DTC	B1413	EVAPORATOR TEMPERATURE SENSOR CIRCUIT

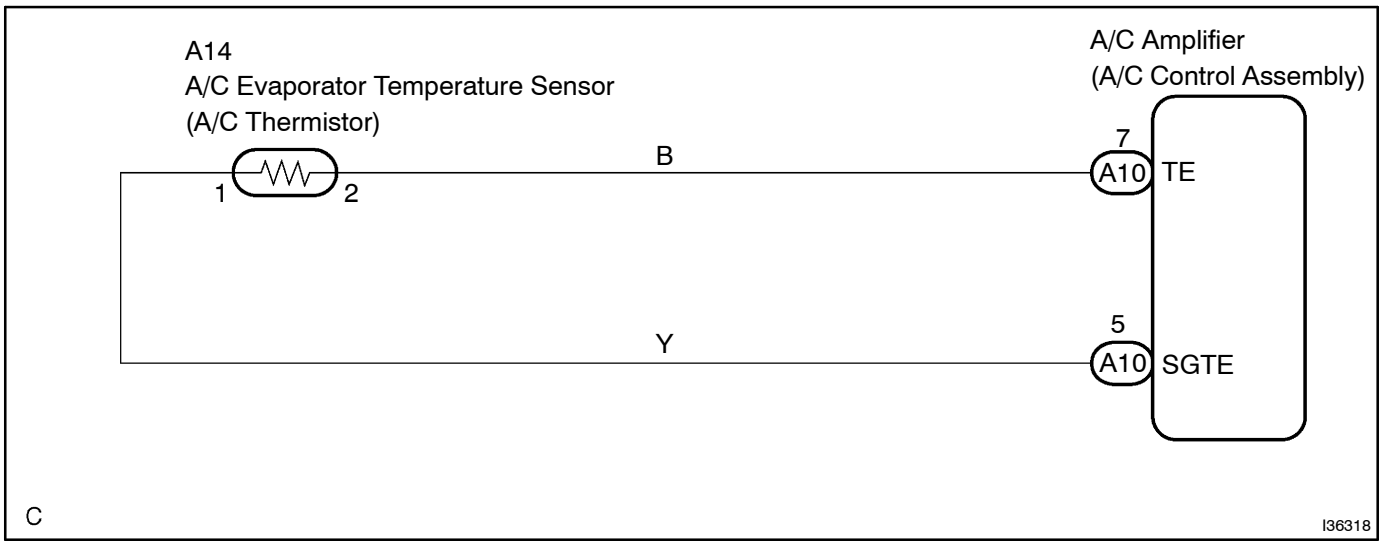
CIRCUIT DESCRIPTION

The A/C evaporator temperature sensor (A/C thermistor) is installed on the evaporator in the air conditioner unit to detect the cooled air temperature that has passed through the evaporator and control the air conditioning . It sends appropriate signals to the A/C amplifier. The resistance of the A/C evaporator temperature sensor (A/C thermistor) changes in accordance with the cooled air temperature that has passed through the evaporator. As the temperature decreases, the resistance increases. As the temperature increases, the resistance decreases.

The A/C amplifier assy applies voltage (5V) to the A/C evaporator temperature sensor (A/C thermistor) and reads voltage changes as the resistance of the A/C evaporator temperature sensor (A/C thermistor) changes. This sensor is used for frost prevention.

DTC No.	Detection Item	Trouble Area
B1413	Open or short in evaporator temperature sensor circuit.	• A/C evaporator temperature sensor (A/C thermistor) • Harness or connector between A/C evaporator temperature sensor and A/C amplifier • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE ON INTELLIGENT TESTER II

(a) Connect the intelligent tester II to DLC3.
(b) Turn the power switch ON and push the intelligent tester II main switch ON.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester II.

DATA LIST / AIR CONDITIONER:

Item	Measurement Item/Display (Range)	Normal Condition	Diagnostic Note
Evaporator temperature sensor (Evap Temp)	Evaporator temperature sensor / min.: –29.7°C (–21.46°F) max.: 59.55°C (139.19°F)	Actual evaporator temperature is displayed	Open in the circuit: –29.7°C (–21.46°F) Short in the circuit: 59.55°C (139.19°F)

OK:

The display is as specified in the normal condition.

Result:

NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

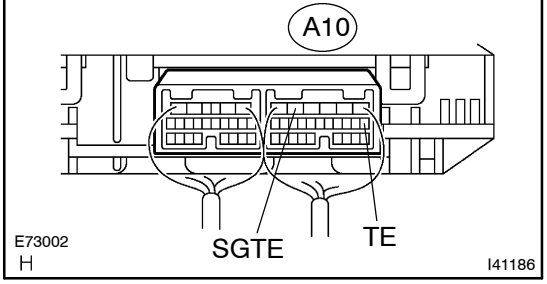
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SEE PAGE 05–1035)**

C → **REPLACE AIR CONDITIONING AMPLIFIER (SEE PAGE 55–52)**

A

2 INSPECT AIR CONDITIONING AMPLIFIER(TE – SG)

Air Conditioning Amplifier Connector Wire Harness View:



(a) Remove the A/C amplifier with connectors still connected.

(b) Measure the voltage according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified condition
A10–7 (TE) – A10–5 (SGTE)	Power switch ON (ON) at 0 °C (32 °F)	2.0 to 2.4 V
A10–7 (TE) – A10–5 (SGTE)	Power switch ON (ON) at 15 °C (59 °F)	1.4 to 1.8 V

HINT:

As the temperature increases, the voltage decreases.

Result:

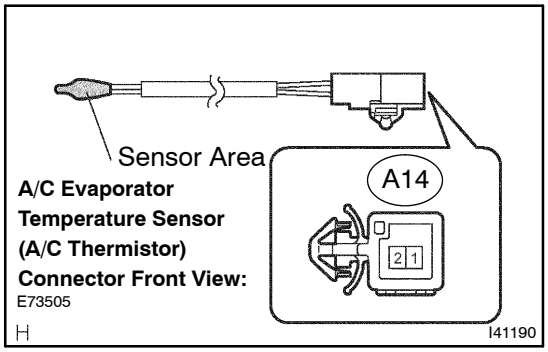
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

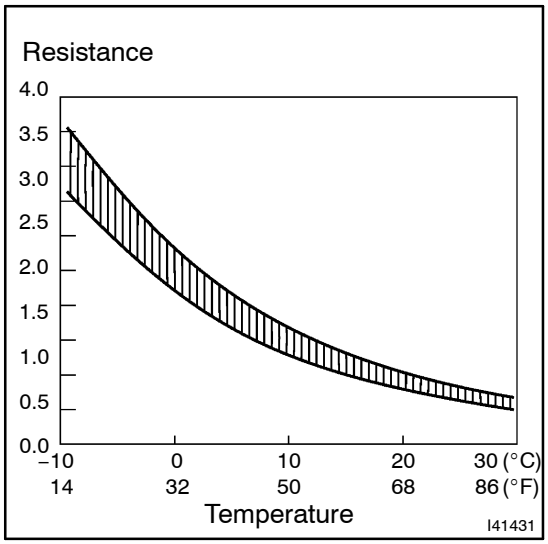
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SEE PAGE 05–1035)**

C → **REPLACE AIR CONDITIONING AMPLIFIER (SEE PAGE 55–52)**

A

3 INSPECT A/C EVAPORATOR TEMPERATURE SENSOR(A/C THERMISTOR)





(a) Remove the A/C evaporator temperature sensor (A/C thermistor).

(b) Disconnect the connector from A/C evaporator temperature sensor (A/C thermistor).

(c) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified condition
A14–1 – A14–2	–10°C (14°F)	7.30 to 9.10 kΩ
A14–1 – A14–2	–5°C (23°F)	5.65 to 6.95 kΩ
A14–1 – A14–2	0°C (32°F)	4.40 to 5.35 kΩ
A14–1 – A14–2	5°C (41°F)	3.40 to 4.15 kΩ
A14–1 – A14–2	10°C (50°F)	2.70 to 3.25 kΩ
A14–1 – A14–2	15°C (59°F)	2.14 to 2.58 kΩ
A14–1 – A14–2	20°C (68°F)	1.71 to 2.05 kΩ
A14–1 – A14–2	25°C (77°F)	1.38 to 1.64 kΩ
A14–1 – A14–2	30°C (86°F)	1.11 to 1.32 kΩ

NOTICE:

- **Even slightly touching the sensor may change the resistance value. Be sure to hold the connector of the sensor.**
- **When measuring, the sensor temperature must be the same as the ambient temperature.**

HINT:

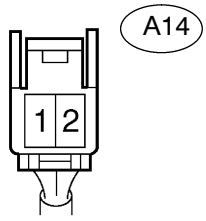
As the temperature increases, the resistance decrease (see the graph below).

NG → **REPLACE A/C EVAPORATOR TEMPERATURE SENSOR(A/C THERMISTOR)**

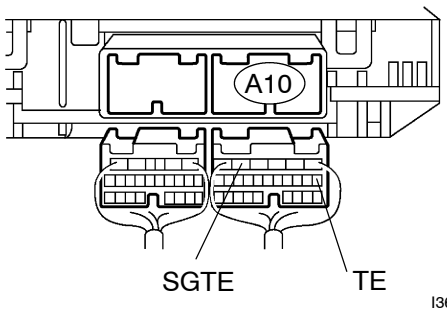
OK

4	CHECK HARNESS AND CONNECTOR(A/C EVAPORATOR TEMPERATURE SENSOR(A/C THERMISTOR) – AIR CONDITIONING AMPLIFIER) (SEE PAGE 01–46)

A/C Evaporator Temperature Sensor (A/C Thermistor) Front View:



Air Conditioning Amplifier Wire Harness View:



(a) Disconnect the connector from A/C evaporator temperature sensor (A/C thermistor) and A/C amplifier.

(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified condition
A10–7 (TE) – A14–2	Always	Below 1 Ω
A10–5 (SGTE) – A14–1	Always	Below 1 Ω
A10–7 (TE) – Body ground	Always	10 kΩ or higher
A10–5 (SGTE) – Body ground	Always	10 kΩ or higher

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

OK

REPLACE AIR CONDITIONING AMPLIFIER (SEE PAGE 55–52)