DTC B1413/13 Evaporator Temperature Sensor Circuit

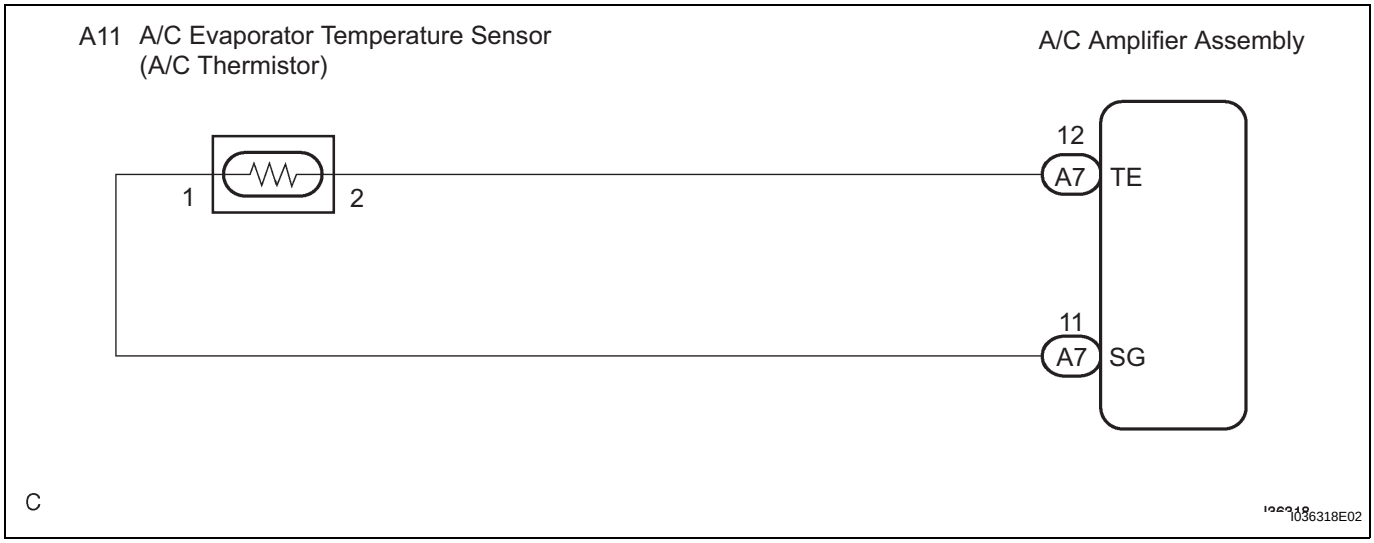
DESCRIPTION

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 assembly. 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 assembly applies voltage (5 V) 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.	DTC Detecting Condition	Trouble Area
B1413/13	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 assembly • A/C amplifier assembly

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

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

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
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

Result	Proceed to
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**

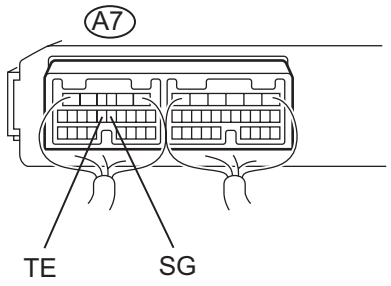
C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

AC

A

2 INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

A/C Amplifier Assembly Connector Wire Harness View:



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

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

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A7-12 (TE) - A7-11 (SG)	Ignition switch ON at 0°C (32°F)	2.2 to 2.6 V
A7-12 (TE) - A7-11 (SG)	Ignition switch ON at 15°C (59°F)	1.3 to 1.7 V

HINT:

As the temperature increases, the voltage decreases.

Result

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

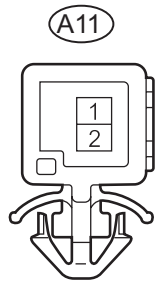
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

3 INSPECT A/C EVAPORATOR TEMPERATURE SENSOR

A/C Evaporator Temprature Sensor (A/C Thermistor) Connector Front View:



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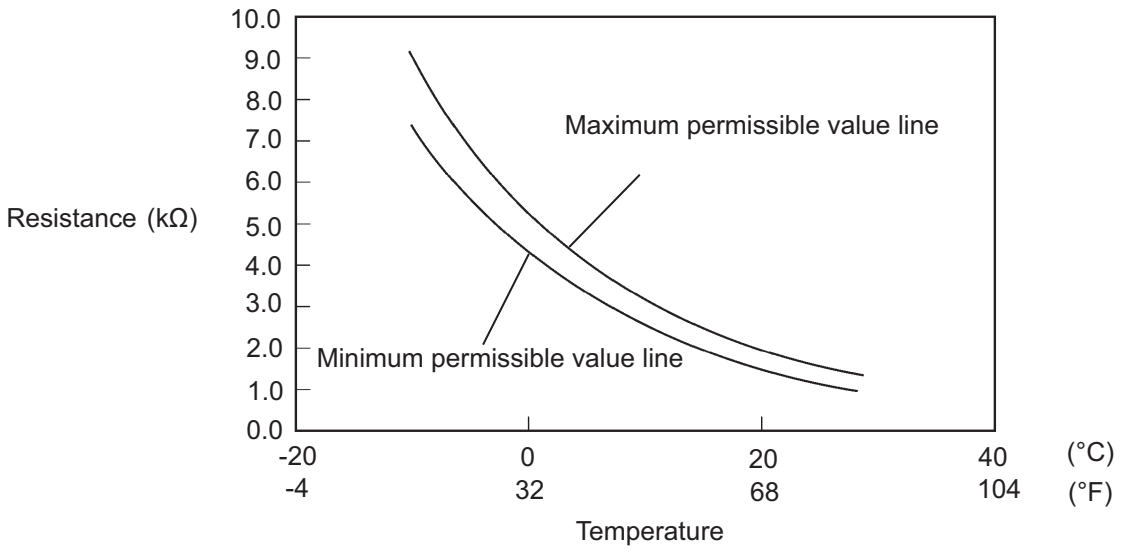
(a) Remove the A/C evaporator temperature sensor (A/C thermistor).
(b) Disconnect the connector from the A/C evaporator temperature sensor (A/C thermistor).
(c) Measure the resistance according to the value(s) in the table below.



C

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Standard resistance

Tester connection	Condition	Specified condition
A11-1 - A11-2	-10°C (14°F)	7.30 to 9.10 kΩ
A11-1 - A11-2	-5°C (23°F)	5.65 to 6.95 kΩ
A11-1 - A11-2	0°C (32°F)	4.40 to 5.35 kΩ
A11-1 - A11-2	5°C (41°F)	3.40 to 4.15 kΩ
A11-1 - A11-2	10°C (50°F)	2.70 to 3.25 kΩ
A11-1 - A11-2	15°C (59°F)	2.14 to 2.58 kΩ
A11-1 - A11-2	20°C (68°F)	1.71 to 2.05 kΩ
A11-1 - A11-2	25°C (77°F)	1.38 to 1.64 kΩ
A11-1 - A11-2	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 decreases (see the graph).

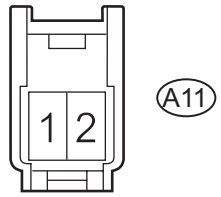
NG → **REPLACE A/C EVAPORATOR TEMPERATURE SENSOR**

AC

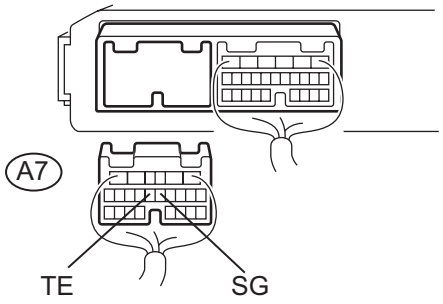
OK

4	CHECK HARNESS AND CONNECTOR (A/C EVAPORATOR TEMPERATURE SENSOR - A/C AMPLIFIER ASSEMBLY)

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



A/C Amplifier Assembly Connector Wire Harness View:



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(a) Disconnect the connector from the A/C amplifier assembly.

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

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-12 (TE) - A11-2	Always	Below 1 Ω
A7-11 (SG) - A11-1	Always	Below 1 Ω
A7-12 (TE) - Body ground	Always	10 kΩ or higher
A7-11 (SG) - Body ground	Always	10 kΩ or higher

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

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY