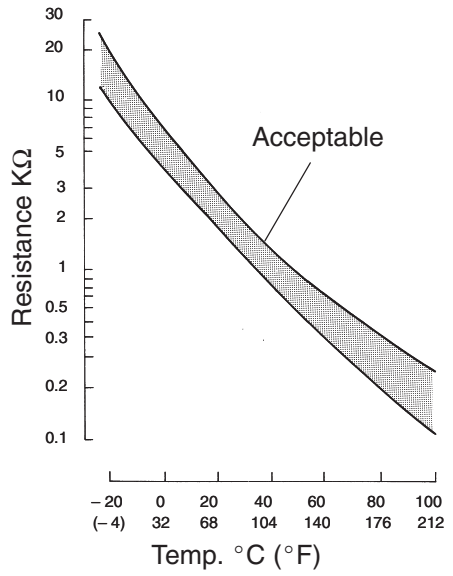
DTC	P0110	INTAKE AIR TEMPERATURE CIRCUIT

DTC	P0112	INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT

DTC	P0113	INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION

(Fig.1)



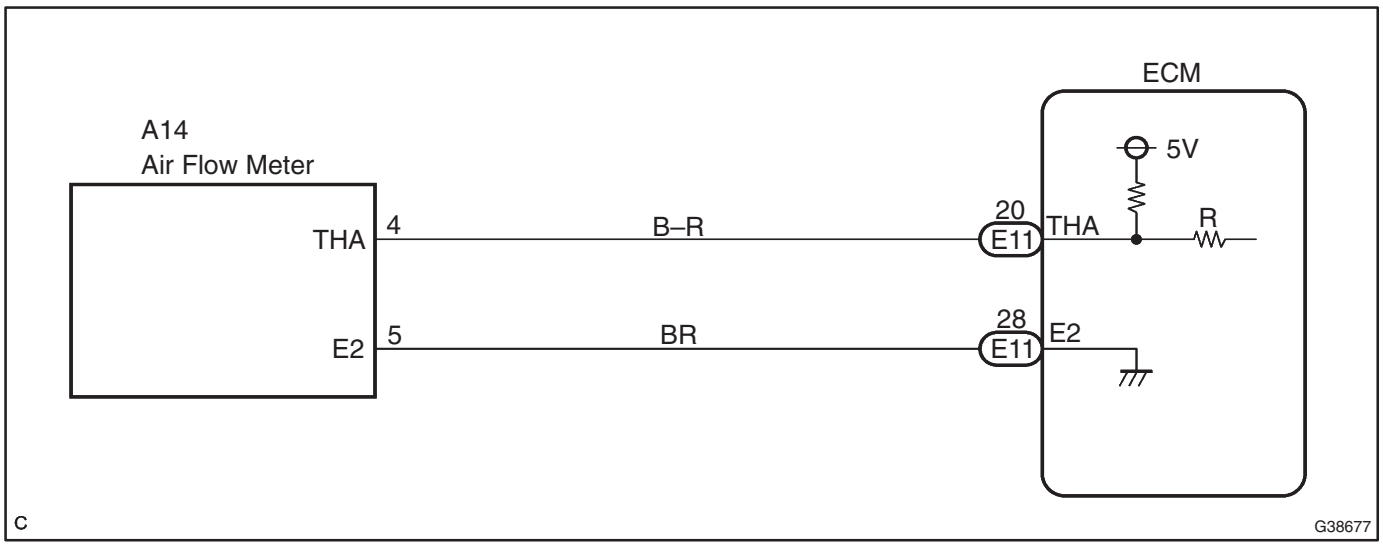
The intake air temperature sensor is built in the mass air flow meter and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature is the greater the thermistor resistance value becomes 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 (THAR) 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 (THAR) also changes. Based on this signal, the ECM increases the fuel injection volume to improve the driveability during cold engine operation.

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.	• Open or short in intake air temperature sensor circuit • Intake air temperature 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 or P0113", use the Intelligent Tester II to confirm the intake air temperature in the "Powertrain / Engine and ECT / DTC".

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 a different system are output simultaneously while terminal E2 is used as a ground terminal, terminal E2 may be open.
- Read freeze frame data using the Intelligent Tester II. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

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

(a) Connect the Intelligent Tester ll to the DLC3.
(b) Turn the ignition switch to ON and turn the Intelligent Tester ll ON.
(c) Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
(d) Read the value.

OK:

Standard: Same as the actual intake air temperature.

Result:

Temperature Displayed	Proceed To
–40˚C (–40˚F)	A
140˚C (284˚F) or more	B
OK (Same as air actual intake temperature)	C

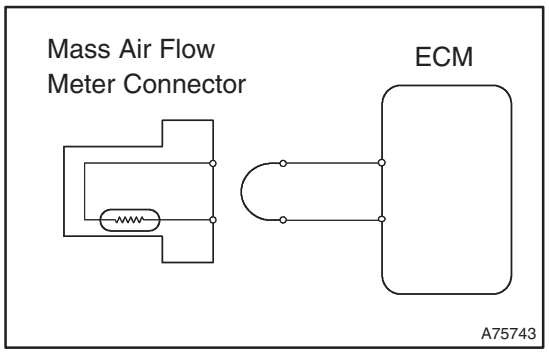
HINT:

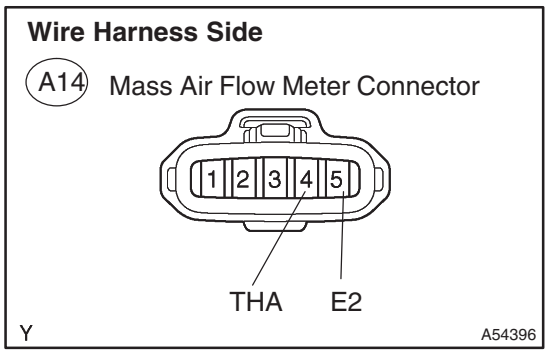
- If there is an open circuit, the Intelligent Tester ll indicates –40˚C (–40˚F).
- If there is a short circuit, the Intelligent Tester ll indicates 140˚C (284˚F) or more.

B	**Go to step 4**
C	**CHECK FOR INTERMITTENT PROBLEMS (See page 05–199)**

A

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





(a) Disconnect the mass air flow meter connector.
(b) Connect terminals THA and E2 of the A14 air flow meter connector.

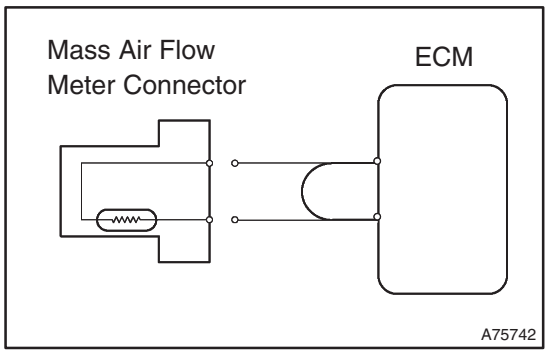
HINT:
Before checking, do visual and contact pressure checks on the ECM connector.

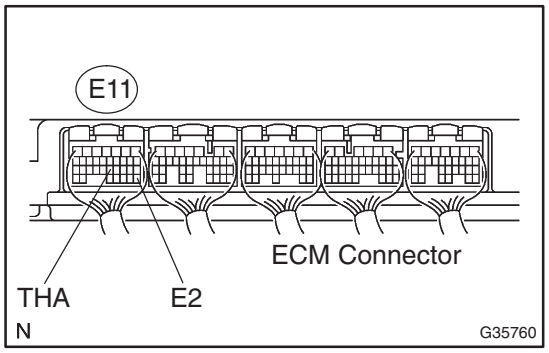
(c) Connect the Intelligent Tester ll to the DLC3.
(d) Turn the ignition switch to ON and turn the Intelligent Tester ll ON.
(e) Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
(f) Read the value.
Standard: 140°C (284°F) or more
(g) Reconnect the mass air flow meter 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)





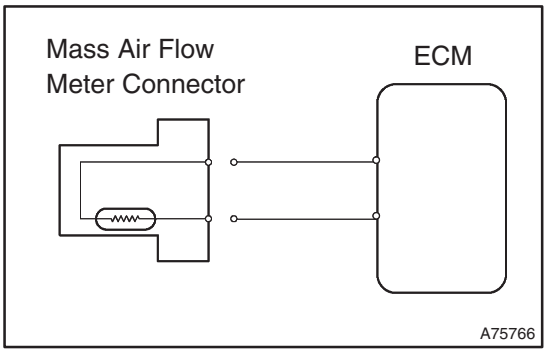
(a) Disconnect the mass air flow meter connector.
(b) Connect terminals THA and E2 of the E11 ECM connector.
(c) Connect the Intelligent Tester ll to the DLC3.
(d) Turn the ignition switch to ON and turn the Intelligent Tester ll ON.
(e) Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
(f) Read the value.
Standard: 140°C (284°F) or more
(g) Reconnect the mass air flow meter connector.

OK	REPAIR OR REPLACE HARNESS OR CONNECTOR

NG

CONFIRM GOOD CONNECTION AT ECM. IF OK, CHECK AND REPLACE ECM (See page 01–36)

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

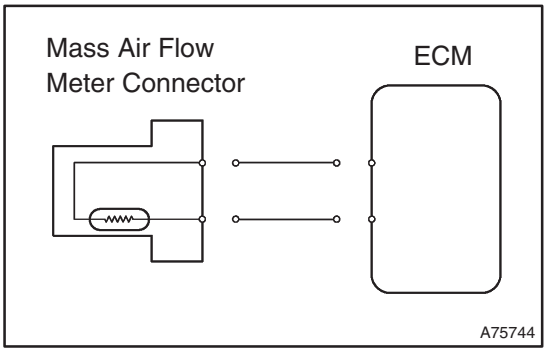


(a) Disconnect the mass air flow meter connector.
(b) Connect the Intelligent Tester II to the DLC3.
(c) Turn the ignition switch to ON and turn the Intelligent Tester II ON.
(d) Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
(e) Read the value.
Standard: –40°C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

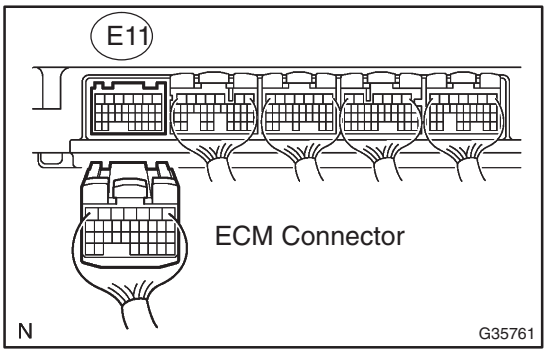
OK → **REPLACE MASS AIR FLOW METER**

NG

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



(a) Disconnect the E11 ECM connector.
(b) Disconnect the A14 mass air flow meter connector.
(c) Turn the ignition switch to ON and turn the Intelligent Tester II ON.
(d) Select the following menu items: Powertrain / Engine and ECT / Data List / Intake Air.
(e) Read the value.
Standard: –40°C (–40°F)
(f) Reconnect the ECM sensor connector.
(g) Reconnect the mass air flow meter connector.



OK → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

NG

CHECK AND REPLACE ECM (See Pub. No. RM1017E, page 10–11)