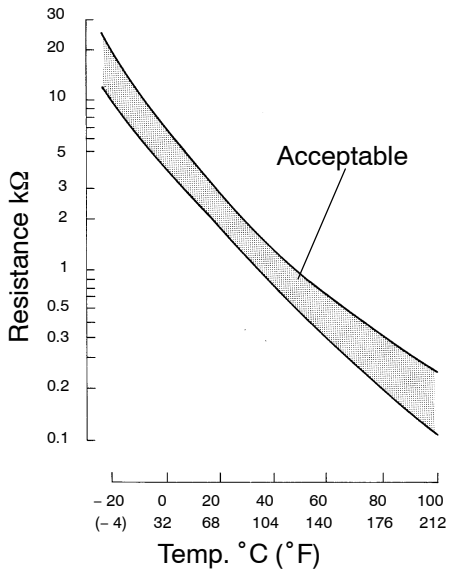
DTC P0110/24 INTAKE AIR TEMP. CIRCUIT MALFANCTION

CIRCUIT DESCRIPTION

(fig. 1)



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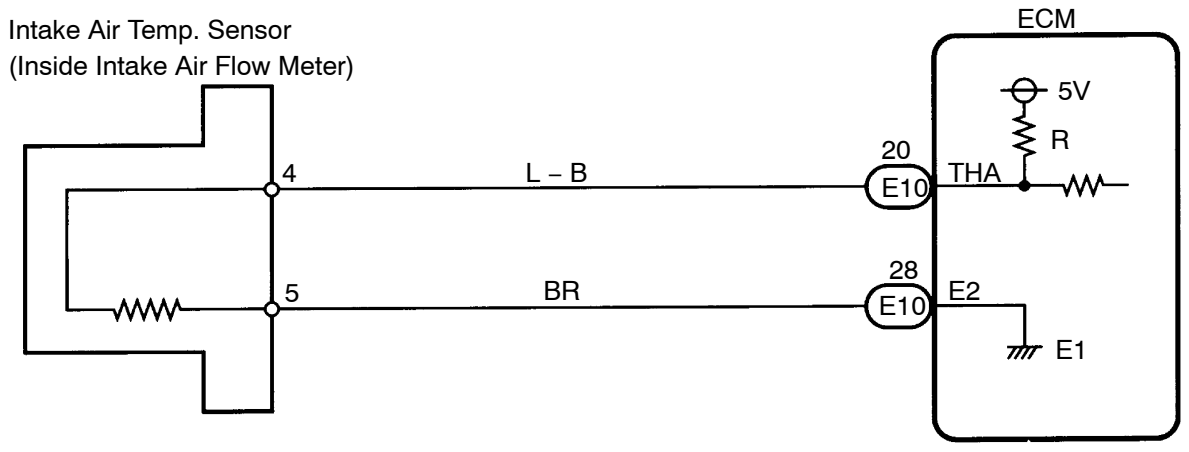
The intake air temp. sensor is built into the air flow meter and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See fig. 1).
The intake air temp. sensor is connected to the ECM (See below). The 5 V power source voltage in the ECM 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 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.	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 intake air flow meter) • ECM

WIRING DIAGRAM



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INSPECTION PROCEDURE

HINT:

- If DTC P0110 (Intake Air Temp. Circuit Malfunction), P0115 (Water Temp. Circuit Malfunction), P0120 (Throttle/Pedal Position Sensor/Switch "A" Malfunction) are output simultaneously, E2 (Sensor Ground) may be open.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining 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 READ VALUE OF HAND–HELD TESTER(INAKE AIR TEMPERATURE)

(a) Read temperature value on the hand–held tester.
Temperature: The same as actual intake air temperature
Resistance:

A	B	C
–40°C (–40°F)	140°C (284°F) or more	OK

B → **Go to step 4**

C → **GO TO RELEVANT DTC CHART**

A

2 READ VALUE OF HAND–HELD TESTER(CHECK FOR OPEN)

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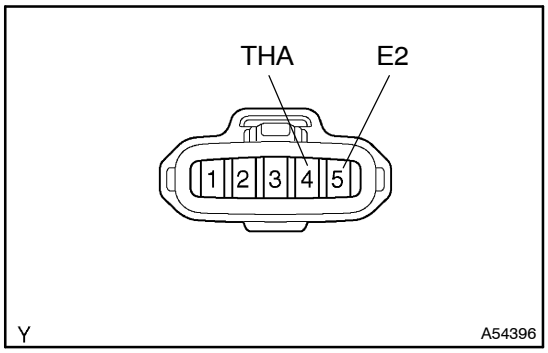
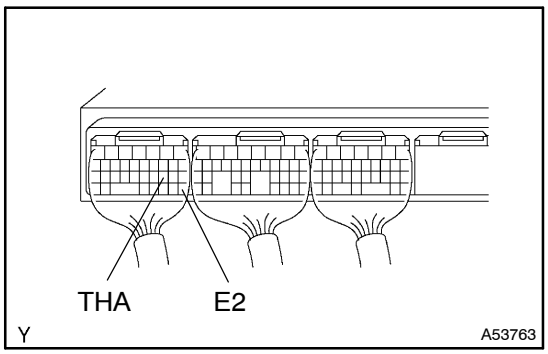


(a) Disconnect the intake air flow meter connector.
(b) Connect the terminal THA with E2.
(c) Turn the ignition switch ON.
(d) Read temperature value on the hand–held tester.
Temperature: 140°C (284°F) or more

OK → **REPLACE INTAKE AIR FLOW METER SUB–ASSY**

NG

3	READ VALUE OF HAND–HELD TESTER(CHECK FOR OPEN)



(a) Connect the terminals THA with E2 of the ECM connector.
HINT:
Before checking, do a visual check and connector connection inspection of the ECM.
(b) Read temperature value on the hand–held tester.
Temperature: 140°C (284°F) or more

OK	CHECK AND REPLACE HARNESS AND CONNECTOR

NG

CHECK AND REPLACE ECM

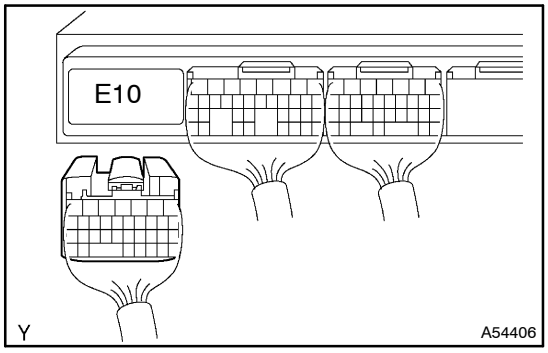
4	READ VALUE OF HAND–HELD TESTER(CHECK FOR SHORT)

(a) Disconnect the intake air flow meter connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand–held tester.
Temperature: –40°C (–40°F)

OK	REPLACE INTAKE AIR FLOW METER SUB–ASSY

NG

5	READ VALUE OF HAND–HELD TESTER(CHECK FOR SHORT)



(a) Disconnect the ECM E10 connector.
(b) Turn the ignition switch ON.
(c) Read temperature value on the hand–held tester.
Temperature: –40°C (–40°F)

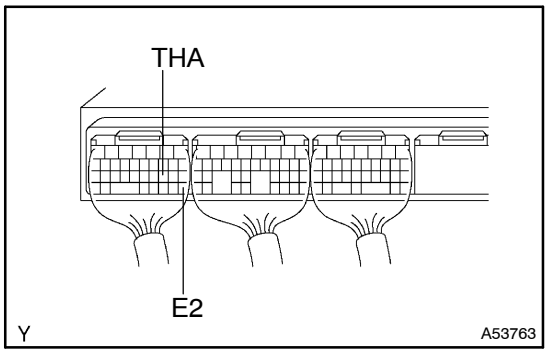
OK	REPAIR OR REPLACE HARNESS AND CONNECTOR

NG

CHECK AND REPLACE ECM

When not using Hand–held Tester:

1	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure voltage between terminals THA and E2 of ECM connector.

VOLTAGE:

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

OK → **CHECK FOR INTERMITTENT PROBLEMS**

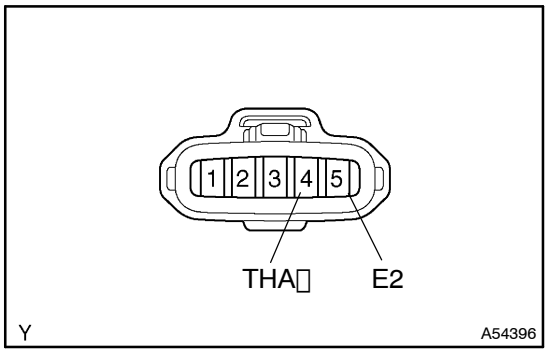
NG

2	INSPECT INTAKE AIR FLOW METER SUB–ASSY (See page 10–14)

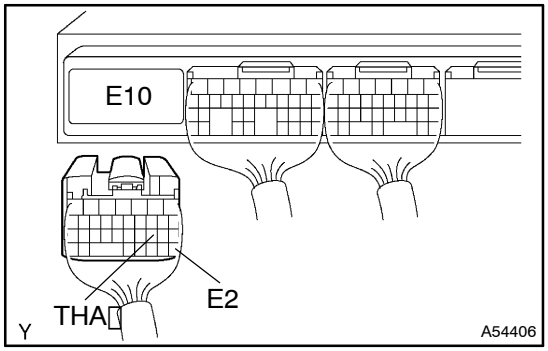
NG → **REPLACE INTAKE AIR FLOW METER SUB–ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(ECM – INTAKE AIR FLOW METER)



(a) Disconnect the intake air flow meter connector.
(b) Disconnect the ECM E10 connector.
(c) Check for open between the terminals THA of the intake air flow meter connector and THA of the ECM connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals THA and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM