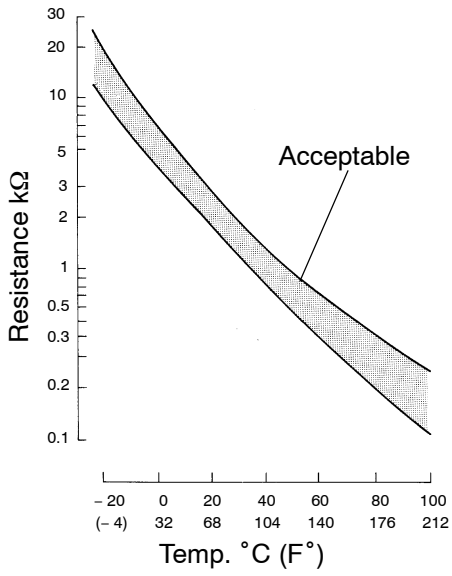
DIAFY–01

DTC	P0110/24	Intake Air Temp. Circuit Malfunction

CIRCUIT DESCRIPTION

(fig. 1)



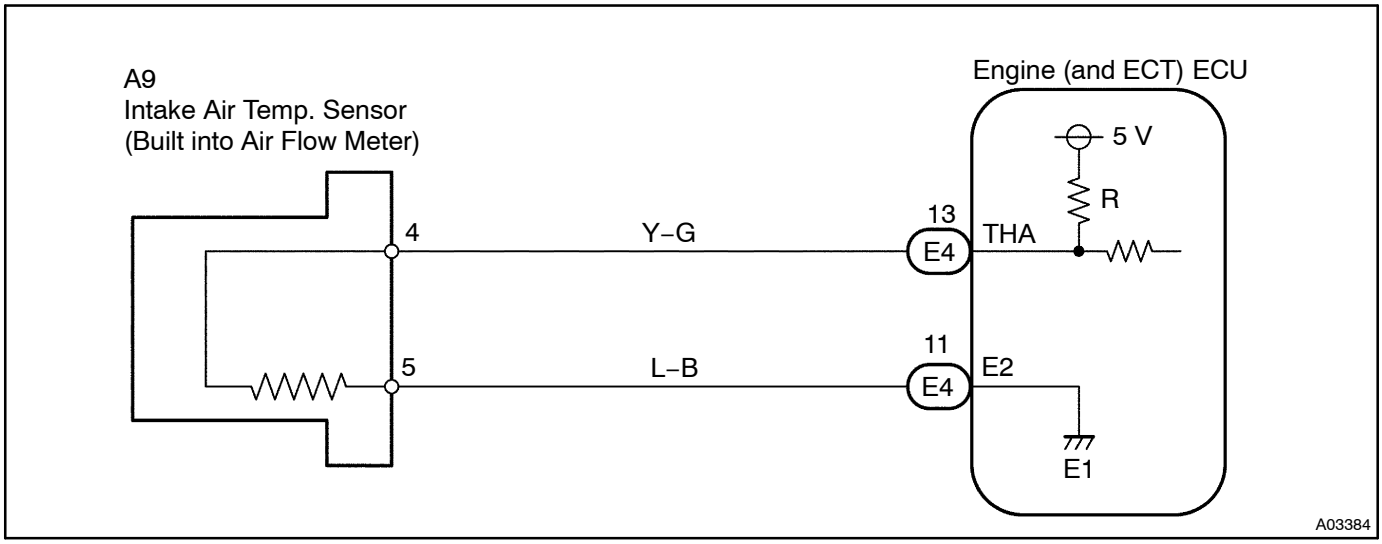
The intake air temp. sensor is built into the air flow meter and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See fig. 1).
The intake air temp. sensor is connected to the engine (and ECT) ECU (See below). The 5 V power source voltage in the engine (and ECT) ECU is applied to the intake air temp. sensor from the terminal THA via resistor R.
That is, the resistor R and the intake air temp. sensor are connected in series. When the resistance value of the intake air temp. sensor changes in accordance with changes in the intake air temperature, the potential at terminal THA also changes. Based on this signal, the engine (and ECT) ECU increases the fuel injection volume to improve driveability during cold engine operation. If the engine (and ECT) ECU detects the DTC "P0110/24", it operates the fail safe function in which the intake air temperature is assumed to be 20˚C (68˚F).

DTC No.	DTC Detecting Condition	Trouble Area
P0110/24	Open or short in intake air temp. sensor circuit	• Open or short in intake air temp. sensor circuit • Intake air temp. sensor (inside air flow meter) • Engine (and ECT) ECU

HINT:
After confirming DTC P0110/24, use the hand–held tester to confirm the intake air temperature from the CURRENT DATA.

Temperature Displayed	Malfunction
–40 ˚C (–40 ˚F)	Open circuit
140˚C (284 ˚F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs P0110/24, P0115/22 and P0120/41 are output simultaneously, E2 (Sensor Ground) may be open.
- Read the freeze frame data on the hand–held tester, which is recorded when a malfunction is detected on the engine. When troubleshooting, it is useful to determine 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.

When using hand–held tester

1	**Connector hand–held tester, and read value of intake air temp.**

PREPARATION:

(a) Connect the hand–held tester to the DLC3.

(b) Turn the ignition switch ON and push the hand–held tester main switch ON.

CHECK:

Read the temperature value on the hand–held tester.

OK:

Same as actual intake air temp.

HINT:

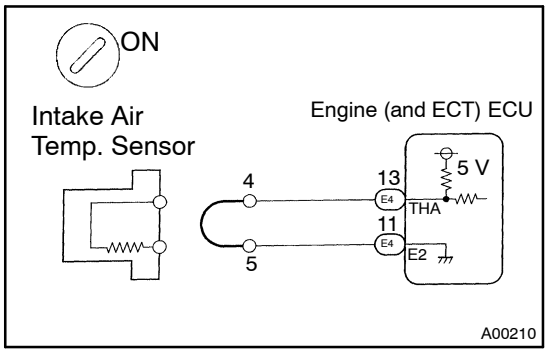
- If there is an open circuit, the hand–held tester indicates –40°C (–40°F).
- If there is a short circuit, the hand–held tester indicates 140°C (284°F) or more.

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

OK

Check for intermittent problems (See page DI–4).

2	Check for open in harness or engine (and ECT) ECU.



PREPARATION:

(a) Disconnect the air flow meter connector.
(b) Connect the sensor wire harness terminals together.
(c) Turn the ignition switch ON.

CHECK:

Read the intake air temperature on the hand–held tester.

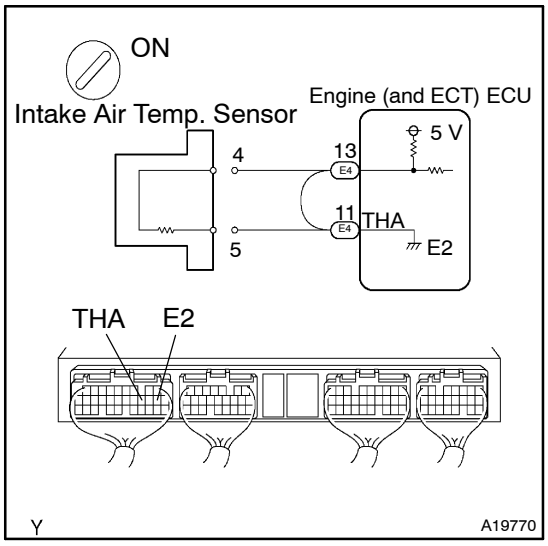
OK:

140°C (284°F) or more

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

NG

3	Check for open in harness or engine (and ECT) ECU.



PREPARATION:

(a) Remove the glove compartment door.
(b) Connect terminals THA and E2 of the engine (and ECT) ECU connector.
(c) Disconnect the air flow meter connector.
(d) Do a visual check and a contact pressure check for the engine (and ECT) ECU connector (See page IN–20).

CHECK:

Read the intake air temperature on the hand–held tester.

OK:

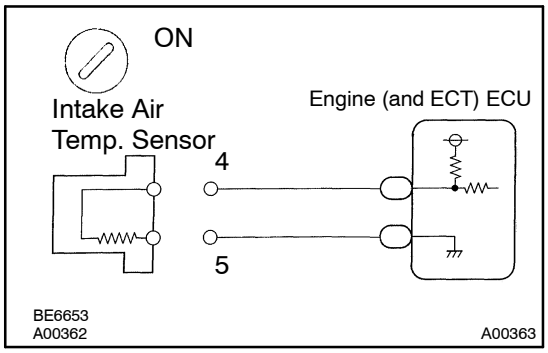
140°C (284°F) or more

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

NG

Confirm good connection at engine (and ECT) ECU.
If OK, check and replace engine (and ECT) ECU (See page IN–20).

4	Check for short in harness and engine (and ECT) ECU.



PREPARATION:

(a) Disconnect the air flow meter connector.

(b) Turn the ignition switch ON.

CHECK:

Read the intake air temperature on the hand–held tester.

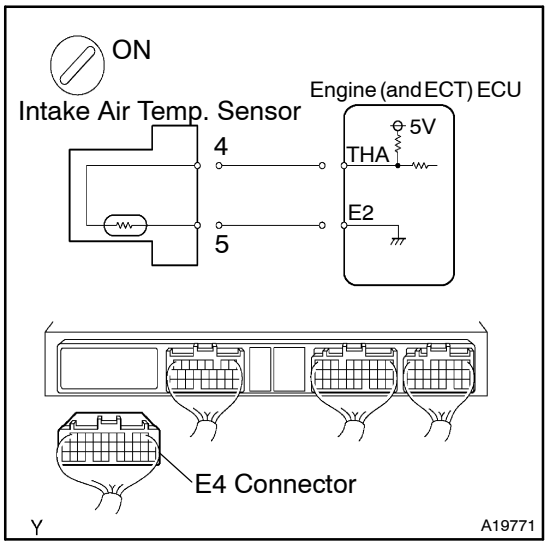
OK:

–40°C (–40°F)

OK	Replace air flow meter.

NG

5	Check for short in harness or engine (and ECT) ECU.



PREPARATION:

(a) Remove the glove compartment door.

(b) Disconnect the E4 engine (and ECT) ECU connector.

(c) Disconnect the air flow meter connector.

(d) Turn the ignition switch ON.

CHECK:

Read the intake air temperature on the hand–held tester.

OK:

–40°C (–40°F)

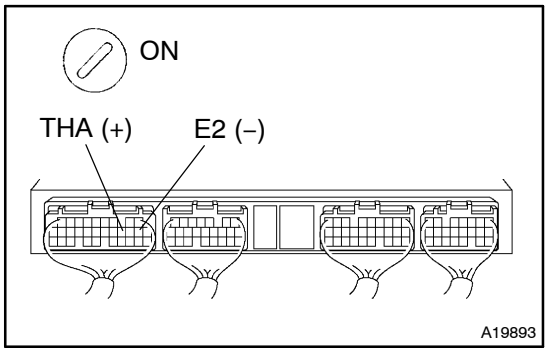
OK	Repair or replace harness or connector.

NG

Check and replace engine (and ECT) ECU (See page IN–20).

When not using hand–held tester

1	Check voltage between terminals THA and E2 of engine (and ECT) ECU connector.



PREPARATION:
(a) Remove the glove compartment door.
(b) Turn ignition switch ON.

CHECK:
Measure the voltage between terminals THA and E2 of the engine (and ECT) ECU connector.

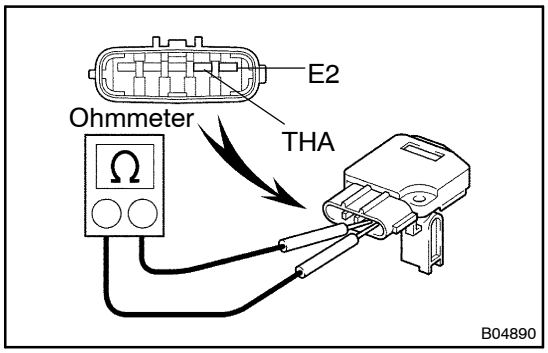
OK:

Intake air temperature	Voltage
20°C (68°F)	0.5 – 3.4 V
60°C (140°F)	0.2 – 1.0 V

OK → **Check for intermittent problems (See page DI–4).**

NG

2	Check intake air temp. sensor.



PREPARATION:
Disconnect the air flow meter connector.

CHECK:
Measure the resistance between terminals THA and E2 of the mass air flow meter connector.

OK:
Resistance is within acceptable zone on the chart.

Intake air temperature	Resistance
20°C (68°F)	2.2 – 2.7 kΩ
80°C (176°F)	0.2 – 0.4 kΩ

NG → **Replace mass air flow meter.**

OK

3	**Check for open and short in harness and connector between engine (and ECT) ECU and intake air temp. sensor (See page IN–20).**

NG → **Repair or replace harness or connector.**

OK

Check and replace engine (and ECT) ECU (See page IN–20).