DTC	B1412/12	Ambient Temperature Sensor Circuit

DESCRIPTION

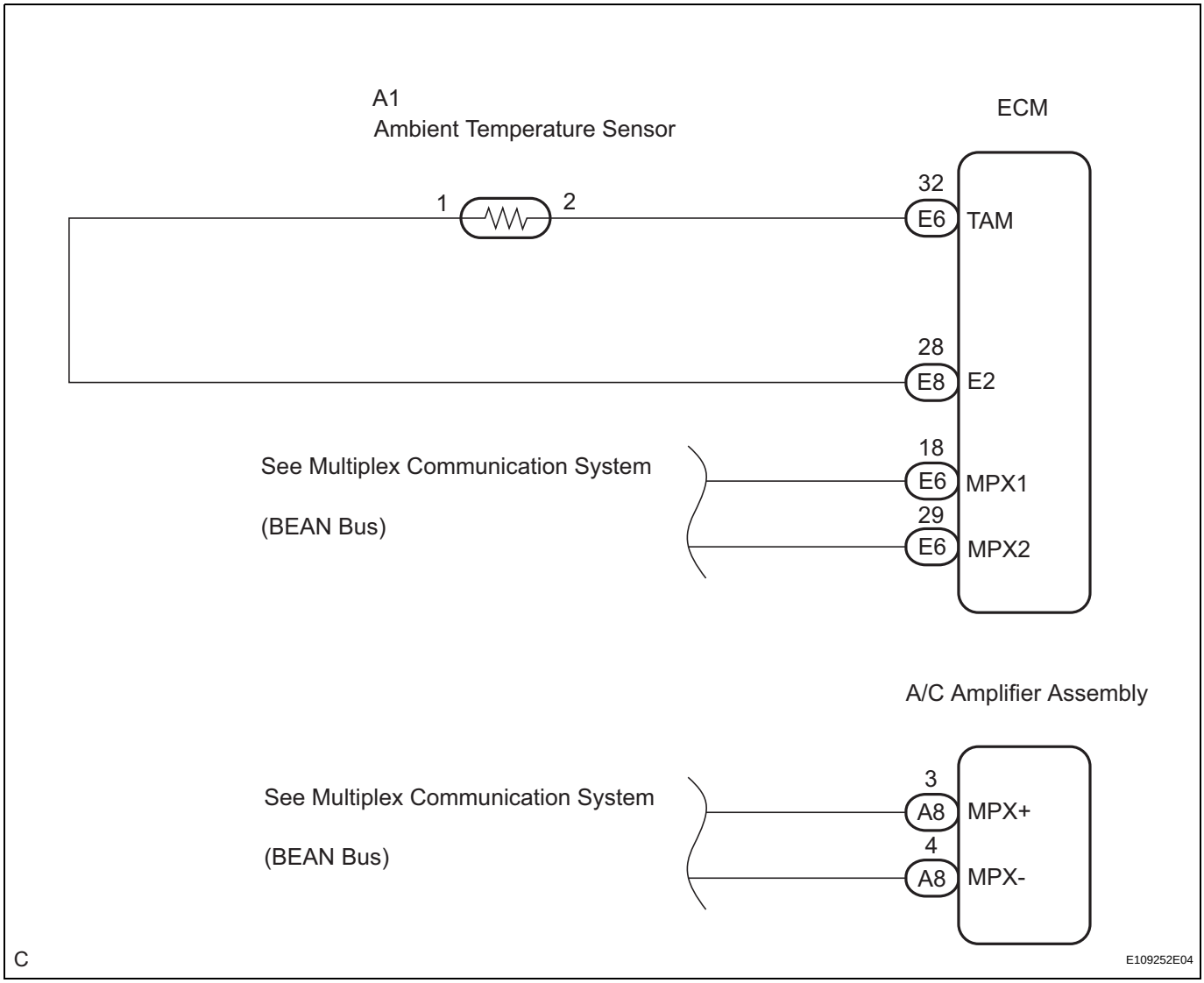
The A/C ambient temperature sensor is installed in the front part of the condenser to detect the ambient temperature and control the heater and air conditioner "AUTO" function. The sensor connected to the ECM detects fluctuation in the ambient temperature that is used for controlling the room temperature. The sensor sends a signal to the A/C amplifier assembly via the ECM. The resistance of the A/C ambient temperature sensor changes in accordance with the ambient temperature. As the temperature decreases, the resistance increases. As the temperature increases, the resistance decreases.

The ECM applies voltage (5 V) to the A/C ambient temperature sensor and reads voltage changes as the resistance of the A/C ambient temperature sensor changes. The ECM sends the read signal to the A/C amplifier via body multiplex communications.

AC

DTC No.	DTC Detecting Condition	Trouble Area
B1412/12	Open or short in ambient temperature sensor circuit	• A/C ambient temperature sensor • Harness or connector between A/C ambient temperature sensor and ECM • ECM • Multiplex communication circuit • 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
AMBIENT TEMP SENS	Ambient temperature sensor / min.: -23.3°C (-9.94°F) max.: 65.95°C (150.71°F)	Actual ambient temperature is displayed	Open in the circuit: -23.3°C (-9.94°F) Short in the circuit: 65.95°C (150.71°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

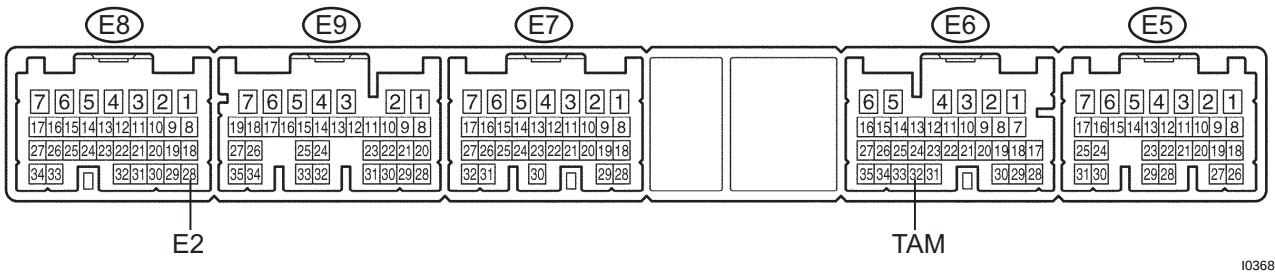
C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

2	INSPECT ECM

(a) Remove the ECM with the connectors still connected.

Front Back Side:



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

Tester connection (Symbols)	Condition	Specified condition
E6-32 (TAM) - E8-28 (E2)	Ignition switch ON at 25°C (77°F)	1.7 to 2.1 V

Tester connection (Symbols)	Condition	Specified condition
E6-32 (TAM) - E8-28 (E2)	Ignition switch ON at 40°C (104°F)	1.0 to 1.4 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 the DTC)	C

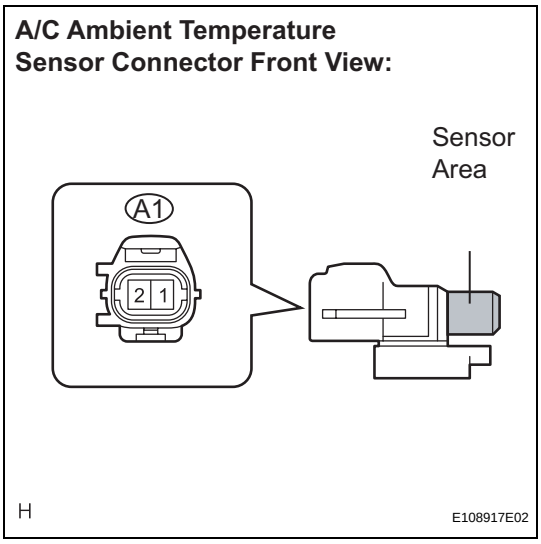
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE ECM**

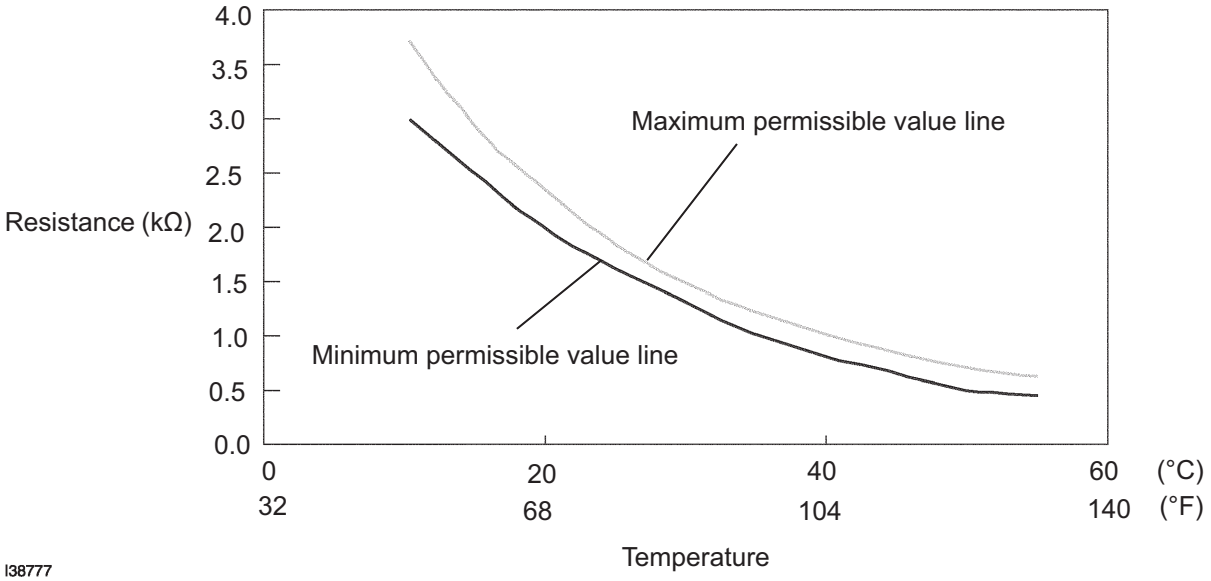
A

3 INSPECT A/C AMBIENT TEMPERATURE SENSOR

A/C Ambient Temperature Sensor Connector Front View:



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



AC

Standard resistance

Tester connection	Condition	Specified condition
A1-1 - A1-2	10°C (50°F)	3.00 to 3.73 kΩ
A1-1 - A1-2	15°C (59°F)	2.45 to 2.88 kΩ
A1-1 - A1-2	20°C (68°F)	1.95 to 2.30 kΩ
A1-1 - A1-2	25°C (77°F)	1.60 to 1.80 kΩ
A1-1 - A1-2	30°C (86°F)	1.28 to 1.47 kΩ
A1-1 - A1-2	35°C (95°F)	1.00 to 1.22 kΩ
A1-1 - A1-2	40°C (104°F)	0.80 to 1.00 kΩ
A1-1 - A1-2	45°C (113°F)	0.65 to 0.85 kΩ
A1-1 - A1-2	50°C (122°F)	0.50 to 0.70 kΩ
A1-1 - A1-2	55°C (131°F)	0.44 to 0.60 kΩ
A1-1 - A1-2	60°C (140°F)	0.36 to 0.50 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.**

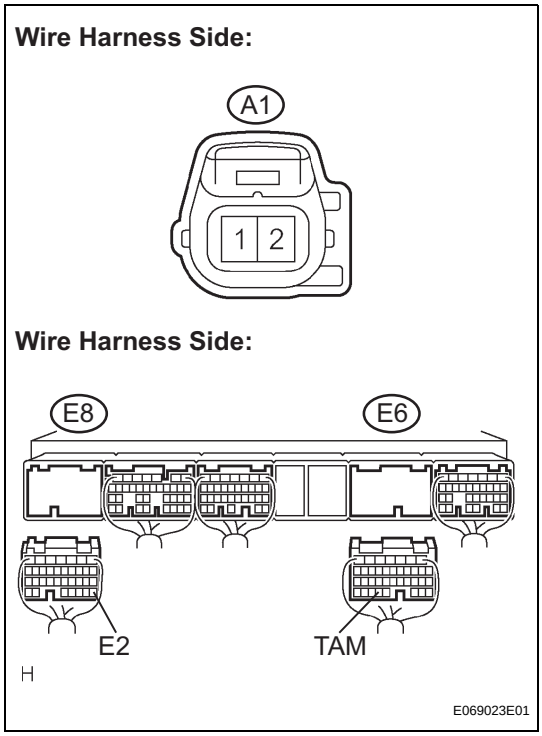
HINT:

As the temperature increases, the resistance decreases (see the graph).

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

OK

4	CHECK HARNESS AND CONNECTOR (A/C AMBIENT TEMPERATURE SENSOR - ECM)



(a) Disconnect the connector from the ECM.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection	Condition	Specified condition
E6-32 (TAM) - A1-2	Always	Below 1 Ω
E8-28 (E2) - A1-1	Always	Below 1 Ω
E6-32 (TAM) - Body ground	Always	10 kΩ or higher
E8-28 (E2) - Body ground	Always	10 kΩ or higher

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

OK →

REPLACE ECM