SYSTEM DESCRIPTION

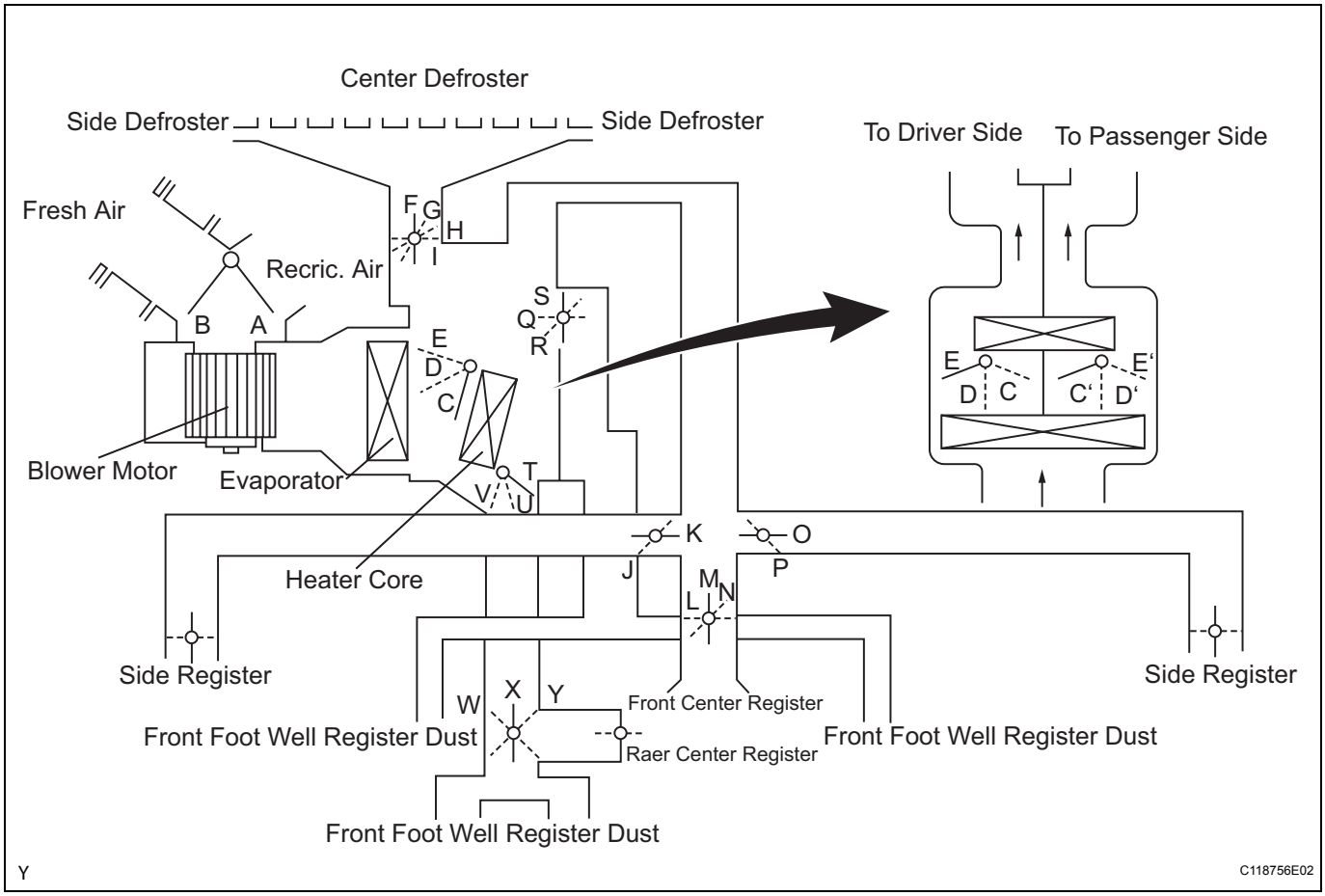
1. GENERAL

(a) The air conditioning system has the following control.

Control	Outline
Neural Network Control	This control is capable of effecting complex control by artificially simulating the information processing method of nervous system of living organisms in order to establish a complex input / output relationship that is similar to a human brain.
Outlet Air Temperature Control	In compliance with the temperature set at the temperature control switch, the neural network control calculates the outlet temperature based on the input signals from various sensors.
	The temperature setting for the driver and front passenger is controlled independently in order to provide a separate vehicle interior temperature for the right and left side. Thus, air conditioning that accommodates the occupants' preferences has been realized.
Blower control	Controls the blower motor in accordance with ten airflow volume that has been calculated by the neural network control based on the input signals from various sensors.
Air Outlet Control	Automatically switches the outlets in accordance with the airflow volume that has been calculated by the neural network control based on the input signals from various sensors.
	In accordance with the engine coolant temperature, outside air temperature, amount of sunlight, required blower outlet temperature, and vehicle speed conditions, this control automatically switches the blower outlet to the FOO / DEF mode to prevent window from becoming fogged when the outside air temperature is low.
Air Inlet Control	automatically controls the air inlet control damper in accordance with the calculation of the required outlet air temperature.
	Drives the servomotor (for air inlet) according to the operation of the air inlet control switch and fixes the dampers in the FRESH or RECIRC position.
Compressor Control	This control turns OFF the magnetic clutch of the A/C compressor when the blower motor is turned OFF at the time, the engine coolant temperature is below a predetermined value, an abnormal refrigerant pressure has been input, or the discharge temperature of the evaporator is below a predetermined value.
	Air Conditioning ECU turns the compressor off if the engine coolant temperature becomes abnormally hot (115°C (239°F) or above) when driving under a high load.
Rear Window Defogger Control	Switches the rear defogger and outside rear mirror heaters*1, on for 15 minutes when the rear defogger switch is switched on. Switches them off if the switch is pressed while they are operating.
Outer Temperature Indicator Control	Based on the signals from the ambient temperature sensor, this control calculates the outside temperature, witch is then corrected in Air Conditioning ECU, and show in the multi information display*2 / multi display*3.
Self- Diagnosis	The DTC (Diagnostic Trouble Code) is stored in the memory when the air Conditioning ECU detects an abnormality in the air conditioning system.

*1: Models with XLS and Limited Grades
*2: Models without Multi Display
*3: Models with Multi Display

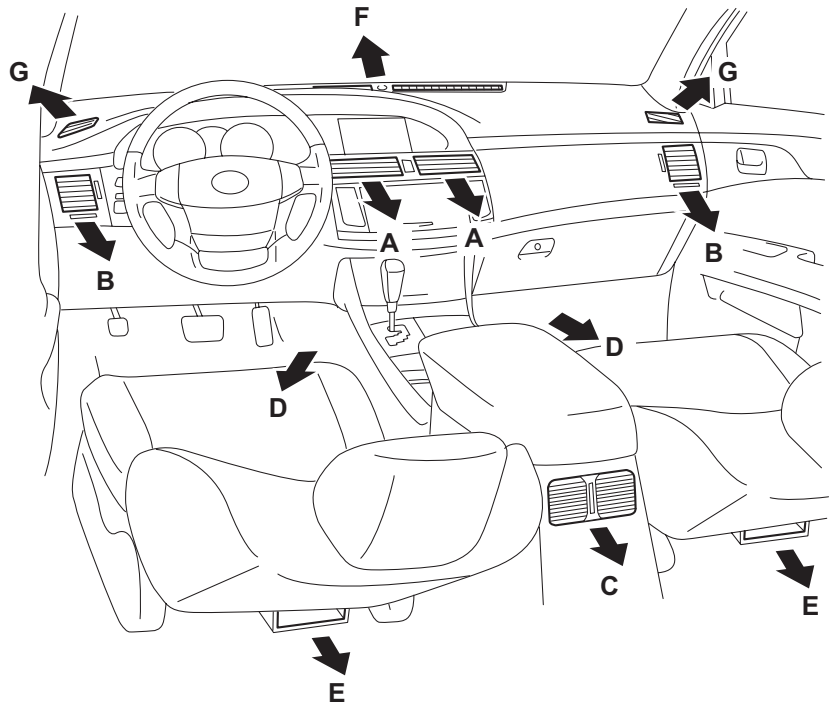
2. MODE POSITION AND DAMPER OPERATION



Function of Main Damper

Control Damper	Operation Position	Damper Position	Operation
Air Inlet Control Damper	FRESH	A	Brings in fresh air.
	RECIRCULATION	B	Recirculates internal air.
Air Mix Control Damper	MAX COLD to MAX HOT Temp. Setting	C - D - E (C' - D' - E') T - U - V	Varies the mixture ratio of the fresh air and the recirculation air in order to regulate the temperature continuously from HOT to COLD.
Mode Control Damper	DEF	F, K, L, P, S	Defrosts the windshield through the center defroster, side defroster, side registers and rear center register.
	FOOT/DEF	G, K, L, P, Q, X	Defrosts the windshield through the center defroster, side defrosters, side registers, and rear center register, while air is also blown out from the front and rear foot well register ducts.
	FOOT	H, K, L, P, Q, X	Air blows out of the foot well register duct, and side registers. In addition ,air blows out slightly form the center defroster and side defroster.
	BI-LEVEL	I, K, N, P, R, X	Air blows out of the front and rear center registers, side registers and front and rear foot well register ducts.
	FACE	I, J, M, O, S, W	Air blows out of the front and rear center registers, and side registers.

3. AIR OUTLET AND AIRFLOW VOLUME



Y

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INDICATION (MODE)	SELECTION AUTO / MANUAL	FACE			FOOT		DEF	
		CTR	SIDE	RR	FR	RR	CTR	SIDE
		A	B	C	D	E	F	G
(FACE - U)	○ / ○	◯	◯	◯	—	—	—	—
(B/L - U)	○ / ○	◯	◯	◯	○	○	—	—
(B/L - L)	○ / -	○	○	○	◯	◯	—	—
(FOOT - F)	○ / -	—	○	○	◯	○	○	○
(FOOT - R)	○ / ○	—	○	○	◯	◯	○	○
(FOOT - D)	○ / -	—	○	○	○	○	○	○
(F/D)	○ / ○	—	○	○	◯	◯	○	○

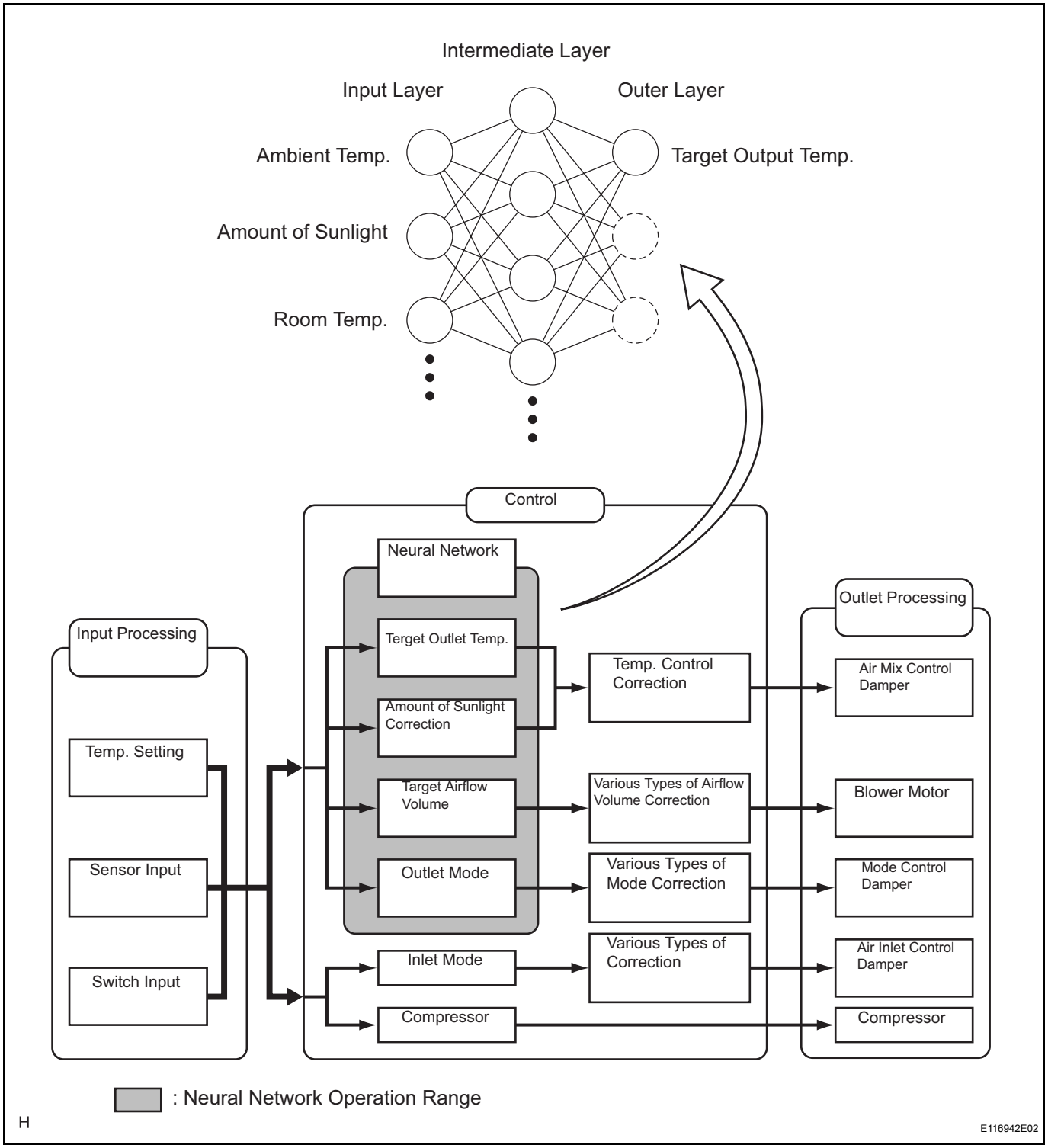
AC

(DEF) 	○ / ○	—	○	—	—	—	◯	◯

4. NEURAL NETWORK CONTROL

(a) In the previous automatic air conditioning system, the ECU determined the required outlet air temperature and blower air volume in accordance with the calculation formula that has been obtained based on information received from the sensors. However, because the sensors of a person is situated. For example, a given amount of solar radiation can feel comfortably warm in a cold climate, or extremely uncomfortable in a hot climate. Therefore, as a technique for effecting a higher level of control, a neural network has been adopted in the automatic air conditioning system. With this technique, the data that has been collected under varying environmental conditions i stored in the ECU, which effects control to provide enhanced air conditioning comfort.

(b) The neural network control consists of neurons the input layer, intermediate layer. The input layer neurons process the input data of the outside temperature, the amount of sunlight, and the cabin temperature based on the outputs of the switches and sensors, and output them to the intermediate layer neurons. Based on this data, the intermediate layer neurons adjust the strength of the mediate layer neurons. based on this data, the intermediate layer neurons adjust the strength of the links among the neurons. The sum of these is then calculated by the output layer neurons in the from of the required outlet temperature, solar correction, target airflow volume, and outlet mode control volume. Accordingly, Air Conditioning ECU controls the servomotors and blower motor in accordance with the control volumes that have been calculated by the neural network control.



5. SELF-DIAGNOSIS

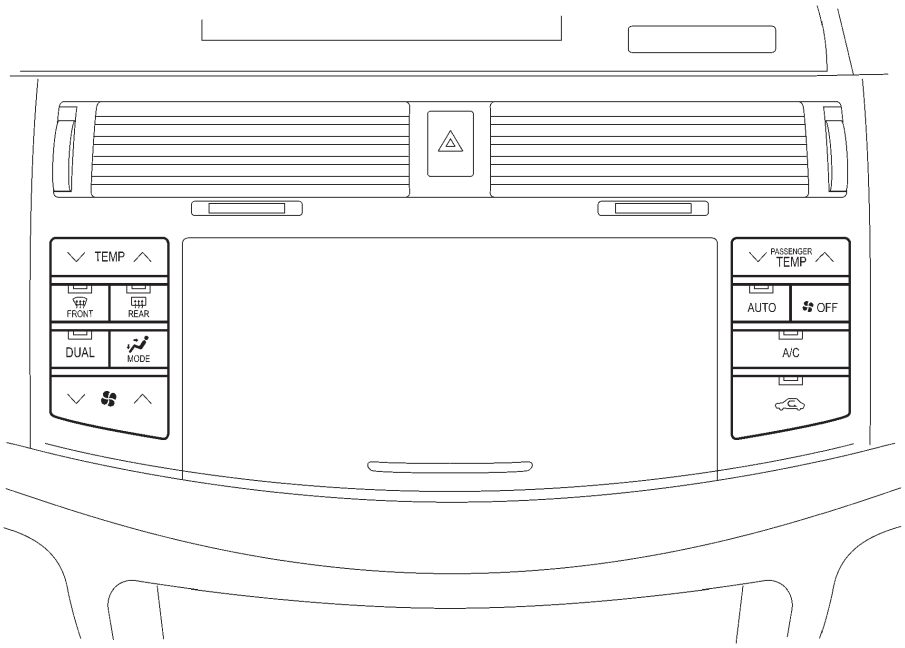
(a) Air Conditioning ECU has a self-diagnosis function. It stores any operation failures in the air conditioning system memory in the form of DTC (Diagnostic Trouble Code).

- There are two methods for reading DTCs. One is to use a intelligent tester, and the other is to read the DTC on the heater control panel switch.
- DTCs are shown on the center display or multi display of the multi-information display, and on the intelligent tester.

AC

6. HEATER CONTROL PANEL

(a) Push-button type heater control panel is used. The temperature control switches for the driver and front passenger are provided on the heater control panel to enhance their ease of use.



C

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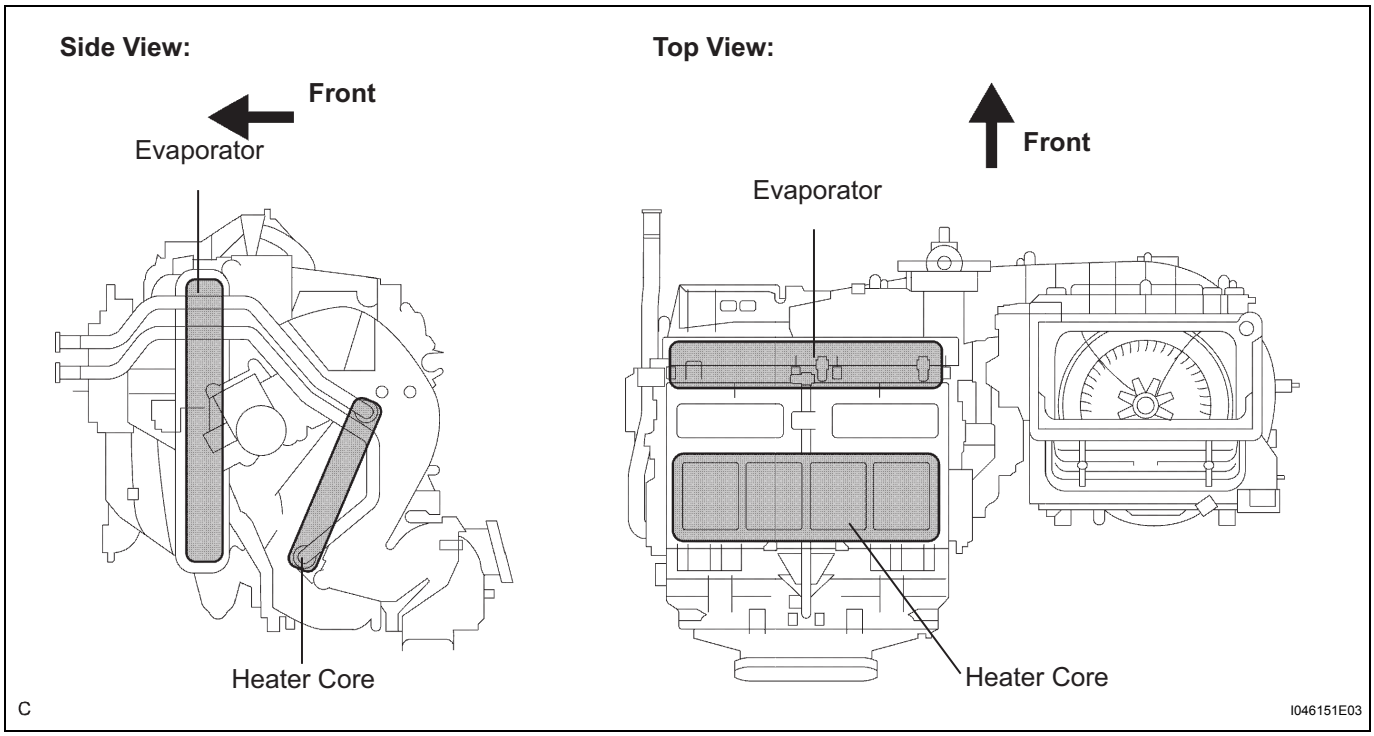
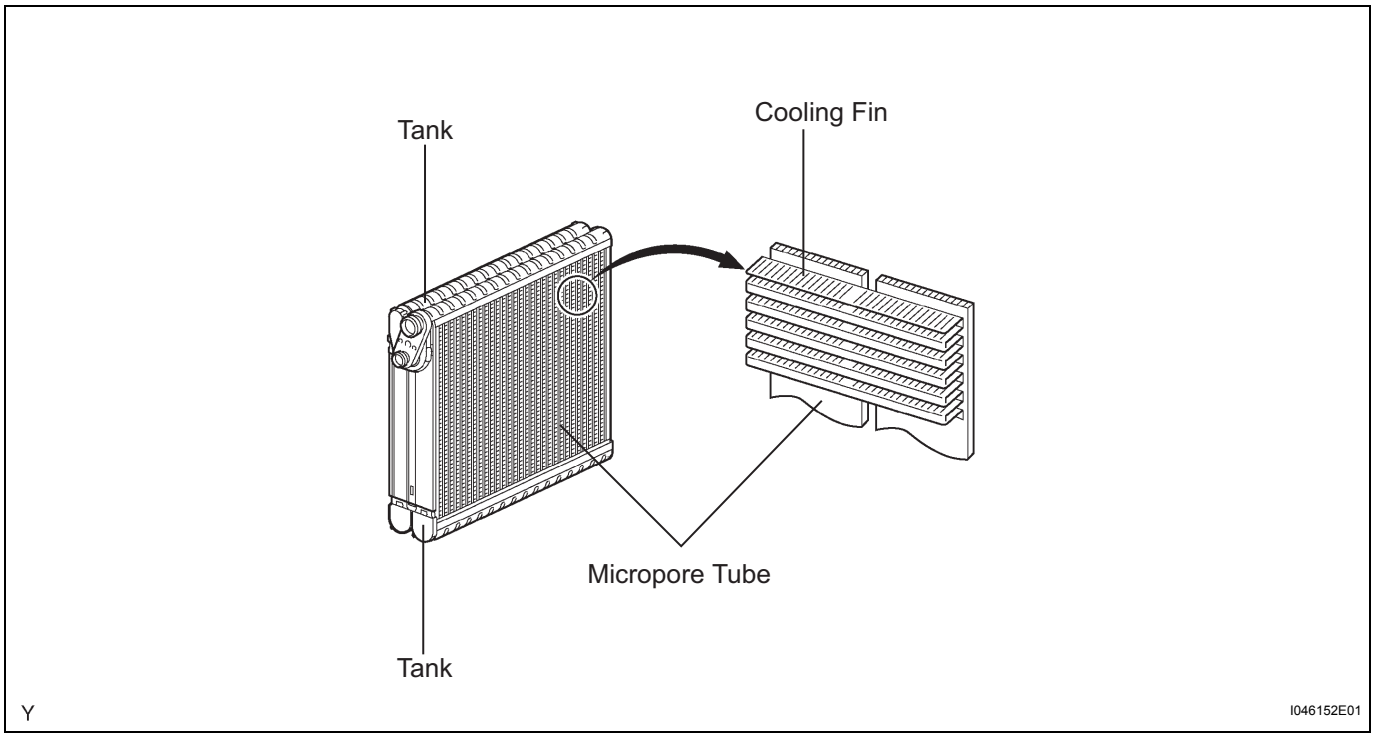
7. AIR CONDITIONING UNIT

(a) A semi-center location air conditioner unit, in the evaporator and heater core are placed in the vehicle's longitudinal direction, is used. As result, the air conditioning unit is made compact and lightweight.

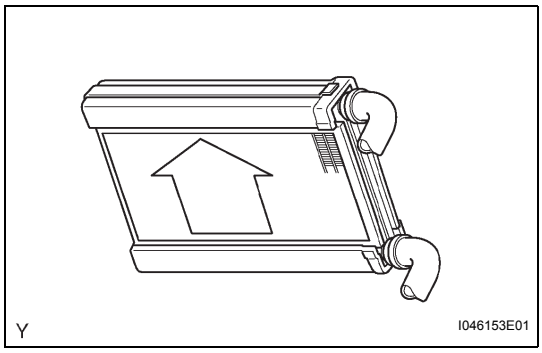


8. EVAPORATOR

(a) A revolutionary super-slim structure evaporator is used. Placing the tanks at the top and the bottom of the evaporator and adopting a micropore tube construction have realized the following effects:



- The hear exchanging efficiency is improved.
- the temperature distribution is made more uniform.
- The evaporator is mode thinner. 58 mm (2.3 in.) → 38 mm (1.5 in.)



9. HEATER CORE

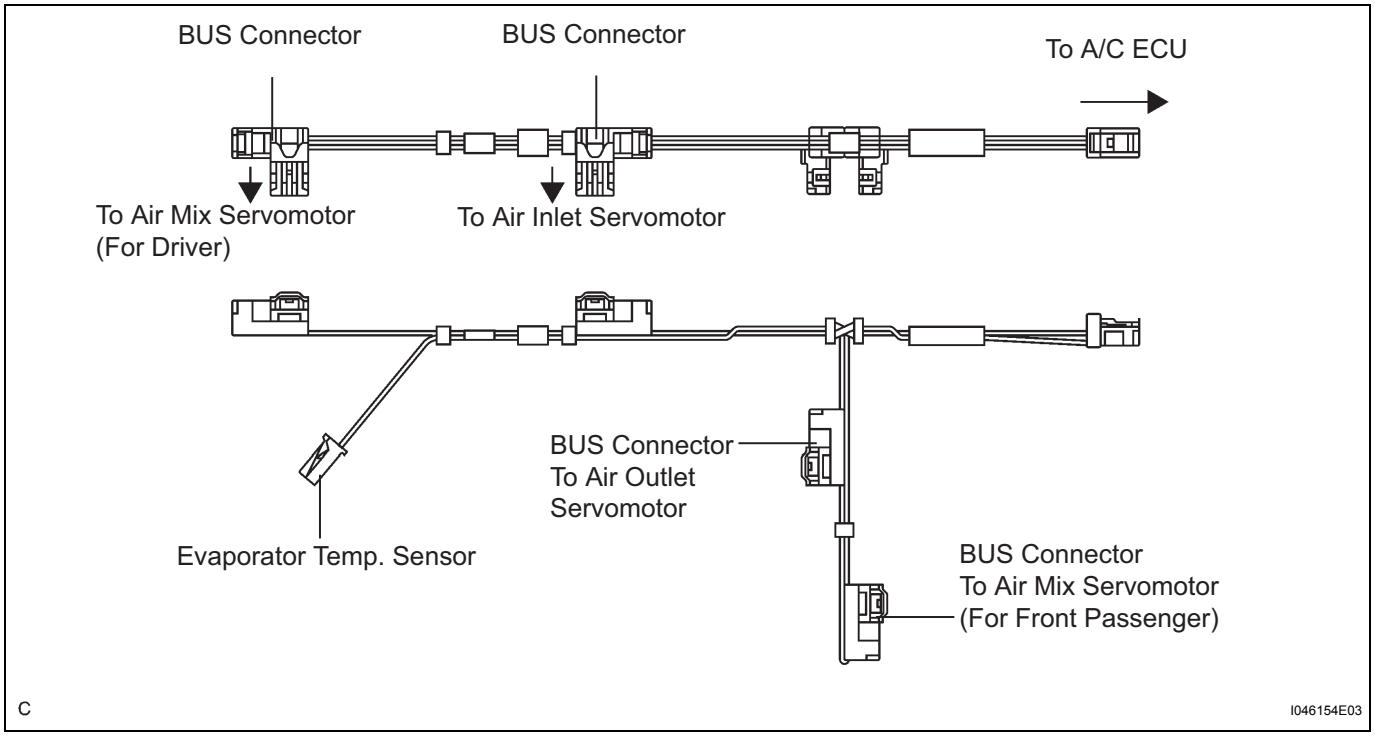
(a) A compact, lightweight, and highly efficient straight flow (full-path flow) aluminum heater core is used.

10. BLOWER MOTOR

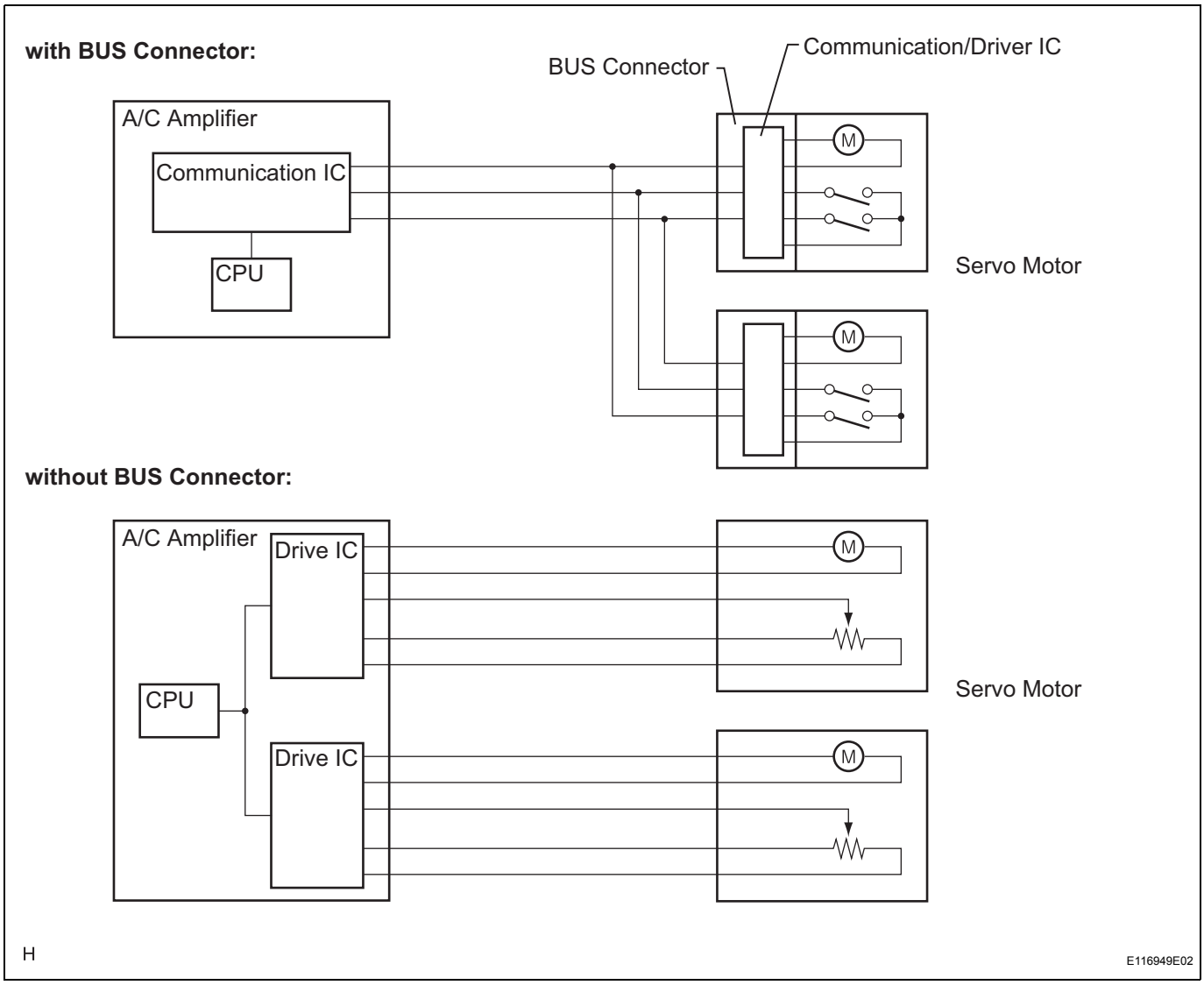
(a) The blower motor has an in-built blower controller, and is controlled with the duty control from the Air Conditioning ECU.

11. BUS CONNECTOR

(a) ABUS connector is used in the wire harness connection that connects the servomotor the Air Conditioning ECU.

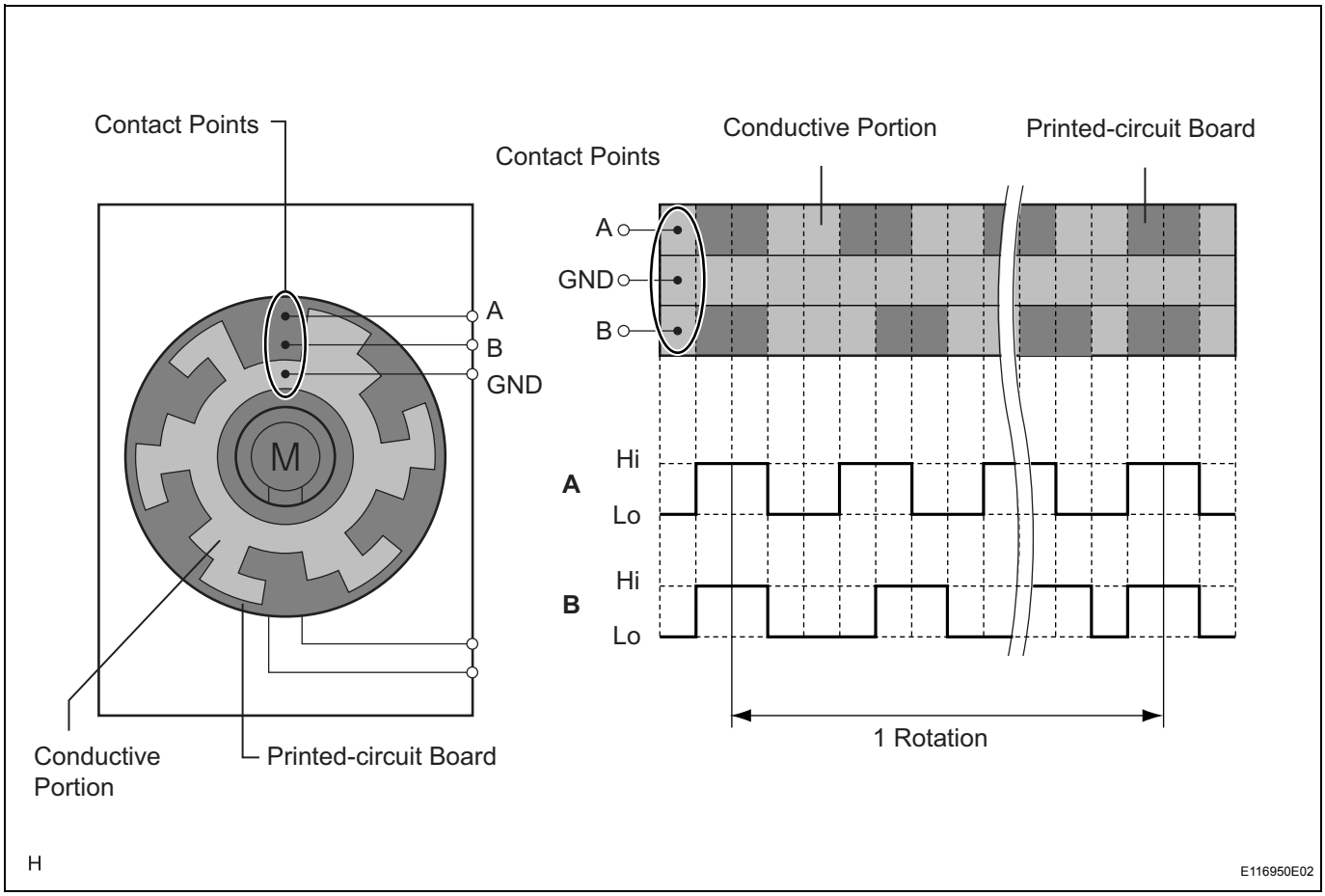


The BUS connector has an in built communication / drive IC which communicates with each servomotor connector, actuates the servomotor, and position detection function. This enables bus communication for the for the servo motor wire harness, for a more lightweight construction and a reduced number of wires.



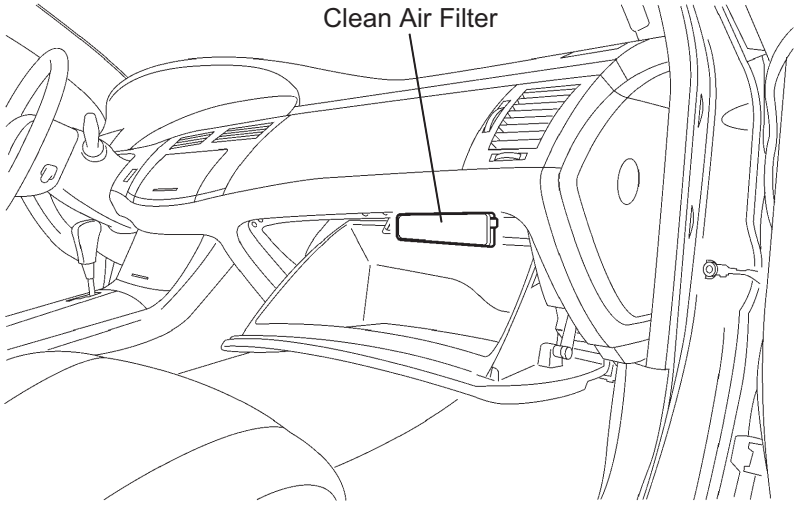
12. SERVO MOTOR

(a) The pulse pattern type servomotor consists of a printed circuit board and servomotor. The printed circuit board has three contact points, phase. The smart connector detects the damper position and movement direction with this signal.



13. CLEAN AIR FILTER

(a) A clean air filter (micro dust and pollen filter) is used. this filter excels in the removal of dust and pollen. The filter made be disposed of easily as a combustible material, a feature that is provided in consideration of the environment.



C

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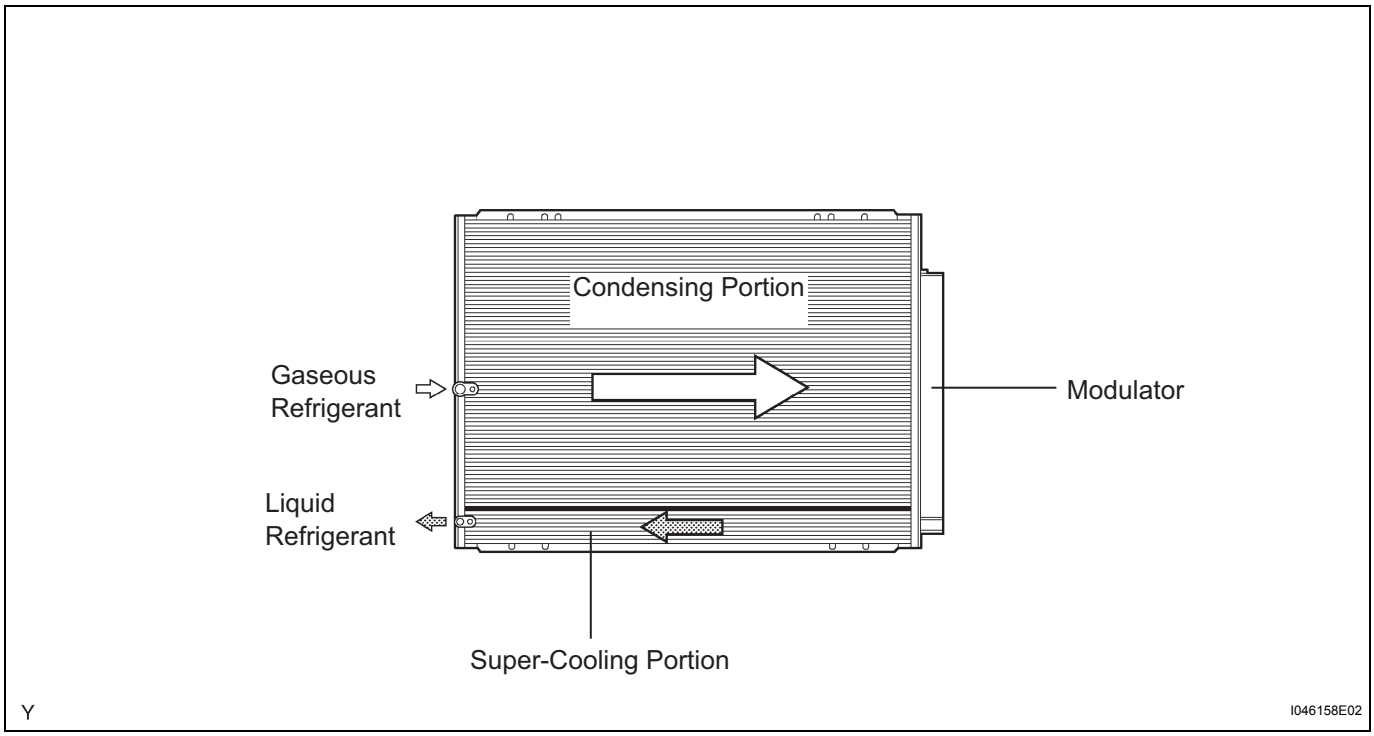
14. CONDENSER

(a) The condenser consisting of two cooling portions: a condensing portion and a super-cooling portion, and gas-liquid separator (modulator) all integrated together. this condenser uses a sub-cool cycle that offers excellent heat-exchange performance.



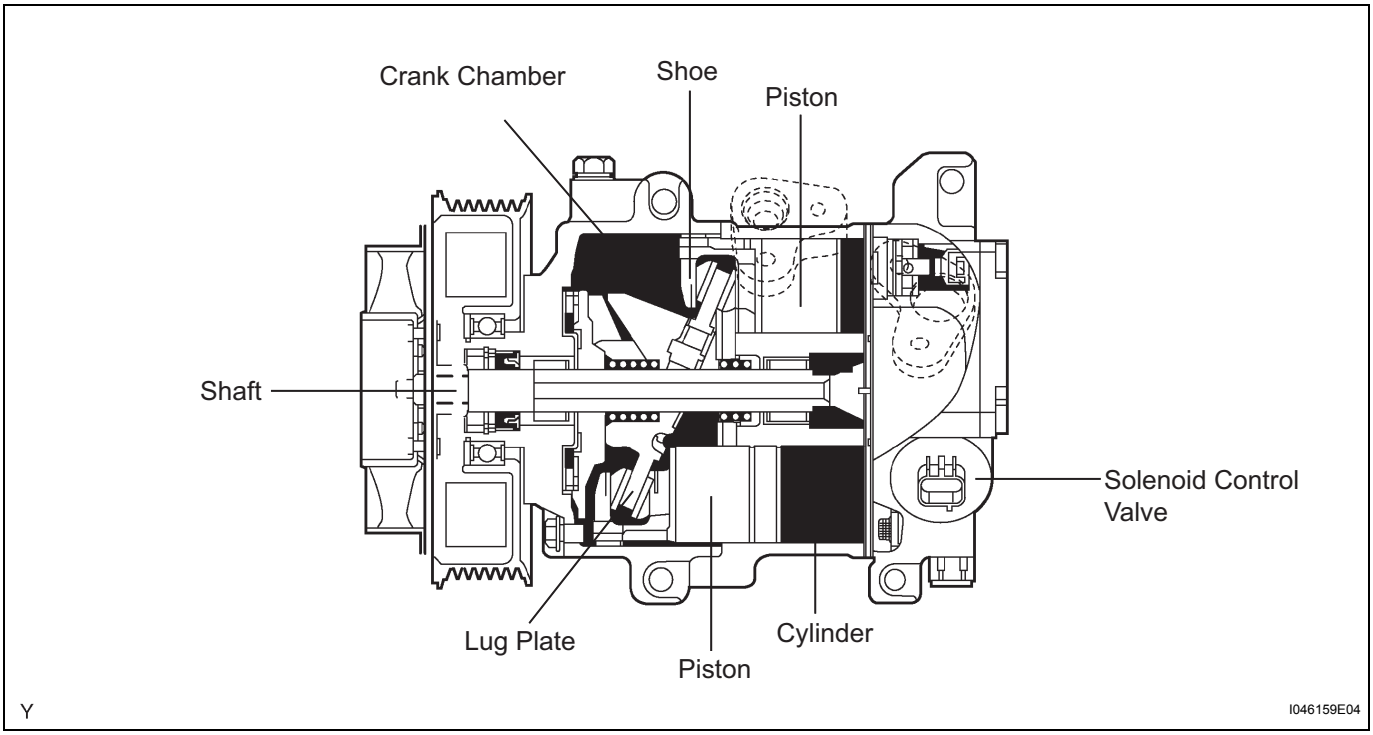
- In the sub-cycle, after the refrigerant passes through the condensing portion of the condenser both the liquid refrigerant and the gaseous refrigerant that could not be liquefied are cooled again in the super-cooling portion. thus, the refrigerant is sent to the evaporator in an almost completely liquefied state.

15. A/C COMPRESSOR

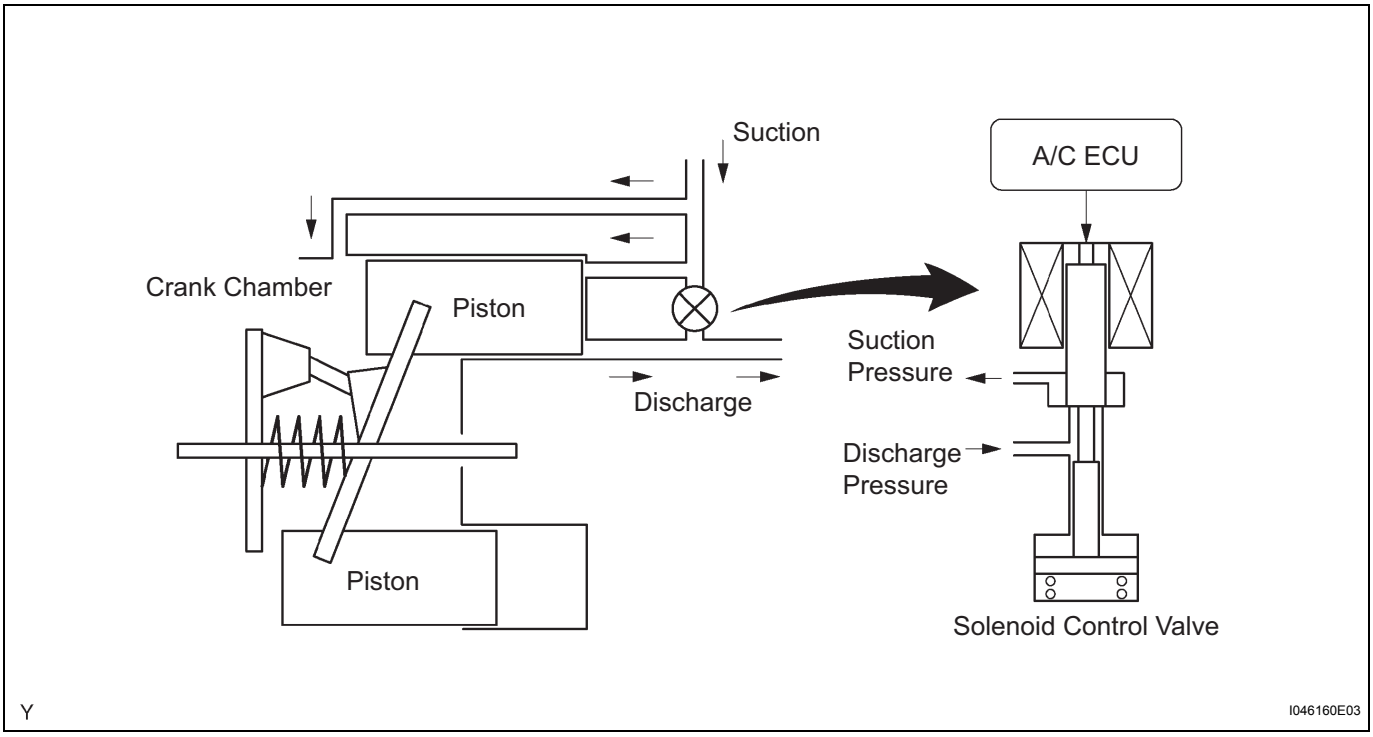
(a) A/C compressor is continuously variable capacity type in which its capacity varies in accordance with the cooling load of the air conditioning.

(1) This compressor consists of the shaft, lug plate, piston, shoe, crank, chamber, cylinder, and solenoid control valve.

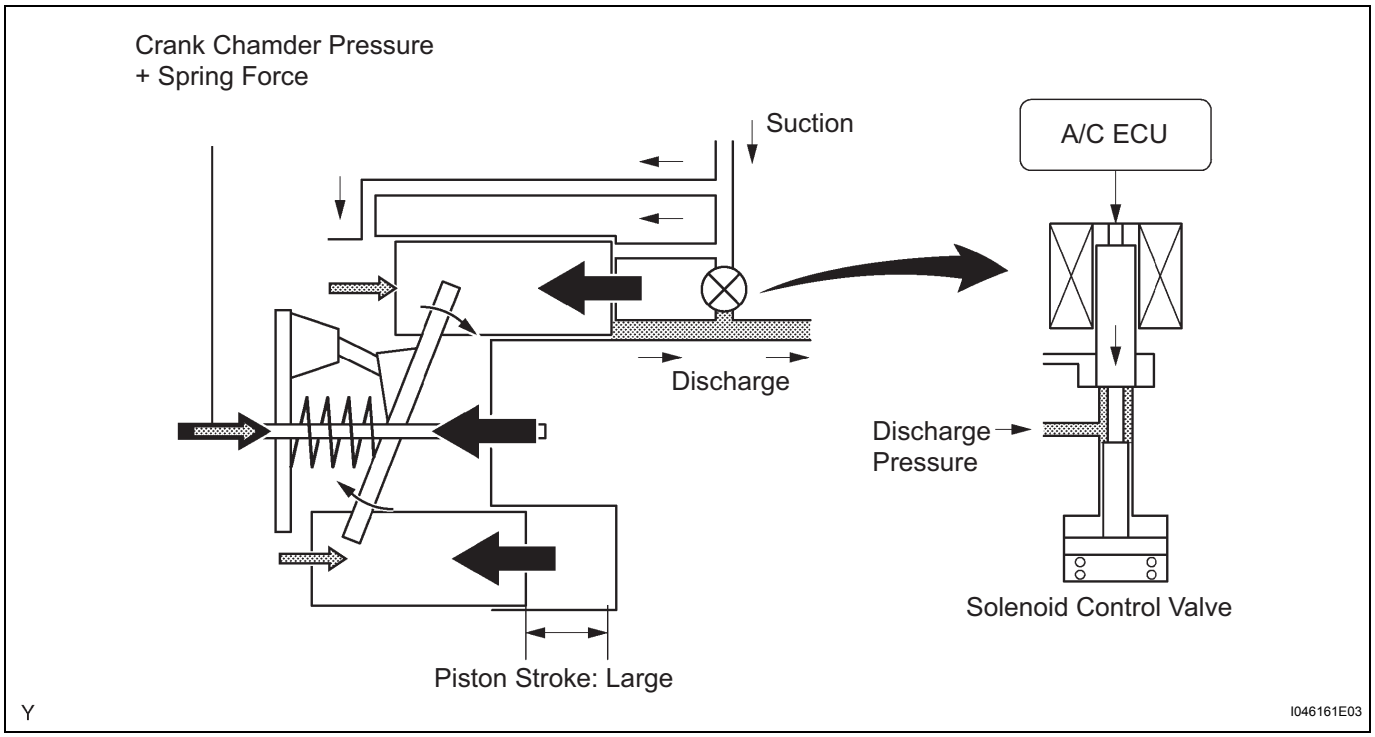
(2) A solenoid control valve that adjusts the suction pressure so that the suction pressure can be controlled as desired is provided.



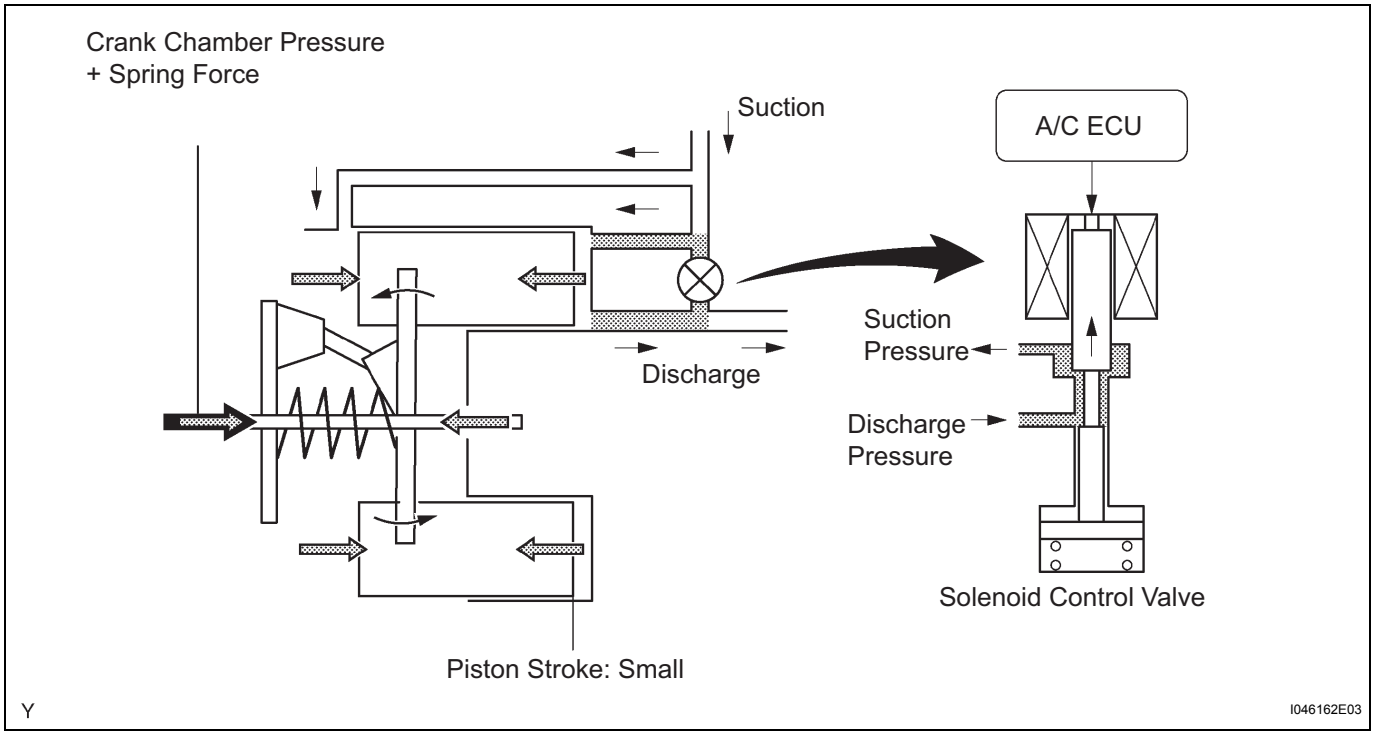
(3) The crank chamber is connected to the suction passage. A solenoid control valve is provided between the suction passage (LO pressure) and the discharge passage (HI pressure).
(4) The solenoid control valve operates under duty cycle control in accordance with the signals from A/C ECU.



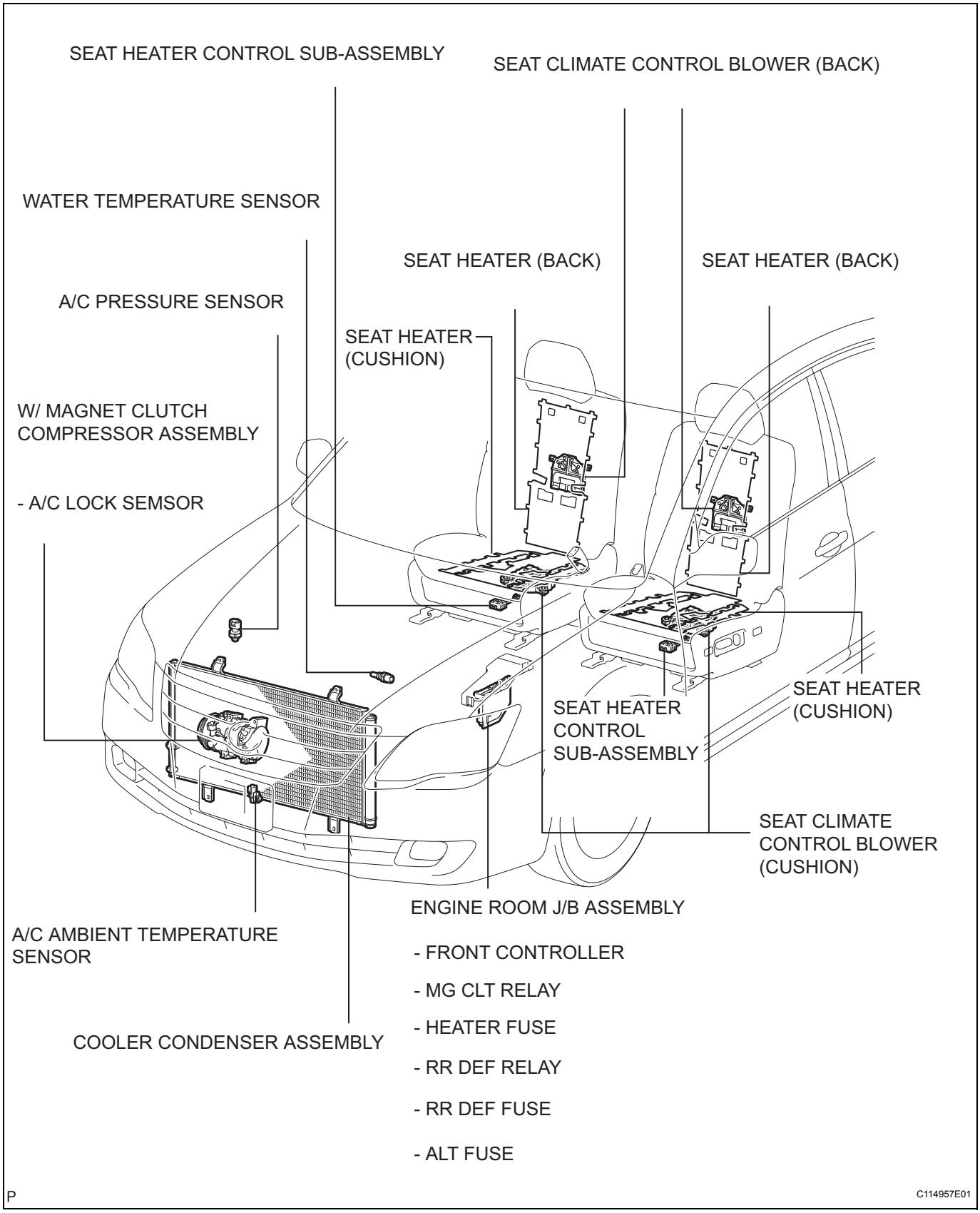
(5) When the solenoid control valve closes (solenoid coil is energized), a difference in pressure is created and the pressure in the crank chamber decreases. Then, the pressure that is applied to the right side of the piston becomes greater than the pressure that is applied to the left side of the piston. this compresses the spring and tilts the lug plate. As a result, the piston stroke increases and the discharge capacity increases.



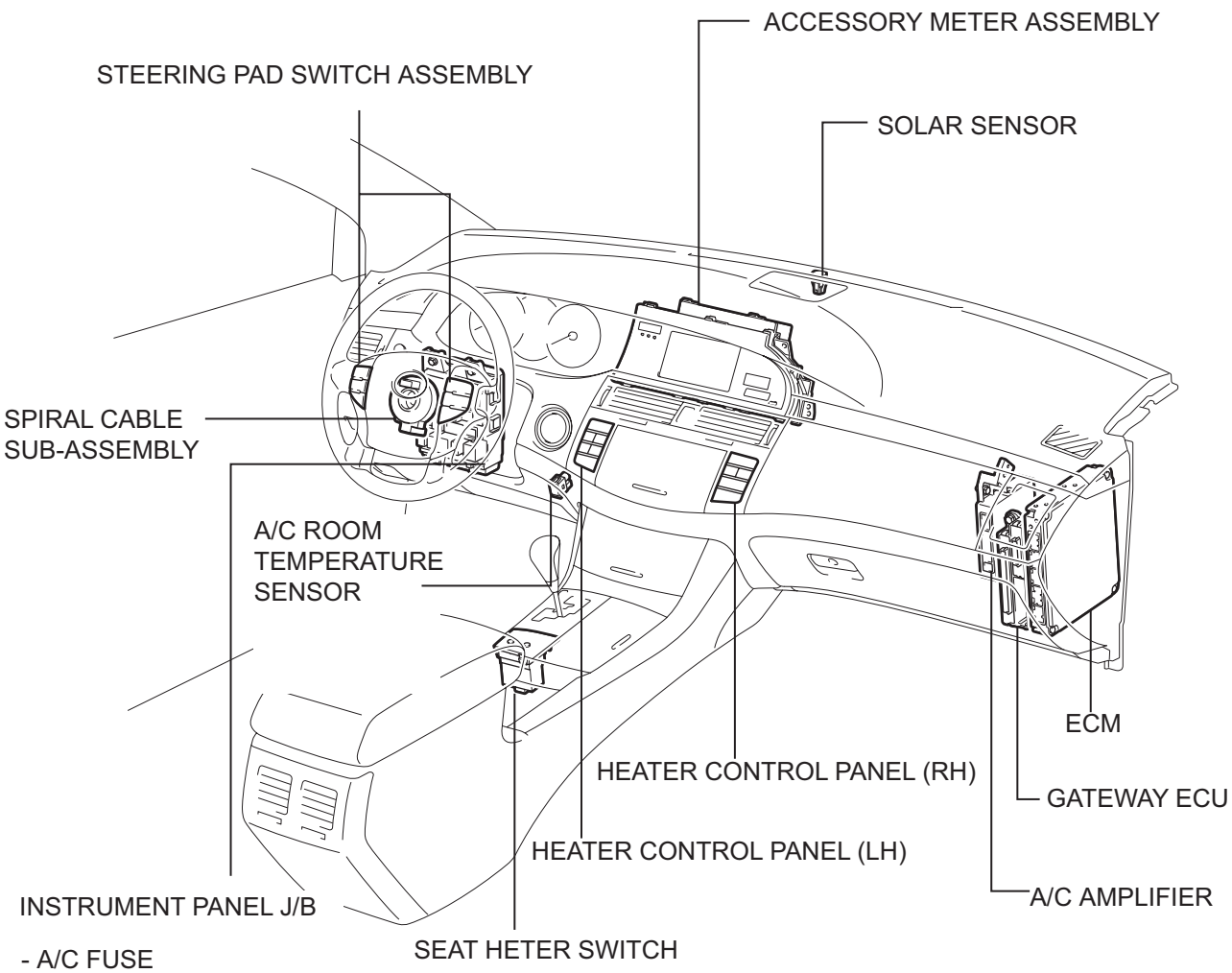
(6) When the solenoid control valve opens (solenoid coil is not energized), the difference in pressure disappears. Then, the pressure that is applied to the right side of the piston. Thus, the spring elongates and eliminates the tilt of the lug plate. As a result, there is no piston stroke and the discharge capacity turns to decrease.


Crank Chamber Pressure
+ Spring Force
Suction
A/C ECU
Suction
Pressure
Discharge
Discharge
Pressure
Solenoid Control Valve
Piston Stroke: Small
Y
I046162E03

PARTS LOCATION



C114957E01



- A/C FUSE
- A/C COMP FUSE
- S-HTR FUSE
- HTR FUSE
- MULTIPLEX NETWORK BODY ECU

P

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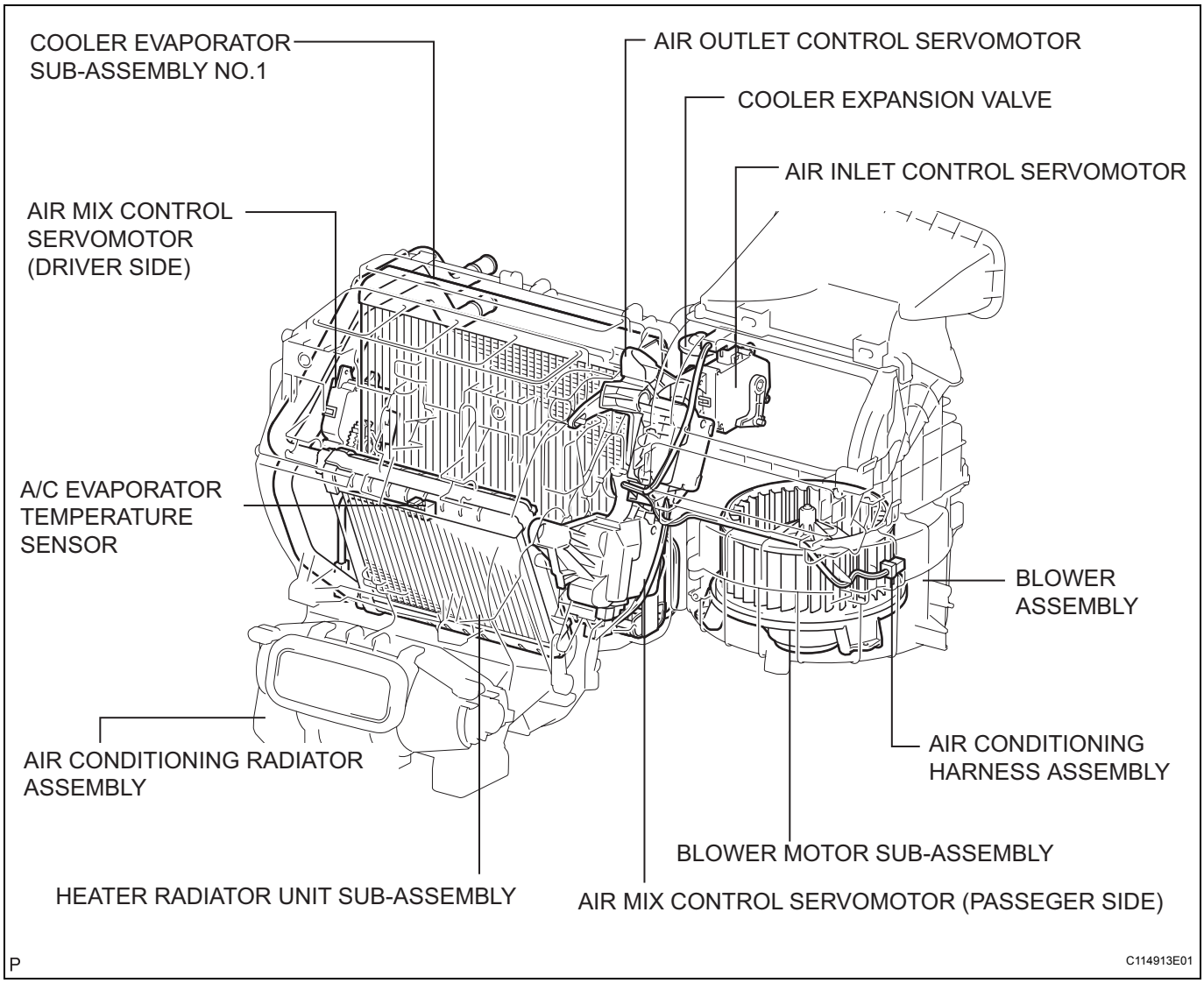
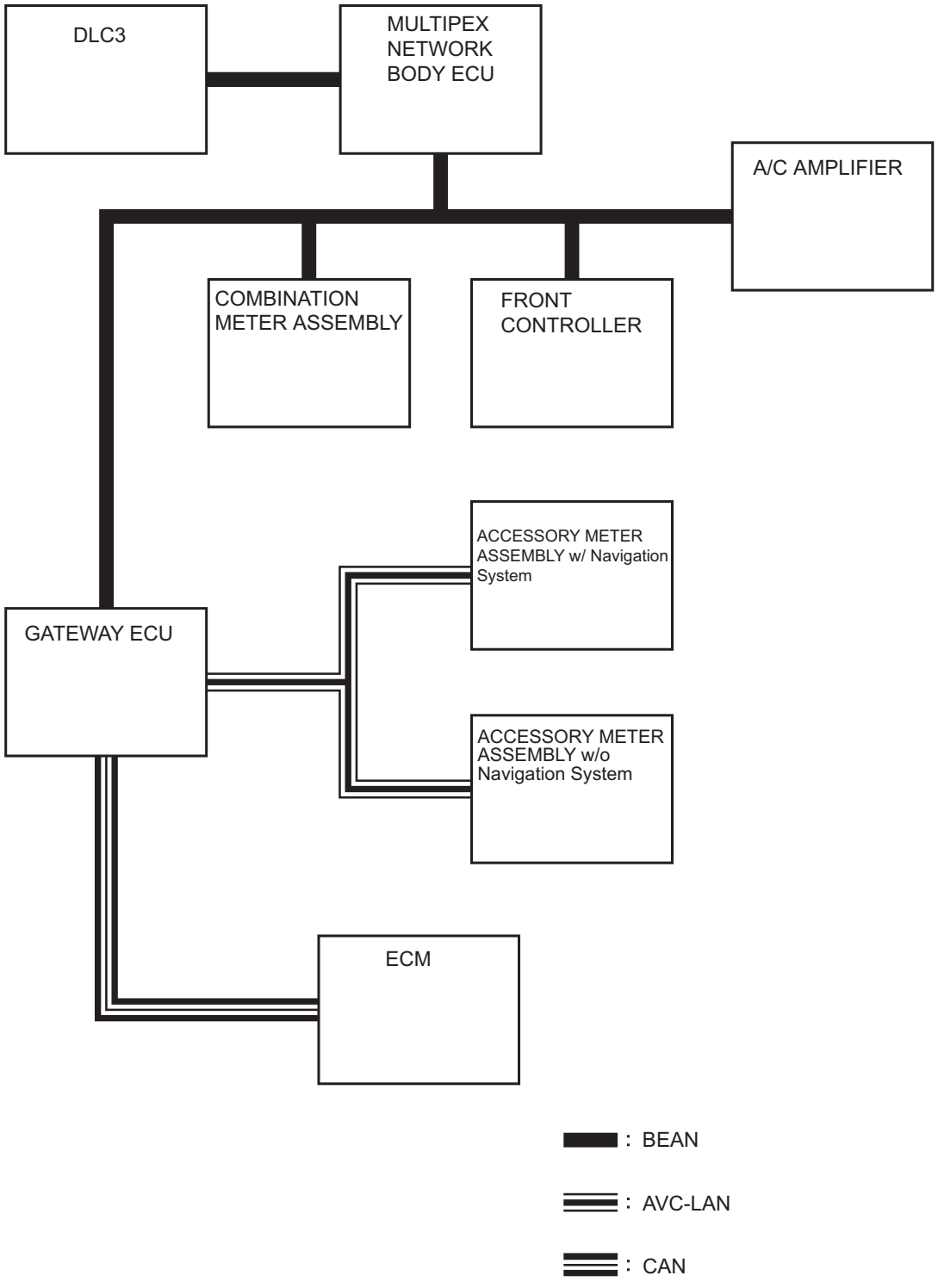
AC


COOLER EVAPORATOR SUB-ASSEMBLY NO.1
AIR OUTLET CONTROL SERVOMOTOR
COOLER EXPANSION VALVE
AIR INLET CONTROL SERVOMOTOR
AIR MIX CONTROL SERVOMOTOR (DRIVER SIDE)
A/C EVAPORATOR TEMPERATURE SENSOR
BLOWER ASSEMBLY
AIR CONDITIONING HARNESS ASSEMBLY
AIR CONDITIONING RADIATOR ASSEMBLY
BLOWER MOTOR SUB-ASSEMBLY
HEATER RADIATOR UNIT SUB-ASSEMBLY
AIR MIX CONTROL SERVOMOTOR (PASSEGER SIDE)
P
C114913E01

SYSTEM DIAGRAM

1. SYSTEM DIAGRAM



N

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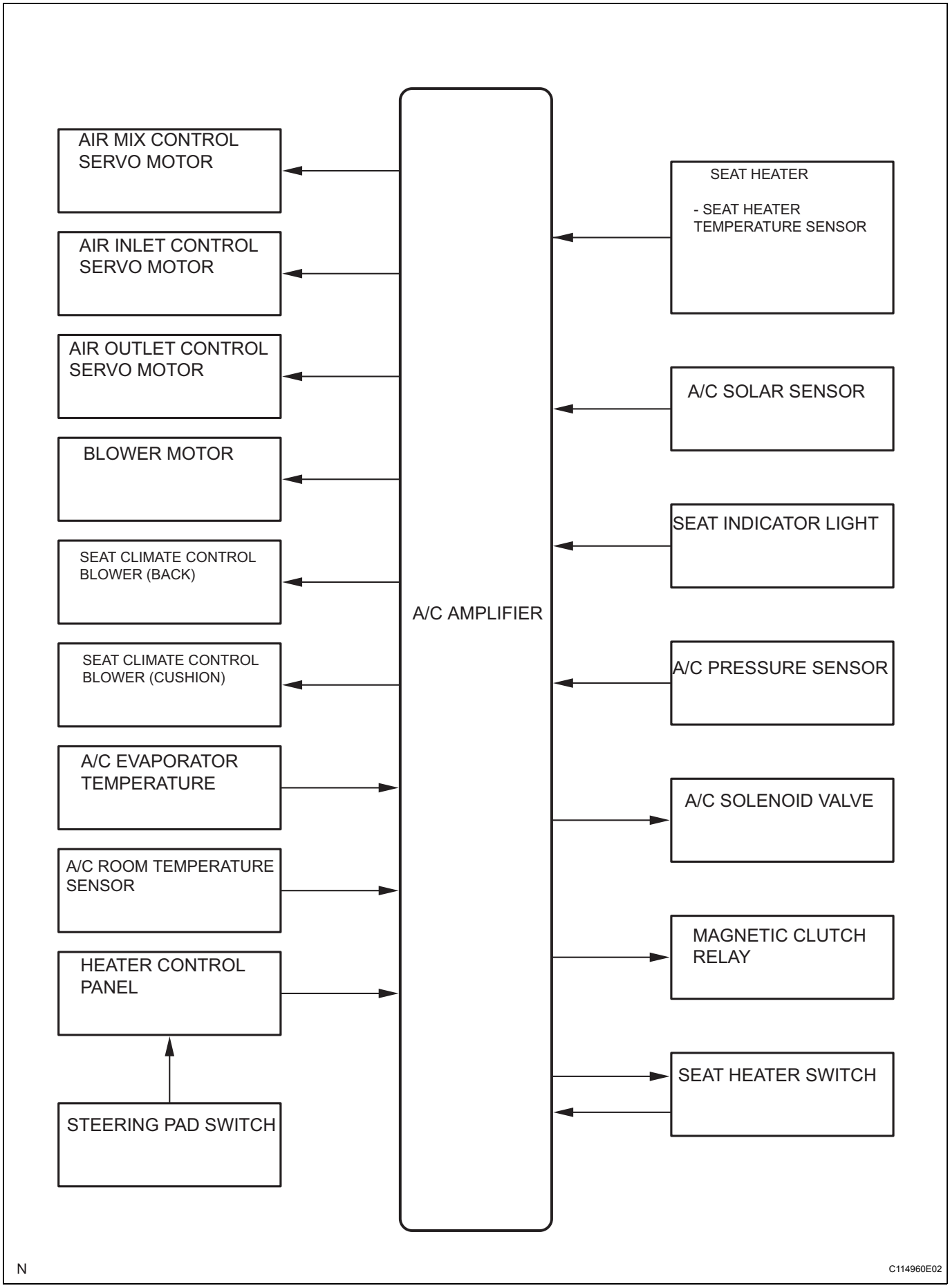
AC

Transmitter	Receiver	Line	Signal
A/C Amplifier	ECM	BEAN / CAN	Heater Relay Control Signal
			Magnetic Clutch Control Signal
			Rear DEF Relay Control Signal
			Idle Up Signal
			Pressure Sensor Signal
			External Variable Control Solenoid Current Signal
A/C Amplifier	Multiplex Network Body ECU	BEAN	Diagnostic Tool Response
			Diagnostic Data
A/C Amplifier	Accessory Meter Assembly	BEAN / CAN-LAN	Indicator ON demand signal
ECM	A/C Amplifier	BEAN / CAN	Engine Speed (500ms)
			Engine Coolant Temperature
			A/C Control Cut Signal
Front Controller	A/C Amplifier	BEAN	Outside Temperature Data
Multiplex Network Body ECU	A/C Amplifier	BEAN	Diagnostic Tool Request Signal
			Diagnostic Erase Signal
Combination Meter Assembly	A/C Amplifier	BEAN	Vehicle Speed Signal


AIR MIX CONTROL SERVO MOTOR
AIR INLET CONTROL SERVO MOTOR
AIR OUTLET CONTROL SERVO MOTOR
BLOWER MOTOR
SEAT CLIMATE CONTROL BLOWER (BACK)
SEAT CLIMATE CONTROL BLOWER (CUSHION)
A/C EVAPORATOR TEMPERATURE
A/C ROOM TEMPERATURE SENSOR
HEATER CONTROL PANEL
STEERING PAD SWITCH
A/C AMPLIFIER
SEAT HEATER
- SEAT HEATER TEMPERATURE SENSOR
A/C SOLAR SENSOR
SEAT INDICATOR LIGHT
A/C PRESSURE SENSOR
A/C SOLENOID VALVE
MAGNETIC CLUTCH RELAY
SEAT HEATER SWITCH
N
C114960E02

AC

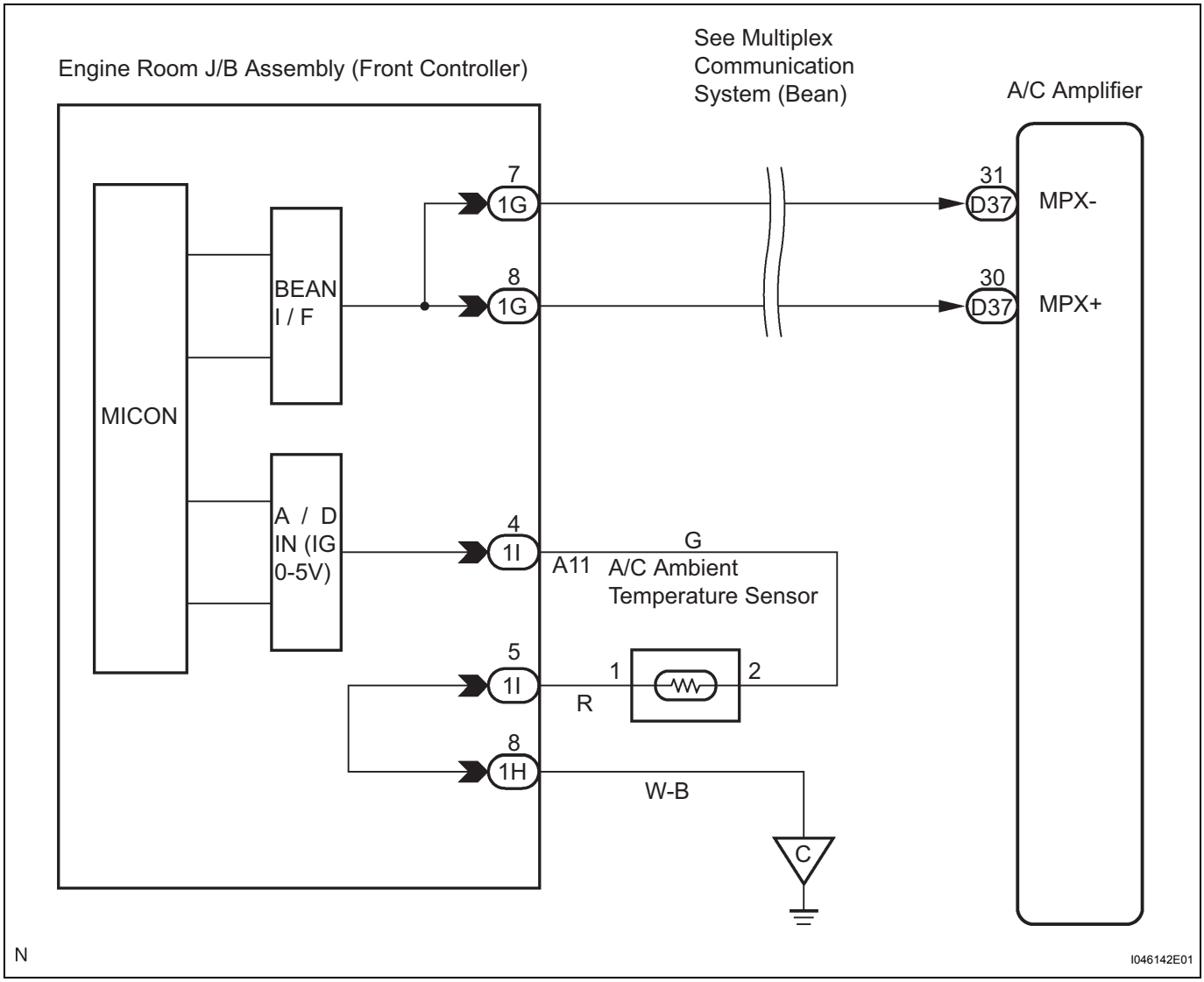
DTC	B1412/12	Ambient Temperature Sensor Circuit

DESCRIPTION

The sensor connected to the engine room J/B assembly (front controller) detects fluctuations in the ambient temperature that is used for controlling the interior temperature. The sensor sends a to the A/C amplifier via the engine room J/B assembly (front controller).

DTC No.	Detection item	Trouble Area
B1412/12	Ambient temperature sensor circuit (Open or short)	• A/C ambient temperature sensor • Harness or connector between A/C ambient temperature sensor and engine room J/B assembly (front controller) • Engine room J/B assembly (Front controller)

WIRING DIAGRAM



INSPECTION PROCEDURE

1 READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent to the DLC3.
(b) Turn the ignition switch on (IG) 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
AMBI TEMP SENS	Ambient temperature sensor / min.: -23.3°C (-9.94°F) max.: 65.96°C (150.71°F)	Actual ambient temperature is displayed	-

OK:
The display is as specified in the normal condition.

Result

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

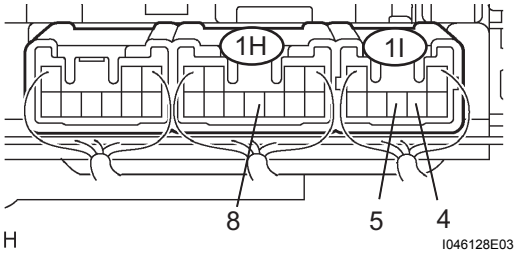
B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C → REPLACE AIR CONDITIONING AMPLIFIER

A

2 INSPECT ENGINE ROOM JUNCTION BLOCK ASSEMBLY (FRONT CONTROLLER)

Engine Room J/B Assembly Connector Wire Harness View:



(a) Remove the engine room J/B assembly (front controller) with connectors still connected.
(b) Turn the ignition switch on (IG).
(c) Measure the voltage according to the value(s) in the table below.

Voltage

Tester connection	Condition	Specified condition
1I-4 - 1I-5	Ignition switch on (IG) at 25°C (77°F)	1.8 to 2.2 V
1I-4 - 1I-5	Ignition switch on (IG) at 40°C (104°F)	1.2 to 1.6 V

HINT:
As the temperature increases, the voltage decreases.

Result

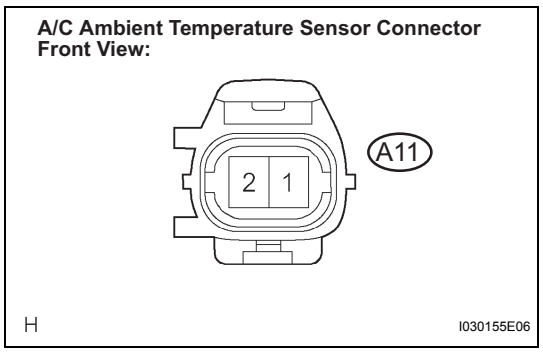
Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

AC

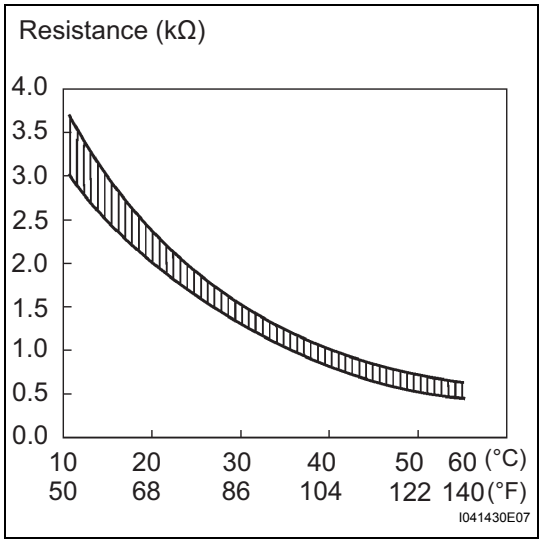
B	PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE
C	Go to step 6

A

3 INSPECT A/C AMBIENT TEMPERATURE SENSOR



(a) Remove the A/C ambient temperature sensor.



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

Resistance

Tester connection	Condition	Specified condition
A11-1 - A11-2	10°C (50°F)	3.00 to 3.73 kΩ
A11-1 - A11-2	15°C (59°F)	2.45 to 2.88 kΩ
A11-1 - A11-2	20°C (68°F)	1.95 to 2.30 kΩ
A11-1 - A11-2	25°C (77°F)	1.60 to 1.80 kΩ
A11-1 - A11-2	30°C (86°F)	1.28 to 1.47 kΩ
A11-1 - A11-2	35°C (95°F)	1.00 to 1.22 kΩ
A11-1 - A11-2	40°C (104°F)	0.80 to 1.00 kΩ
A11-1 - A11-2	45°C (113°F)	0.65 to 0.85 kΩ
A11-1 - A11-2	50°C (122°F)	0.50 to 0.70 kΩ
A11-1 - A11-2	55°C (131°F)	0.44 to 0.60 kΩ
A11-1 - A11-2	60°C (140°F)	0.36 to 0.50 kΩ

NOTICE:

- **Only hold the sensor at its connector. Touching the sensor may change the resistance value.**
- **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

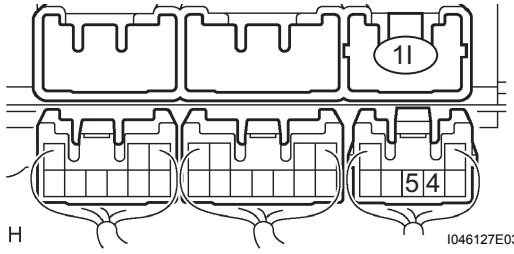
OK

4	CHECK HARNESS AND CONNECTOR (ENGINE ROOM J/B ASSEMBLY - A/C AMBIENT TEMPERATURE SENSOR)

A/C Ambient Temperature Sensor Connector Front View:

(a) Disconnect the connector from A/C ambient temperature sensor.

Engine Room J/B Assembly Connector Wire Harness View:



(b) Disconnect the connector from the engine room J/B assembly.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

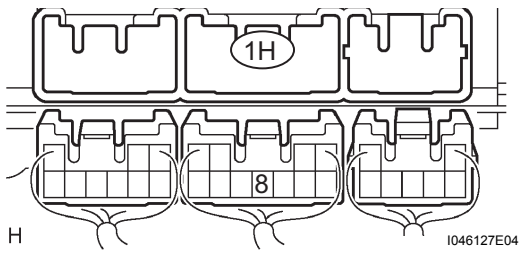
Tester connection	Condition	Specified condition
1I-5 - A11-1	Always	Below 1 Ω
1I-4- A11-2	Always	Below 1 Ω
1I-5 - Body ground	Always	10 kΩ or higher
1I-4 - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5	CHECK HARNESS AND CONNECTOR (ENGINE ROOM J/B ASSEMBLY (FRONT CONTROLLER) - BODY GROUND)

Engine Room J/B Assembly Connector Wire Harness View:



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

Resistance

Tester connection	Condition	Specified condition
1H-8 - Body ground	Always	Below 1 Ω

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

6	REPLACE ENGINE ROOM JUNCTION BLOCK ASSEMBLY (FRONT CONTROLLER)

HINT:
Check for DTC B1412/12 after replacing the engine room J/B assembly.

AC

OK:
DTC B1412/12 is not output.

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

OK

END

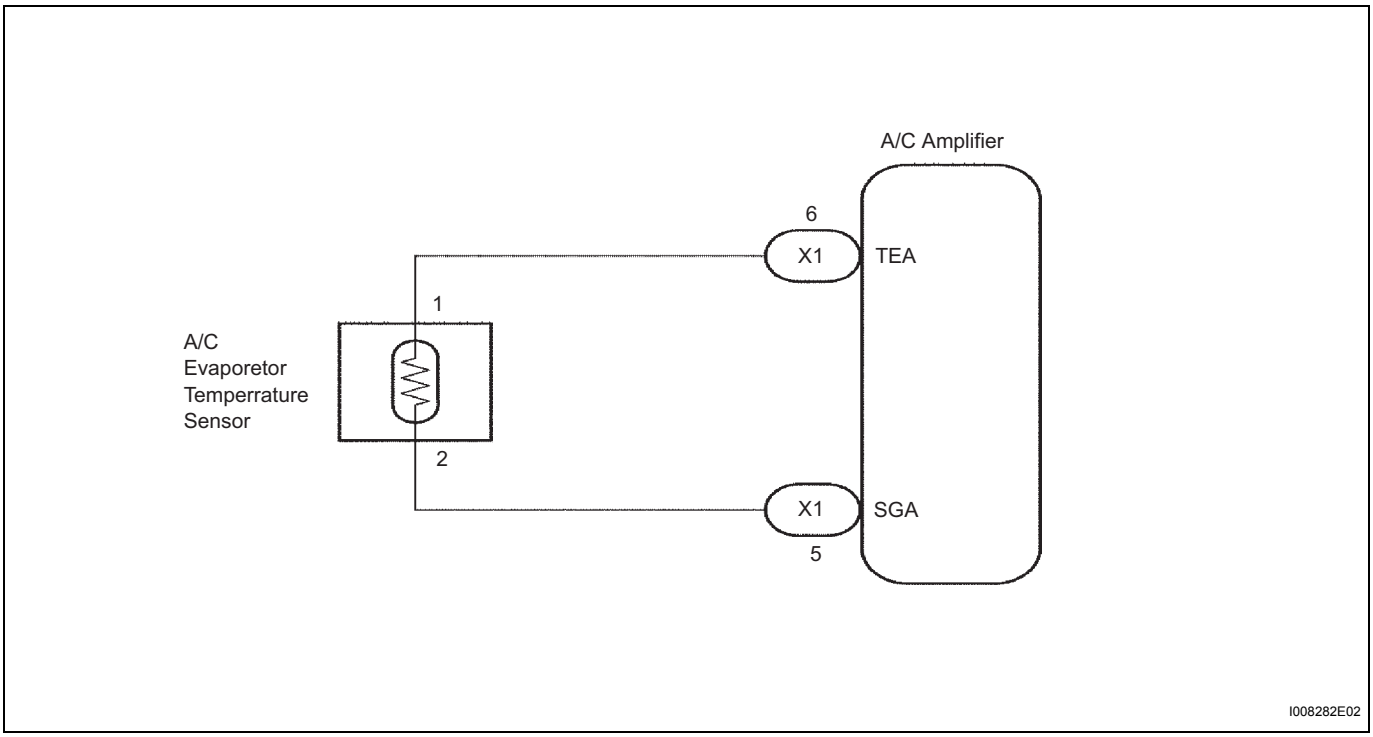
DTC B1413/13 Evaporator Temperature Sensor Circuit

DESCRIPTION

This sensor detects the evaporator temperature and sends the appropriate signals to the A/C amplifier. It is used for frost prevention, temperature and time-lag air flow control.

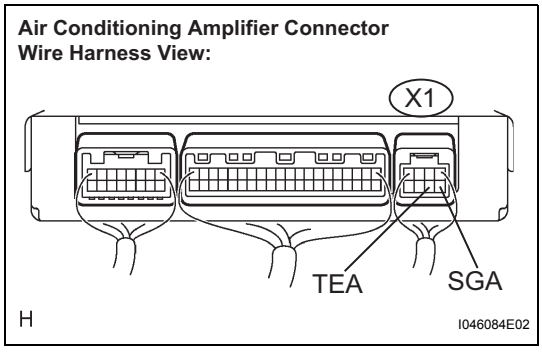
DTC No.	Detection Item	Trouble Area
B1413/13	Evaporator temperature sensor circuit (Open or short)	• A/C evaporator temperature sensor • Harness or connector between A/C evaporator temperature sensor and A/C amplifier • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT AIR CONDITIONING AMPLIFIER (TEA - SGA)



(a) Remove the air conditioning amplifier with connectors still connected.
(b) Turn the ignition switch on (IG).
(c) Measure the voltage according to the value(s) in the table below.

Voltage

Tester connection	Condition	Specified condition
X1-6 (TEA) - X1-5 (SGA	Ignition switch on (IG) at 0°C (32°F)	2.0 to 2.4 V
X1-6 (TEA) - X1-5 (SGA	Ignition switch on (IG) at 15°C (59°F)	1.4 to 1.8 V

HINT:
As the temperature increases, the voltage decreases.

AC

Result

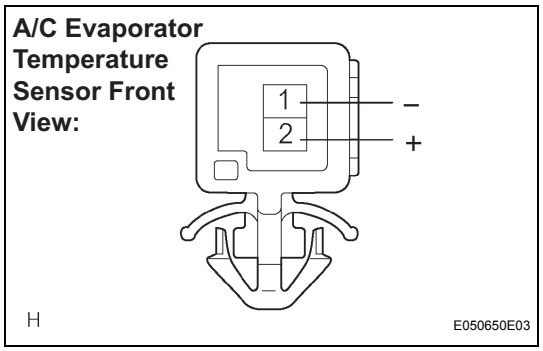
Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

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

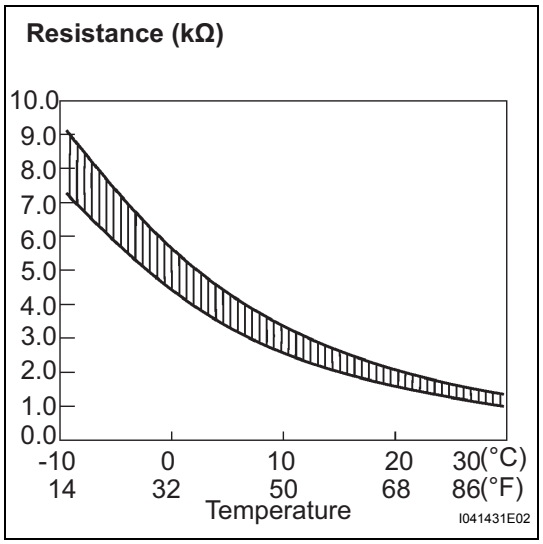
C → REPLACE AIR CONDITIONING AMPLIFIER

A

2 INSPECT A/C EVAPORATOR TEMPERATURE SENSOR



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



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

Resistance

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

NOTICE:

- **Only hold the sensor at its connector. Touching the sensor may change the resistance value.**
- **When measuring, the sensor temperature must be the same as the ambient temperature.**

HINT:

- As the temperature increases, the resistance decrease (See the graph).
- When replacing the A/C evaporator temperature sensor, the attached sub-harness should be replaced along with the sensor.

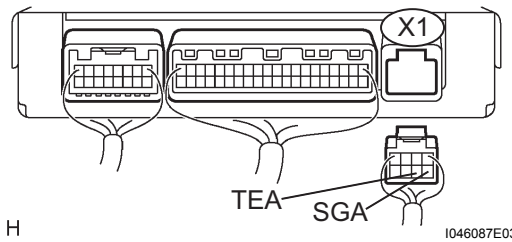
AC

NG → REPLACE A/C EVAPORATOR TEMPERATURE SENSOR

OK

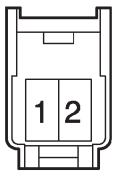
3	CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER - A/C EVAPORATOR TEMPERATURE SENSOR)

Air Conditioning Amplifier Connector Wire Harness View:



(a) Disconnect the connector from the air conditioning amplifier.

A/C Evaporator Temperature Sensor Connector Front View:



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

Resistance

Tester connection	Condition	Specified condition
X1-6 (TEA) - 1	Always	Below 1 Ω
X1-5 (SGA) - 2	Always	Below 1 Ω
X1-6 (TEA) - Body ground	Always	10 kΩ or higher
X1-5 (SGA) - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER

AIR CONDITIONING SYSTEM

PRECAUTION

1. INITIALIZATION

NOTICE:

- **When disconnecting the negative (-) battery terminal, initialize the following system after the terminal is reconnected.**

System Name	See Procedure
Power Window Control	See page IN-29
Sliding Roof System	

- **Perform the RESET MEMORY (AT initialization) when replacing the automatic transaxle assembly, engine assembly or ECM (See page AX-15).**
- **Perform the REGISTRATION (VIN registration) when replacing the ECM (See page ES-19).**

HINT:

Initialization can not be completed by only removing the battery.

2. FOR USING INTELLIGENT TESTER

CAUTION:

Observe the following items for safety reasons:

- **Read its instruction books before using the tester.**
- **Prevent the tester cable from being caught on the pedals, shift lever and steering wheel when driving with the tester connected to the vehicle.**
- **When driving the vehicle for testing purposes using the tester, two persons are required. One is for driving the vehicle, and the other operates the tester.**

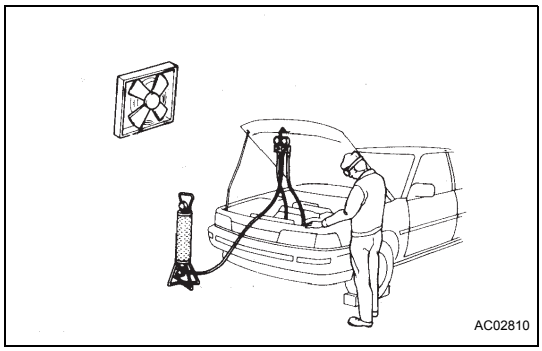
3. EXPRESSIONS OF IGNITION SWITCH

(a) The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this section.

Switch Type		Ignition Switch (position)	Engine Switch (condition)
Expression	Ignition Switch off	LOCK	Off
	Ignition Switch on (IG)	ON	On (IG)
	Ignition Switch on (ACC)	ACC	On (ACC)
	Engine Start	START	Start

4. FOR USING BATTERY DURING INSPECTION

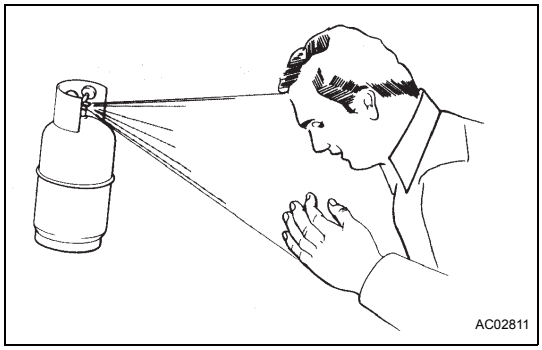
(a) While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.



5. DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR NEAR NAKED FLAME

(a) Do not handle the refrigerant in an enclosed area or near naked flame.

6. ALWAYS WEAR EYE PROTECTION

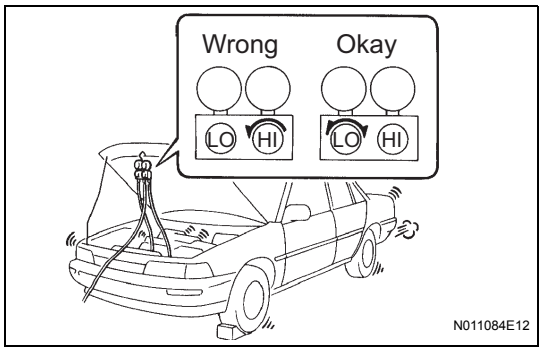


7. BE CAREFUL NOT TO GET LIQUID REFRIGERANT IN YOUR EYES OR ON YOUR SKIN

(a) If liquid refrigerant gets in your eyes or on your skin:
(1) Wash the area with lots of cool water.
CAUTION:
Do not rub your eyes or skin.
(2) Apply clean petroleum jelly to the skin.
(3) Go immediately to a physician or hospital for professional treatment.

8. NEVER HEAT THE CONTAINER OR EXPOSE IT TO NAKED FLAME

9. BE CAREFUL NOT TO DROP THE CONTAINER OR APPLY PHYSICAL SHOCKS TO IT



10. DO NOT OPERATE THE COMPRESSOR WITHOUT ENOUGH REFRIGERANT IN THE REFRIGERANT SYSTEM

(a) If there is not enough refrigerant in the refrigerant system, oil lubrication will be insufficient and compressor burnout may occur. Necessary care should be taken to avoid this.

11. DO NOT OPEN HIGH PRESSURE MANIFOLD VALVE WHILE COMPRESSOR IS OPERATING

(a) If the high pressure valves are opened, refrigerant flows in the reverse direction and could cause the charging cylinder to rupture. Open and close only the low pressure valve.

12. BE CAREFUL NOT TO OVERCHARGE SYSTEM WITH REFRIGERANT

(a) If refrigerant is overcharged, it causes problems such as insufficient cooling, poor fuel economy, engine overheating etc.

13. DO NOT OPERATE ENGINE AND COMPRESSOR WITH NO REFRIGERANT
CAUTION:
Doing so may damage the inside of the compressor because the compressor parts always move regardless of whether the A/C system is turned on or off.

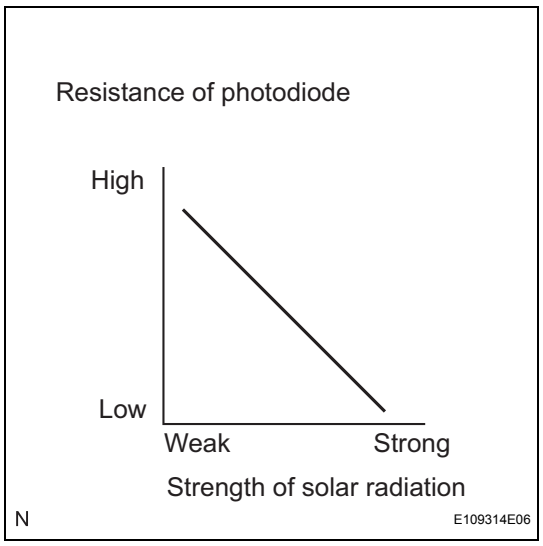
14. SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

(a) This vehicle is equipped with an SRS (Supplemental Restraint system) such as the driver, front passenger, side, curtain shield sir bags etc.. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices (See page RS-1).

DTC	B1421/21	Solar Sensor Circuit (Passenger Side)

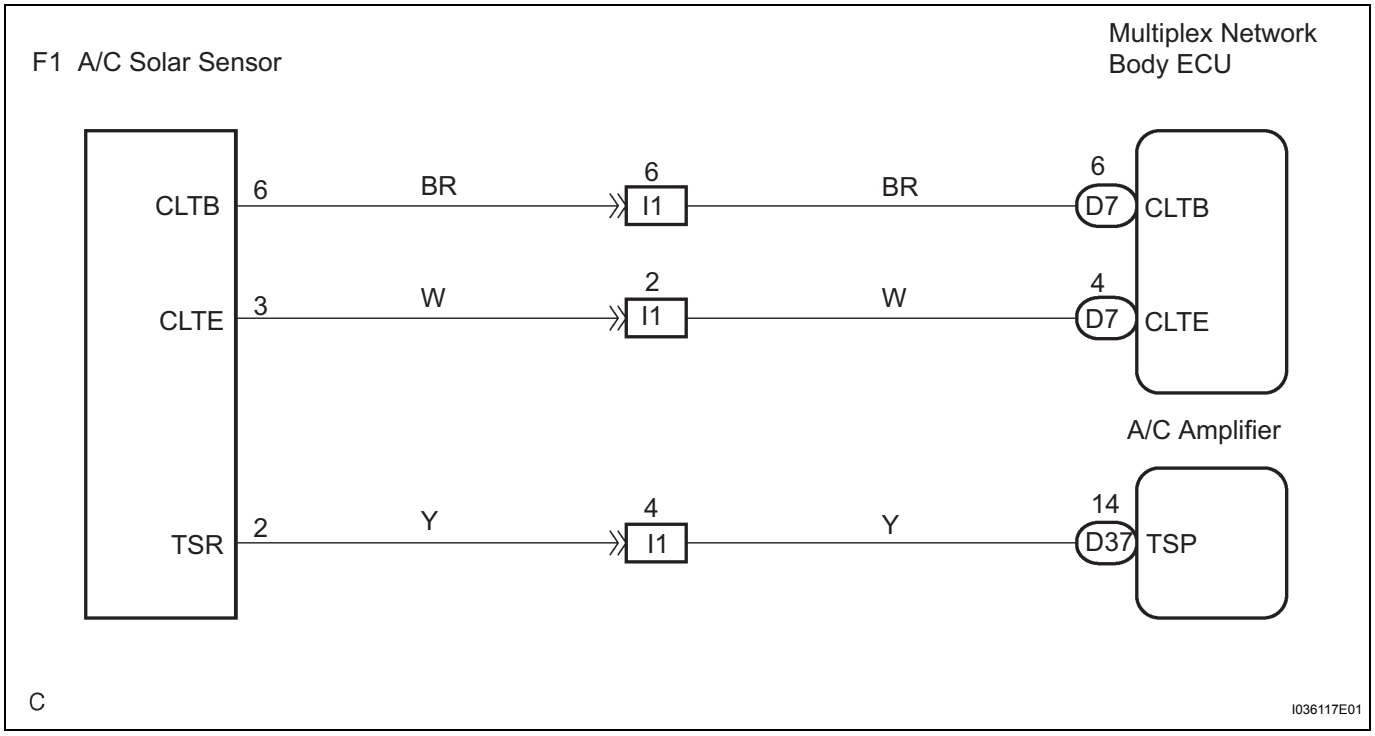
DESCRIPTION

The solar sensor is installed on the upper part of the instrument panel. The solar sensor detects the amount of solar radiation and controls the "AUTO" function of the air conditioner. The out put voltage of the solar sensor changes according to the amount decreases, the voltage increases. The air conditioning amplifier reads the output voltage from the solar sensor.



DTC No.	Detection Item	Trouble Area
B1421/21	Open or short in Solar sensor circuit. (If the check is performed in a dark place, DTC B1421/21 may be displayed.) (Passenger side)	• A/C solar sensor • Harness or connector between A/C solar sensor and A/C amplifier • A/C amplifier

WIRING DIAGRAM



AC

INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG) 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	Measure Item / Display (Range)	Normal Condition	Diagnostic Note
SOLAR SENS-P	Solar sensor (Passenger side) / min.: 0 max.: 255	Increases as brightness increases	-

OK:

The display is as specified in the normal condition.

Result

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

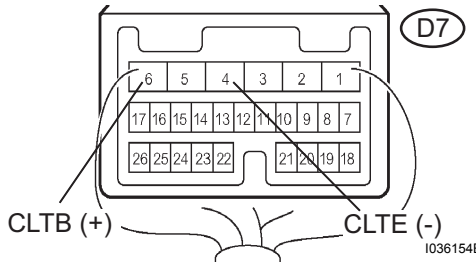
B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C → REPLACE AIR CONDITIONING AMPLIFIER

A

2	INSPECT MULTIPLEX NETWORK BODY ECU

Multiplex Network Body ECU Connector Wire Harness View:



(a) Remove the multiplex network body ECU with
(b) Turn the ignition switch on (IG).
(c) Measure the voltage according to the value(s) in the table below.

Voltage

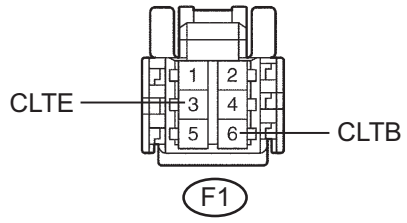
Tester connection (Symbols)	Condition	Specified condition
D7-6 (CLTB) - D7-4 (CLTE)	Ignition switch on (IG)	10 to 14 V

OK → Go to step 4

NG

3 CHECK HARNESS AND CONNECTOR

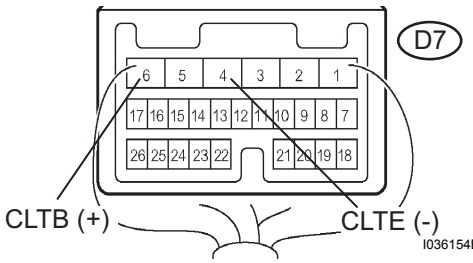
A/C Solar Sensor Connector Front View:



I036118E05

(a) Disconnect the connector from the A/C solar sensor.

Multiplex Network Body ECU Connector Wire Harness View:



I036154E06

(b) Disconnect the connector from the multiplex network body ECU.

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

Resistance

Tester connection (Symbols)	Condition	Specified condition
F1-6 (CLTB) - D7-6 (CLTB)	Always	Below 1 Ω
F1-3 (CLTE) - D7-4 (CLTE)	Always	Below 1 Ω
F1-6 (CLTB) - Body ground	Always	10 kΩ or higher
F1-3 (CLTE) - Body ground	Always	10 kΩ or higher

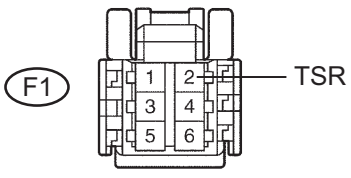
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE MULTIPLEX NETWORK BODY ECU

4 CHECK HARNESS AND CONNECTOR

A/C Solar Sensor Connector Wire Harness View:

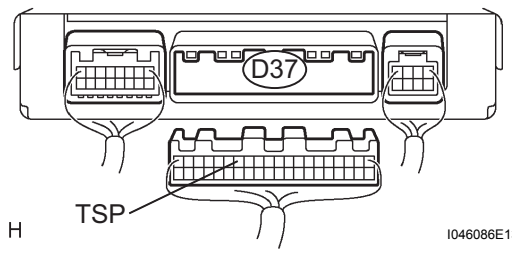


I036118E06

(a) Disconnect the connector from A/C solar sensor.

AC

Air Conditioning Amplifier Wire Harness View:



(b) Disconnect the connector from the A/C amplifier.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

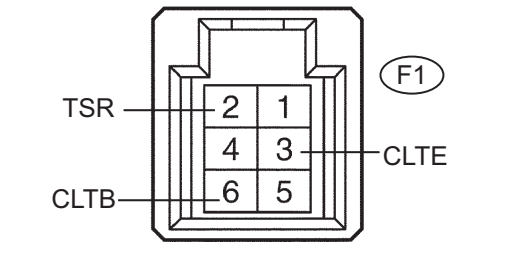
Tester connection (Symbols)	Condition	Specified condition
D37-14 (TSP) - F1-2 (TSR)	Always	Below 1 Ω
D37-14 (TSP) - Body ground	Always	10 kΩ or higher

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

OK

5 INSPECT A/C SOLAR SENSOR

A/C Solar Sensor Connector From Back Side:



(a) Remove the A/C solar sensor.
(b) Apply Battery voltage between terminals F1-3 (CLTE) and F1-6 (CLTB) of the A/C solar sensor.
(c) Measure the voltage according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
F1-2 (TSR) - F1-32 (CLTE)	Sensor is subject to electric light	4.0 to 4.6 V
F1-2 (TSR) - F1-32 (CLTE)	Sensor is covered with a cloth	Below 0.8 V

NOTICE:

- **The connection procedure for using a digital tester such as a TOYOTA electrical tester is shown above. When using an analog tester, connect the positive (+) lead to terminal 2 and negative (-) lead to terminal 1 of the solar sensor.**
- **While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.**

HINT:

- As the inspection light is moved away from the sensor the voltage increases.
- Use an incandescent lamp for inspection. Bring it within 30 cm (11.8 in.) of the solar sensor.

NG → **REPLACE A/C SOLAR SENSOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER

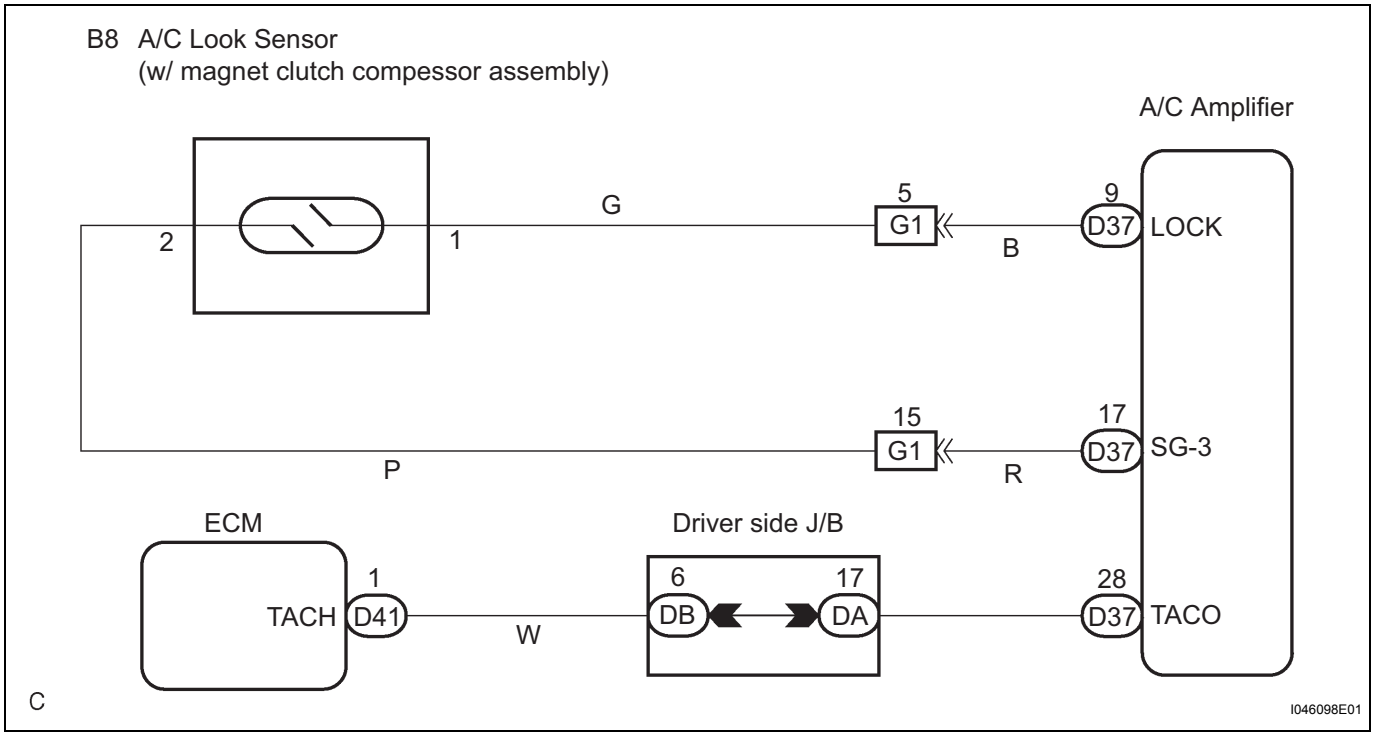
DTC	B1422/22	Compressor Lock Sensor Circuit

DESCRIPTION

The ECM sends the engine speed signal to the TACO terminal of the A/C amplifier. The A/C amplifier reads the difference between compressor speed and engine speed. When the difference becomes too big, the A/C amplifier determines that the compressor locks, and turns the magnetic clutch off.

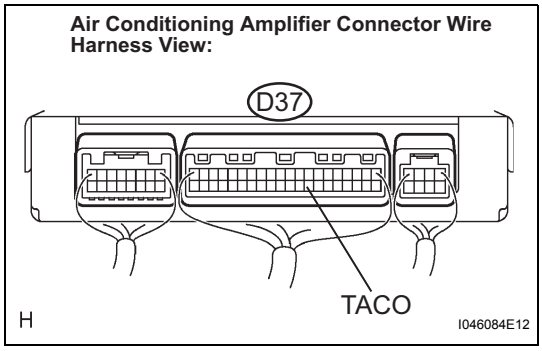
DTC No.	DTC Detection Condition	Trouble Area
B1422/22	Compressor lock sensor circuit (Open or short)	• A/C lock sensor (w/ magnet clutch compressor assembly) • Compressor drive belt • Harness and connector between A/C amplifier and ECM • Harness and connector between A/C lock sensor (w/ magnet clutch compressor assembly) and A/C amplifier • ECM • A/C amplifier

WIRING DIAGRAM

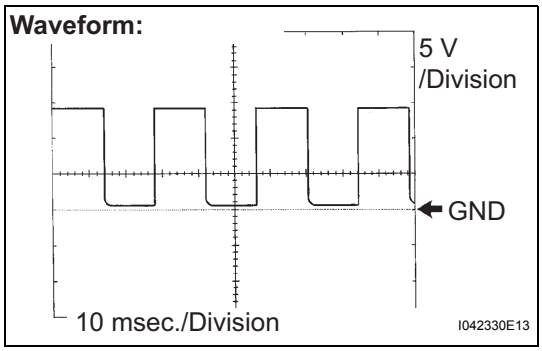


INSPECTION PROCEDURE

1 INSPECT AIR CONDITIONING AMPLIFIER



(a) Remove the A/C amplifier with connectors still connected.
(b) Start the engine and press the A/C switch.



(c) Measure the waveform according to the condition in the table below.

Standard

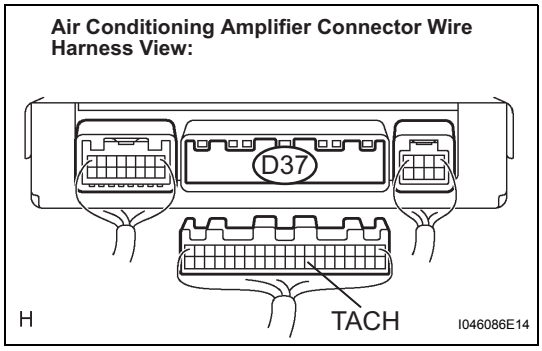
Tester connection (Symbols)	Condition	Specified condition
D37-28 (TACO) - Body ground	Engine running A/C switch: ON	Pulse generation (See waveform)

OK:
Wave form appears as shown in the illustration.

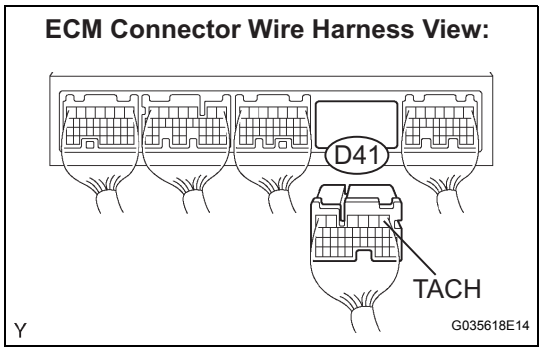
OK	Go to step 3

NG

2 CHECK HARNESS AND CONNECTOR (ECM - AIR CONDITIONING AMPLIFIER)



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



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

Standard

Tester connection (Symbols)	Condition	Specified condition
D37-28 (TACO) - D41-1 (TACH)	Always	Below 1 Ω
D37-28 (TACO) - Body ground	Always	10 kΩ or higher

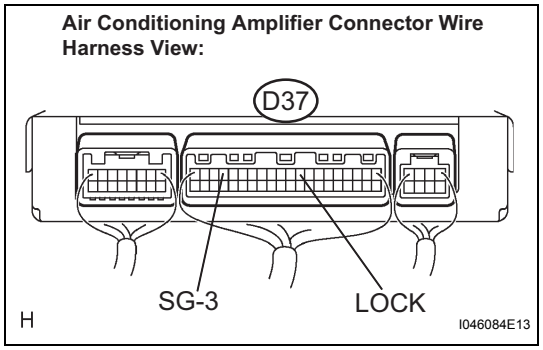
AC

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

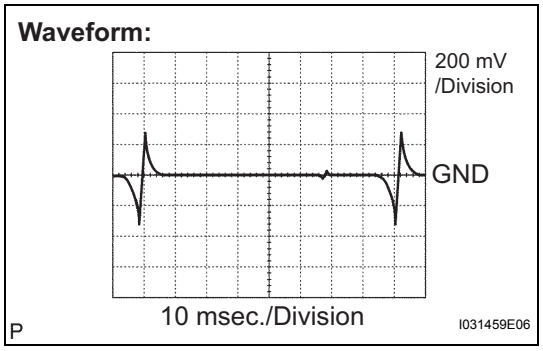
OK

GO TO SFI SYSTEM

3 INSPECT AIR CONDITIONING AMPLIFIER (LOCK - SG-3)



(a) Remove the A/C amplifier with connectors still connected.
(b) Start the engine and press the AUTO switch.



(c) Measure the waveform according to the condition in the table below.

Standard

Tester connection (Symbols)	Condition	Specified condition
D37-9 (LOCK) - D37-17 (SG-3)	Engine running Magnetic clutch ON Blower switch: ON	Pulse generation (See waveform)

Result

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

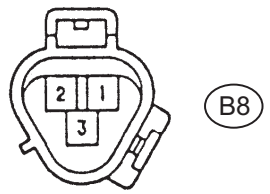
B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C → REPLACE AIR CONDITIONING AMPLIFIER

A

4	INSPECT A/C LOCK SENSOR (W/ MAGNET CLUTCH COMPRESSOR ASSEMBLY)

A/C Lock Sensor Connector Front View:



le–3–2 E005280E12

(a) Disconnect the A/C lock sensor (w/ magnet clutch compressor assembly) connector.
(b) Measure the resistance according to the value(s) in the table below/

Resistance

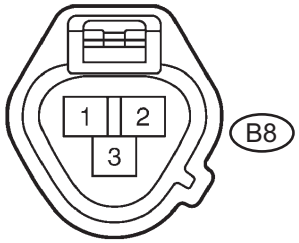
Tester connection	Condition	Specified condition
D37-28 (TACO) - D41-1 (TACH)	at 20°C (68°F)	160 to 320 Ω

NG → **REPLACE A/C LOCK SENSOR (W/ MAGNET CLUTCH COMPRESSOR ASSEMBLY)**

OK

5	CHECK HARNESS AND CONNECTOR (A/C LOCK SENSOR - AIR CONDITIONING AMPLIFIER)

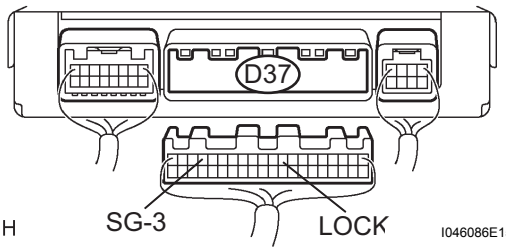
Wire Harness Side Connector Front View:



P E051630E04

(a) Disconnect the connector from A/C lock sensor (w/ magnet clutch compressor assembly)

Air Conditioning Amplifier Connector Wire Harness View:



H I046086E15

(b) Disconnect the connector from the A/C amplifier.
(c) Measure the resistance according to the value(s) in the table below.

Standard

Tester connection (Symbols)	Condition	Specified condition
D37-9 (LOCK) - B8-1	Always	Below 1 Ω
D37-17 (SG-3) - B8-2	Always	Below 1 Ω
D37-9 (LOCK) - Body ground	Always	10 kΩ or higher
D37-17 (SG-3) - Body ground	Always	10 kΩ or higher

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

OK

REPLACE AIR CONDITIONING AMPLIFIER

AC

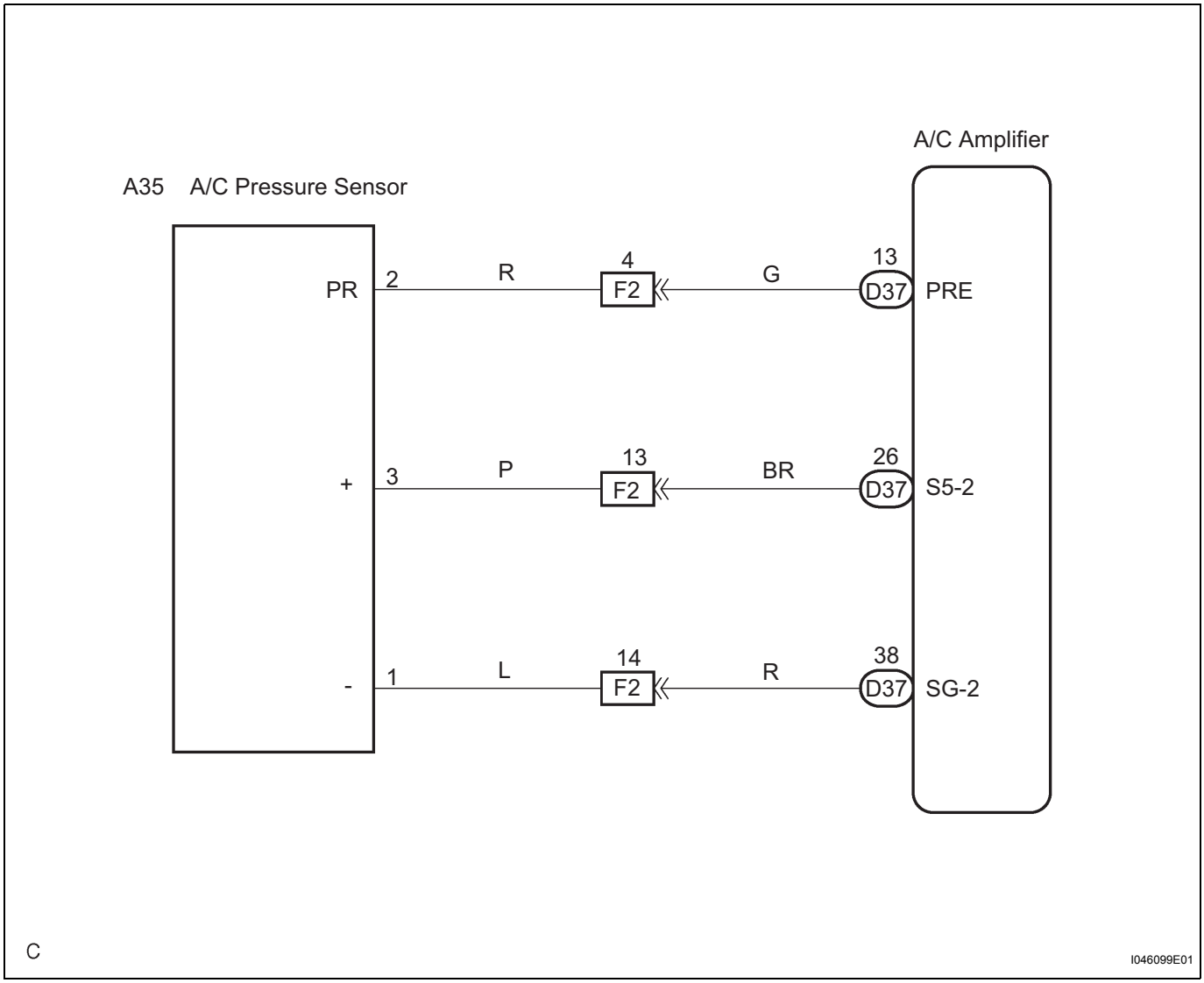
DTC	B1423/23	Pressure Switch Circuit

DESCRIPTION

This DTC is output when refrigerant pressure is extremely low (0.19 MPa (2.0 kgf/cm^2, 28 psi) or less) or extremely high (3.14 MPa (32.0 kgf/cm^2, 455 psi) or more). The pressure sensor, which is installed on the pipe of the high pressure side to detect refrigerant pressure, outputs the refrigerant pressure signal to the air conditioning amplifier. The air conditioning amplifier converts the signals into pressure according to the sensor characteristics to control the compressor.
HINT:
Be sure to check the refrigerant volume first when this DTC is output because this DTC can also be output if there is no refrigerant in the cycle.

DTC No.	Detection Item	Trouble Area
B1423/23	• Pressure switch circuit (open or short) • Abnormal refrigerant pressure below 196 kPa (2.6 kgf/cm^2, 28 psi) over 3.140 kPa (32.0 kgf/cm^2, 455 psi) below 190 kPa (2.0 kgf/cm^2, 28 psi) over 3,140 kPa (32.0 kgf/cm^2, 455 psi)	• A/C Pressure sensor • Harness or connector between A/C pressure sensor and A/C amplifier • Refrigerant pipe line • A/C amplifier

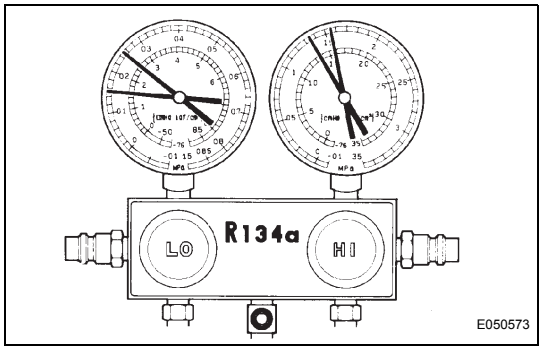
WIRING DIAGRAM



AC

INSPECTION PROCEDURE

1 INSPECT REFRIGERANT PRESSURE



(a) Set the manifold gauge (See page AC-134).
(b) Read the manifold gauge pressure when the following conditions are established.
(1) Prepare the vehicle according to the chart below.

Item	Condition
R/F Switch	RECIRC (30 to 35°C (86 to 95°F))
Vehicle Doors	Fully open
Temperature Setting	MAX COLD
Blower Speed	HI
A/C	ON

Standard:

Low pressure side:

0.15 to 0.25 MPa (1.5 to 2.5 kgf/cm^2, 21.3 to 35.6 psi)

High pressure side:

1.37 to 1.57 MPa (14 to 16 kgf/cm^2, 199 to 228 psi)

NG → **CHARGE REFRIGERANT**

OK

2 READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to DTC3.
(b) Turn the ignition switch on (IG) and push the intelligent tester main switch on.
(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
REG PRESS SENS	Regulator pressure sensor / min.: 0 max.: 255	Actual regulator pressure is displayed	-

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**

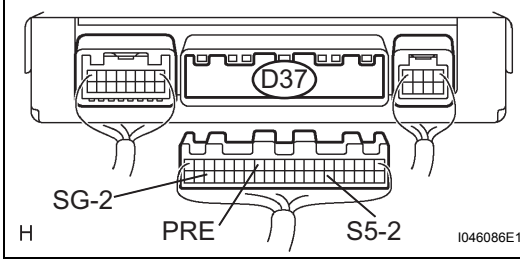
C → **REPLACE AIR CONDITIONING AMPLIFIER**

AC

A

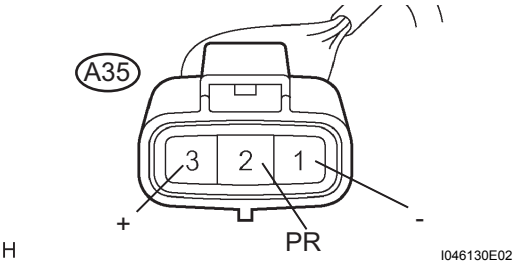
3 CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - A/C PRESSURE SENSOR)

Air Conditioning Amplifier Connector Wire Harness View:



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

A/C Pressure Sensor Connector Wire Harness View:



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

Resistance

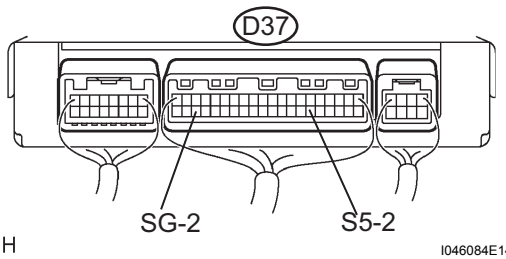
Tester Connection (Symbols)	Condition	Specified Condition
A35-2 (PR) - D37-13 (PRE)	Always	Below 1 Ω
A35-3 (+) - D37-26 (S5-2)	Always	Below 1 Ω
A35-1 (-) - D37-28 (SG-2)	Always	Below 1 Ω
D37-13 (PRE) - Body ground	Always	10 kΩ or higher
D37-26 (S5-2) - Body ground	Always	10 kΩ or higher
D37-28 (SG-2) - Body ground	Always	10 kΩ or higher

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

OK

4 INSPECT AIR CONDITIONING AMPLIFIER (S5-2 - SG-2)

Air Conditioning Amplifier Connector Wire Harness View:



(a) Remove the A/C amplifier.
(b) Reconnect the connector to the A/C amplifier.
(c) Measure the voltage according to the value(s) in the table below.

Voltage

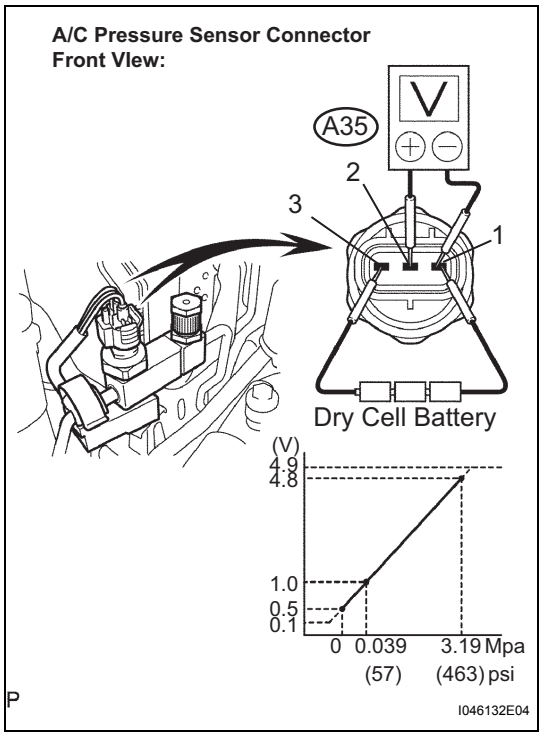
Tester Connection (Symbols)	Condition	Specified Condition
D37-26 (S5-2) - D37-38 (SG-2)	Ignition switch on (IG)	4.5 to 5.5 V
D37-26 (S5-2) - D37-38 (SG-2)	Ignition switch off	Below 1 V

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

AC

OK

5	INSPECT A/C PRESSURE SENSOR



(a) Start the engine.
(b) Operate the air conditioning system.
(c) Disconnect the connector from A/C pressure sensor.
(d) Install the manifold gauge set (See page AC-134).
(e) Connect the positive (+) lead from the three 1.5 V dry cell batteries to terminal 3 and negative (-) lead to terminal 1.
(f) Check the voltage between terminals 2 and 1 of A/C pressure sensor.

Voltage:

The voltage depends on the refrigerant pressure as shown in the chart.

NG → **REPLACE A/C PRESSURE SENSOR**

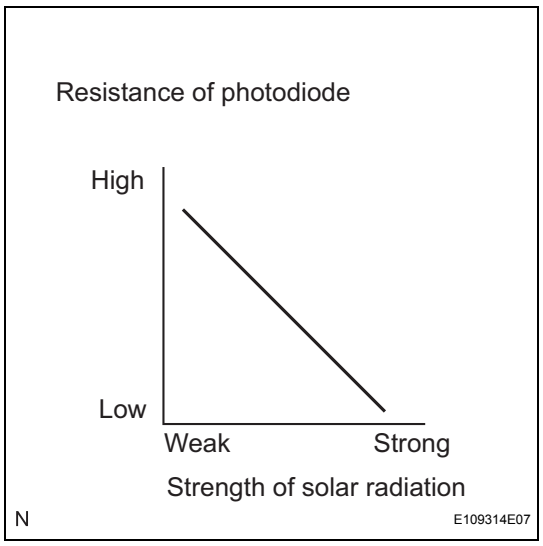
OK

REPLACE AIR CONDITIONING AMPLIFIER

DTC	B1424/24	Solar Sensor Circuit (Driver Side)

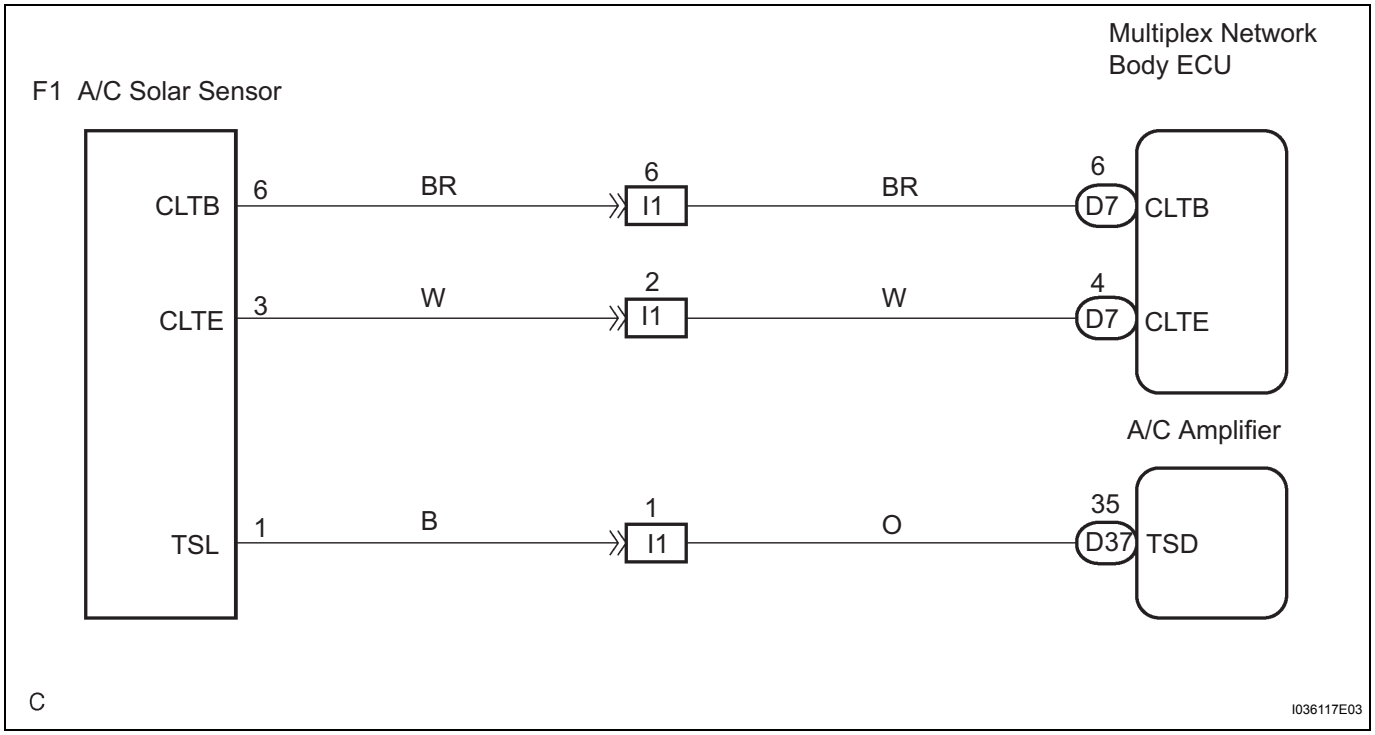
DESCRIPTION

The solar sensor is installed on the upper part of the instrument panel. The solar sensor detects the amount of solar radiation and controls the "AUTO" function of the air conditioner. The out put voltage of the solar sensor changes according to the amount decreases, the voltage increases. The air conditioning amplifier reads the output voltage from the solar sensor.



DTC No.	Detection Item	Trouble Area
B1424/24	Open or short in Solar sensor circuit. (If the check is performed in a dark place, DTC B1424/24 may be displayed.) (Driver side)	• A/C solar sensor • Harness or connector between A/C solar sensor and A/C amplifier • A/C amplifier

WIRING DIAGRAM



AC

INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG) 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
SOLAR SENS-D	Solar sensor (Driver side) / min.: 0 max.: 255	Increases as brightness increases	-

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

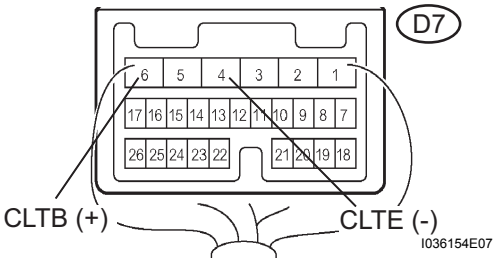
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER**

A

2	INSPECT MULTIPLEX NETWORK BODY ECU (CLTB - CLTE)

Multiplex Network Body ECU Connector Wire Harness View:



(a) Remove the multiplex network body ECU with connectors sill connected.
(b) Turn the ignition switch on (IG).
(c) Measure the voltage according to the value(s) table below.
Voltage

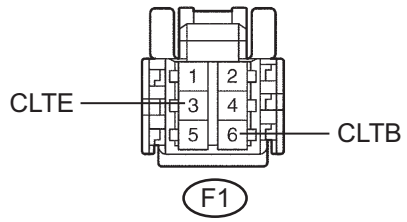
Tester Connection (Symbols)	Condition	Specified Condition
D7-6 (CLTB) - D7-4 (CLTE)	Ignition switch on (IG)	10 to 14 V

OK → **Go to step 4**

NG

3	CHECK HARNESS AND CONNECTOR (MULTIPLEX NETWORK BDY ECU - A/C SOLAR SENSOR)

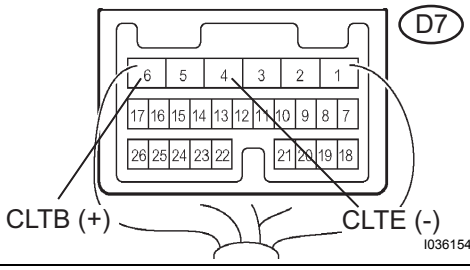
A/C Solar Sensor Connector Front View:



I036118E07

(a) Disconnect the connector from the A/C solar sensor.

Multiplex Network Body ECU Connector Wire Harness View:



I036154E08

(b) Disconnect the connector from the multiplex network body ECU.

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

Resistance

Tester Connection (Symbols)	Condition	Specified Condition
F1-6 (CLTB) - D7-6 (CLTB)	Always	Below 1 Ω
F1-3 (CLTE) - D7-4 (CLTE)	Always	Below 1 Ω
F1-6 (CLTB) - Body ground	Always	10 kΩ or higher
F1-3 (CLTE) - Body ground	Always	10 kΩ or higher

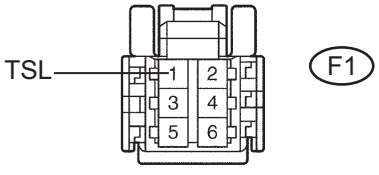
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE MULTIPLEX NETWORK BODY ECU

4	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - A/C SOLAR SENSOR)

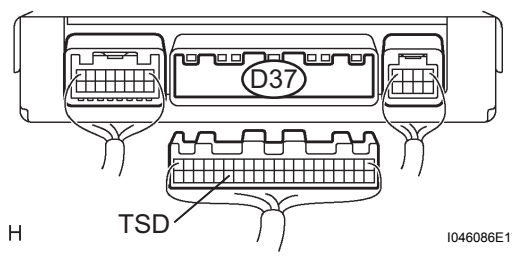
A/C Solar Sensor Connector Wire Harness View:



I036118E08

(a) Disconnect the connector from the A/C solar sensor.

Air Conditioning Amplifier Wire Harness View:



(b) Disconnect the connector from the A/C amplifier.
(c) Measure the resistance according to the value(s) table below.

Resistance

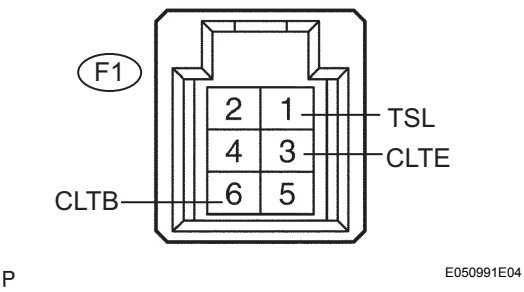
Tester Connection (Symbols)	Condition	Specified Condition
D37-35 (TSD) - F1-1 (TSL)	Always	Below 1 Ω
D37-35 (TSD) - Body ground	Always	10 kΩ or higher

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

OK

5 INSPECT A/C SOLAR SENSOR

A/C Solar Sensor Connector From Back Side:



(a) Remove the A/C solar sensor.
(b) Apply battery voltage between terminals F1-3 (CLTE) and F1-6 (CLTB) of the A/C solar sensor.
(c) Measure the voltage according to the value(s) table below.

Voltage

Tester Connection (Symbols)	Condition	Specified Condition
F1-1 (TSL) - F1-3 (CLTE)	Sensor is subject to electric light	4.0 to 4.6 V
F1-1 (TSL) - F1-3 (CLTE)	Sensor is subject to electric light	Below 0.8 V

NOTICE:

- **The connection procedure for using a digital tester such as a TOYOTA electrical tester is shown above. when using an analog tester, connect the positive (+) lead to terminal 2 and negative (-) lead to terminal 1 of the solar sensor.**
- **While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.**

HINT:

- As the inspection light is moved away from the sensor, the voltage increases.
- Use an incandescent light for inspection. Bring it within 30 cm (11.8 in.) of the solar sensor.

NG → **REPLACE A/C SOLAR SENSOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER

DTC	B1441/41	Air Mix Damper Control Servo Motor Circuit (Passenger Side)

DESCRIPTION

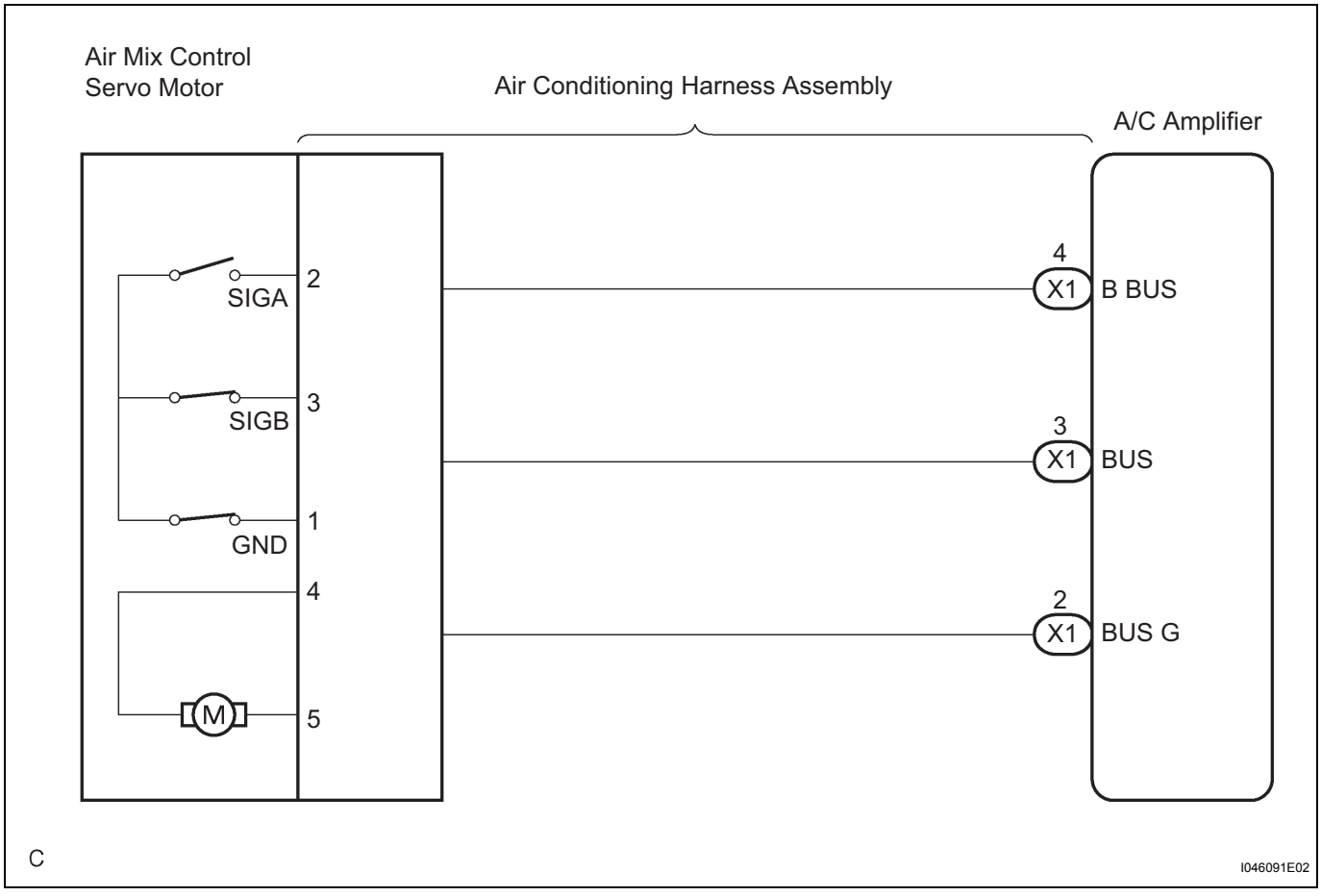
The air mix damper servo sends pulse signals to inform the A/C amplifier of the damper position. The A/C amplifier activates the motor (normal, reverse) based on the signals to move the air mix damper (passenger seat) to any position, which adjusts the amount of air passing the heater core after passing the evaporator to control the blowing temperature.

HINT:

Confirm that no mechanical problem is present because this diagnostic code can be out put when either a damper link or damper is mechanically locked.

DTC No.	Detection Item	Trouble Area
B1441/41	Air mix damper position sensor value does not change even if air conditioner amplifier assembly operates air mix servo motor.	• Air mix control servo motor • Air conditioning harness assembly • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to DLC3.

AC

(b) Turn the ignition switch on (IG) and push the intelligent tester main switch on.
(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.

DATA LIST / AIR CONDITIONER:

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
AIR MIX PULSE-P	Air mix servo motor target pulse (Passenger side) / min.: 0 max.: 255	Damper is at "MAX. COOL": 105 (pulse) Damper is at "MAX. HOT": 7 (pulse)	-

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**

A

2 REPLACE AIR MIX CONTROL SERVO MOTOR

HINT:
Since the servo motor cannot be inspected while it is removed from the vehicle, replace the servo motor with a normal one and check that the condition returns to normal.

NG

REPLACE AIR CONDITIONING HARNESS ASSEMBLY

DTC	B1442/42	Air Inlet Damper Control Servo Motor Circuit

DESCRIPTION

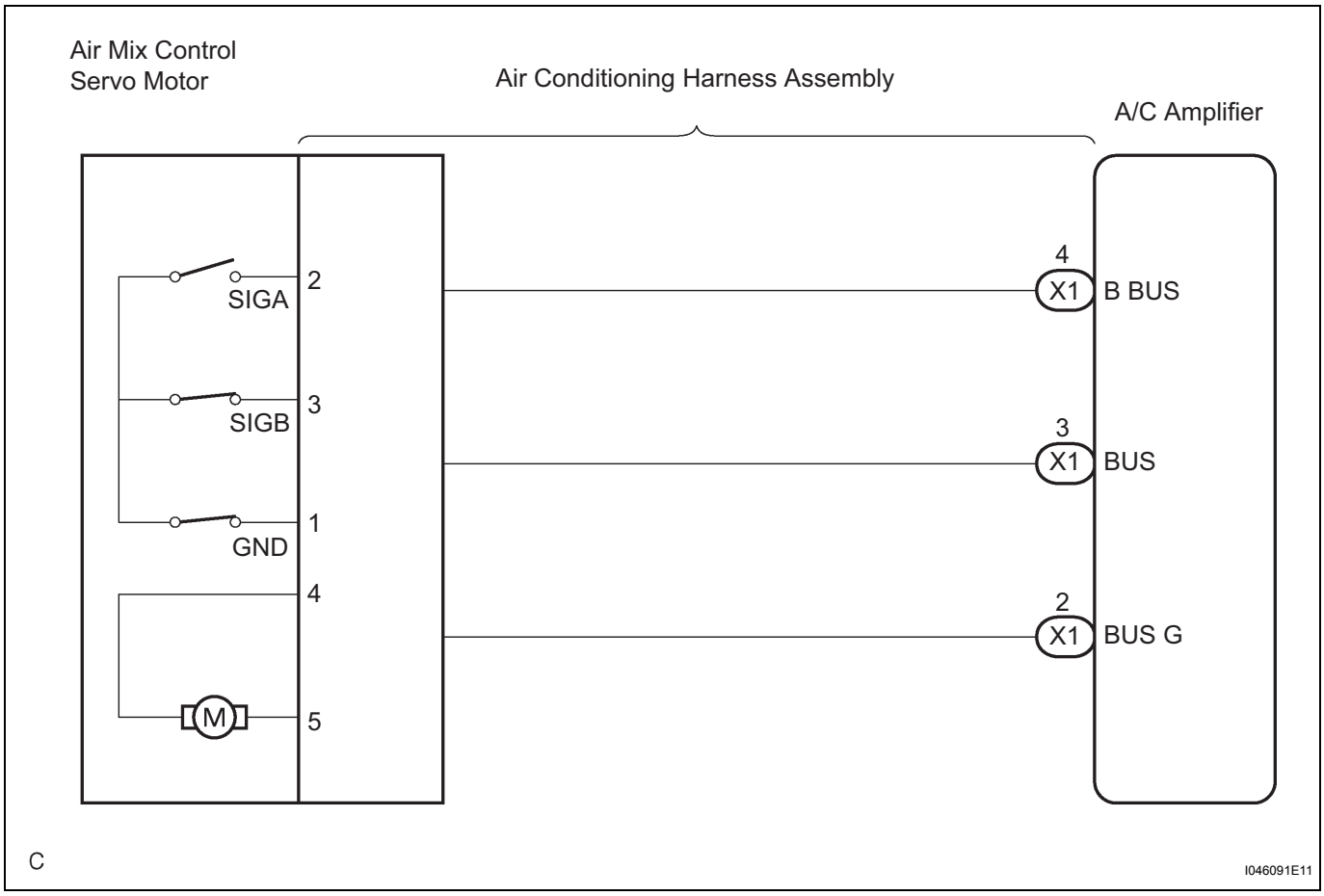
The damper servo (air inlet control) sends pulse signals to inform the A/C amplifier of the damper position. The A/C amplifier activates the motor (normal, reverse) based on the signals to move the air inlet mode selection air inlet control damper to any position, which controls the intake air used as FRESH, FRESH/ RECIRCULATION and RECIRCULATION.

HINT:

Confirm that no mechanical problem is present because this diagnostic code can be output when either a damper link or damper is mechanically locked.

DTC No.	Detection Item	Trouble Area
B1442/42	Air inlet damper position sensor value does not change even if air conditioner amplifier operates air inlet damper control servo motor.	• Air inlet control servo motor • Air conditioning harness assembly • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER

AC

(a) Connect the intelligent tester to DLC3.
(b) Turn the ignition switch on (IG) and push the intelligent tester main switch on.

(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.

DATA LIST / AIR CONDITIONER:

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/I DAMP PLS	Air inlet damper target pulse / min.: 0 max.: 255	Damper is at "RECIRCULATION": 7 (pulse) Damper is at "FRESH": 28 (pulse)	-

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**

A

2 REPLACE AIR INLET CONTROL SERVO MOTOR

HINT:
Since the servo motor cannot be inspected while it is removed from the vehicle, replace the servo motor with a normal one and check that the condition returns to normal.

NG

REPLACE AIR CONDITIONING HARNESS ASSEMBLY

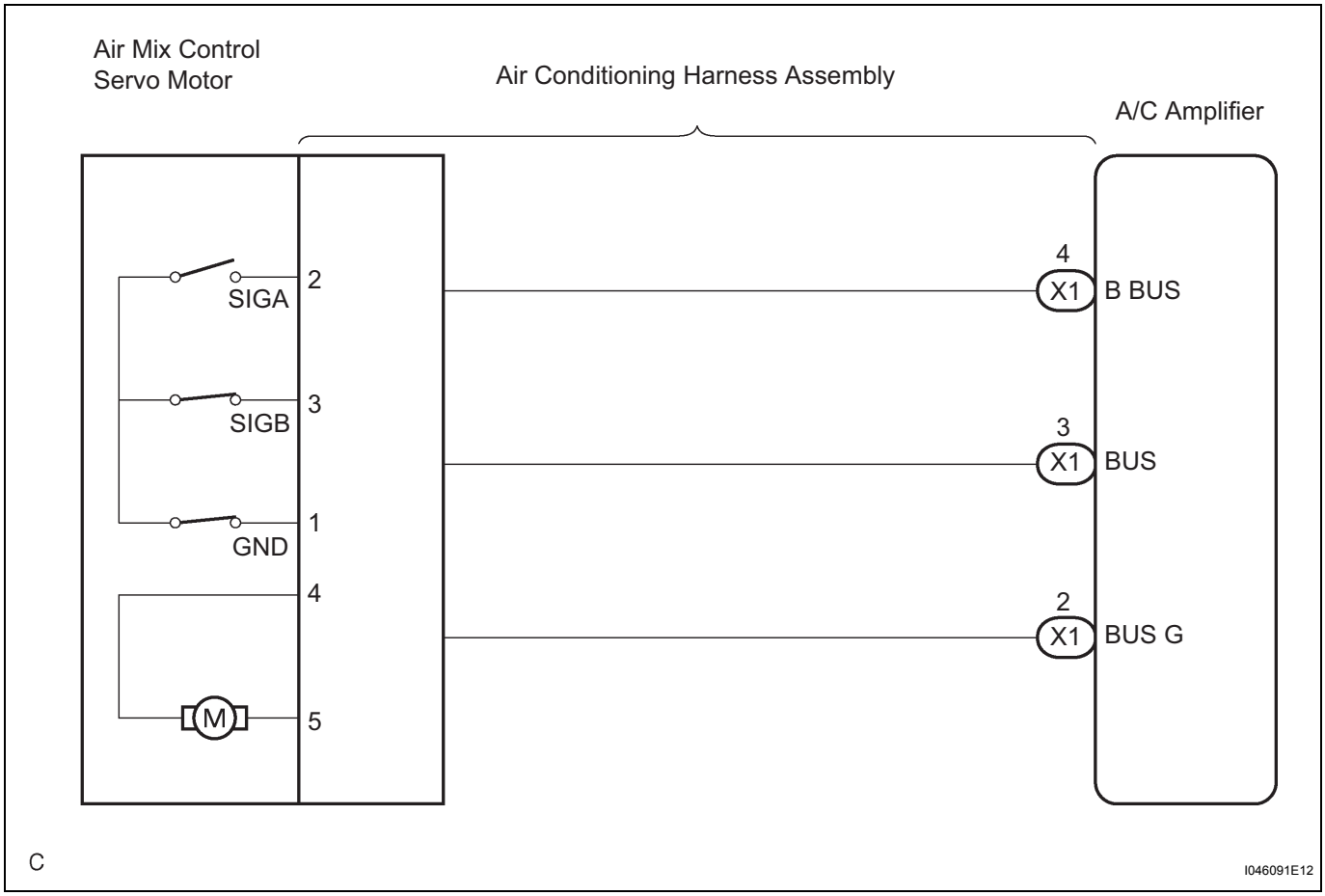
DTC	B1443/43	Air Outlet Damper Control Servo Motor Circuit

DESCRIPTION

The mode damper servo sends pulse signals to inform the A/C amplifier of the damper position. The A/C amplifier activates the motor (normal, reverse) based on the signals to move the mode damper to any position, which controls the air outlet switching.
HINT:
Confirm that no mechanical problem is present because this diagnostic code can be output when either a damper link or damper is mechanically locked.

DTC No.	Detection Item	Trouble Area
B1443/43	Air outlet damper position sensor value does not change even if air conditioner amplifier operates air outlet damper control servo motor.	• Air outlet control servo motor • Air conditioning harness assembly • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to DLC3.
(b) Turn the ignition switch on (IG) and push the intelligent tester main switch on.

AC

(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.

DATA LIST / AIR CONDITIONER:

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
AIR OUT PULSE-D	Air outlet servo motor target pulse (Driver side) / min.: 0 max.: 255	Damper is at "FACE": 8 (pulse) Damper is at "B/L": 30 (pulse) Damper is at "FOOT": 67 (pulse) Damper is at "F/D": 80 (pulse) Damper is at "DEF": 97 (pulse)	-

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**

A

2 REPLACE AIR OUTLET CONTROL SERVO MOTOR

HINT:
Since the servo motor cannot be inspected while it is removed from the vehicle, replace the servo motor with a normal one and check that the condition returns to normal.

NG

REPLACE AIR CONDITIONING HARNESS ASSEMBLY

DTC	B1446/46	Air Mix Damper Control Servo Motor Circuit (Driver Side)

DESCRIPTION

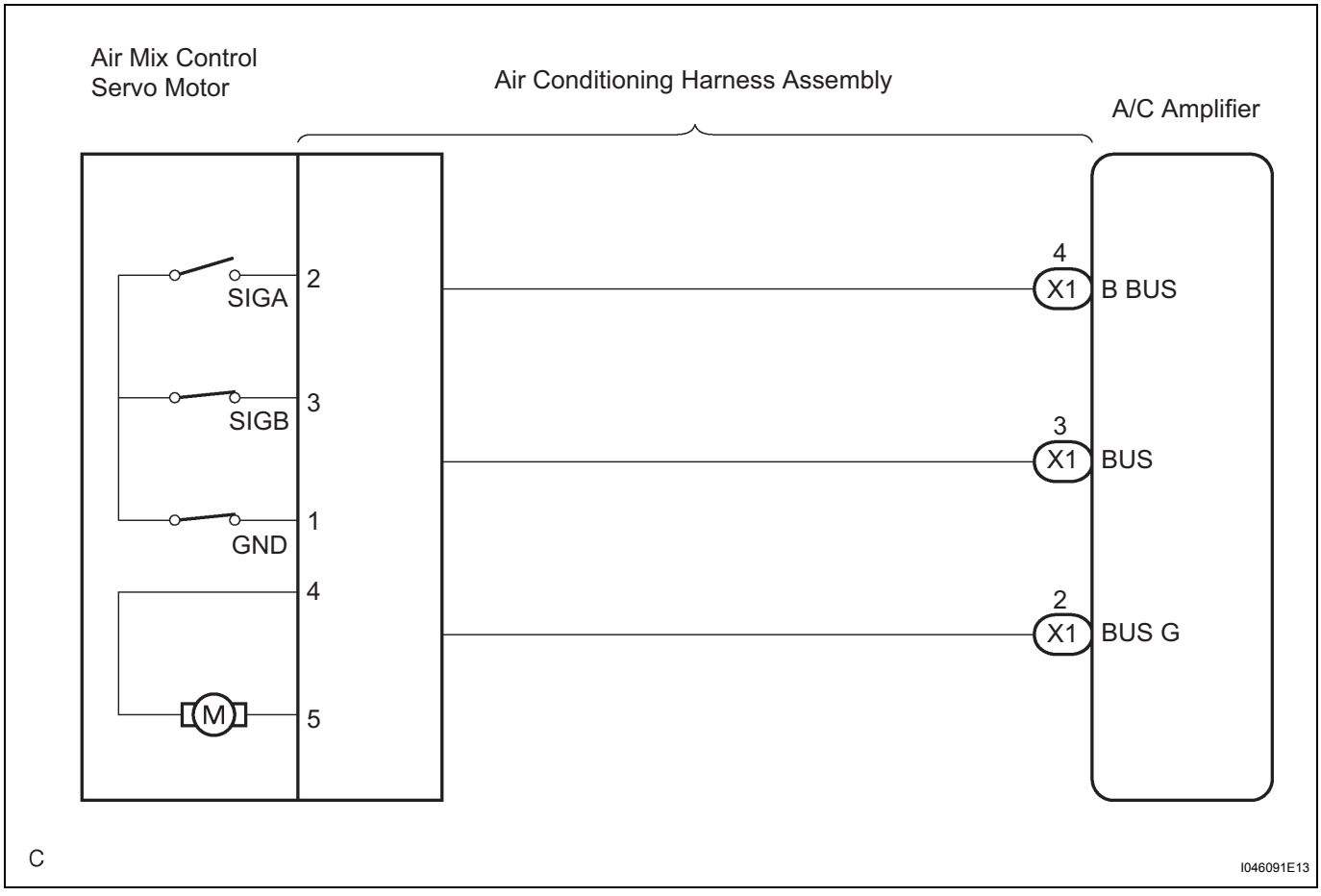
The air mix damper servo sends pulse signals to inform the A/C amplifier of the damper position. The A/C amplifier activates the motor (normal, reverse) based on the signals to move the air mix damper (driver seat) to any position, which adjusts the amount of air passing the heater core after passing the evaporator to control the blowing air temperature.

HINT:

Confirm that no mechanical problem is present because this diagnostic code can be output when either a damper link or damper is mechanically locked.

DTC No.	Detection Item	Trouble Area
B1446/46	Air mix damper position sensor value does not change even if air conditioner amplifier assembly operates air mix servo motor.	• Air mix control servo motor • Air conditioning harness assembly • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to DLC3.

AC

(b) Turn the ignition switch on (IG) and push the intelligent tester main switch on.
(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.

DATA LIST / AIR CONDITIONER:

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
AIR MIX PULSE-D	Air mix servo motor target pulse (Driver side) / min.: 0 max.: 255	Damper is at "MAX.COOL": 5 (pulse) Damper is at "MAX.HOT": 103 (pulse)	-

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**

A

2 REPLACE AIR MIX CONTROL SERVO MOTOR

HINT:
Since the servo motor cannot be inspected while it is removed from the vehicle, replace the servo motor with a normal one and check that the condition returns to normal.

NG

REPLACE AIR CONDITIONING HARNESS ASSEMBLY

HOW TO PROCEED WITH TROUBLESHOOTING

The intelligent tester can be used in steps 3, 6, 7, 8 and 11.

1	VEHICLE BROUGHT TO WORKSHOP

NEXT

2	CUSTOMER PROBLEM ANALYSIS

(a) Confirm problem symptoms.

NEXT

3	CHECK AND CLEAR THE DTCS

NEXT

4	PROBLEM SYMPTOM CONFIRMATION

→ SYMPTOM OCCURS (GO TO STEP6)

→ SYMPTOM DOES NOT OCCUR (GO TO STEP5)

5	SYMPTOM SIMULATION

NEXT

6	CHECK BODY MULTIPLEX COMMUNICATION SYSTEM

(a) Check for the DTC output.

→ MULTIPLEX DTC OUTPUTS (PROCEED TO "BODY MULTIPLEX COMMUNICATION SYSTEM")

→ NO MULTIPLEX DTC (GO TO STEP 7)

7	CHECK CAN COMMUNICATION SYSTEM

(a) Check for the DTC output.

→ CAN DTC OUTPUTS (PROCEED TO "CAN COMMUNICATION SYSTEM")

NO CAN DTC (GO TO STEP 8)

8	DTC CHECK (OTHER THAN MULTIPLEX DTC)

MALFUNCTION CODE (GO TO STEP 9)

NORMAL CODE (GO TO STEP 10)

9	DTC CHART

GO TO STEP 12

10	PROBLEM SYMPTOMS TABLE

NEXT

11	ACTUATOR CHECK

NEXT

12	CIRCUIT INSPECTION

NEXT

13	PROBLEM IDENTIFICATION

NEXT

14	PARTS INSPECTION

NEXT

15	REPAIR

NEXT

16	CONFIRMATION TEST

NEXT

END

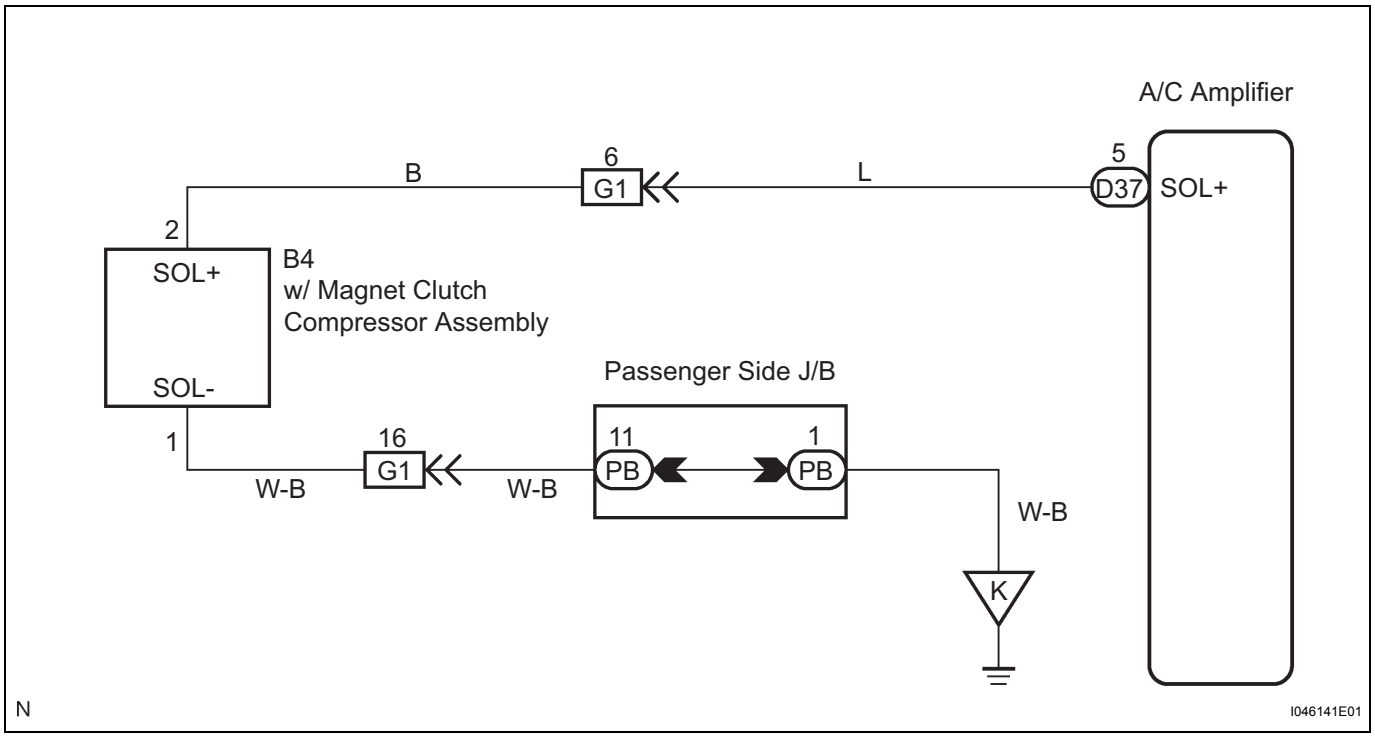
DTC	B1451/51	Compressor Solenoid Circuit

DESCRIPTION

In this circuit, the compressor assembly receives a signal on refrigerant compression required by the A/C amplifier. Based on the signal, the compressor assembly changes the degree of refrigerant compression.

DTC No.	Detection Item	Trouble Area
B1451/51	Solenoid of the externally changeable compressor circuit (Open or short)	• w/ Magnet clutch compressor assembly • Harness and connector between A/C amplifier and solenoid of the externally changeable compressor • A/C amplifier

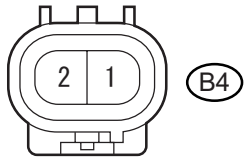
WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT W/MAGNETIC CLUTCH COMPRESSOR ASSEMBLY

w/ Magnet Clutch Compressor Assembly Connector Front View:



H C129705E03

(a) Disconnect the w/ magnet clutch compressor assembly connector.
(b) Measure the resistance according to the value(s) in the table below.

AC

Resistance

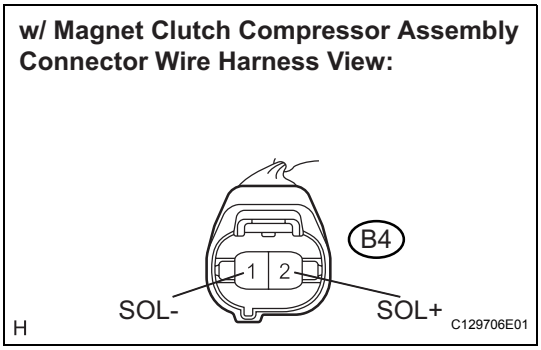
Tester Connection	Condition	Specified Condition
B4-2 (SOL+) - B4-1 (SOL-)	at 20°C (68°F)	10 to 11 Ω

NG → REPLACE MAGNETIC CLUTCH ASSEMBLY

OK

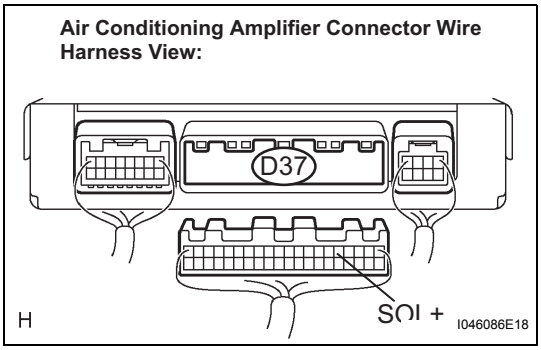
2 CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER - WIHT MAGNET CLUTCH COMPRESSOR ASSEMBLY)

w/ Magnet Clutch Compressor Assembly Connector Wire Harness View:



(a) Disconnect the connector from cooler compressor assembly.

Air Conditioning Amplifier Connector Wire Harness View:



(b) Disconnect the connector from the A/C amplifier.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

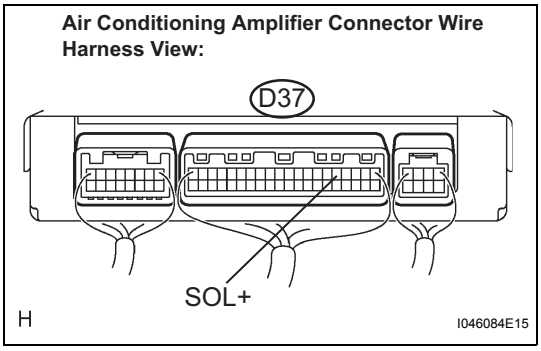
Tester Connection	Condition	Specified Condition
D37-5 (SOL+) - B4-2 (SOL+)	Always	Below 1 Ω
D37-5 (SOL+) - Body ground	Constant	10 kΩ or higher
B4-1 (SOL-) - Body ground	Constant	Below 1 Ω

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

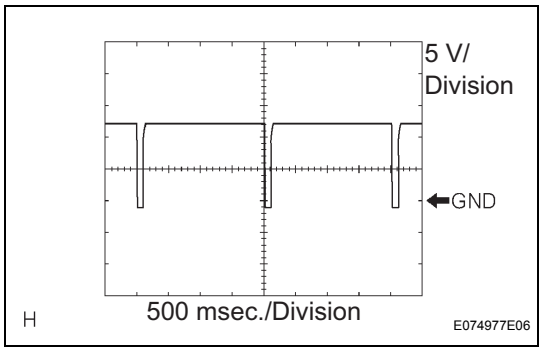
OK

3 INSPECT AIR CONDITIONING AMPLIFIER (SOL +-BODY GROUND)

Air Conditioning Amplifier Connector Wire Harness View:



(a) Remove the air conditioning amplifier with connectors still connected.
(b) Turn the ignition switch on (IG).
(c) Press the AUTO switch ON.



(d) Measure the waveform between terminal SOL+ (D37-5) of the A/C amplifier and body ground.

OK:

Waveform appears as shown in the illustration.

HINT:

Waveform varies with the blower level.

Result

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

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

A →

REPLACE AIR CONDITIONING AMPLIFIER

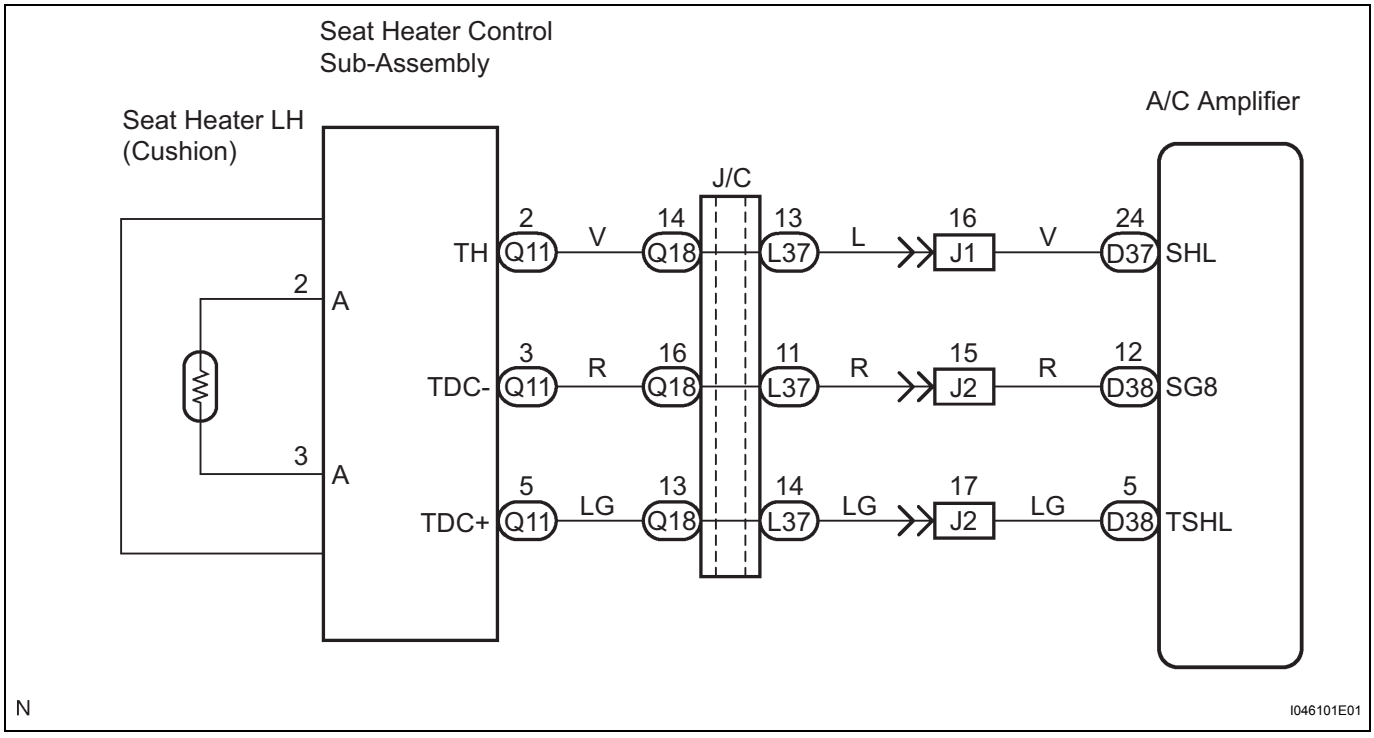
DTC	B1463/63	Driver Side Seat Heater Temperature Sensor Circuit

DESCRIPTION

Voltage is output from the A/C amplifier to the seat heater control sub-assembly. The voltage changes according to the resistance of the thermistor in the seat heater LH (cushion). The A/C amplifier reads changes in voltage to control the seat heater. The resistance of the thermistor in the seat heater LH (cushion) differs according to ambient temperature.

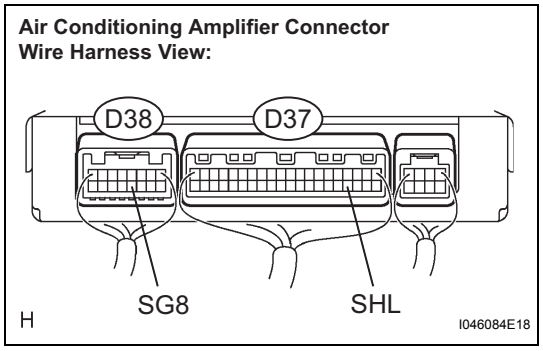
DTC No.	Detection Item	Trouble Area
B1463/63	Seat heater temperature sensor (Open or short) (Driver side)	• Seat heater control sub-assembly • Seat heater LH (Seat cushion) • Harness or connector between seat heater control sub-assembly and A/C amplifier • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT AIR CONDITIONING AMPLIFIER



(a) Remove the A/C amplifier with connectors still connected.
(b) Turn the ignition switch on (IG).
(c) Measure the voltage and resistance according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
D37-24 (SHL) - Body ground	Seat heater switch: ON	Below 1 V
D37-24 (SHL) - Body ground	Seat heater switch: OFF	10 to 14 V

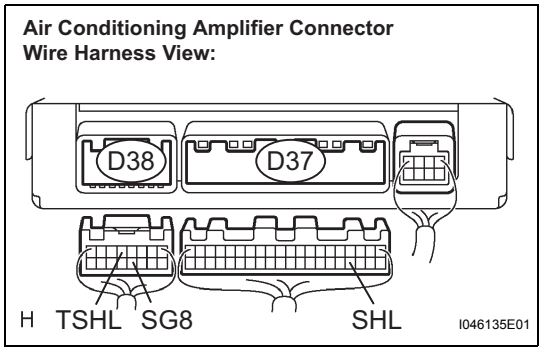
Resistance

Tester connection (Symbols)	Condition	Specified condition
D38-12 (SG8) - Body ground	Always	Below 1 Ω

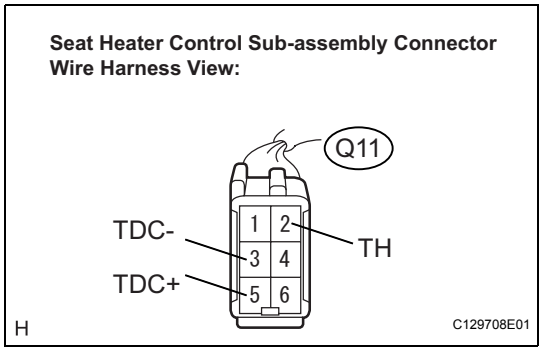
NG → REPLACE AIR CONDITIONING AMPLIFIER

OK

2 CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER - SEAT HEATER CONTROL SUB-ASSEMBLY))



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



(b) Disconnect the connector from the seat heater control sub-assembly.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

Tester connection (Symbols)	Condition	Specified condition
D38-5 (TSHL) - Q11-5 (TDC+)	Always	Below 1 Ω
D38-12 (SG8) - Q11-3 (TDC-)	Always	Below 1 Ω
D37-24 (SHL) - Q11-2 (TH)	Always	Below 1 Ω

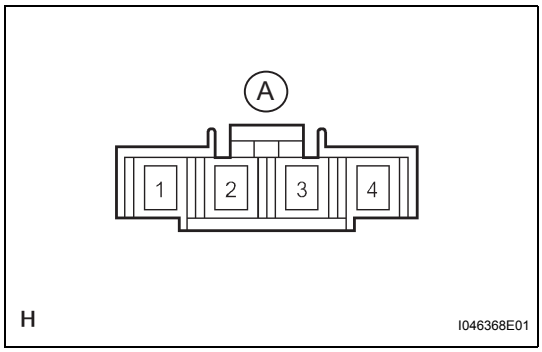
AC

Tester connection (Symbols)	Condition	Specified condition
D38-5 (TSHL) - Body ground	Always	10 kΩ or higher
D38-12 (SG8) - Body ground	Always	10 kΩ or higher
D37-24 (SHL) - Body ground	Always	10 kΩ or higher

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

OK

3 INSPECT SEAT HEATER LH (SEAT CUSHION)



(a) Disconnect the seat cushion heater.
(b) Heat the temperature sensor and thermostat with a light.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

Terminal No.	Condition	Specified condition
A2 - A3	Ambient temperature (15 °C to 40 °C)	4 kΩ to 15 kΩ

If the resistance is not as specified, replace the seat cushion heater assembly.

NG → **REPLACE SEAT HEATER LH (SEAT CUSHION)**

OK

REPLACE SEAT HEATER CONTROL SUB-ASSEMBLY

REFRIGERANT

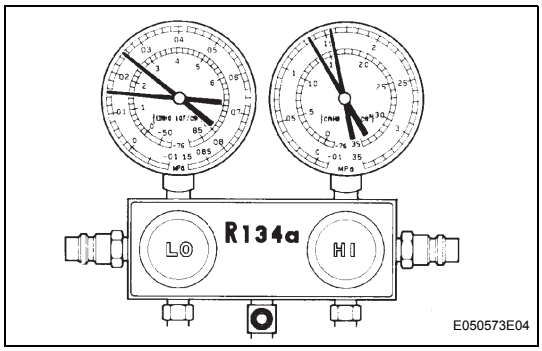
ON-VEHICLE INSPECTION

1. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

(a) This is a method in which trouble is located by using a manifold gauge set. Read the manifold gauge pressure when the following conditions are established.

Test conditions:

- Temperature at the air inlet with the switch set at RECIRC is 30 to 35°C (86 to 95°F)
- Engine is running at 1500 rpm
- Blower sped control switch is in the "HI" position
- Temperature control dial is in the "COOL" position
- A/C switch is ON
- Doors fully open



(1) The refrigeration system functions normally.

Gauge reading:

Low pressure side:

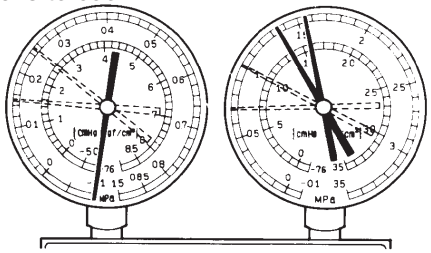
0.15 to 0.25 MPa (1.5 to 2.5 kgf/cm^2, 21.3 to 35.6 psi)

High pressure side:

1.37 to 1.57 MPa (14 to 16 kgf/cm^2, 199 to 228 psi)

(2) Moisture present in refrigeration system.

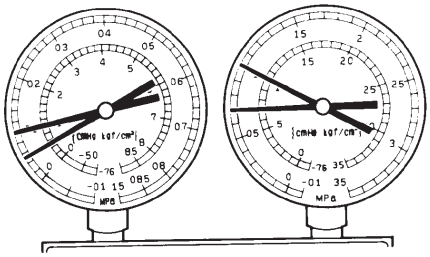
Condition: Periodially cools and then fails to cool



Symptom	Probable cause	Diagnosis	Corrective Actions
During operation, pressure on low pressure side cycles between normal and vacuum.	Moisture in refrigeration system freezes at expansion valve orifice causing a temporary stop of cycle, however, when it melts, normal state is restored.	• Dryer in oversaturated state • Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant	1. Replace condenser 2. Remove moisture in cycle by repeatedly evacuating air 3. Supply a proper amount of new refrigerant

(3) Insufficient cooling

Condition : Cooling system does not function effectively.

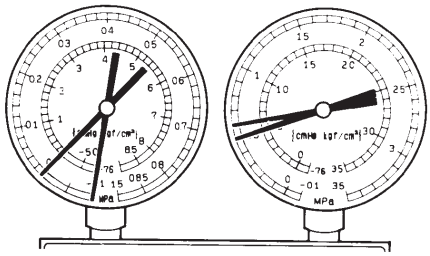


I022118E07

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure low on both low and high pressure sides • Insufficient cooling performance	Gas leakage in refrigeration system	• Insufficient refrigerant • Refrigerant leaking	1. Check for gas leakage and repair if necessary 2. Supply a proper amount of new refrigerant 3. If indicated pressure value is close to 0 when connected to the gauge, create the vacuum after inspecting and repairing the location of leak

(4) Poor circulation of refrigerant

Condition : Cooling system does not function effectively.

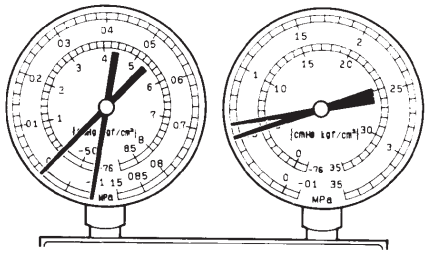


I022119E08

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure low on both low and high pressure sides • Frost on pipe from condenser to unit	Refrigerant flow obstructed by dirt in receiver	Receiver clogged	Replace condenser

(5) Refrigerant does not circulate.

Condition : Cooling system does not function. (Sometimes it may function)

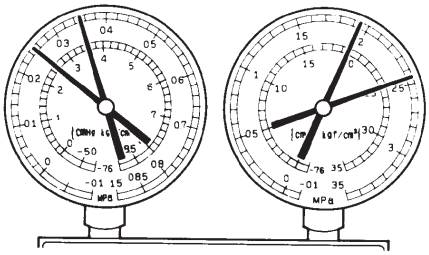


I022120E06

Symptom	Probable cause	Diagnosis	Corrective Actions
• Vacuum indicated on low pressure side, very low pressure indicated on high pressure side • Frost or condensation seen on piping on both sides of cooler condenser core or cooler expansion value	• Refrigerant flow obstructed by moisture or dirt in refrigeration system • Refrigerant flow obstructed by gas leaked from expansion valve	Refrigerant does not circulate	1. Check expansion valve 2. Clean out dirt in expansion valve by blowing air 3. Replace condenser 4. Evaporate air and supply a proper amount of new refrigerant 5. For gas leakage from expansion valve, replace expansion valve

(6) Refrigerant overcharged or insufficient cooling of condenser

Condition: Cooling system does not function effrctively.

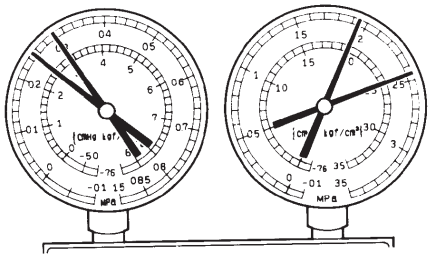


I022121E13

Symptom	Probable cause	Diagnosis	Corrective Actions
Pressure too high on both low and high pressure sides	• Unable to develop sufficient performance due to excessive use of refrigeration system • Insufficient cooling of condenser	• Excessive refrigerant in cycle → too much refrigerant supplied • Condenser cooling insufficient → condenser fins clogged at cooling fan	1. Clean condenser *1 2. Check cooling fan with cooling fan motor operated *2 3. If (*1) and (*2) are in normal state, check the amount of refrigerant and supply a proper amount of refrigerant

(7) Air present in refrigeration system

Condition : Cooling system does not function.



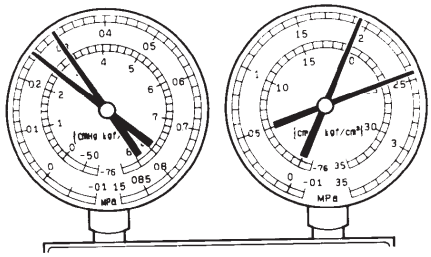
NOTE: These gauge indications occur when the refrigeration system opens and the refrigerant is charged without vacuum purging.

I022122E13

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure too high on both low and high pressure sides • The low pressure piping too hot to touch	Air in system	• Air present in refrigeration system • Insufficient vacuum purging	1. Check compressor oil to see if it is dirty or insufficient 2. Evacuate air and supply new refrigerant

(8) Expansion valve malfunction

Condition : Insufficient Cooling.

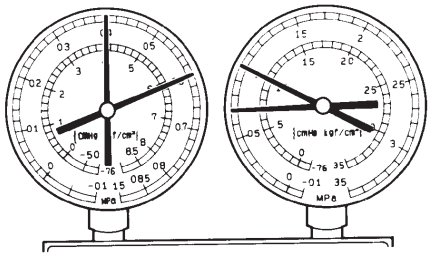


I022123E08

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure too high on both low and high pressure sides • Frost or a large amount of condensation on piping on low pressure side	Trouble in expansion valve	• Excessive refrigerant in low pressure piping • Expansion valve opened too wide	Check expansion valve

(9) Defective compressor

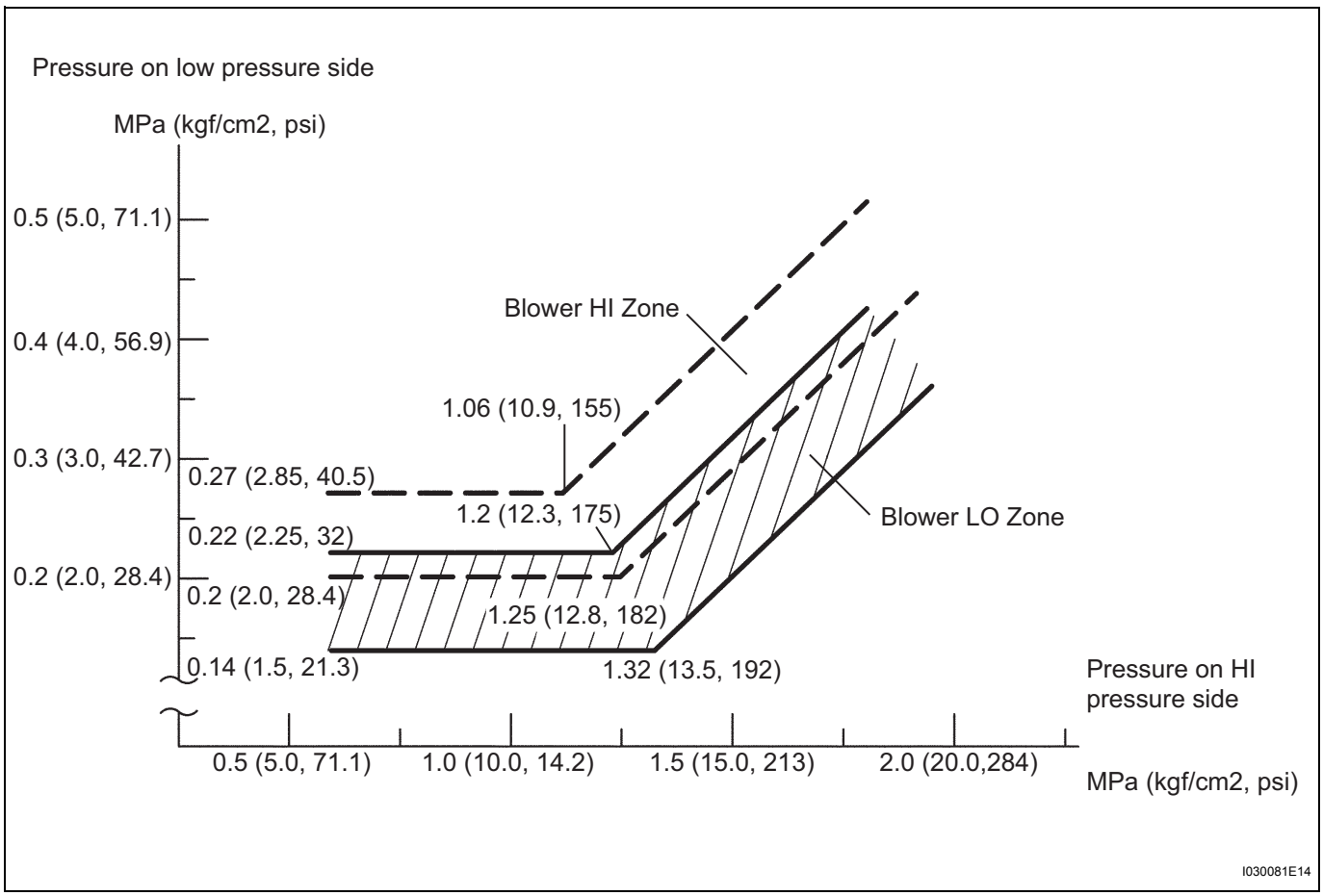
Condition : Insufficient Cooling.



I022124E08

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure too high on low pressure sides • Pressure too low on high pressure sides	Internal leak in compressor	• Compression failure • Leakage from damaged valve or broken sliding parts	Repair or replace compressor

Gauge readings (Reference)


Pressure on low pressure side
MPa (kgf/cm2, psi)
0.5 (5.0, 71.1)
0.4 (4.0, 56.9)
0.3 (3.0, 42.7)
0.2 (2.0, 28.4)
Blower HI Zone
1.06 (10.9, 155)
0.27 (2.85, 40.5)
1.2 (12.3, 175)
Blower LO Zone
0.22 (2.25, 32)
0.2 (2.0, 28.4)
1.25 (12.8, 182)
0.14 (1.5, 21.3)
1.32 (13.5, 192)
Pressure on HI pressure side
0.5 (5.0, 71.1)
1.0 (10.0, 14.2)
1.5 (15.0, 213)
2.0 (20.0,284)
MPa (kgf/cm2, psi)
I030081E14

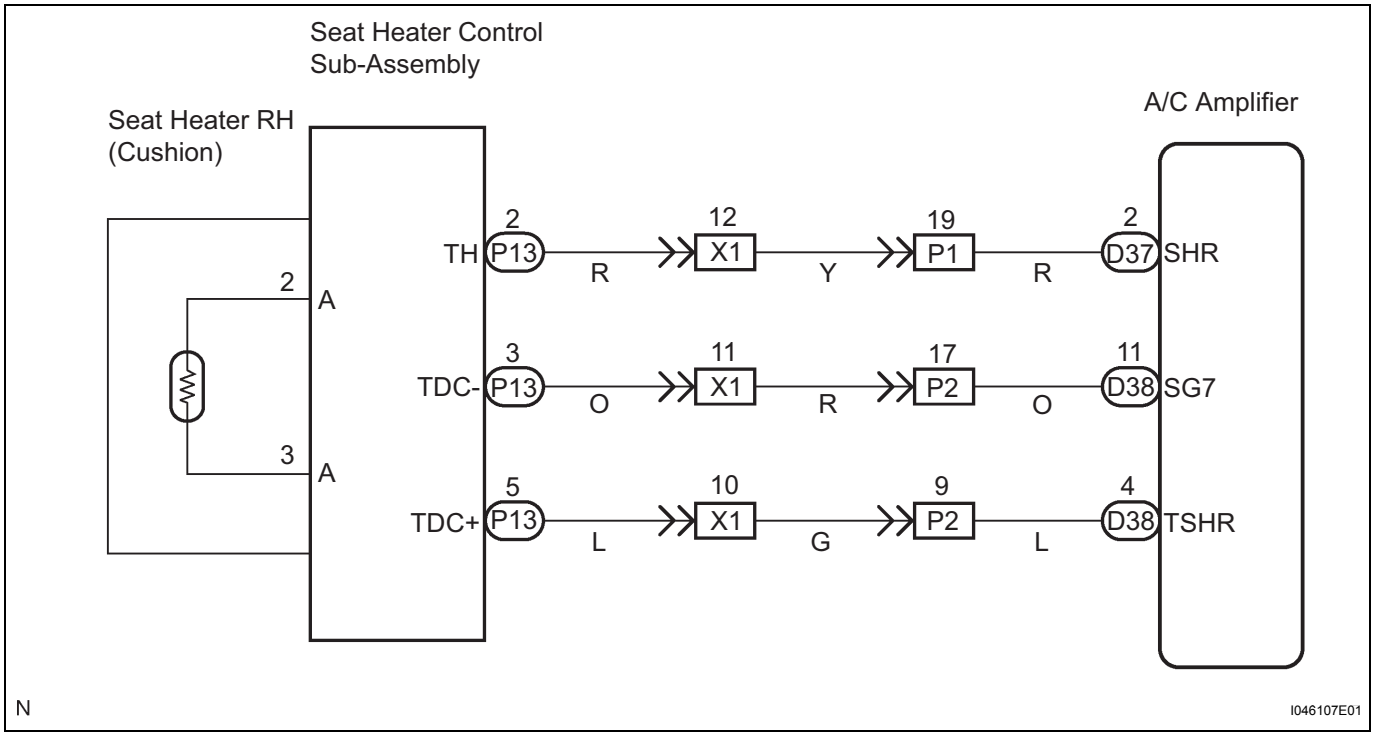
DTC	B1464/64	Front Passenger Side Seat Heater Temperature Sensor Circuit

DESCRIPTION

Voltage is output from the A/C amplifier to the seat heater control sub-assembly. The voltage changes according to the resistance of the thermistor in the seat heater LH (cushion). The A/C amplifier reads changes in voltage to control the seat heater. The resistance of the thermistor in the seat heater LH (cushion) differs according to ambient temperature.

DTC No.	Detection Item	Trouble Area
B1464/64	Seat heater temperature sensor (Open or short) (Passenger side)	• Seat heater control sub-assembly • Seat heater RH (Seat cushion) • Harness or connector between seat heater control sub-assembly and A/C amplifier • A/C amplifier

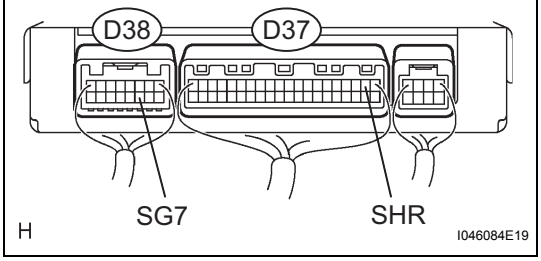
WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT AIR CONDITIONING AMPLIFIER

Air Conditioning Amplifier Connector Wire Harness View:



(a) Remove the A/C amplifier with connectors still connected.
(b) Turn the ignition switch on (IG).
(c) Measure the voltage and resistance according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
D37-2 (SHR) - Body ground	Seat heater switch: ON	Below 1 V
D37-2 (SHR) - Body ground	Seat heater switch: OFF	10 to 14 V

Resistance

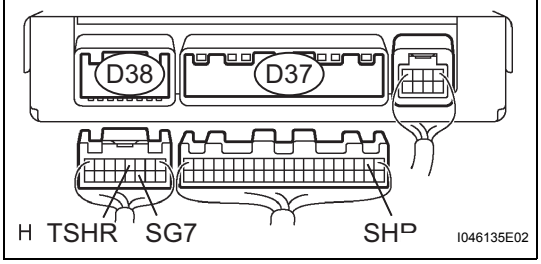
Tester connection (Symbols)	Condition	Specified condition
D38-11 (SG7) - Body ground	Always	Below 1 Ω

NG → REPLACE AIR CONDITIONING AMPLIFIER

OK

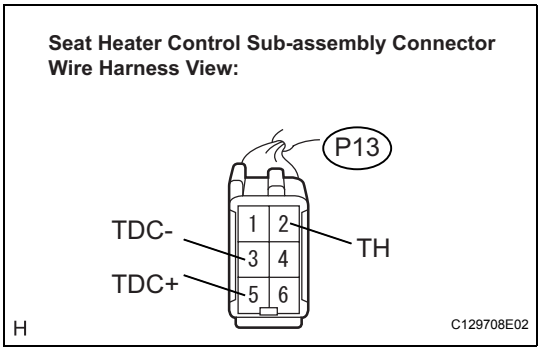
2 CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER - SEAT HEATER CONTROL SUB-ASSEMBLY)

Air Conditioning Amplifier Connector Wire Harness View:



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

Seat Heater Control Sub-assembly Connector Wire Harness View:



(b) Disconnect the connector from the seat heater sub-assembly.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

Tester connection (Symbols)	Condition	Specified condition
D38-4 (TSHR) - P13-5 (TDC+)	Always	Below 1 Ω
D38-11 (SG7) - P13-3 (TDC-)	Always	Below 1 Ω
D37-2 (SHR) - P13-2 (TH)	Always	Below 1 Ω

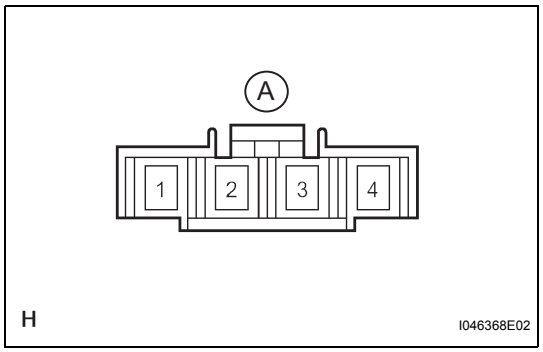
AC

Tester connection (Symbols)	Condition	Specified condition
D38-4 (TSHR) - Body ground	Always	10 kΩ or higher
D38-11 (SG7) - Body ground	Always	10 kΩ or higher
D37-2 (SHR) - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3 INSPECT SEAT HEATER RH (SEAT CUSHION)



(a) Disconnect the seat cushion heater.
(b) Heat the temperature sensor and thermostat with a light.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

Terminal No.	Condition	Specified condition
A2 - A3	Ambient temperature (15 °C to 40 °C)	4 kΩ to 15 kΩ

If the resistance is not as specified, replace the seat cushion heater assembly.

NG → REPLACE SEAT HEATER RH (SEAT CUSHION)

OK

REPLACE SEAT HEATER CONTROL SUB-ASSEMBLY

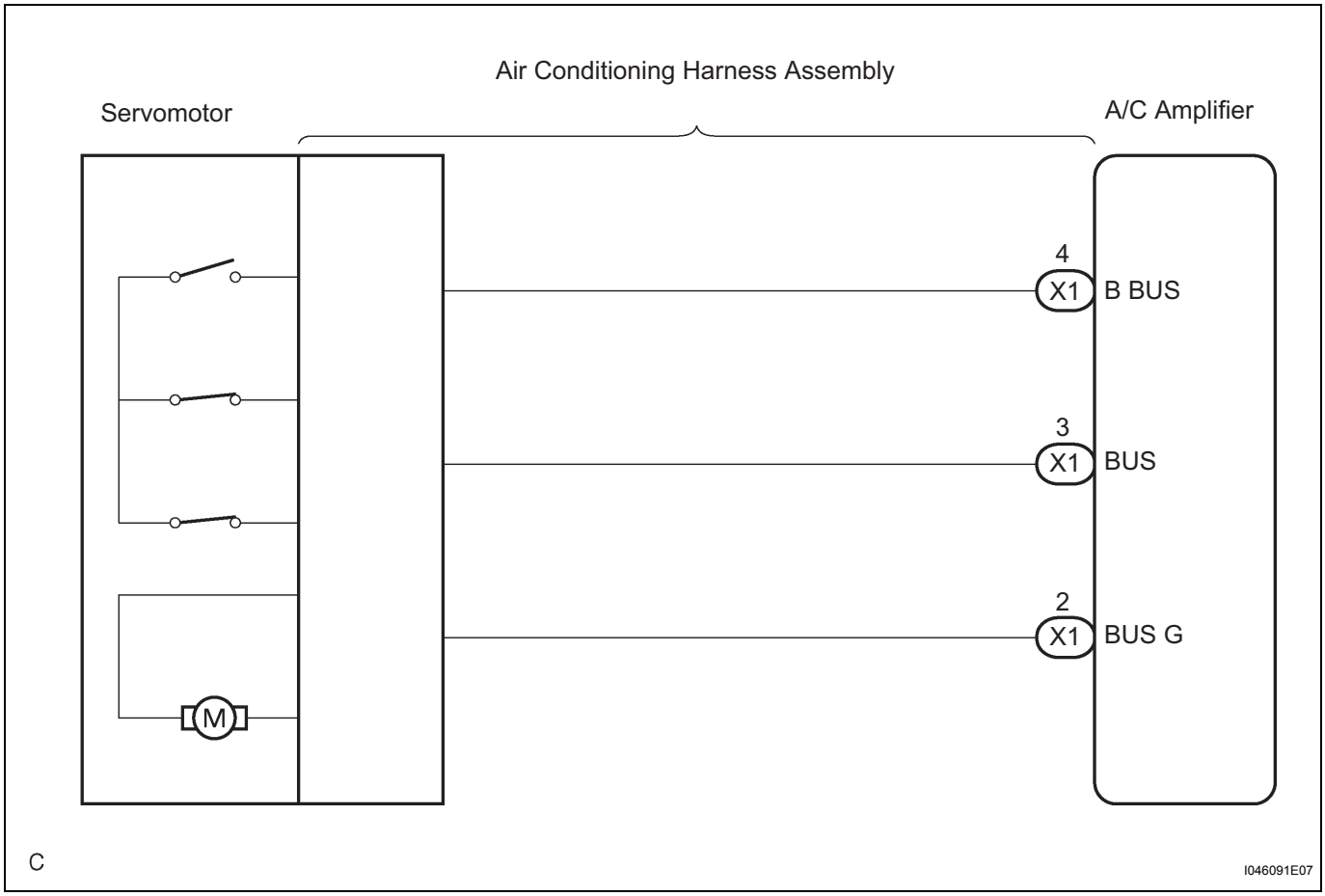
DTC	B1497/97	BUS IC Communication Malfunction

DESCRIPTION

The air conditioning harness assembly connects the air conditioning amplifier and each servomotor. The A/C amplifier supplies power and sends operation instructions to each servomotor through the air conditioning harness assembly. Each servomotor sends the damper position information to the A/C amplifier.

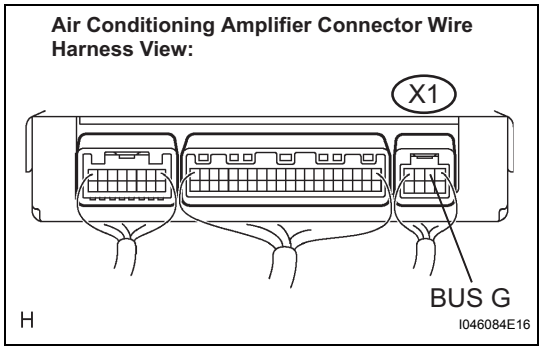
DTC No.	Detection Item	Trouble Area
B1497/97	Communication line error or open	• Air conditioning harness assembly • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT AIR CONDITIONING AMPLIFIER



(a) Remove the A/C amplifier with connectors still connected.
(b) Measure the voltage according to the value(s) in the table below.

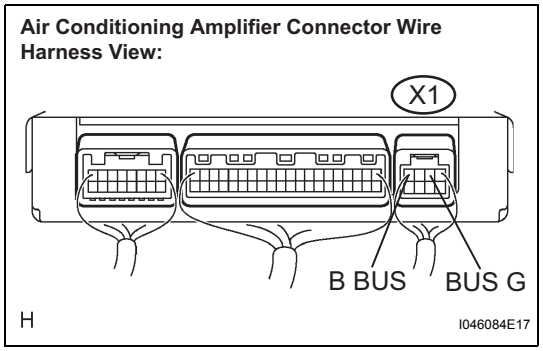
Voltage

Tester Connection	Condition	Specified Condition
X1-2 (BUS G) - Body ground	Always	Below 1 V

NG → REPLACE AIR CONDITIONING AMPLIFIER

OK

2 INSPECT AIR CONDITIONING AMPLIFIER



(a) Remove the A/C amplifier with connectors still connected.
(b) Measure the voltage according to the value(s) in the table below.

Voltage

Tester Connection	Condition	Specified Condition
X1-4 (B BUS) - X1-2 (BUS G)	Ignition switch on (IG)	10 to 14 V
X1-4 (B BUS) - X1-2 (BUS G)	Ignition switch off	Below 1 V

NG → REPLACE AIR CONDITIONING AMPLIFIER

OK

REPLACE AIR CONDITIONING HARNESS ASSEMBLY

DTC B1499/99 Multiplex Communication Circuit

DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
B1499/99	Open in multiplex communication circuit	•Multiplex communication system

INSPECTION PROCEDURE

1	CHECK DIAGNOSTIC TROUBLE CODE (DTC B1499/99)

(a) Clear the DTC (See page AC-39).
(b) Read the DTC (See page AC-39).

Result

Result	Proceed to
DTC (B1499/99) is not output	A
DTC (B1499/99) is output	B

B → GO TO MULTIPLEX COMMUNICATION SYSTEM

A

SYSTEM OK

Blower Motor Circuit

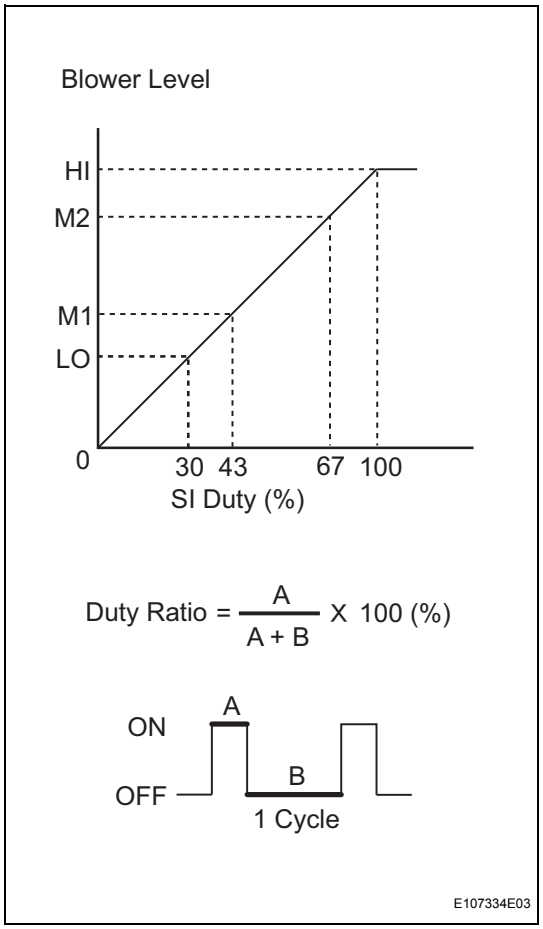
DESCRIPTION

The blower motor is operated by signals from the A/C amplifier. Blower motor speed signals are transmitted by changes in the duty ratio.

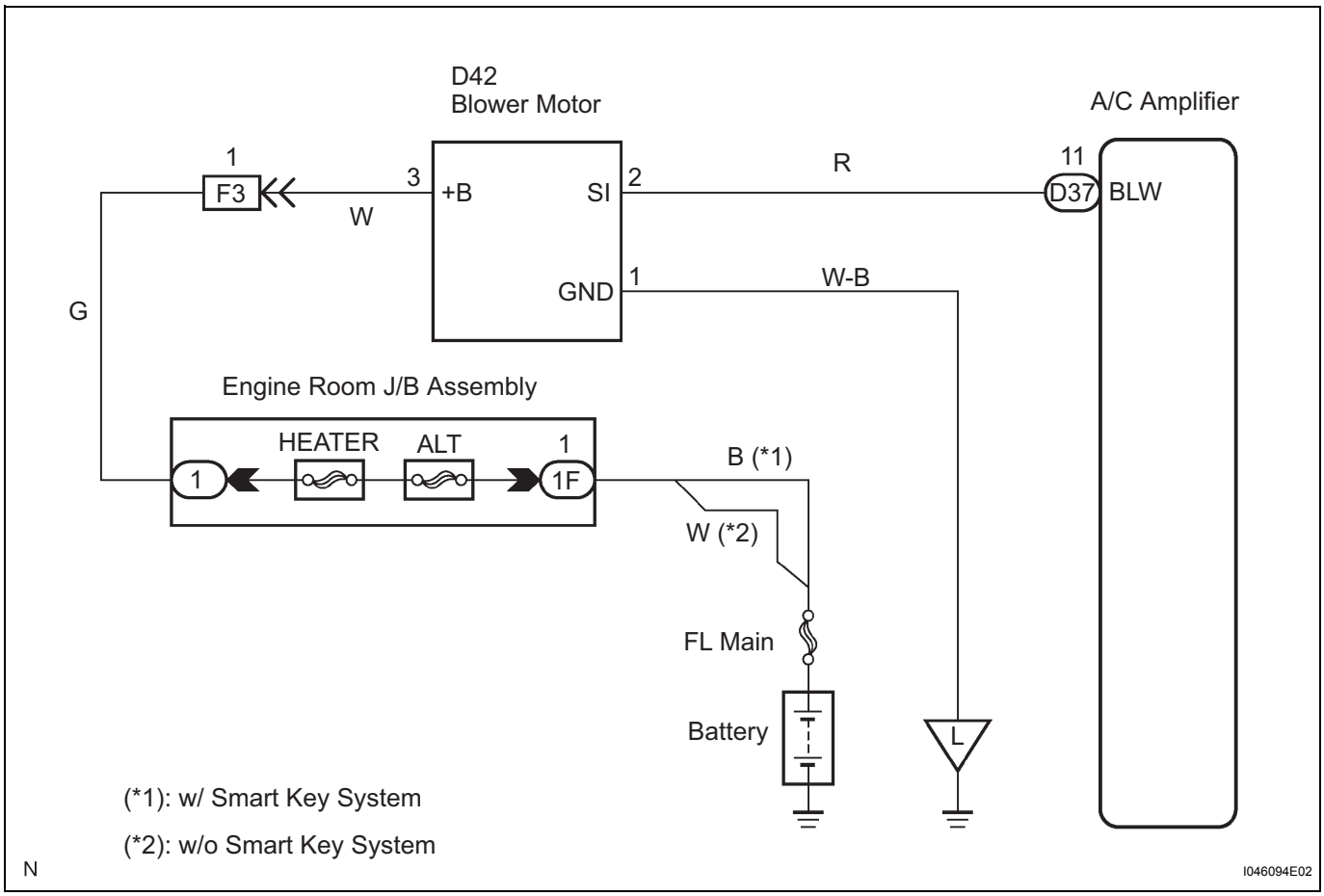
Duty Ratio:

The duty ratio is the ratio of the period of continuity in one cycle. For example, if A is the period of continuity in one cycle, B is the period of non-continuity.

The blower motor controller controls the blower motor speed.



WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG) 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
BLOWER LEVEL	Blower motor speed level / min.: 0 level max.: 31 level	Increases in the range between 0 and 31 as the speed increase	-

OK:
The display is as specified in the normal condition.

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

OK

2	CHECK ACTUATOR

(a) Set the actuator check mode (See page AC-45).

AC

(b) Press the UPDr switch to set the step operation.
(c) Check the air flow level by hand.

Display Code	Blower level
0	0
1	1
2	17
3	17
4	17
5	17
6	17
7	17
8	17
9	31

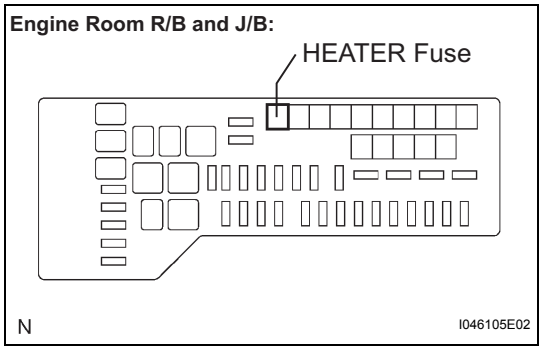
OK:
Blower level changes in accordance with each display code.

NG → **Go to step 3**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

3 INSPECT FUSE (HEATER)



(a) Remove the HEATER fuse from the engine room R/B and J/B.
(b) Measure the resistance according to the value(s) in the table below.
Resistance

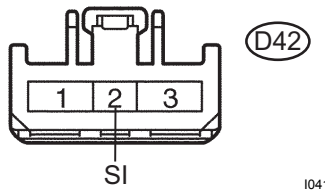
Tester item	Condition	Specified condition
HEATER fuse	Always	Below 1 Ω

NG → **REPLACE FUSE (HEATER)**

OK

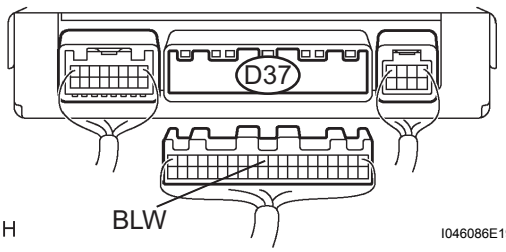
4	CHECK HARNESS AND CONNECTOR (BLOWER MOTOR - AIR CONDITIONING AMPLIFIER)

Blower Motor Connector Wire Harness View:



(a) Disconnect the connector from blower motor.

Air Conditioning Amplifier Connector Wire Harness View:



(b) Disconnect the connector from the A/C amplifier.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

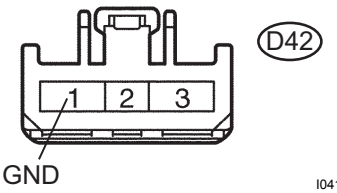
Tester connection (Symbols)	Condition	Specified condition
D37-11 (BLW) - D42-2 (SI)	Always	Below 1 Ω
D37-11 (BLW) - Body ground	Constant	10 kΩ or higher

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

OK

5	CHECK HARNESS AND CONNECTOR (BLOWER MOTOR - BODY GROUND)

Blower Motor Connector Front View:



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

Resistance

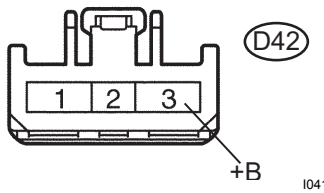
Tester connection (Symbols)	Condition	Specified condition
D42-1(GND) - Body ground	Constant	Below 1 Ω

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

OK

6 CHECK HARNESS AND CONNECTOR (BLOWER MOTOR - BATTERY)

Blower Motor Connector Front View:



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

Voltage

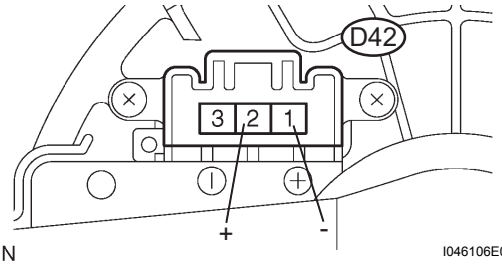
Tester connection (Symbols)	Condition	Specified condition
D42-1(+B) - Body ground	Constant	10 to 14 V

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

OK

7 INSPECT BLOWER MOTOR

Blower Motor Connector Front View:



(a) Remove the blower motor.
(b) Connect positive (+) lead to terminal 2 of the blower motor connector and negative (-) lead to terminal 1.

OK:

Blower motor operates smoothly.

NOTICE:

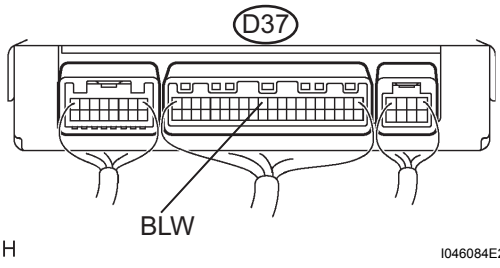
While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

NG → **REPLACE BLOWER MOTOR**

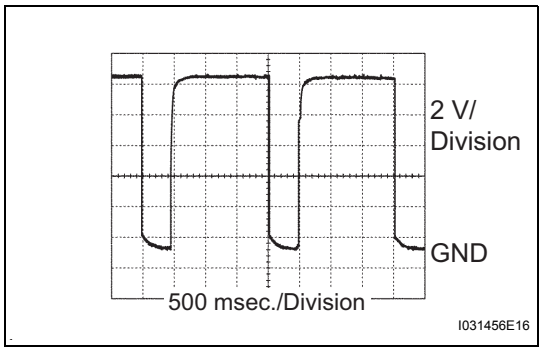
OK

8 INSPECT AIR CONDITIONING AMPLIFIER (BLW - BODY GROUND)

Air Conditioning Amplifier Connector Wire Harness View:



(a) Reconnect the connector to the blower motor.
(b) Reconnect the connector to the A/C amplifier.
(c) Remove the A/C amplifier with connectors still connected.
(d) Turn the ignition switch on (IG).
(e) Press the blower switch on (LO).



(f) Measure the waveform between terminal BLW (D37-11) of the A/C amplifier and body ground.
HINT:
Waveform varies with the blower level.

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

OK

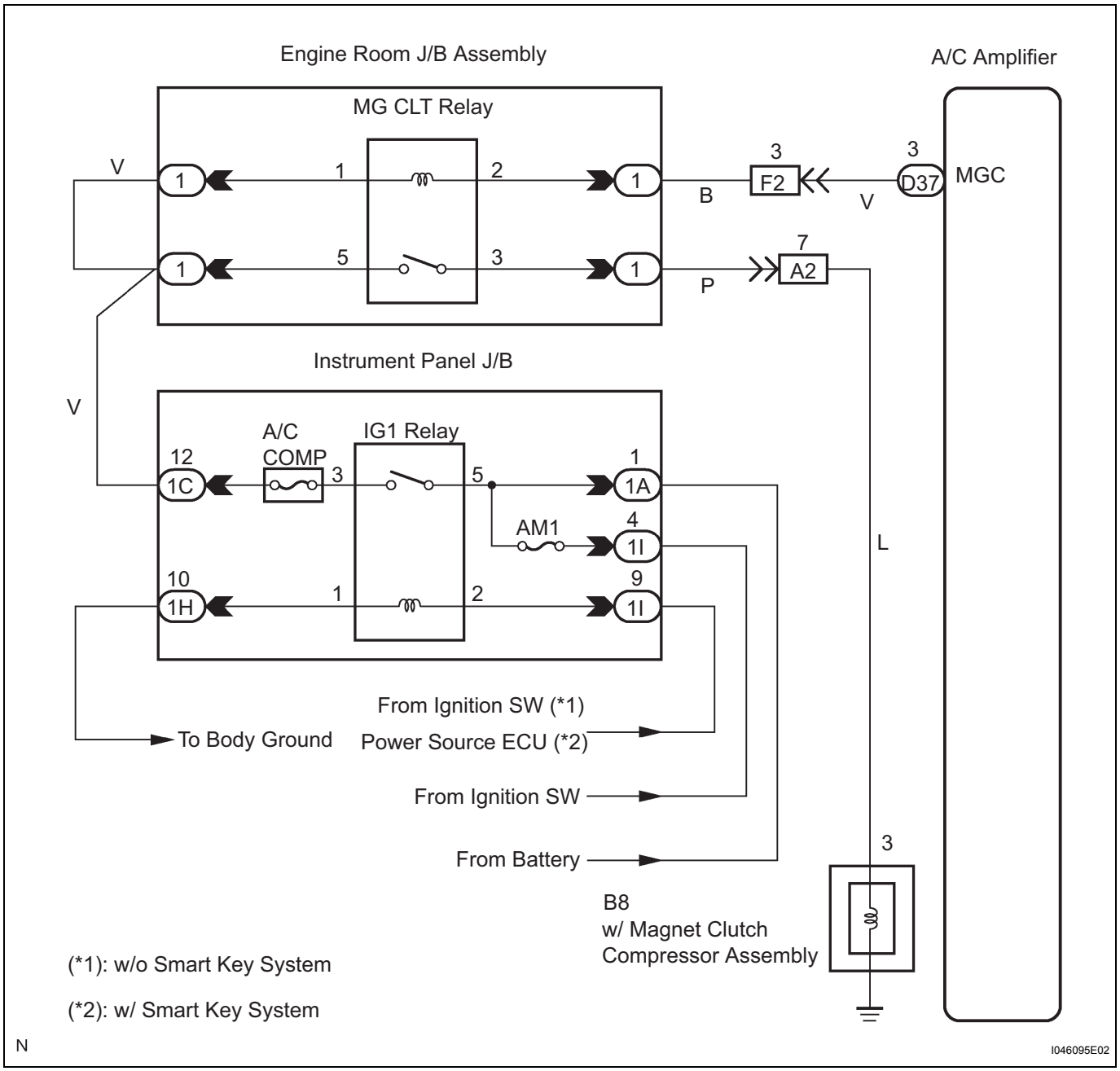
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Compressor Circuit

DESCRIPTION

When the A/C switch is turned on, the magnetic clutch ON signal is sent from the MGC terminal of the A/C amplifier. Then, the MG CLT relay turns on to operate the magnetic clutch.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Connect the intelligent tester to DLC3.

AC

(b) Turn the ignition switch on (IG) and push the intelligent tester main switch on.
(c) Select the item below in the ACTIVE TEST and then check that the relay operates.

DATA LIST / AIR CONDITIONER:

Item	Measurement Item / Display (Range)	Diagnostic Note
A/C MAG CLUTCH	Magnetic clutch relay / OFF,ON	-

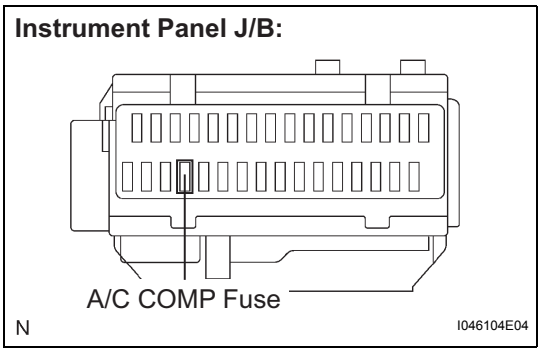
NG → **Go to step 2**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

2 INSPECT FUSE (A/C COMP)

Instrument Panel J/B:



(a) Remove the A/C COMP fuse from the instrument panel J/B.
(b) Measure the resistance according to the value(s) in the table below.

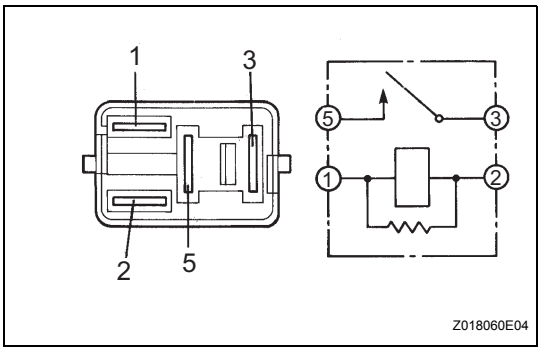
Resistance

Tester item	Condition	Specified condition
A/C COMP fuse	Always	Below 1 Ω

NG → **REPLACE FUSE (A/C COMP)**

OK

3 INSPECT MAGNETIC CLUTCH RELAY



(a) Remove the MG CLT relay (magnetic clutch relay) from engine room R/B and J/B.
(b) Measure the resistance according to the value(s) in the table below.

Resistance

Tester connection	Condition	Specified condition
3 - 5	Always	10 kΩ or higher
3 - 5	When Battery voltage is applied to terminals 1 and 2	Below 1 Ω (When Battery voltage is applied to terminals 1 and 2)

NOTICE:
While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

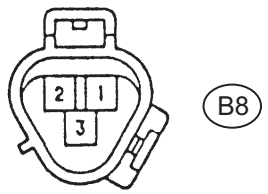
NG → **REPLACE MAGNETIC CLUTCH RELAY**

OK

AC

4 INSPECT W/MAGNETIC CLUTCH COMPRESSOR ASSEMBLY

w/ Magnetic Clutch Compressor Assembly Connector Front View:



E005280E13

Ie–3–2

(a) Disconnect the connector from the w/ magnet clutch compressor assembly.
(b) Measure the resistance according to the value(s) in the table below.

Resistance

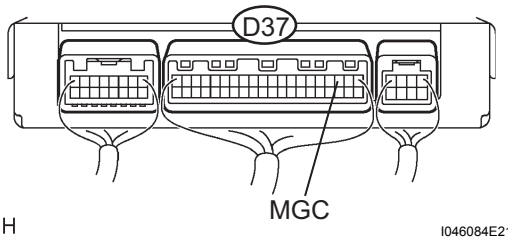
Tester connection	Condition	Specified condition
B8-3 - Body Ground	Always	Below 1 Ω

NG → **REPLACE W/MAGNETIC CLUTCH COMPRESSOR ASSEMBLY**

OK

5 INSPECT AIR CONDITIONING AMPLIFIER

Air Conditioning Amplifier Connector Wire Harness Side:



I046084E21

(a) Remove the A/C amplifier and disconnect the connector.
(b) Turn the ignition switch on (IG).
(c) Measure the voltage according to the value(s) in the table below.

voltage

Tester connection	Condition	Specified condition
D37-3 (MGC)- Body Ground	Magnet clutch: ON	Below 1 V
D37-3 (MGC)- Body Ground	Magnet clutch: OFF	10 to 14 V

Result

Result	Proceed to
NG	A
OK (w/o Smart key system)	B
OK (w/Smart key system)	C

B → **GO TO STARTING SYSTEM**

C → **GO TO PUSH BUTTON START SYSTEM**

A

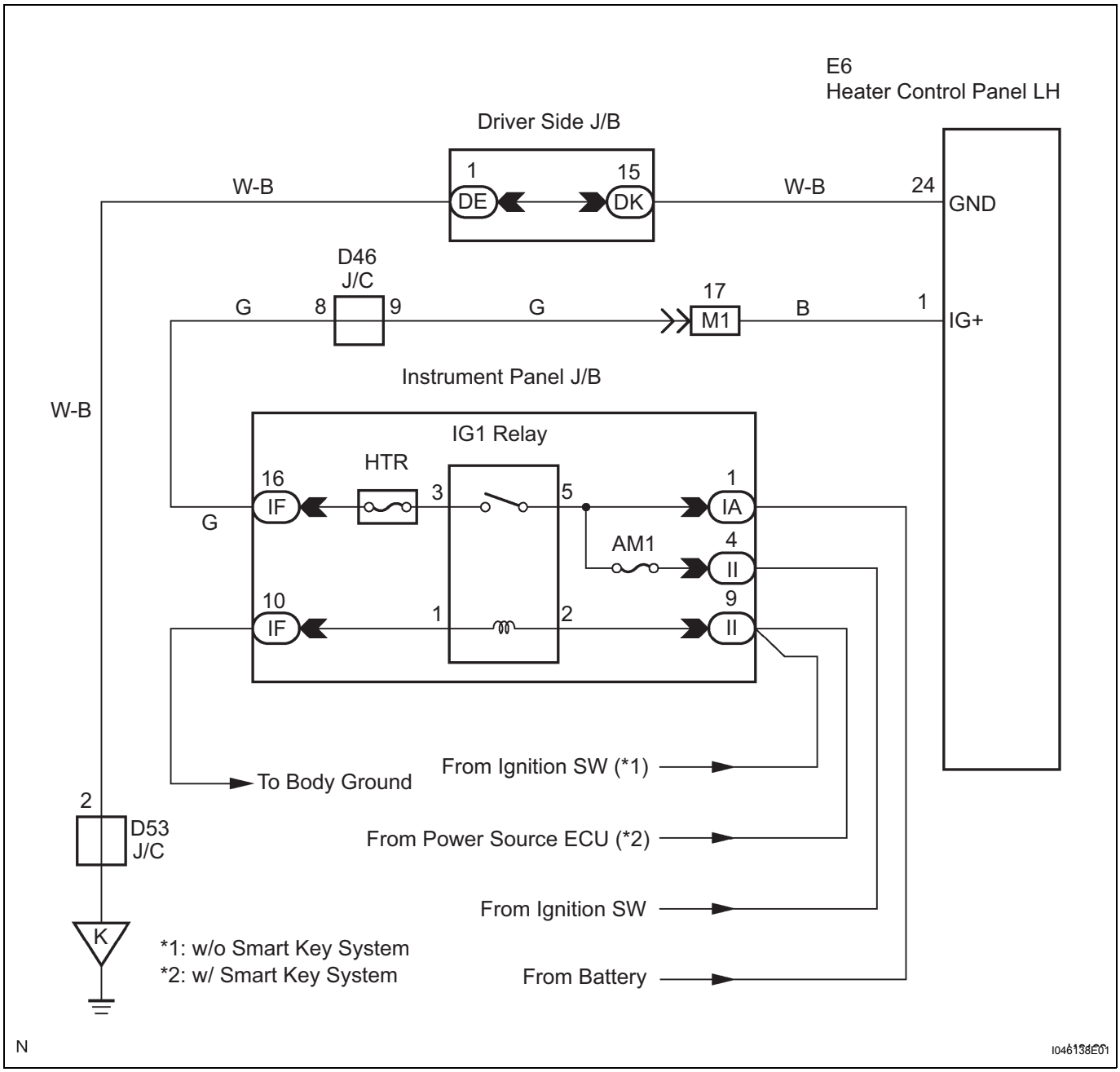
REPLACE AIR CONDITIONING AMPLIFIER

Heater Control Panel Power Source Circuit

DESCRIPTION

Battery voltage is supplied to the heater control panel through the HTR fuse.

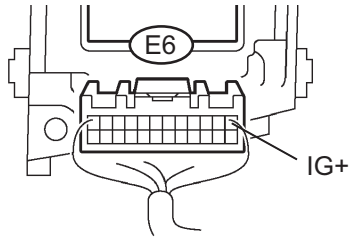
WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK HARNESS AND CONNECTOR (IG+ - BODY GROUND)

Heater Control Panel LH Connector Wire Harness View:



(a) Disconnect the connector from heater control panel LH.
(b) Measure the voltage according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
E6-1 (IG+) - Body ground	Ignition switch on (IG)	10 to 14 V
E6-1 (IG+) - Body ground	Ignition switch off	Below 1 V

Result

Result	Proceed to
OK	A
NG (w/o Smart key system)	B
NG (w/ Smart key system)	C

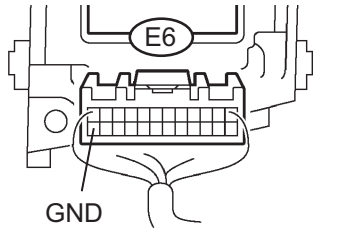
B → GO TO STARTING SYSTEM

C → GO TO PUSH BUTTON START SYSTEM

A

2 CHECK HARNESS AND CONNECTOR (GND - BODY GROUND)

Heater Control Panel LH Connector Wire Harness View:



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

Resistance

Tester connection (Symbols)	Condition	Specified condition
E6-24 (GND) - Body ground	Always	Below 1 Ω

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

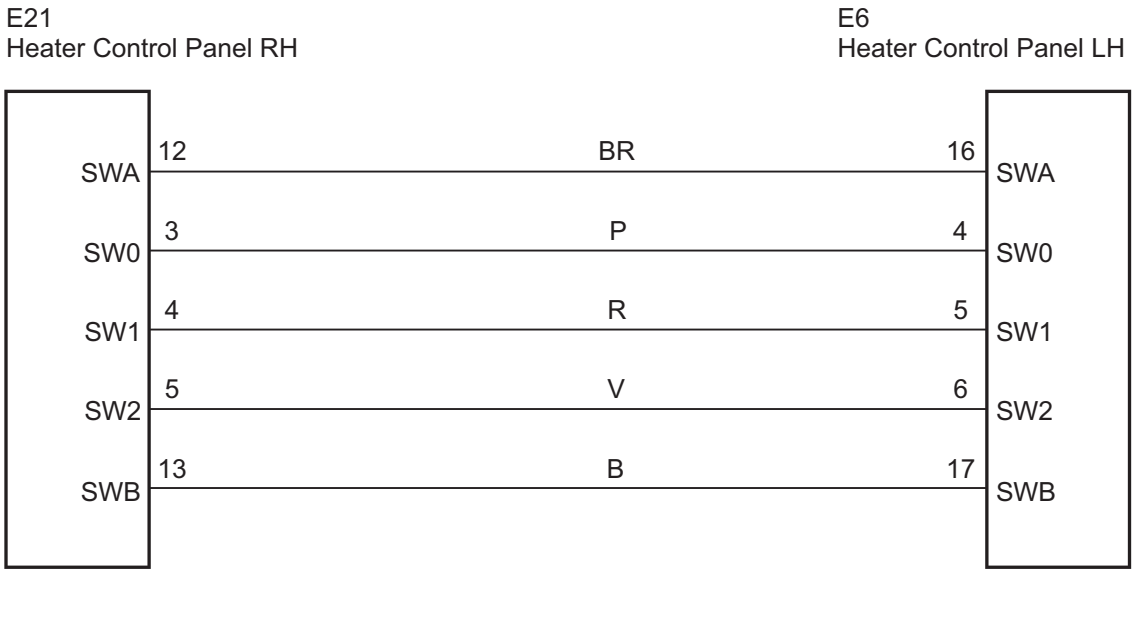
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Heater Control Switch Circuit

DESCRIPTION

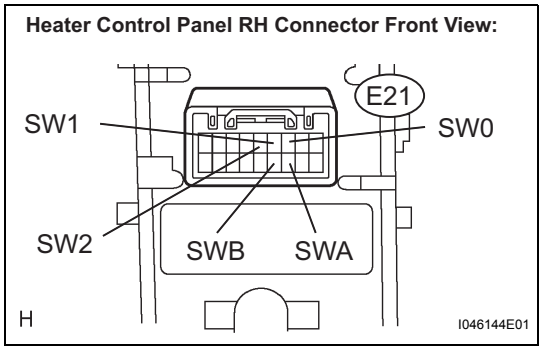
The heater control panel LH receives the heater control panel switch operation signal from the heater control panel RH.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT HEATER CONTROL PANEL RH



(a) Remove the heater control panel RH.
(b) Disconnect the connector from heater control panel RH.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

Tester item (Symbols)	Condition	Specified condition
E21-13 (SWB) - E21-5 (SW2)	REC switch: ON	Below 1 Ω
E21-13 (SWB) - E21-3 (SW0)	OFF switch: ON	Below 1 Ω
E21-13 (SWB) - E21-4 (SW1)	P-TEMP UP switch: ON	Below 1 Ω
E21-12 (SWA) - E21-5 (SW2)	A/C switch: ON	Below 1 Ω
E21-12 (SWA) - E21-3 (SW0)	AUTO switch: ON	Below 1 Ω
E21-12 (SWA) - E21-4 (SW1)	P-TEMP DW switch: ON	Below 1 Ω

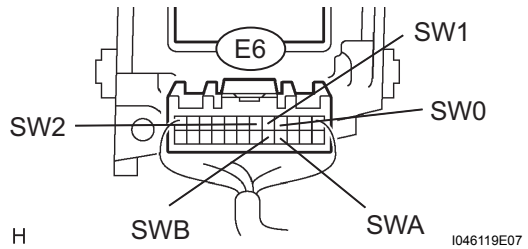
Tester item (Symbols)	Condition	Specified condition
E21-13 (SWB) - E21-5 (SW2)	REC switch: OFF	10 kΩ or higher
E21-13 (SWB) - E21-3 (SW0)	OFF switch: OFF	10 kΩ or higher
E21-13 (SWB) - E21-4 (SW1)	P-TEMP UP switch: OFF	10 kΩ or higher
E21-12 (SWA) - E21-5 (SW2)	A/C switch: OFF	10 kΩ or higher
E21-12 (SWA) - E21-3 (SW0)	AUTO switch: OFF	10 kΩ or higher
E21-12 (SWA) - E21-4 (SW1)	P-TEMP DW switch: OFF	10 kΩ or higher

NG → REPLACE HEATER CONTROL PANEL RH

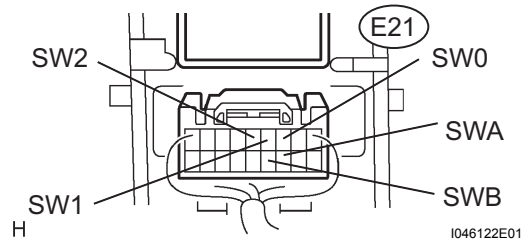
OK

2 CHECK HARNESS AND CONNECTOR (HEATER CONTROL PANEL RH - HEATER CONTROL PANEL LH)

Heater Control Panel RH Connector Wire Harness View:



Heater Control Panel LH Connector Wire Harness View:



(a) Disconnect the connector from heater control panel LH.

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

Resistance

Tester connection (Symbols)	Condition	Specified condition
E6-16 (SWA) - E21-12 (SWA)	Always	Below 1 Ω
E6-4 (SW0) - E21-3 (SW0)	Always	Below 1 Ω
E6-5 (SW1) - E21-4 (SW1)	Always	Below 1 Ω
E6-6 (SW2) - E21-5 (SW2)	Always	Below 1 Ω
E6-17 (SWB) - E21-13 (SWB)	Always	Below 1 Ω
E6-16 (SWA) - Body ground	Always	10 kΩ or higher
E6-4 (SW0) - Body ground	Always	10 kΩ or higher
E6-5 (SW1) - Body ground	Always	10 kΩ or higher
E6-6 (SW2) - Body ground	Always	10 kΩ or higher

Tester connection (Symbols)	Condition	Specified condition
E6-17 (SWB) - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

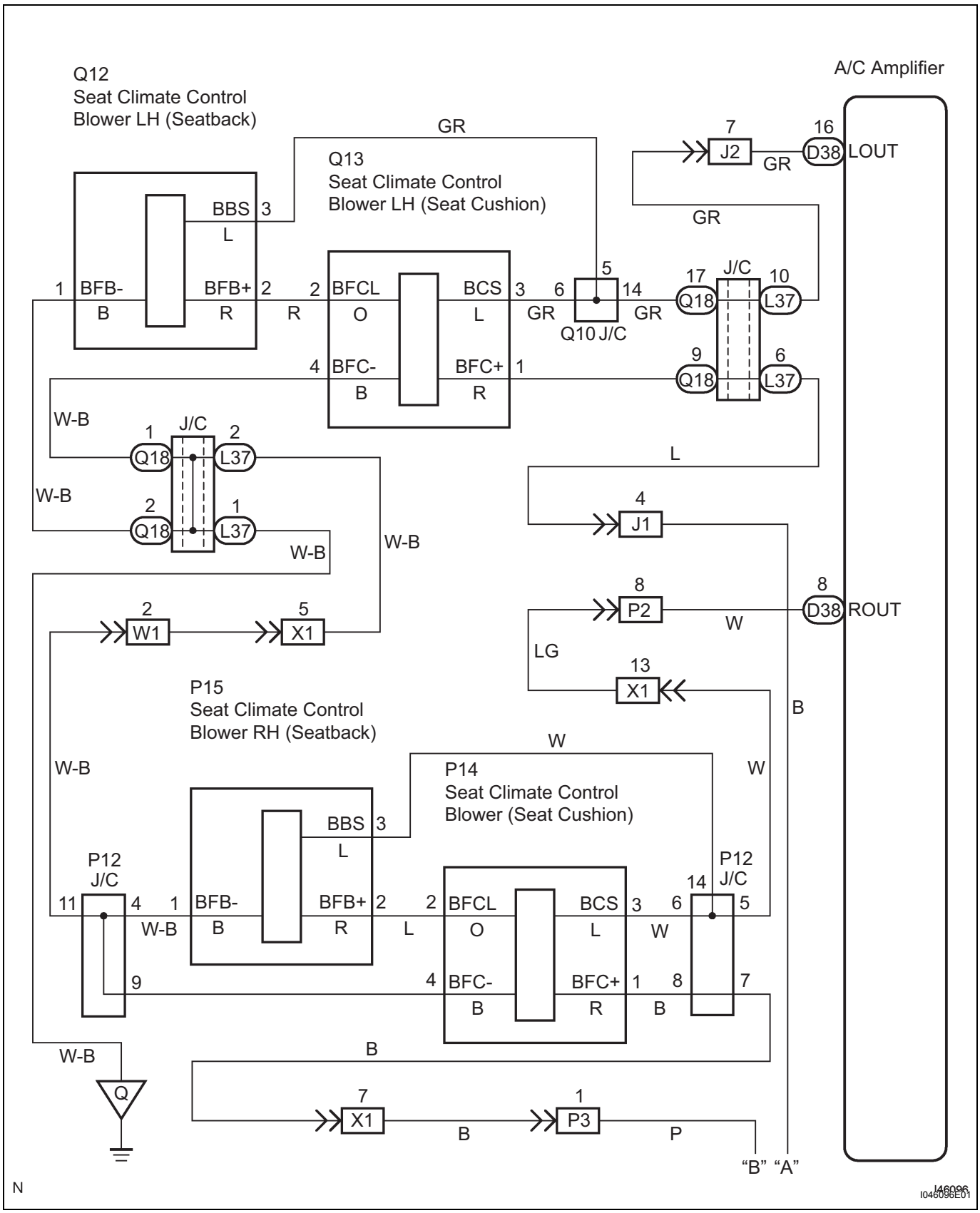
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

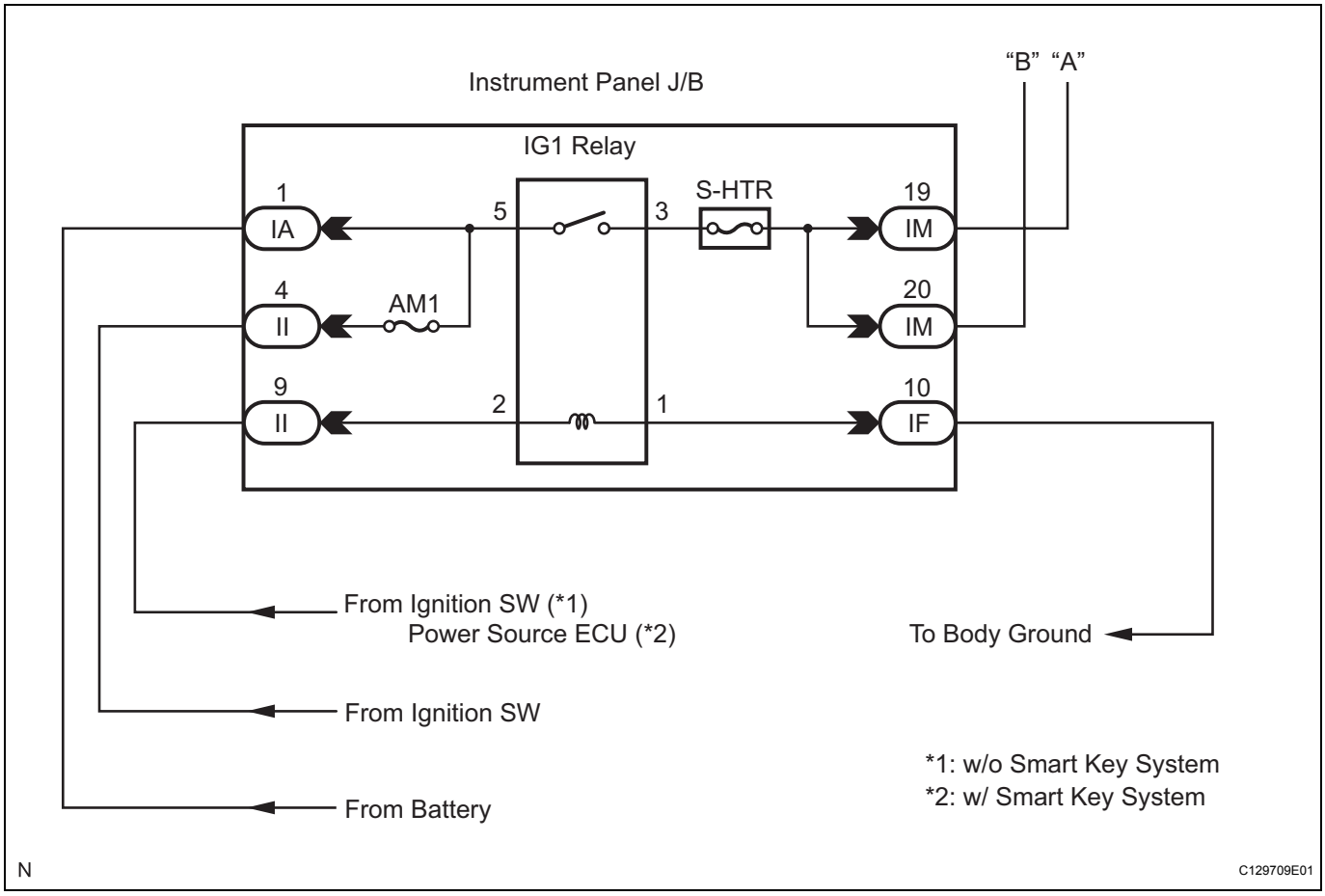
Seat Blower Control Circuit

DESCRIPTION

The seat blower changes airflow volume according to a signal from the A/C amplifier.

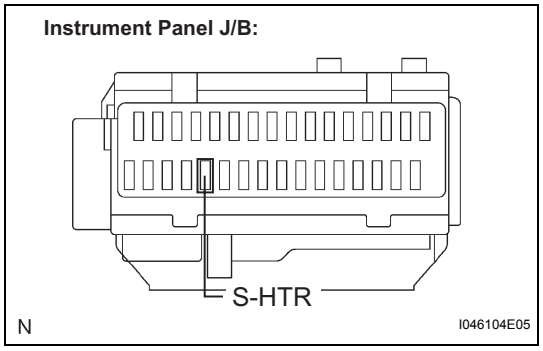
WIRING DIAGRAM





INSPECTION PROCEDURE

1	INSPECT FUSE (S-HTR)



(a) Remove the S-HTR fuse from the instrument panel J/B.
(b) Measure the resistance according to the value(s) in the table below.

Resistance

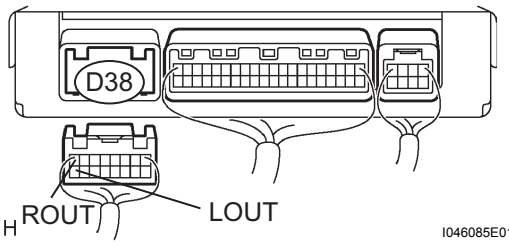
Tester item	Condition	Specified condition
S-HTR fuse	Always	Below 1 Ω

NG → **REPLACE FUSE (S-HTR)**

OK

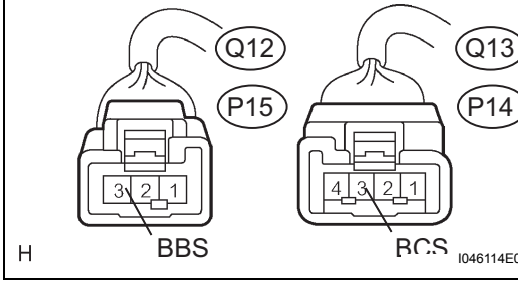
2 CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - SEAT CLIMATE CONTROL BLOWER)

Air Conditioning Amplifier Connector Wire Harness View:



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

Seat Climate Control Blower Connector Front View:



(b) Disconnect the connector from the seat climate control blower.

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

Resistance

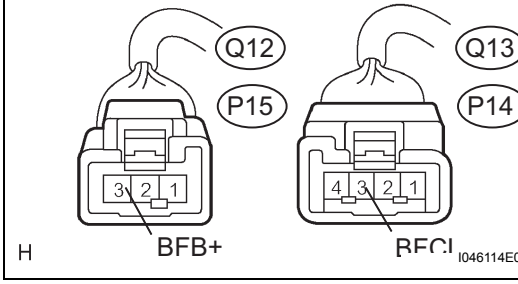
Tester connection (Symbols)	Condition	Specified condition
D38-16 (LOUT) - Q13-3 (BCS)	Always	Below 1 Ω
D38-16 (LOUT) - Q12-3 (BBS)	Always	Below 1 Ω
D38-8 (ROUT) - P14-3 (BCS)	Always	Below 1 Ω
D38-8 (ROUT) - P15-3 (BBS)	Always	Below 1 Ω
D38-16 (LOUT) - Body ground	Always	10 kΩ or higher
D38-8 (ROUT) - Body ground	Always	10 kΩ or higher

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

OK

3 CHECK HARNESS AND CONNECTOR (SEAT CUSHION CLIMATE BLOWER - SEAT BACK CLIMATE BLOWER)

Seat Climate Control Blower Connector Front View:



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

Resistance

Tester connection (Symbols)	Condition	Specified condition
Q12-2 (BFB+) - Q13-2 (BFCL)	Always	Below 1 Ω
P15-2 (BFB+) - P14-2 (BFCL)	Always	Below 1 Ω
Q12-2 (BFB+) - Body ground	Always	10 kΩ or higher

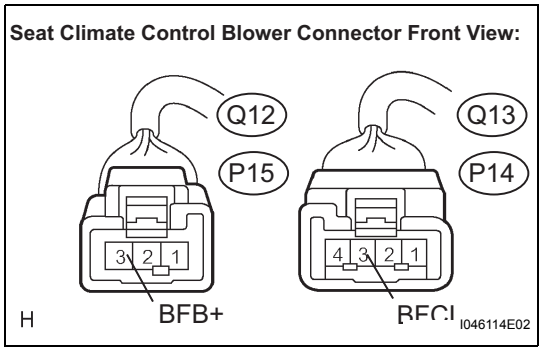
AC

Tester connection (Symbols)	Condition	Specified condition
P15-2 (BFB+) - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4 CHECK HARNESS AND CONNECTOR (SEAT CLIMATE CONTROL BLOWER - BATTERY)



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

Resistance

Tester connection (Symbols)	Condition	Specified condition
Q13-1 (BFC+) - Body ground	Ignition switch off	Below 1 Ω
Q13-1 (BFC+) - Body ground	Ignition switch on (IG)	10 to 14 V
P14-1 (BFC+) - Body ground	Ignition switch off	Below 1 Ω
P14-1 (BFC+) - Body ground	Ignition switch on (IG)	10 to 14 V

Result

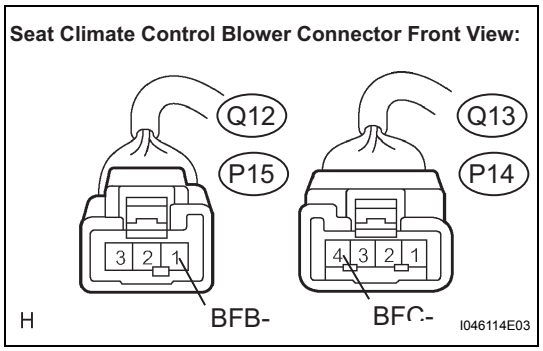
Result	Proceed to
OK	A
NG (w/o Smart key system)	B
NG (w/ Smart key system)	C

B → GO TO STARTING SYSTEM

C → GO TO PUSH BUTTON START SYSTEM

A

5 CHECK HARNESS AND CONNECTOR (SEAT CLIMATE CONTROL BLOWER - BODY GROUND)



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

Resistance

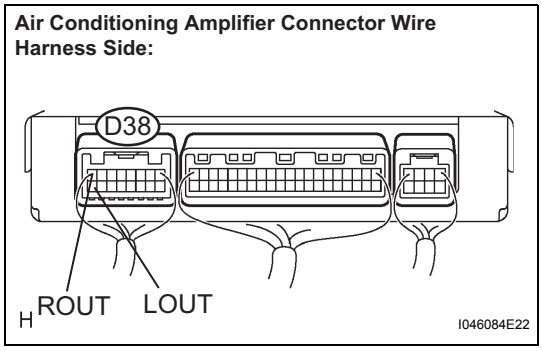
Tester connection (Symbols)	Condition	Specified condition
Q12-1 (BFB-) - Body ground	Always	Below 1 Ω
Q13-4 (BFC-) - Body ground	Always	Below 1 Ω
P14-4 (BFC-) - Body ground	Always	Below 1 Ω
P15-1 (BFB-) - Body ground	Always	Below 1 Ω

AC

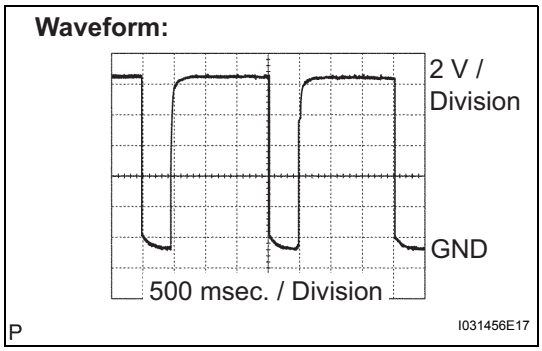
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

6 INSPECT AIR CONDITIONING AMPLIFIER



(a) Remove the A/C amplifier with connectors still connected.
(b) Turn the ignition switch on (IG).



(c) Measure the waveform according to the value(s).
Waveform

Tester connection (Symbols)	Connection	Specified condition
D38-8 (ROUT) - Body ground	Seat heater switch: ON	See waveform
D38-16 (LOUT) - Body ground	Seat heater switch: ON	See waveform

OK:
Waveform appears as shown in the illustration.
HINT:
Waveform varies with the blower level.

NG → REPLACE AIR CONDITIONING AMPLIFIER

OK

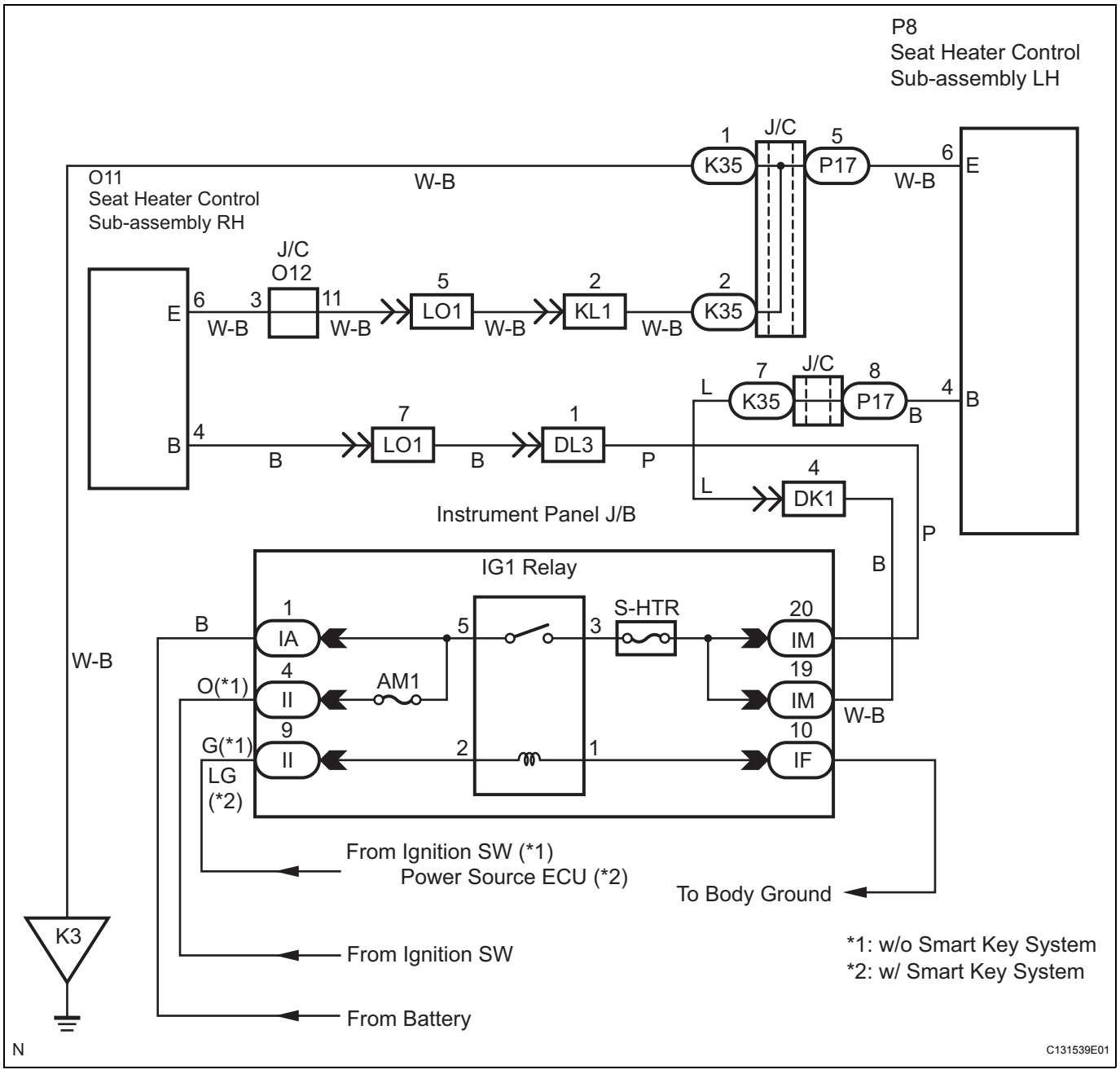
REPLACE SEAT CLIMATE CONTROL BLOWER

Seat Heater Control Power Source Circuit

DESCRIPTION

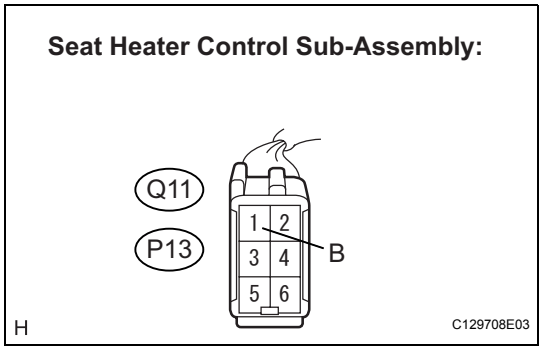
Battery voltage is supplied to the seat heater control sub-assembly through the S-HTR fuse.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK HARNESS AND CONNECTOR (B - BATTERY)



(a) Disconnect the connector from seat heater control sub-assembly.
(b) Measure the voltage according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
Q11-1 (B) - Body ground	Ignition switch on (IG)	10 to 14 V
Q11-1 (B) - Body ground	Ignition switch off	Below 1 V
P13-1 (B) - Body ground	Ignition switch on (IG)	10 to 14 V
P13-1 (B) - Body ground	Ignition switch off	Below 1 V

Result

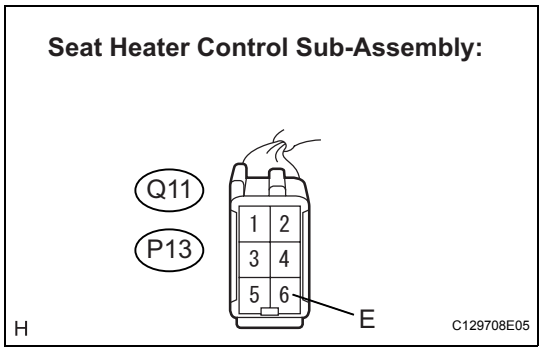
Result	Proceed to
OK	A
NG (w/o Smart key system)	B
NG (w/ Smart key system)	C

B → GO TO STARTING SYSTEM

C → GO TO PUSH BUTTON START SYSTEM

A

2	CHECK HARNESS AND CONNECTOR (E - BODY GROUND)



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

Resistance

Tester connection (Symbols)	Condition	Specified condition
Q11-6 (E) - Body ground	Always	Below 1 Ω
P13-6 (E) - body ground	Always	Below 1 Ω

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

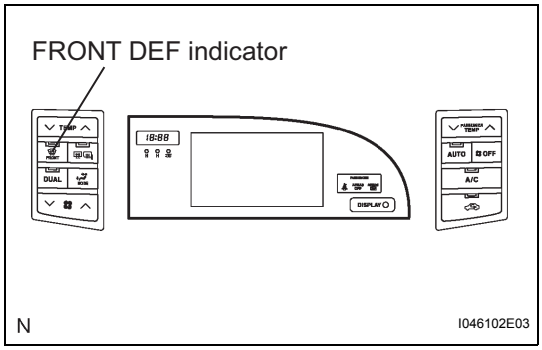
CUSTOMIZE PARAMETERS

HINT:
The followings are the possible items to be customized.
NOTICE:

- **After confirming whether the items of the customer's request is applicable or not for the customized items, perform the customization.**
- **Be sure to record the current value before customizing.**
- **When troubleshooting, be aware that function may be set to OFF by customizing. (Example: In the case of "The wireless operation does not function", check that wireless operation is not set to OFF by customizing, then perform the troubleshooting.)**

AIR CONDITIONER

DISPLAY (ITEM)	DEFAULT	CONTENTS	SETTING
SET TEMP SHIFT (Set Temperature Shift)	NORMAL	To control with the shifted temperature against the display temperature.	+2C / +1C / NORMAL / -1C / -2C
AIR INLET MODE (Air Inlet Mode)	AUTO	In case of turning the A/C ON when you desire to make the compartment cool down quickly, this is the function to change the mode automatically to RECIRCULATED mode.	MANUAL / AUTO
COMPRESSOR MODE (Compressor Mode)	AUTO	Function to turn the A/C ON automatically by pressing the AUTO button when the blower is ON and the A/C is OFF.	MANUAL / AUTO
COMPRS / DEF OPER (Compressor / Air Inlet DEF Operation)	LINK	Function to turn the A/C ON automatically linking with the FRONT DEF button when A/C OFF.	NORMAL / LINK
EVAP CTRL (Evaporator Control)	AUTO	Function to set the evaporator control to the AUTOMATIC position (AUTO) to save power or the coldest position (MANUAL) to dehumidify the air and to prevent the windows fogging up.	MANUAL / AUTO
BUTTON PRS BUZ (Button Press Buzzer)	ON	Function to sound a buzzer when a button is pressed.	OFF / ON
FOOT / EF MODE (Foot / DEF auto mode)	ON	Function to turn the air flow from FOOT / DEF ON automatically when AUTO MODE is ON.	OFF / ON
AUTO BLOW UP (Foot / DEF automatic blow up function)	ON	Function to switch the blower level automatically when the defroster is ON.	OFF / ON
AMBIENT TMP SFT (Ambient Temperature Shift)	NORMAL	To control with the shifted ambient temperature against the display ambient temperature.	+3C / +2C / +1C / NORMAL / -1C / -2C / -3C
FOOT AIR LEAK (Foot Air Leak)	ON	Function to cut off the airstream felt underfoot while the vehicle is moving.	OFF / ON

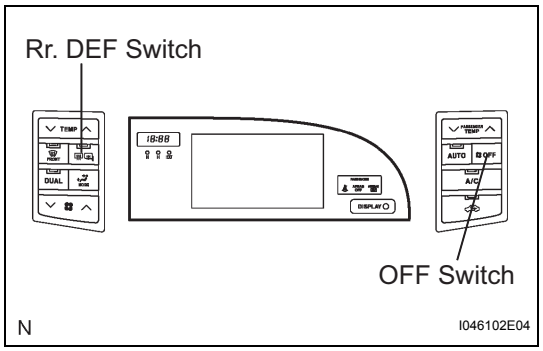


INITIALIZATION

1. STEP MOTORS INITIALIZING FUNCTION

(a) Step motor initializing procedure (Automatic initializing).

(1) When the battery is reconnected and the ignition switch is turned to the on (IG) for the first time, the initializing function of the step motors is activated. IN this case, the "FRONT DEF" indicator blinks.
HINT:
Initialization will be automatically completed after several seconds.

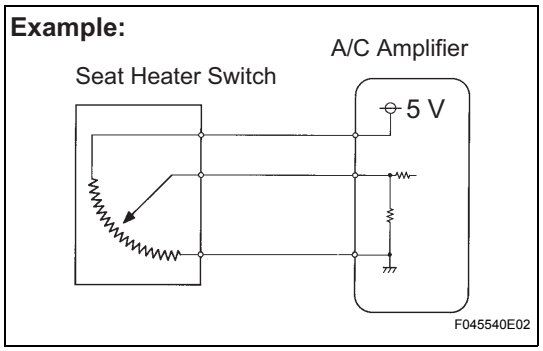


(2) If mode indication is different from the actual air outlet in actuator check, turn the ignition switch on (IG) while pressing the "Rr, DEF" and "OFF" switches simultaneously. Step motor initialization occurs and the "FRONT DEF" indicator blinks.

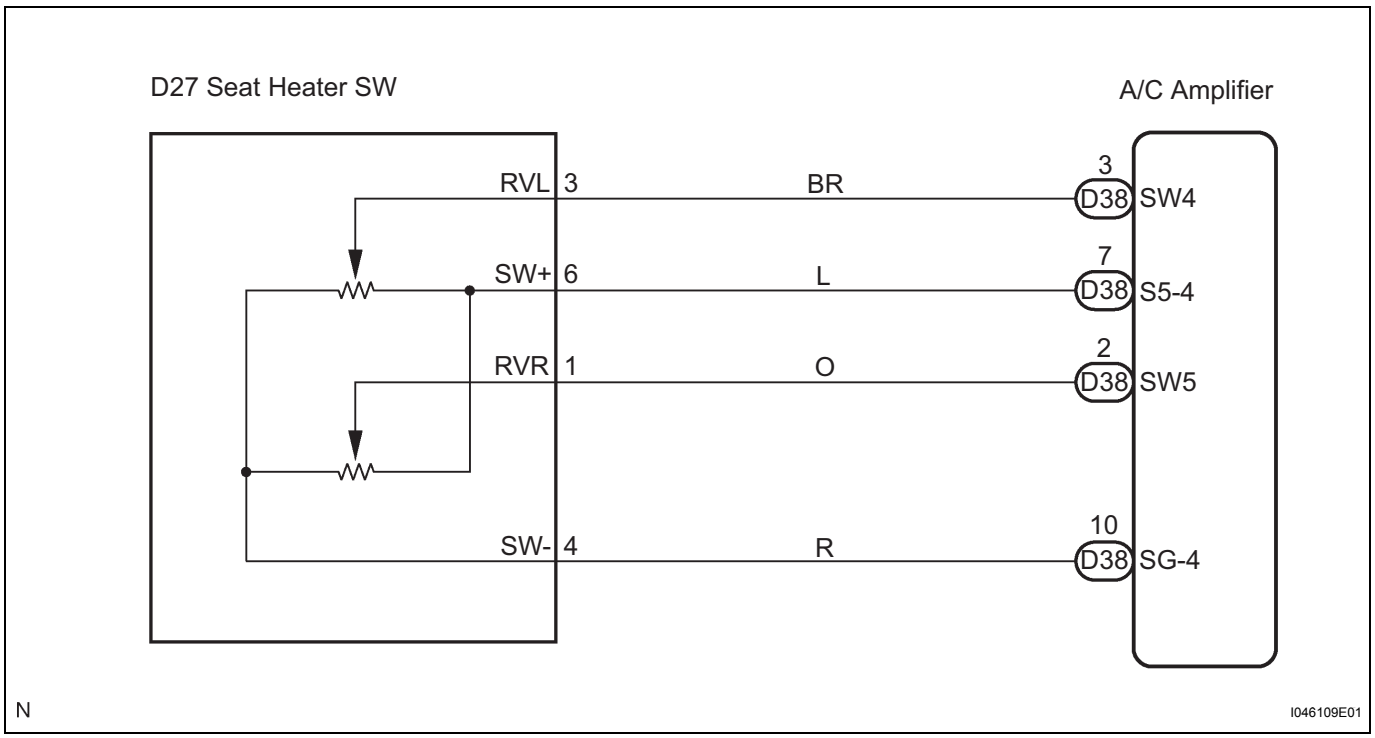
Seat Heater Switch Circuit

DESCRIPTION

Voltage of 5 V is output from the S5-4 terminal of the A/C amplifier to the seat heater SW. The SW4 and SW5 terminals of the A/C amplifier read changes in voltage sent back from the seat heater SW. The voltage sent back from the seat heater SW differs according to the set temperature of the seat heater SW.



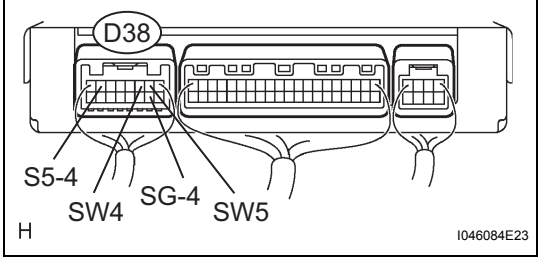
WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT AIR CONDITIONING AMPLIFIER

Air Conditioning Amplifier Connector Wire Harness View:



(a) Remove the A/C amplifier with connectors still connected.
(b) Turn the ignition switch on (IG).
(c) Measure the voltage according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
D38-7 (S5-4) - D38-10 (SG-4)	Ignition switch on (IG)	4.5 to 5.5 V
D38-3 (SW4), D38-2 (SW5) - D38-10 (SG-4)	Seat heater switch: COOL (HI)	0.17 V
D38-3 (SW4), D38-2 (SW5) - D38-10 (SG-4)	Seat heater switch: COOL (MID)	0.48 to 1.17 V
D38-3 (SW4), D38-2 (SW5) - D38-10 (SG-4)	Seat heater switch: COOL (LO)	1.31 to 2.01 V
D38-3 (SW4), D38-2 (SW5) - D38-10 (SG-4)	Seat heater switch: OFF	2.15 to 2.83 V
D38-3 (SW4), D38-2 (SW5) - D38-10 (SG-4)	Seat heater switch: HOT (LO)	2.97 to 3.67 V
D38-3 (SW4), D38-2 (SW5) - D38-10 (SG-4)	Seat heater switch: HOT (MID)	3.81 to 4.49 V
D38-3 (SW4), D38-2 (SW5) - D38-10 (SG-4)	Seat heater switch: HOT (HI)	4.8 V

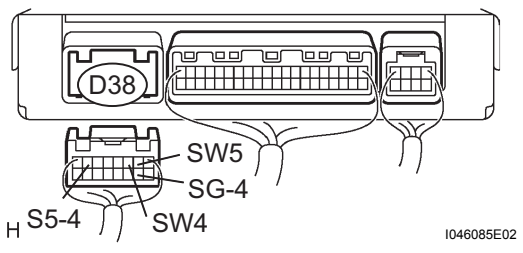
NG → Go to step 2

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

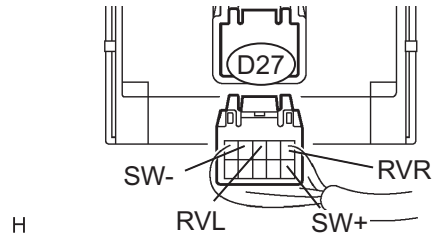
2	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - SEAT HEATER SWITCH)

Air Conditioning Amplifier Connector Wire Harness View:



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

Seat Heater Switch Connector Wire Harness View:



(b) Disconnect the connector from the seat heater switch.
(c) Measure the resistance according to the value(s) in the table below.

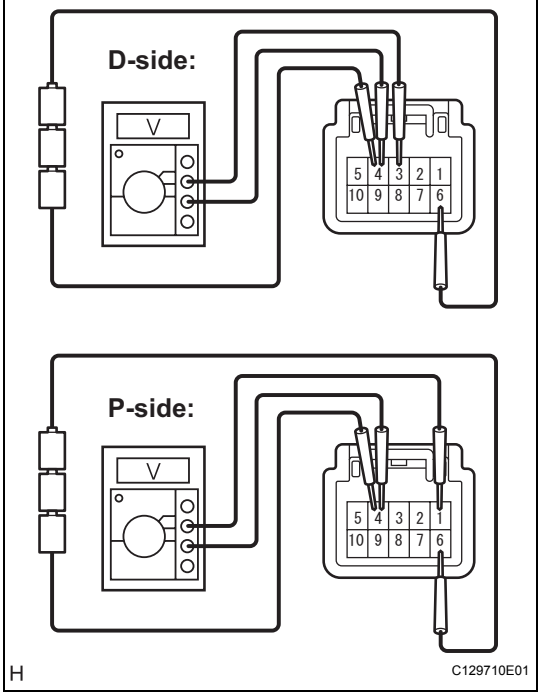
Resistance

Tester connection (Symbols)	Condition	Specified condition
D38-3 (SW4) - D27-3 (RVL)	Always	Below 1 Ω
D38-2 (SW5) - D27-1 (RVR)	Always	Below 1 Ω
D38-7 (S5-4) - D27-6 (SW+)	Always	Below 1 Ω
D38-10 (SG-4) - D27-4 (SW-)	Always	Below 1 Ω
D38-3 (SW4) - Body ground	Always	10 kΩ or higher
D38-2 (SW5) - Body ground	Always	10 kΩ or higher
D38-7 (S5-4) - Body ground	Always	10 kΩ or higher
D38-10 (SG-4) - Body ground	Always	10 kΩ or higher

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

OK

3 INSPECT SEAT HEATER SWITCH



(a) Connect the 3 dry cell batteries (1.5 V) in series.
(b) Remove the seat heater switch.
(c) Connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead from the battery to terminal 4.
(d) Measure the voltage between terminals 3*1, 1*2 and 4 according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
D27-6 (SW+) - D27-4 (SW-)	Always	4.0 to 5.0 V
D27-3 (RVL)*1, D27-1 (RVR)*2 - D27-4 (SW-)	Seat heater switch: COOL (HI)	0.15 V
D27-3 (RVL)*1, D27-1 (RVR)*2 - D27-4 (SW-)	Seat heater switch: COOL (MID)	0.43 to 1.05 V
D27-3 (RVL)*1, D27-1 (RVR)*2 - D27-4 (SW-)	Seat heater switch: COOL (LO)	1.18 to 1.81 V
D27-3 (RVL)*1, D27-1 (RVR)*2 - D27-4 (SW-)	Seat heater switch: OFF	1.94 to 2.55 V
D27-3 (RVL)*1, D27-1 (RVR)*2 - D27-4 (SW-)	Seat heater switch: HOT (LO)	2.67 to 3.30 V
D27-3 (RVL)*1, D27-1 (RVR)*2 - D27-4 (SW-)	Seat heater switch: HOT (MID)	3.43 to 4.04 V

AC

Tester connection (Symbols)	Condition	Specified condition
D27-3 (RVL)*1, D27-1 (RVR)*2 - D27-4 (SW-)	Seat heater switch: HOT (HI)	4.3 V

*1: Driver side
*2: Front passenger side

NG → REPLACE SEAT HEATER SWITCH

OK

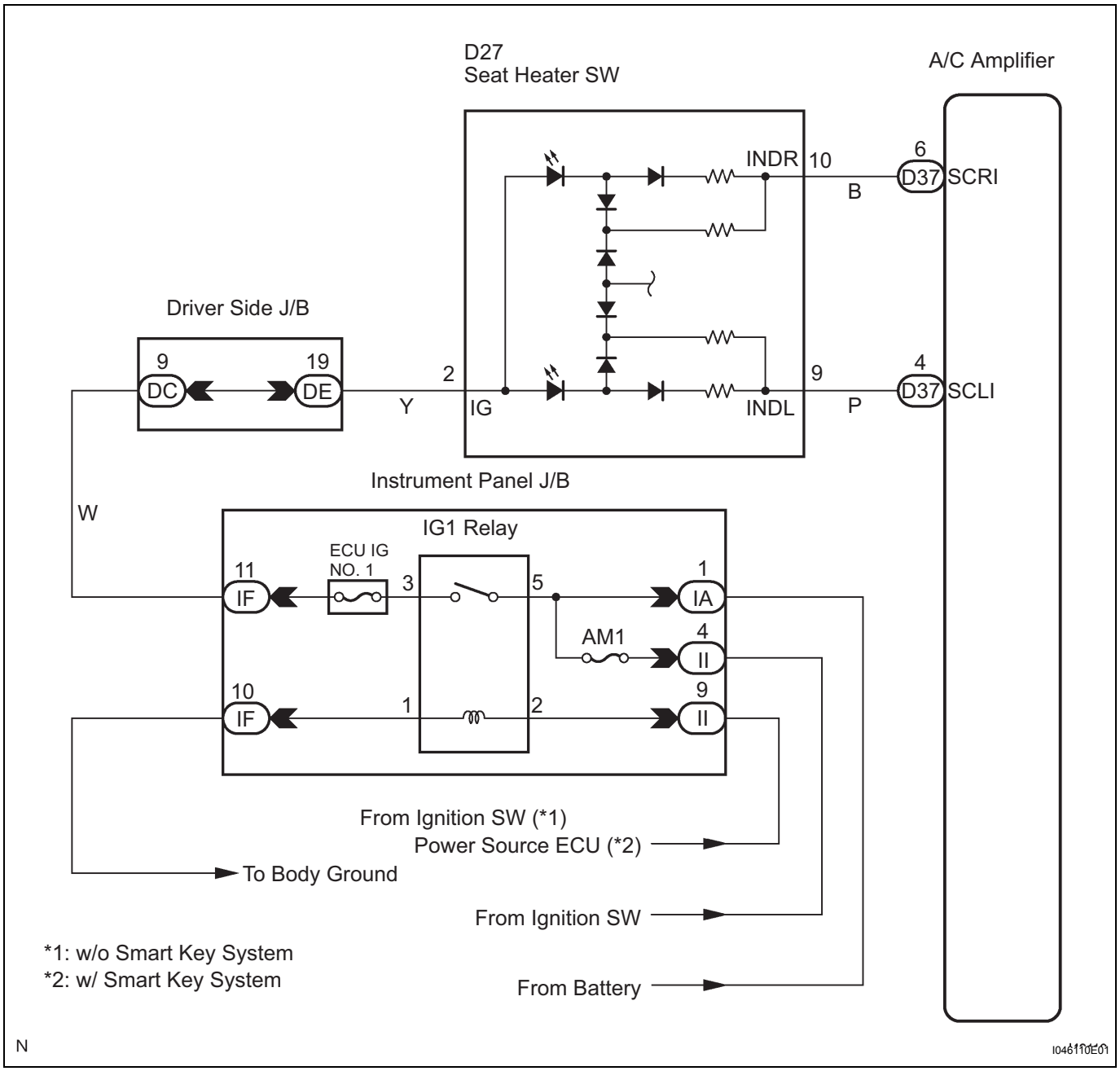
REPLACE AIR CONDITIONING AMPLIFIER

Seat Heater Switch Indicator Circuit

DESCRIPTION

Battery voltage is supplied to the seat heater switch through the S-HTR fuse. When the seat heater switch is turned on, the seat heater switch indicator comes on.

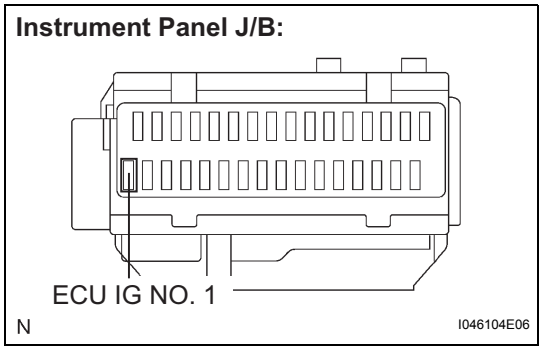
WIRING DIAGRAM



AC

INSPECTION PROCEDURE

1 INSPECT FUSE (ECU IG NO. 1)



(a) Remove the ECU IG NO. 1 fuse from the instrument panel J/B.
(b) Measure the resistance according to the value(s) in the table below.

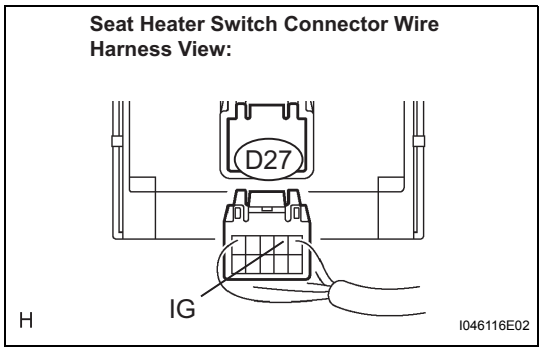
Resistance

Tester item	Condition	Specified condition
IG NO. 1 fuse	Always	Below 1 Ω

NG → **REPLACE FUSE (ECU IG NO. 1)**

OK

2 CHECK HARNESS AND CONNECTOR (SEAT HEATER SWITCH - BATTERY)



(a) Disconnect the connector from seat heater switch.
(b) Measure the voltage according to the value(s) in the table below.

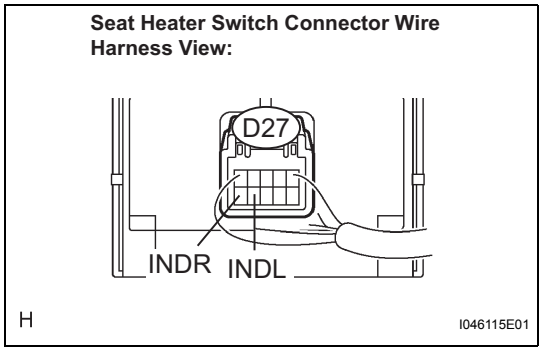
Voltage

Tester connection (Symbols)	Condition	Specified condition
D27-2 (IG) - Body ground	Ignition switch on (IG)	10 to 14 V
D27-2 (IG) - Body ground	Ignition switch off	Below 1 V

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

OK

3 INSPECT SEAT HEATER SWITCH



(a) Reconnect the connector to the seat heater switch.
(b) Measure the voltage according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
D27-10 (INDR) - Body ground	Ignition switch on (IG)	10 to 14 V
D27-9 (INDL) - Body ground	Ignition switch on (IG)	10 to 14 V
D27-10 (INDR) - Body ground	Ignition switch off	Below 1 V
D27-9 (INDL) - Body ground	Ignition switch off	Below 1 V

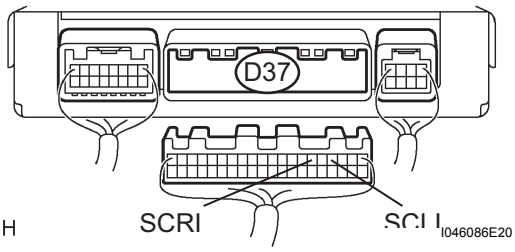
AC

NG → REPLACE SEAT HEATER SWITCH

OK

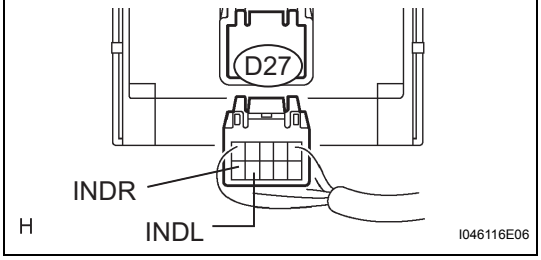
4	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - SEAT HEATER SWITCH)

Air Conditioning Amplifier Connector Wire Harness View:



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

Seat Heater Switch Connector Wire Harness View:



(b) Disconnect the connector from the seat heater switch.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

Tester connection (Symbols)	Condition	Specified condition
D37-6 (SCRI) - D27-10 (INDR)	Always	Below 1 Ω
D37-4 (SCLI) - D27-9 (INDL)	Always	Below 1 Ω
D37-6 (SCRI) - D27-10 (INDR)	Always	10 kΩ or higher
D37-4 (SCLI) - D27-9 (INDL)	Always	10 kΩ or higher

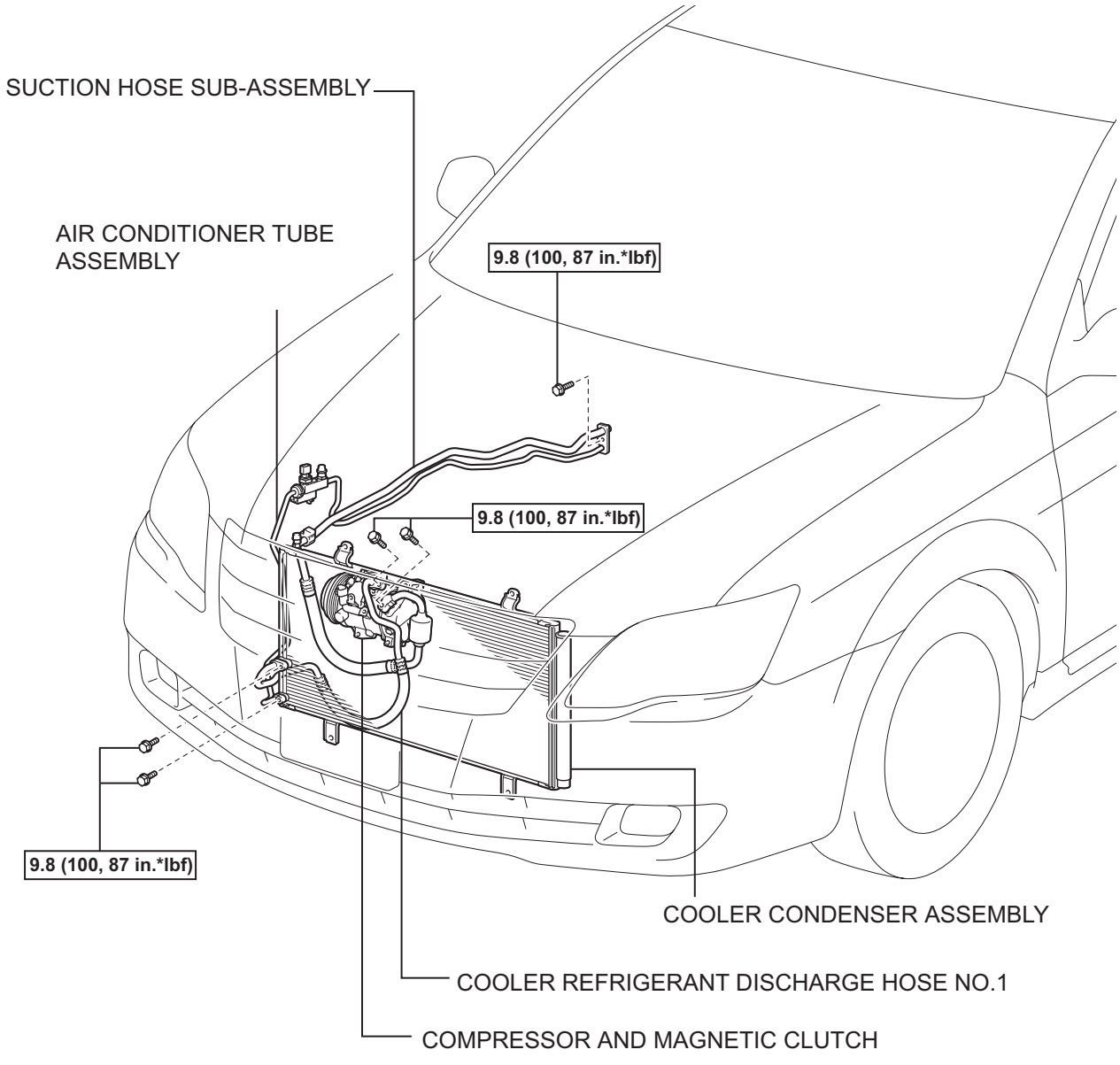
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER

REFRIGERANT LINE

COMPONENTS



N*m (kgf*cm, ft.*lbf) : Specified torque

P

C114914E01

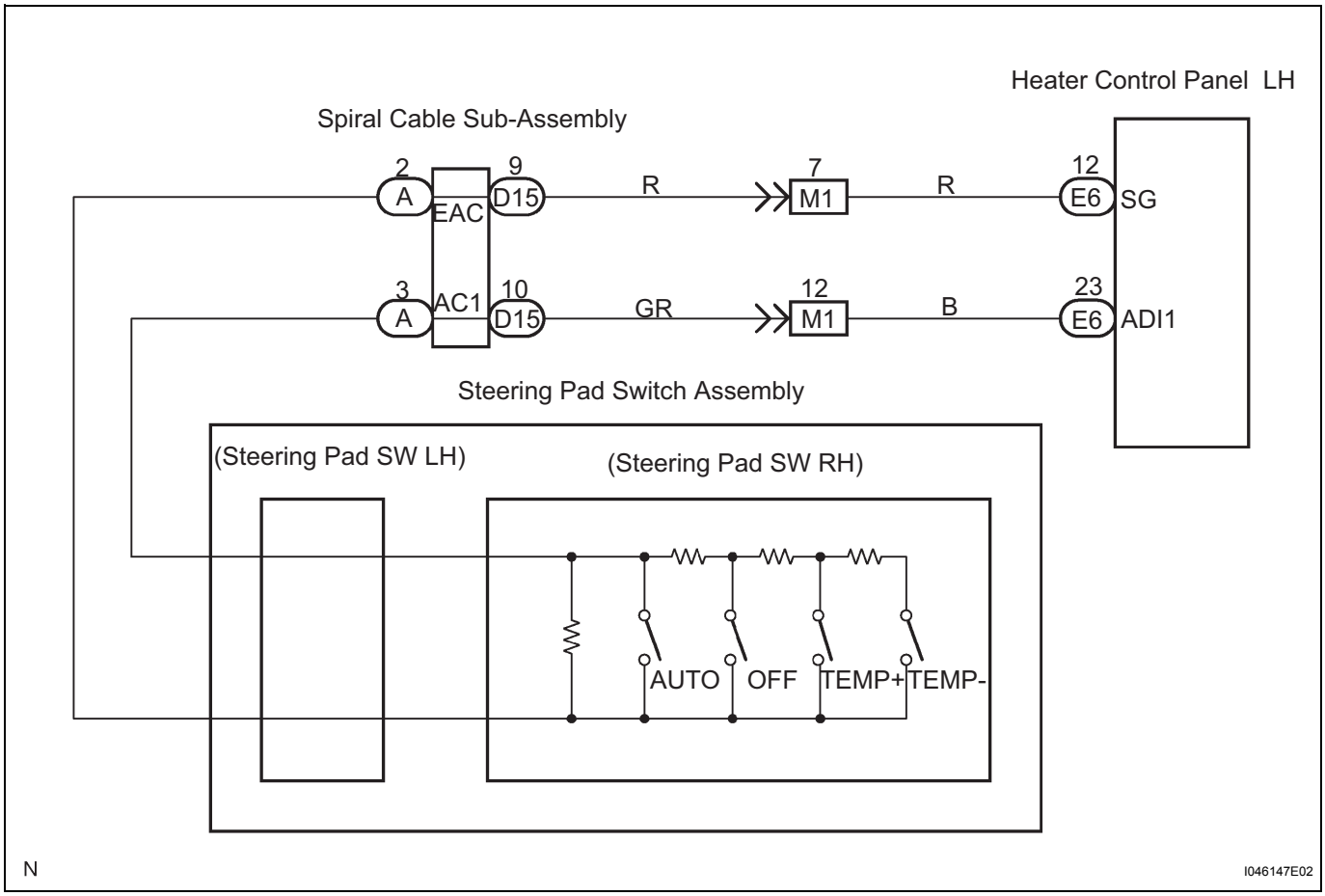
AC

Steering Pad Switch Circuit

DESCRIPTION

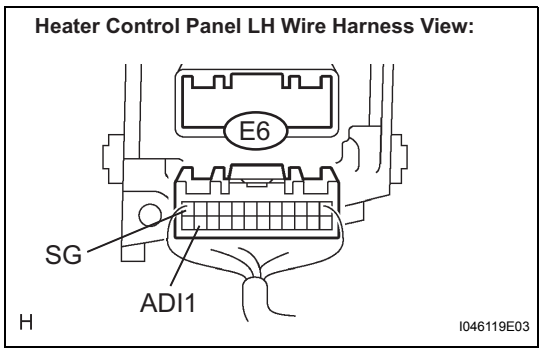
AUTO, OFF, TEMP UP (+), TEMP DOWN (-) switches are located on the steering pad switch. The resistance of the steering pad switch changes in accordance with switch operation. The heater control panel outputs voltage to the steering pad switch and reads voltage changes according to the resistance changes with switch operation.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT HEATER CONTROL PANEL (ADI1 - SG)



(a) Remove the heater control panel LH with connectors still connected.

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

Resistance

Tester connection (Symbols)	Condition	Specified condition
E6-23 (ADI1) - E6-12 (SG)	AUTO switch: ON	Below 2.5 Ω
E6-23 (ADI1) - E6-12 (SG)	OFF switch: ON	330 Ω

AC

Tester connection (Symbols)	Condition	Specified condition
E6-23 (ADI1) - E6-12 (SG)	TEMP+ switch: ON	1,010 Ω
E6-23 (ADI1) - E6-12 (SG)	TEMP- switch: ON	3,210 Ω

NG → Go to step 2

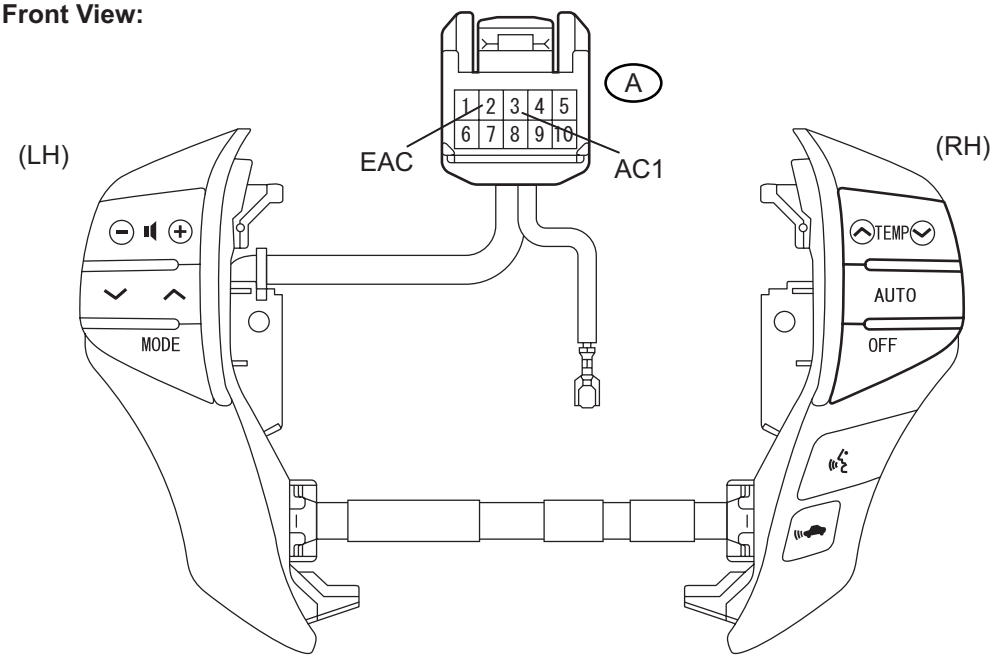
OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

2 INSPECT STEERING PAD SWITCH ASSEMBLY (AC - EAC)

(a) Remove the steering pad switch assembly.

Steering Pad Switch Assembly Connector Front View:



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

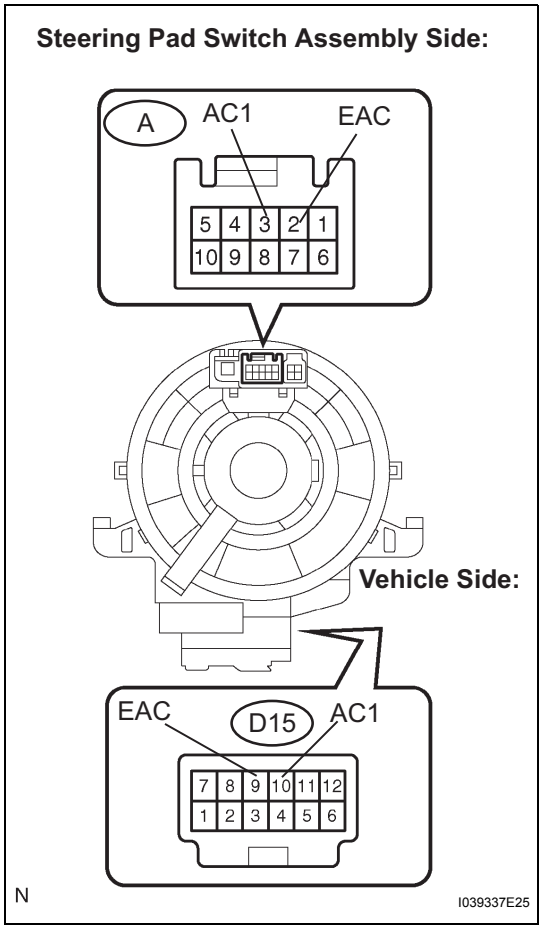
Resistance

Tester connection (Symbols)	Condition	Specified condition
A3 (AC1) - A2 (EAC)	AUTO switch: ON	Below 2.5 Ω
A3 (AC1) - A2 (EAC)	OFF switch: ON	330 Ω
A3 (AC1) - A2 (EAC)	TEMP+ switch: ON	1,010 Ω
A3 (AC1) - A2 (EAC)	TEMP- switch: ON	3,210 Ω

NG → REPLACE STEERING PAD SWITCH ASSEMBLY

OK

3	INSPECT SPIRAL CABLE SUB-ASSEMBLY



(a) Disconnect the connector from spiral cable sub-assembly.
(b) Measure resistance according to the value(s) in the table below.

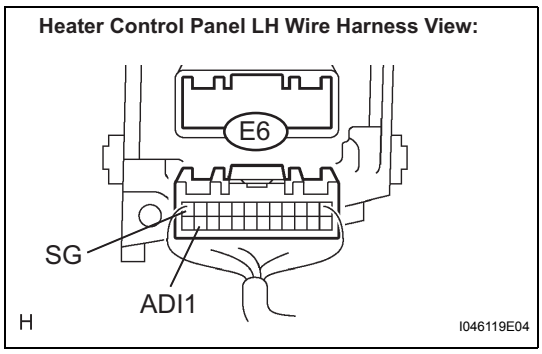
Resistance

Tester connection (Symbols)	Condition	Specified condition
D15-10 (AC1) - A-3 (AC1)	Always	Below 1 Ω
D15-9 (EAC) - A-2 (EAC)	Always	Below 1 Ω

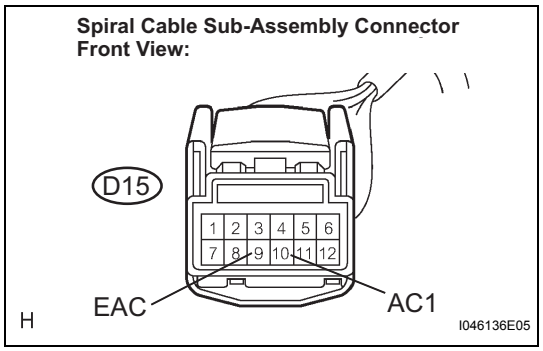
NG → REPLACE SPIRAL CABLE SUB-ASSEMBLY

OK

4	CHECK HARNESS AND CONNECTOR (HEATER CONTROL PANEL LH - SPIRAL CABLE SUB-ASSEMBLY)



(a) Disconnect the connector from heater control panel LH.



(b) Disconnect the connector from the spiral cable sub-assembly.

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

Resistance

Tester connection	Condition	Specified condition
E6-23 (ADI1) - D15-10 (AC1)	Always	Below 1 Ω
E6-12 (SG) - D15-9 (EAC)	Always	Below 1 Ω
E6-23 (ADI1) - D15-10 (AC1)	Always	10 kΩ or higher
E6-12 (SG) - D15-9 (EAC)	Always	10 kΩ or higher

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

OK

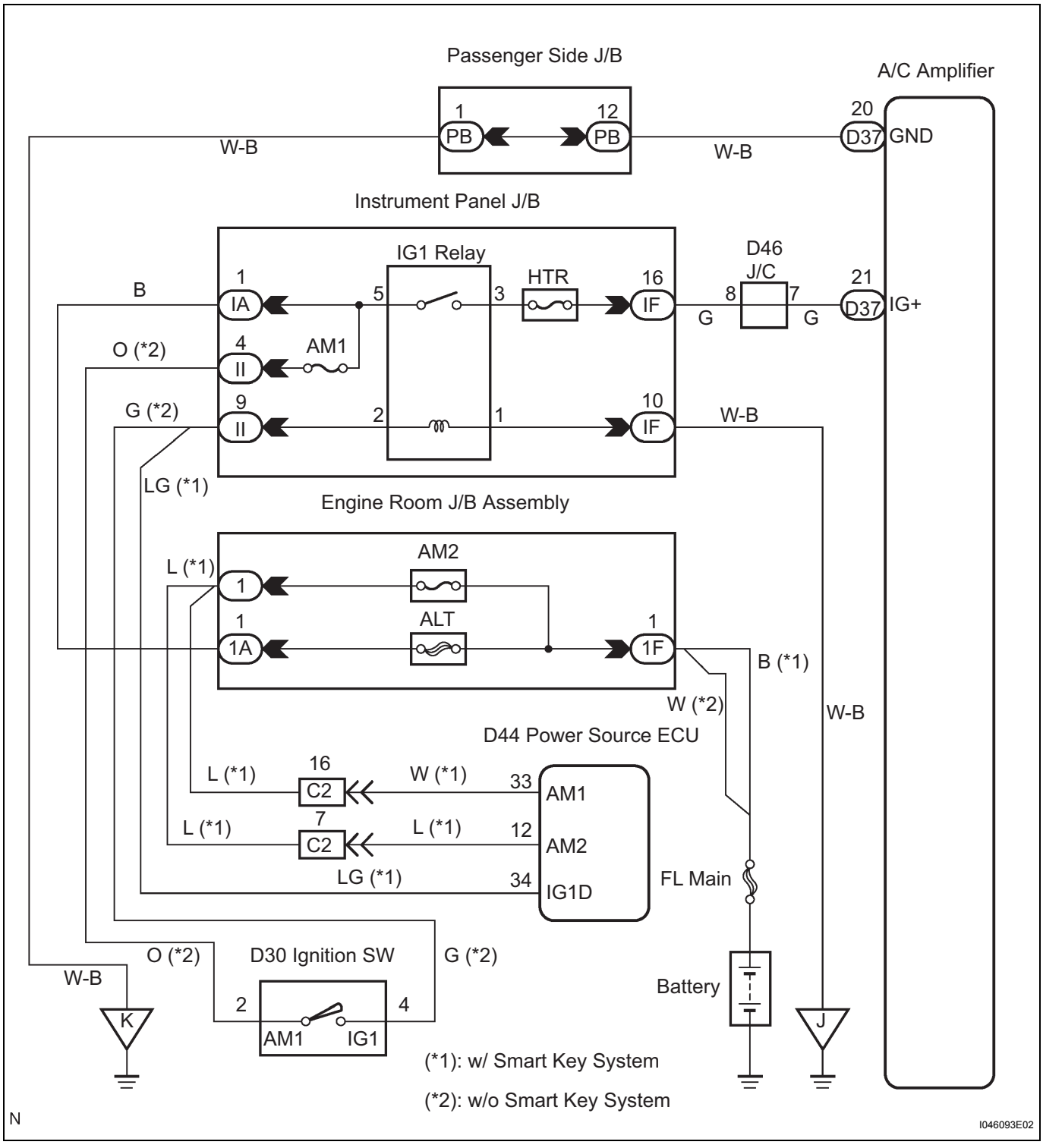
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

IG Power Source Circuit

DESCRIPTION

The main power source is supplied to the A/C amplifier when the ignition switch is turned to the on (IG). The power source supplied is used for operating the A/C amplifier and servomotor, etc.

WIRING DIAGRAM

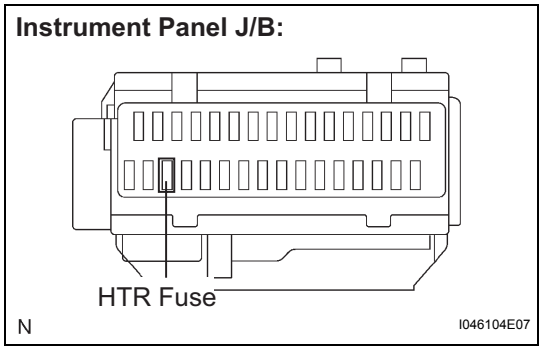


AC

INSPECTION PROCEDURE

HINT:
Start the engine before inspection. Check the IG1 relay or battery if the engine does not start.

1 INSPECT FUSE (HTR)



(a) Remove the HTR fuse from the instrument panel J/B.
(b) Measure the resistance according to the value(s) in the table below.

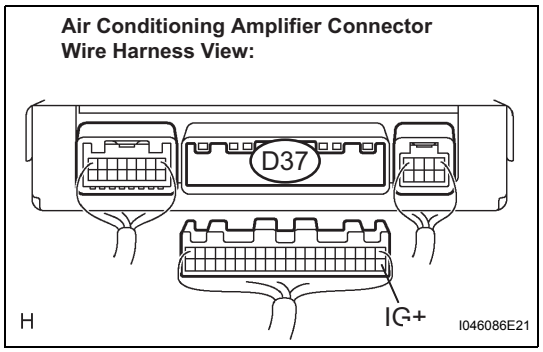
Resistance

Tester item	Condition	Specified condition
HTR fuse	Always	Below 1 Ω

NG → REPLACE FUSE (HTR)

OK

2 CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - BATTERY)



(a) Disconnect the connector from A/C amplifier.
(b) Measure the voltage according to the value(s) in the table below.

Voltage

Tester connection (Symbols)	Condition	Specified condition
D37-21 (IG+) - Body ground	Ignition switch off	Below 1.0 V
D37-21 (IG+) - Body ground	Ignition switch on (IG)	10 to 14 V

Result

Result	Proceed to
OK	A
NG (w/o Smart Key system)	B
NG (w/ Smart Key system)	C

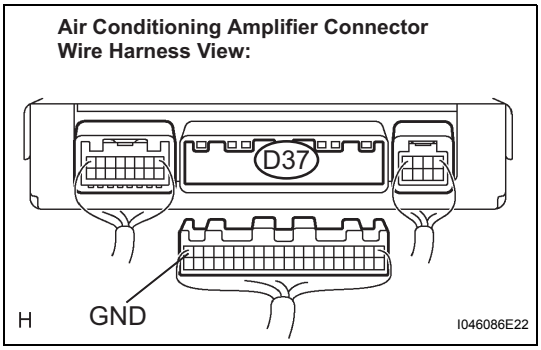
B → GO TO STARTING SYSTEM

C → GO TO PUSH BUTTON START SYSTEM

A

3	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - BOY GROUND)

Air Conditioning Amplifier Connector Wire Harness View:



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

Resistance

Tester connection (Symbols)	Condition	Specified condition
D37-20 (GND) - Body ground	Always	Below 1 Ω

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

OK

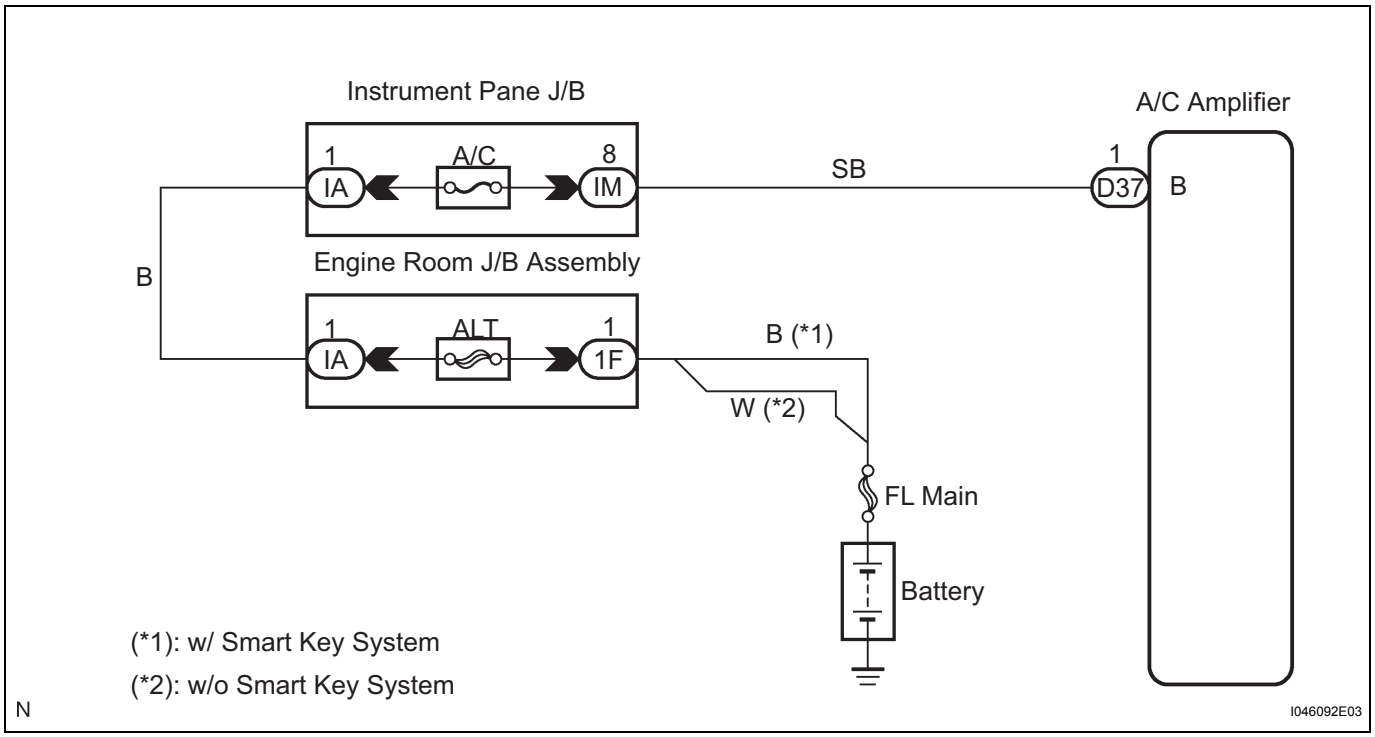
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Back-up Power Source Circuit

DESCRIPTION

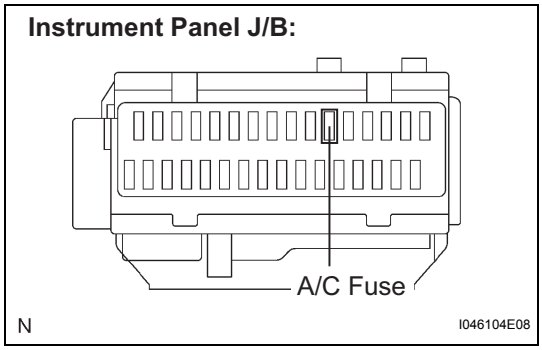
This is back-up power source circuit for the A/C amplifier. Power is supplied even when turning the ignition switch off and is used for diagnostic trouble code memory, etc.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT FUSE (A/C)



(a) Remove the A/C fuse from the instrument panel J/B.
(b) Measure the resistance according to the value(s) in the table blow.

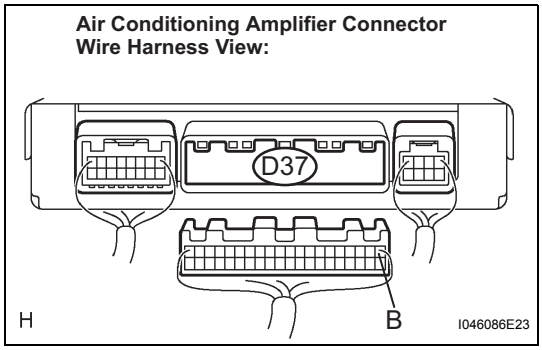
Resistance

Tester item	Condition	Specified condition
A/C fuse	Always	Below 1 Ω

NG → **REPLACE FUSE (A/C)**

OK

2	CHECK HARNESS AND CONNECTOR (+B - BODY GROUND)



(a) Remove the A/C amplifier and disconnect the connector.
(b) Measure the voltage according to the value(s) in the table blow.

Voltage

Tester connection (Symbols)	Condition	Specified condition
D37-1 (B) - Body ground	Always	10 to14 V

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

OK

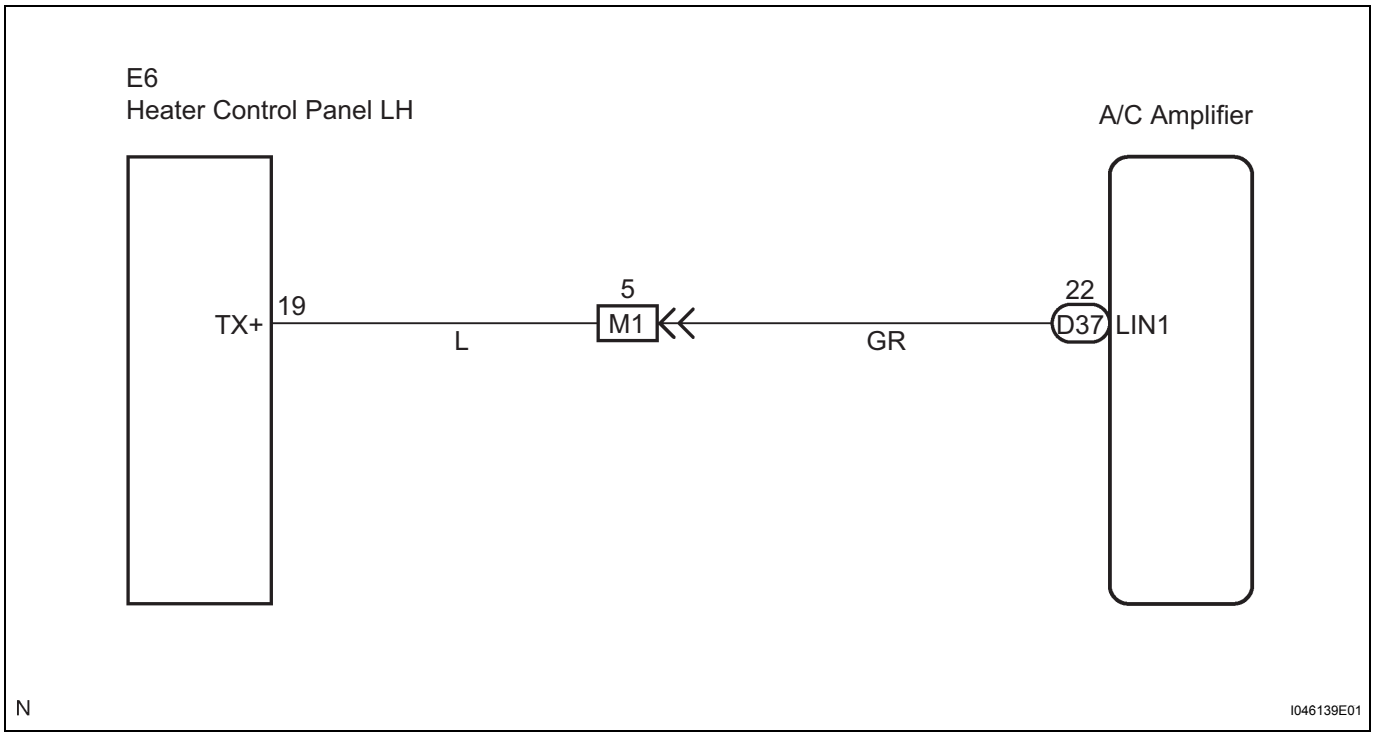
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

LIN Communication Circuit

DESCRIPTION

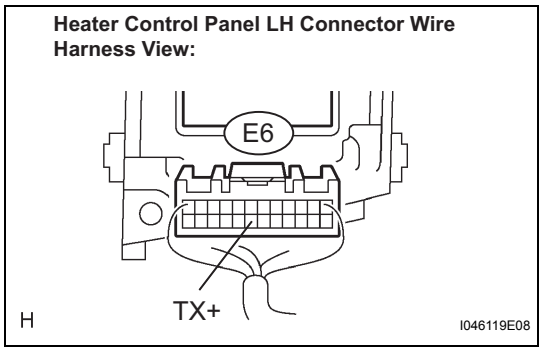
The heater control panel switch operation signal to the A/C amplifier.

WIRING DIAGRAM



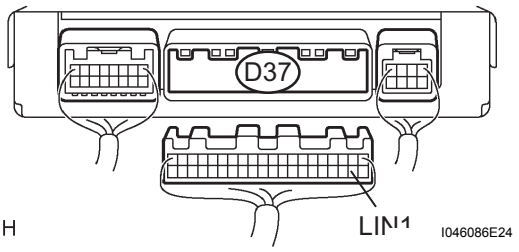
INSPECTION PROCEDURE

1	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - HEATER CONTROL PANEL LH)



(a) Disconnect the connector from heater control panel LH.

Air Conditioning Amplifier Connector Wire Harness View:



(b) Disconnect the connector from the A/C amplifier.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

Tester connection (Symbols)	Condition	Specified condition
D37-22 (LIN1) - E6-19 (TX+)	Always	Below 1 Ω
D37-22 (LIN1) - E6-19 (TX+)	Always	10 kΩ or higher

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

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

(a) Start up the engine.
(b) Turn the A/C switch on.
(c) Operate the cooler compressor at an engine rpm of approximately 1,000 for 5 to 6 minutes to circulate the refrigerant and collect compressor oil remaining in each component into the cooler compressor as much as possible.
(d) Stop the engine.
(e) Using SST, let the refrigerant gas out.
SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)

2. CHARGE REFRIGERANT

(a) Perform vacuum purging using a vacuum pump.
(b) Charge refrigerant HFC-134a (R134a)
Specified amount:
450 to 550 g (15.9 to 19.4oz.)
SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)
NOTICE:
Do not operate the cooler compressor before charging refrigerant as the cooler compressor does not work properly without any refrigerant, which causes the compressor to overheat.
HINT:
Prepare a service can to recharge refrigerant if using the refrigerant gas collected with the freon collection / recycling device because the collective rate of the device is approximately 90%.

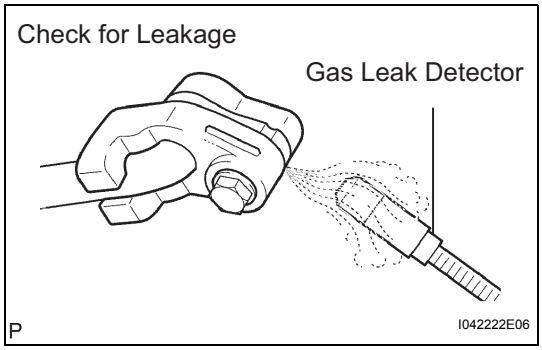
3. WARM UP ENGINE

(a) Warm up the engine at less than 1,850 rpm for 2 minutes or more after charging refrigerant.
NOTICE:
Be sure to warm up the compressor before turning the A/C switch on after removing and installing the cooler refrigerant lines (including the compressor), to prevent damage to the compressor.

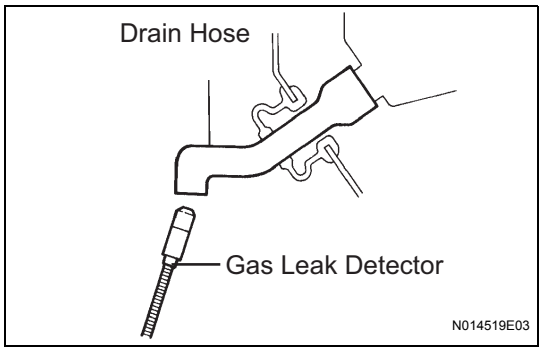
4. CHECK FOR LEAKAGE OF REFRIGERANT

(a) After recharging refrigerant gas, check for leakage of refrigerant gas using a halogen leak detector.
(b) Carry out under the following conditions:
- Stop the engine.
- Secure good ventilation (the gas leak detector may react to volatile gases which are not refrigerant, such as evaporated gasoline and exhaust gas).
- Repeat the test 2 or 3 times.

- Make sure that there is some refrigerant remaining in the refrigeration system.
  When the compressor is off: approx. 392 to 588 kPa (4 to 6 kgf/cm^2, 57 to 85 psi)



(c) Using a gas leak detector, check for leakage of the refrigerant line.



(d) Bring the gas leak detector close to the drain hose with the detector's power off.
HINT:
- After the blower motor has stopped, let the cooling unit stand for more than 15 minutes.
- Bring the gas leak detector sensor under the drain hose.
- When bringing the gas leak detector close to the drain hose, make sure that the gas leak detector does not react to volatile gases.

If such reaction is unavoidable, the vehicle must be lifted up.

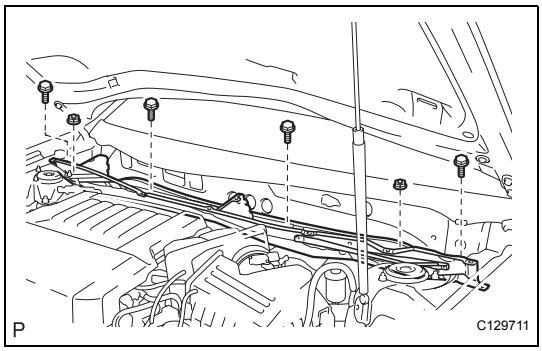
(e) If a gas leak is not detected on the drain hose, remove the blower motor control from the cooling unit. Insert the gas leak detector sensor into the unit and perform the test.

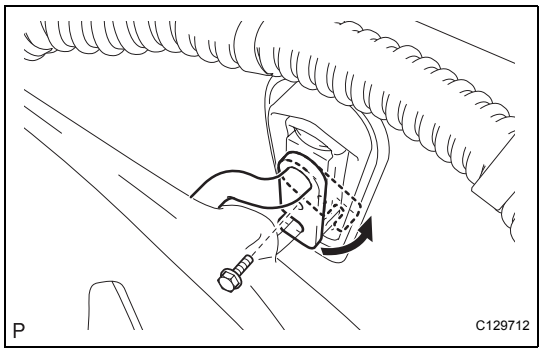
(f) Disconnect the pressure switch connector and leave it for approximately 20 minutes. Bring the gas leak detector close to the pressure switch and perform the test.

REMOVAL

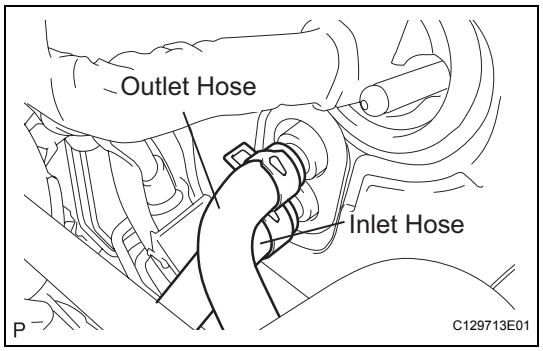
HINT:
- Installation is in the reverse order of removal.
- COMPONENTS for instrument panel safety pad sub-assembly: See page IP-2.

1. **DISCONNECT BATTERY NEGATIVE TERMINAL**
   (a) Wait for 90 seconds after disconnecting the cable to prevent the airbag working.
2. **REMOVE WINDSHIELD WIPER ARM AND BLADE ASSEMBLY LH (See page WW-38)**
3. **REMOVE WINDSHIELD WIPER ARM AND BLADE ASSEMBLY RH (See page WW-38)**
4. **REMOVE COWL TOP VENTILATOR LOUVER RH (See page WW-38)**
5. **REMOVE WINDSHIELD WIPER MOTOR AND LINK (See page WW-38)**
6. **REMOVE COWL TOP OUTSIDE PANEL FRONT**
   (a) Remove the 4 bolts, 2 nuts and cowl top outside panel front.
7. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM (See page AC-138)**





8. **DISCONNECT SUCTION HOSE SUB-ASSEMBLY**
   (a) Remove the bolt, and slide the hook connector.
   (b) Disconnect the suction hose sub-assembly.
   (c) Remove the O-ring from the suction hose sub-assembly.
   NOTICE:
   Seal the openings of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.
9. **DISCONNECT AIR CONDITIONER TUBE AND ACCESSORY**
   (a) Disconnect the air conditioner tube & accessory.
   (b) Remove the O-ring from the air conditioner tube & accessory.
   NOTICE:
   Seal the openings of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



10. DISCONNECT HEATER WATER OUTLET HOSE A(FROM HEATER UNIT)

(a) Slide the clip and disconnect the heater water outlet hose A.

NOTICE:

- **Do not apply excessive force to the heater water outlet hose A.**
- **Prepare a drain pan or cloth in case the cooling water leaks.**

11. DISCONNECT HEATER WATER INLET HOSE A

(a) Slide the clip and disconnect the heater water inlet hose A.

NOTICE:

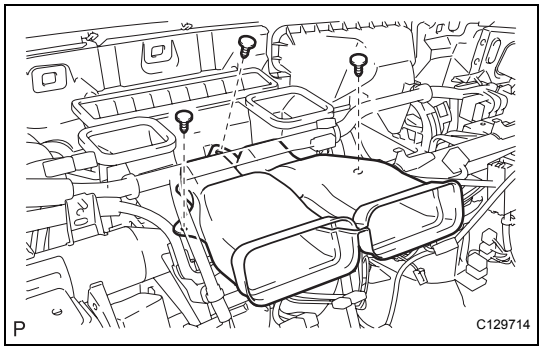
- **Do not apply excessive force to the heater water inlet hose A.**
- **Prepare a drain pan or cloth in case the cooling water leaks.**

12. REMOVE INSTRUMENT PANEL SAFETY PAD SUB-ASSEMBLY

IP-8

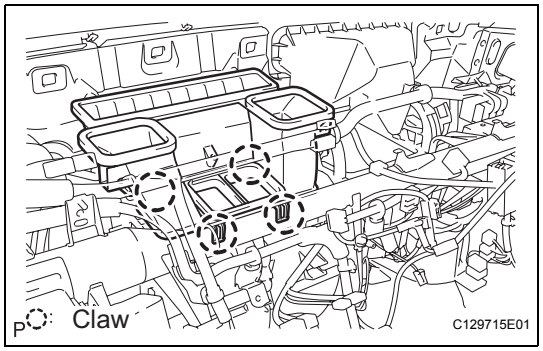
HINT:

Refer to the removal procedures for the instrument panel safety pad sub-assembly w/ front passenger airbag assembly.



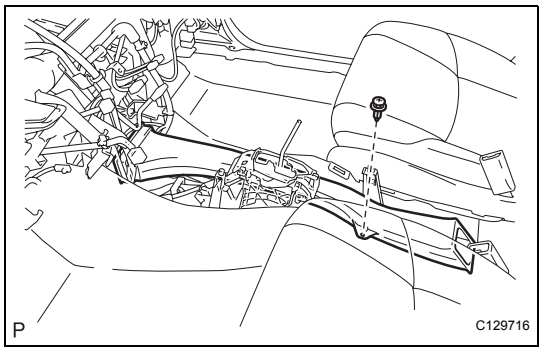
13. REMOVE HEATER TO REGISTER DUCT NO.2

(a) Remove the 3 clips and heater to register duct No.2.



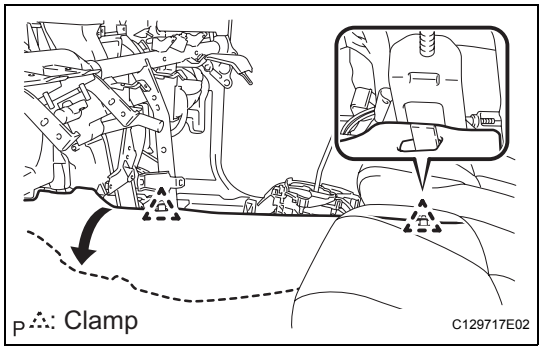
14. REMOVE HEATER TO REGISTER DUCT ASSEMBLY NO.6

(a) Disengage the 4 claws and then remove the heater to register duct No.6.



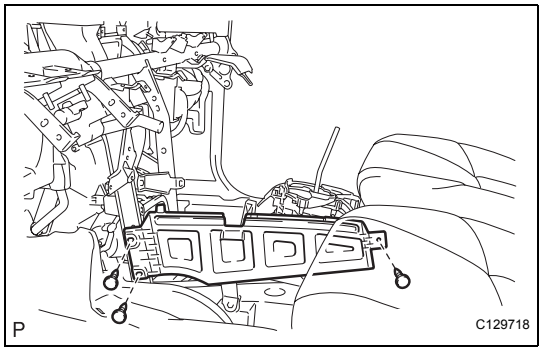
15. REMOVE CONSOLE BOX DUCT NO.1

(a) Remove the clip and console box duct No.1.

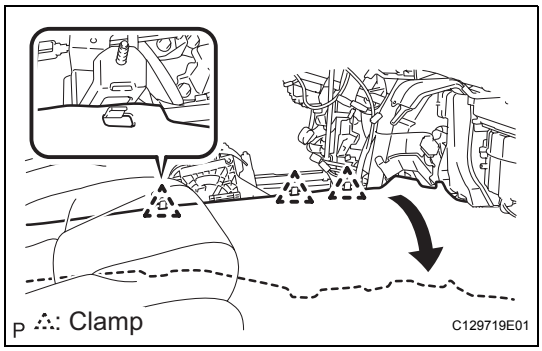


16. REMOVE FLOOR CARPET BRACKET LH

(a) Release the 2 clamps.
(b) Turn back the floor carpet.

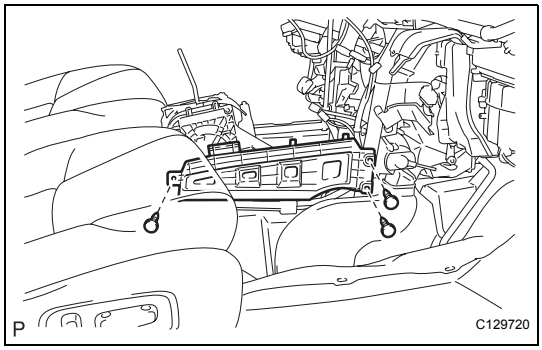


(c) Remove the 3 clips.
(d) Remove the floor carpet bracket LH.

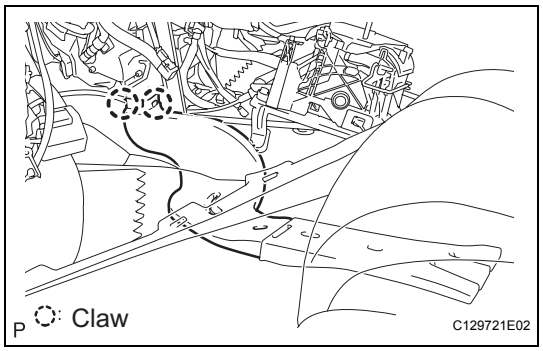


17. REMOVE FLOOR CARPET BRACKET RH

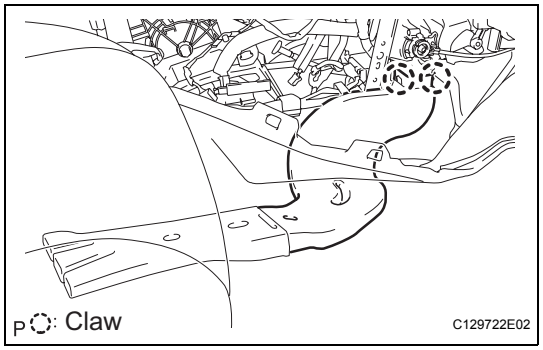
(a) Release the 3 clamps.
(b) Turn back the floor carpet.



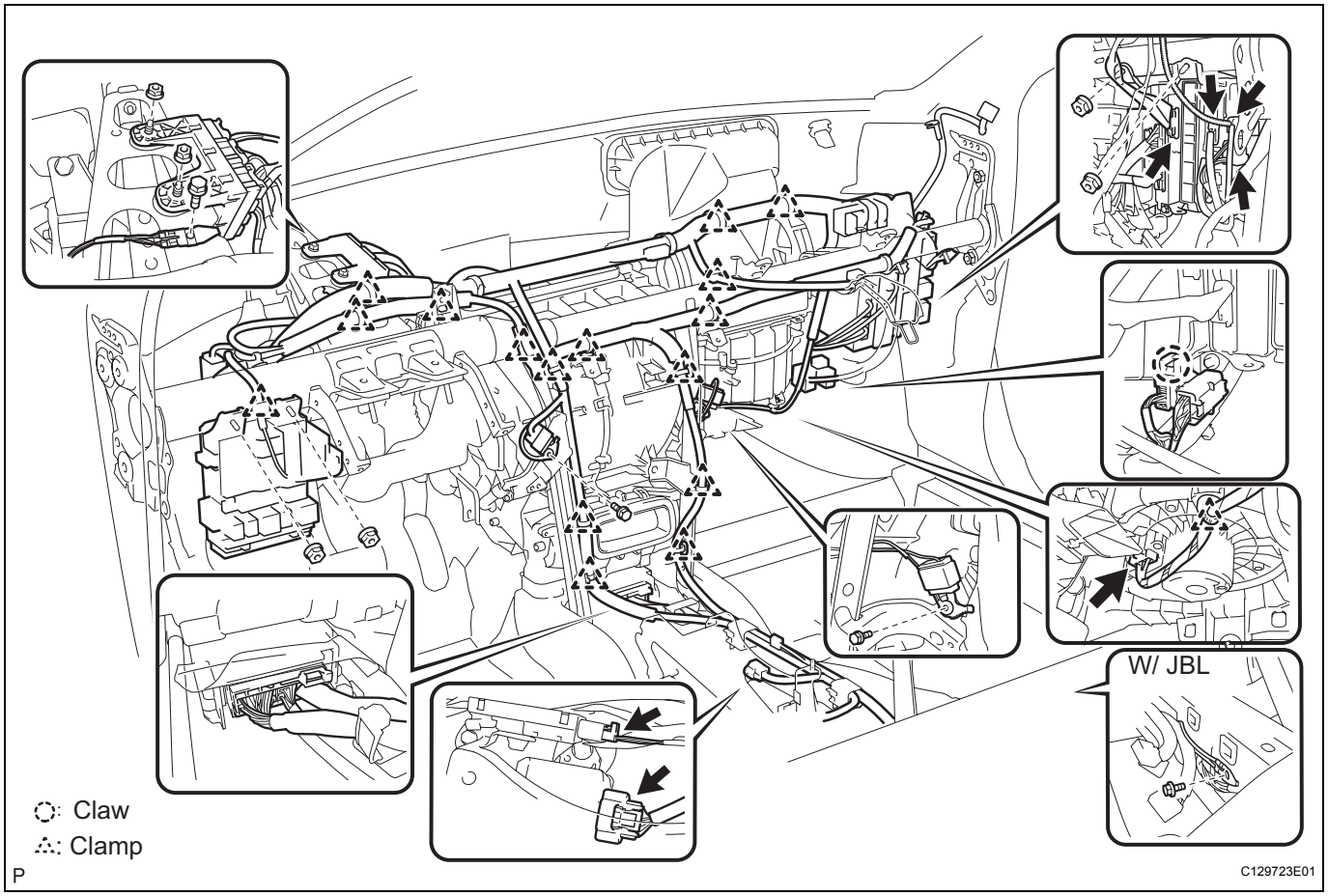
(c) Remove the 3 clips.
(d) Remove the floor carpet bracket RH.



18. **REMOVE AIR DUCT REAR NO.2**
    (a) Release the 2 claws and remove the air duct rear No.2.

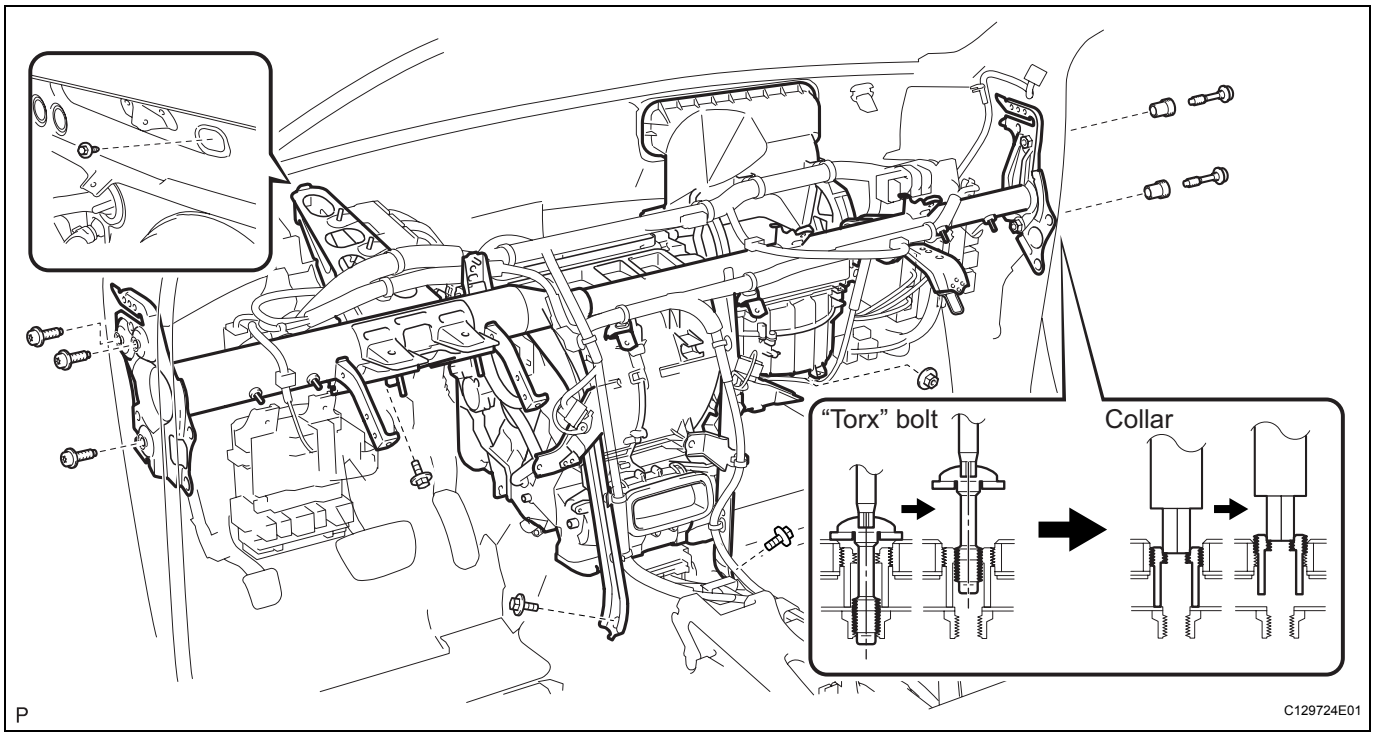


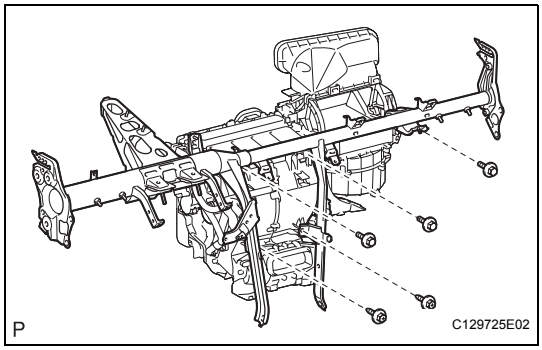
19. **REMOVE AIR DUCT REAR NO.1**
    (a) Release the 2 claws and remove the air duct rear No.1.
20. **REMOVE AIR DUCT SUB-ASSEMBLY NO.1 (See page SR-37)**
21. **SEPARATE STEERING INTERMEDIATE SHAFT ASSEMBLY (See page SR-37)**
22. **REMOVE STEERING COLUMN ASSEMBLY (See page SR-37)**
23. **REMOVE INSTRUMENT PANEL REINFORCEMENT ASSEMBLY**
    (a) Disconnect each connector and remove each clamp. Disconnect the wire harness.
    (b) Remove the 6 nuts and 3 bolts.



AC

(c) Remove the 3 bolts and nut.
(d) Using a "Torx" socket wrench (T40), remove the 5 "Torx" bolts.
HINT:
The "Torx" bolts on the passenger side can be removed with the collar or for adjustment.
(e) Using a hexagon wrench 12 mm, remove the 2 collars and instrument panel reinforcement assembly with the air conditioner unit assembly.



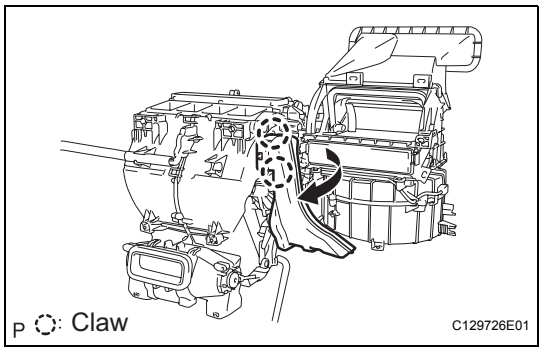


(f) Remove the 3 bolts, 2 screws and instrument panel reinforcement assembly.

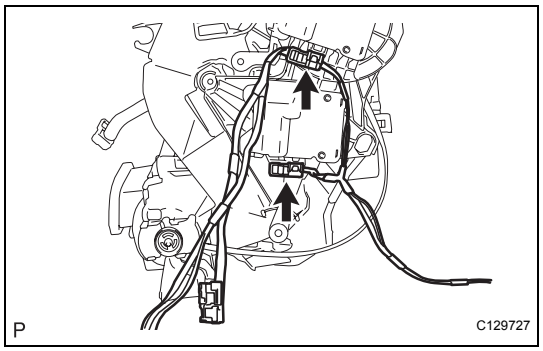
DISASSEMBLY

1. REMOVE AIR DUCT SUB-ASSEMBLY NO.2

(a) Release the 2 claws and remove the air duct sub-assembly No.2 as shown in the illustration.

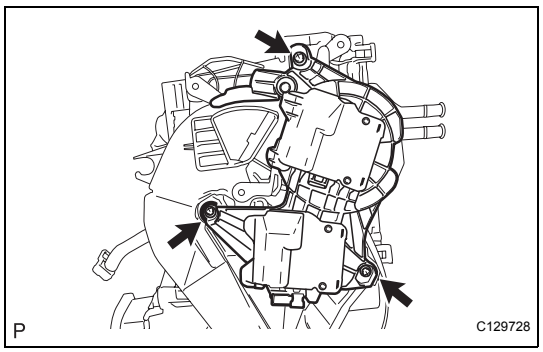


2. REMOVE BLOWER ASSEMBLY (See page AC-157)

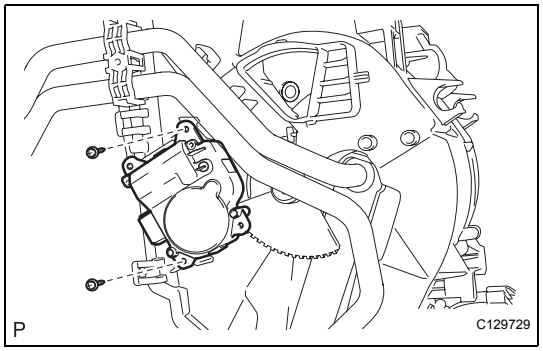


3. REMOVE AIR OUTLET CONTROL SERVO MOTOR

(a) Disconnect the 2 connectors and remove the air conditioner harness.

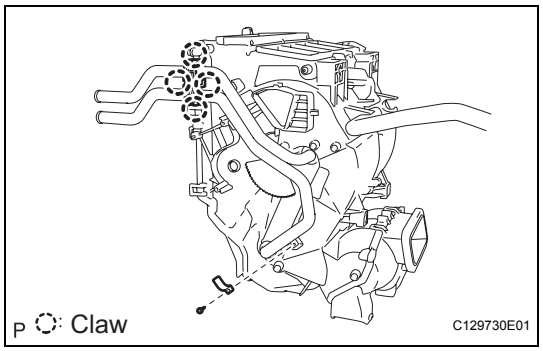


(b) Remove the 3 screws and then the air outlet control servo motor.



4. REMOVE AIR MIX CONTROL SERVO MOTOR

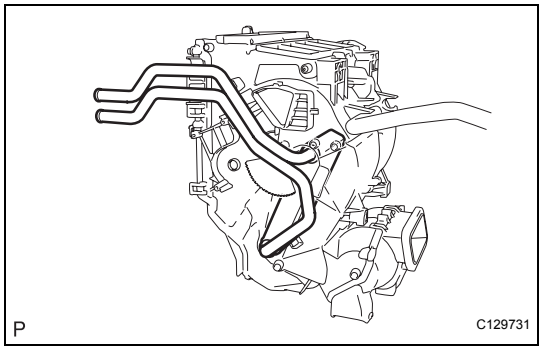
(a) Remove the 2 screws and air mix control servo motor.



5. REMOVE HEATER RADIATOR UNIT SUB-ASSEMBLY

(a) Remove the screw and clamp.

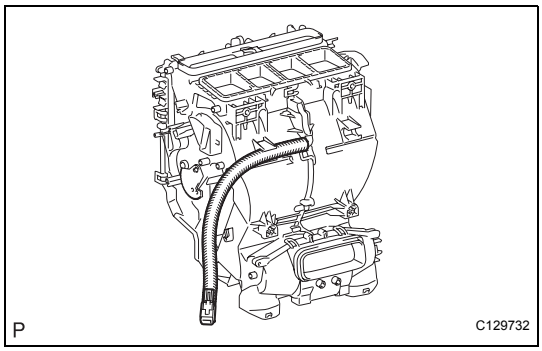
(b) Release the 4 claws and remove the clamp.



(c) Remove the heater radiator unit sub-assembly from the air conditioning radiator assembly.

NOTICE:

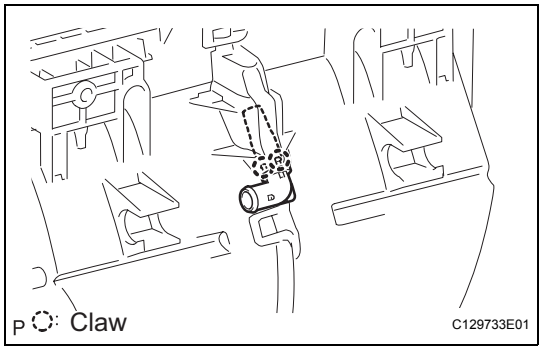
Prepare a drain pan or cloth in case the cooling water leaks.



6. REMOVE COOLER AIR HOSE

(a) Remove the cooler air hose with the cooler (room temp. sensor) thermistor.

(b) Remove the cooler air hose with the cooler (room temp. sensor) thermistor.



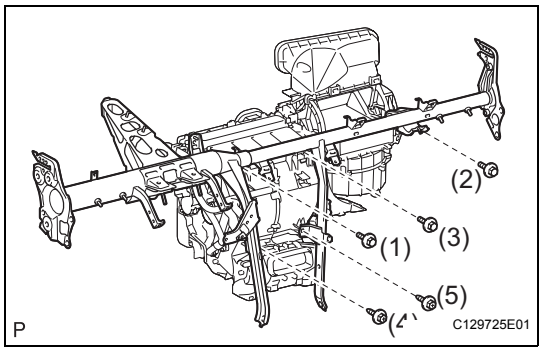
7. REMOVE ASPIRATOR

(a) Disengage the 2 claws and then remove the aspirator.

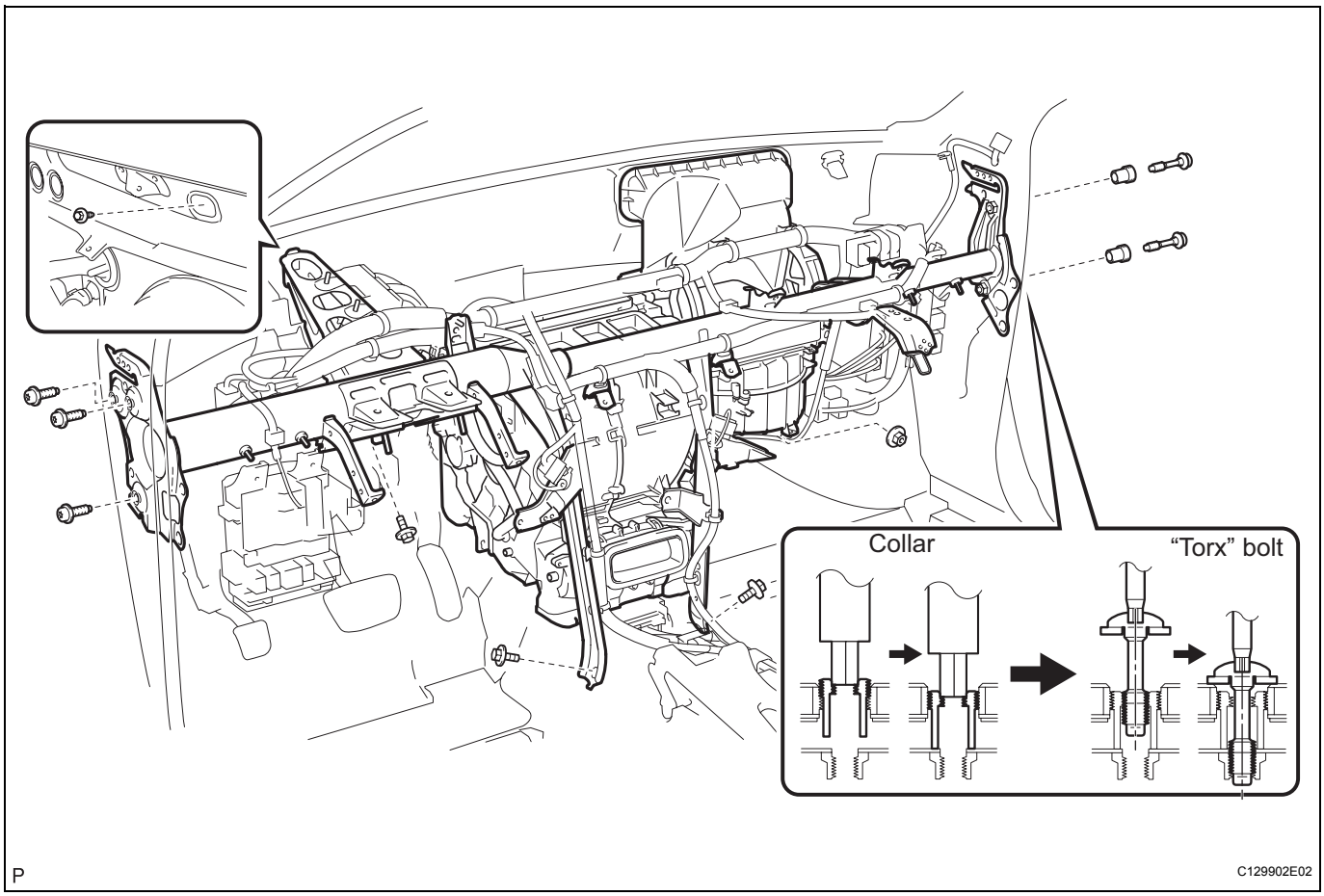
REASSEMBLY

1. **INSTALL ASPIRATOR**
2. **INSTALL COOLER AIR HOSE**
3. **INSTALL HEATER RADIATOR UNIT SUB-ASSEMBLY**
4. **INSTALL AIR MIX CONTROL SERVO MOTOR**
5. **INSTALL AIR OUTLET CONTROL SERVO MOTOR**
6. **INSTALL BLOWER ASSEMBLY**
7. **INSTALL AIR DUCT SUB-ASSEMBLY NO.2**

INSTALLATION

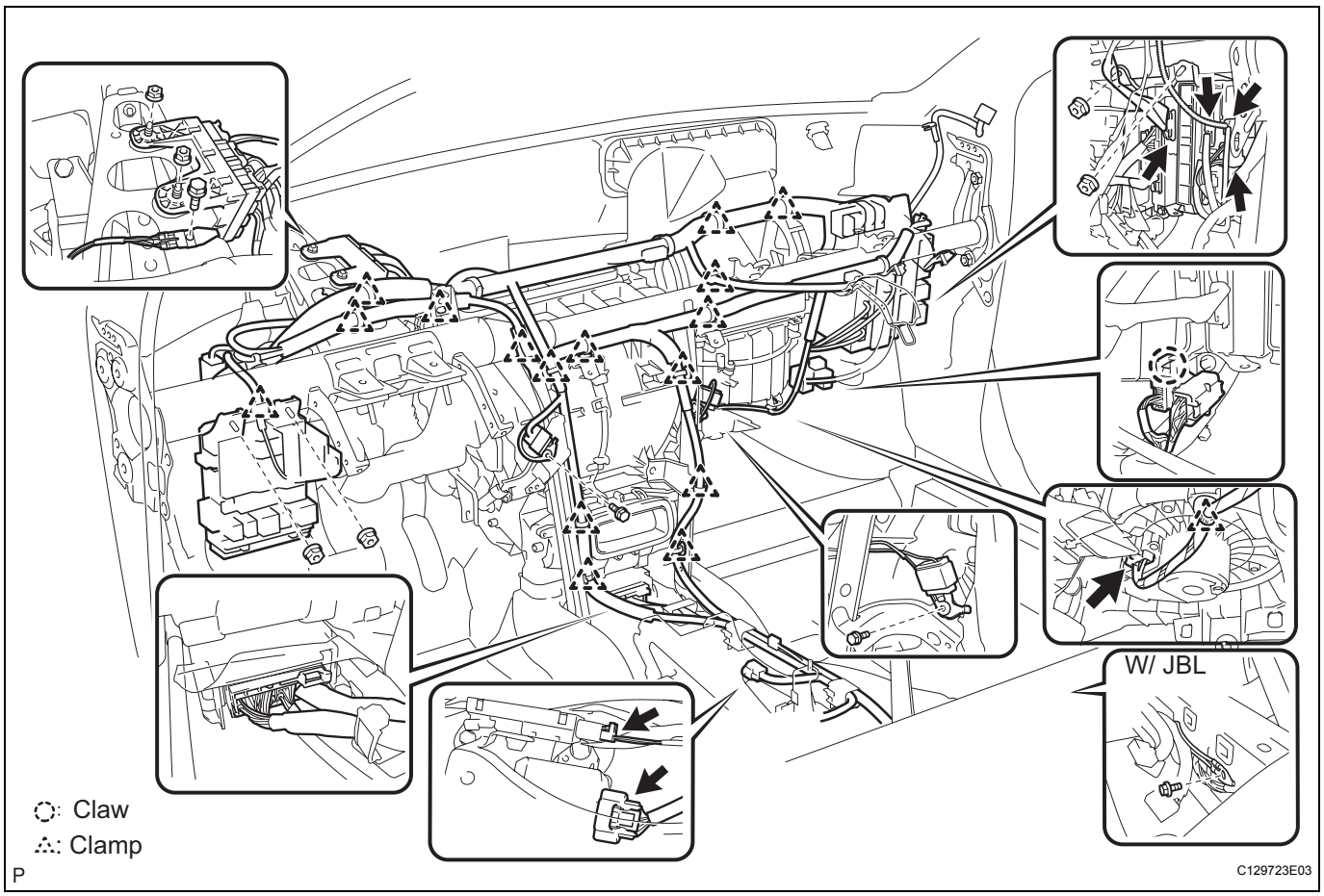


1. **INSTALL INSTRUMENT PANEL REINFORCEMENT ASSEMBLY**
   (a) Install the conditioner unit assembly to the instrument panel reinforcement assembly with the 2 screws and 3 bolts.
   Torque: Bolt
   9.8 N*m (100 kgf*cm, 87 in.*lbf)
   NOTICE:
   Tighten the bolts and screws in the order shown in the illustration to install the air conditioner unit assembly.
   (b) Driver seat:
      (1) Using a "Torx" socket wrench (T40), install the instrument panel reinforcement assembly with the 3 "Torx" bolts.
      Torque: 17 N*m (173 kgf*cm, 13 ft.*lbf)
   (c) Passenger seat:
      (1) Using a hexagon wrench 12 mm, install the instrument panel reinforcement assembly with the 2 bolts.
      Torque: 6.0 N*m (61 kgf*cm, 53 in.*lbf)
      (2) Using a "Torx" socket wrench (T40), install the instrument panel reinforcement assembly with the 2 "Torx" bolts.
      Torque: 20 N*m (204 kgf*cm, 15 in.*lbf)
   (d) Install the 3 bolts and nut.
   Torque: NUT
   9.8 N*m (100 kgf*cm, 87 in.*lbf)
   BOLT A
   20 N*m (204 kgf*cm, 15 ft.*lbf)



(e) Connect the connectors and clamps.

(f) Install the 6 nuts and 3 bolts.



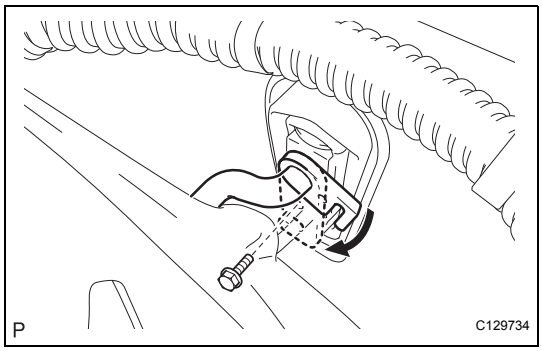
2. **CONNECT STEERING INTERMEDIATE SHAFT ASSEMBLY (See page SR-45)**

3. **INSTALL STEERING COLUMN ASSEMBLY (See page SR-45)**

4. **INSTALL INSTRUMENT PANEL SAFETY PAD SUB-ASSEMBLY (See page IP-17)**

5. **INSTALL AIR CONDITIONER TUBE AND ACCESSORY**
   (a) Remove the attached vinyl tape from the tube.
   (b) Sufficiently apply compressor oil to a new O-ring and fitting surface of the air conditioning tube assembly.
   Compressor oil:
   ND-OIL 8 or equivalent
   (c) Install the O-ring on the liquid tube sub-assembly.
   (d) Install the liquid tube sub-assembly.

6. **INSTALL SUCTION HOSE SUB-ASSEMBLY**
   (a) Remove the attached vinyl tape from hose.
   (b) Sufficiently apply compressor oil to a new O-ring and the fitting surface of the suction hose sub-assembly.
   Compressor oil:
   ND-OIL 8 or equivalent
   (c) Install the O-ring on the suction hose sub-assembly.



(d) Move the hook connector in the direction indicated by the arrow in the illustration.
(e) Insert the pipe joint into the fitting hole securely and tighten the bolt.
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

7. **CONNECT BATTERY NEGATIVE TERMINAL**

8. **PERFORM SYSTEM INITIALIZE**
(a) Some system need initialization when disconnecting the cable from the negative battery terminal.
HINT:
See page IN-29

9. **ADD ENGINE COOLANT (See page CO-7)**

10. **CHECK FOR ENGINE COOLANT LEAKS (See page CO-8)**

11. **CHARGE REFRIGERANT (See page AC-138)**

12. **WARM UP ENGINE (See page AC-139)**

13. **CHECK FOR LEAKAGE OF REFRIGERANT (See page AC-139)**

14. **INSTALL WINDSHIELD WIPER MOTOR AND LINK (See page WW-40)**

15. **INSTALL WINDSHIELD WIPER ARM AND BLADE ASSEMBLY RH (See page WW-40)**

16. **INSTALL WINDSHIELD WIPER ARM AND BLADE ASSEMBLY LH (See page WW-41)**

REMOVAL

HINT:
- Installation is in the reverse order of removal.
- COMPONENTS for instrument panel safety pad sub-assembly: See page IP-2.

1. **DISCONNECT BATTERY NEGATIVE TERMINAL**
   (a) Wait for 90 seconds after disconnecting the cable to prevent the airbag working.
2. **REMOVE WINDSHIELD WIPER ARM AND BLADE ASSEMBLY LH (See page WW-38)**
3. **REMOVE WINDSHIELD WIPER ARM AND BLADE ASSEMBLY RH (See page WW-38)**
4. **REMOVE COWL TOP VENTILATOR LOUVER RH (See page WW-38)**
5. **REMOVE WINDSHIELD WIPER MOTOR AND LINK (See page WW-38)**
6. **REMOVE COWL VENTILATOR PANEL SUB-ASSEMBLY**
   HINT:
   See page AC-144
7. **DISCHARGE FROM REFRIGERATION SYSTEM (See page AC-138)**
8. **DISCONNECT SUCTION HOSE SUB-ASSEMBLY (See page AC-144)**
9. **DISCONNECT AIR CONDITIONER TUBE AND ACCESSORY (See page AC-144)**
10. **DISCONNECT HEATER WATER OUTLET HOSE A(FROM HEATER UNIT) (See page AC-145)**
11. **DISCONNECT HEATER WATER INLET HOSE A (See page AC-145)**
12. **REMOVE INSTRUMENT PANEL SAFETY PAD SUB-ASSEMBLY (See page IP-14)**
13. **REMOVE AIR DUCT SUB-ASSEMBLY NO.1 (See page SR-37)**
14. **SEPARATE STEERING INTERMEDIATE SHAFT ASSEMBLY (See page SR-37)**
15. **REMOVE STEERING COLUMN ASSEMBLY (See page SR-37)**
16. **REMOVE HEATER TO REGISTER DUCT NO.2 (See page AC-145)**
17. **REMOVE HEATER TO REGISTER DUCT ASSEMBLY NO.6 (See page AC-145)**
18. **REMOVE CONSOLE BOX DUCT NO.1 (See page AC-146)**

19. **REMOVE FLOOR CARPET BRACKET LH (See page AC-146)**

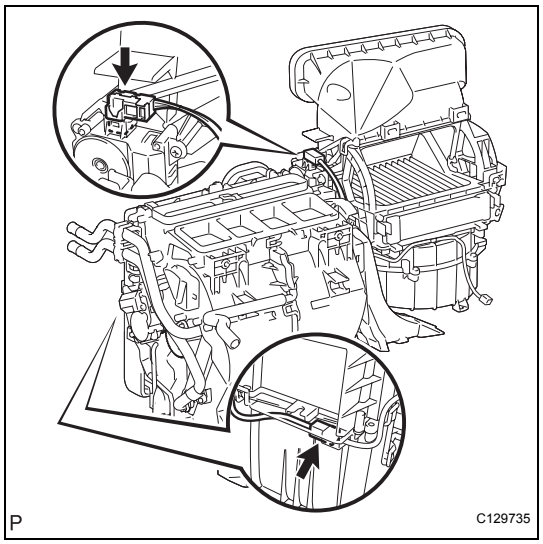
20. **REMOVE FLOOR CARPET BRACKET RH (See page AC-146)**

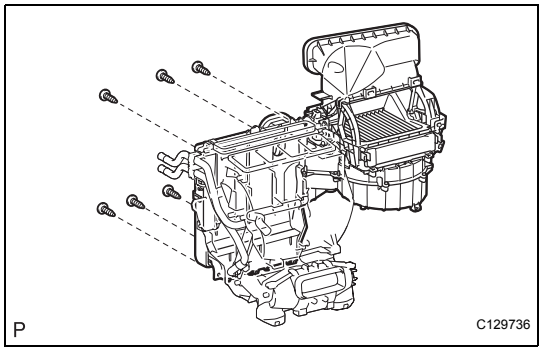
21. **REMOVE INSTRUMENT PANEL REINFORCEMENT ASSEMBLY (See page AC-147)**

22. **REMOVE AIR DUCT SUB-ASSEMBLY NO.2 (See page AC-148)**

23. **REMOVE BLOWER ASSEMBLY**

(a) Remove the connector and clamp, and disconnect the wire harness.



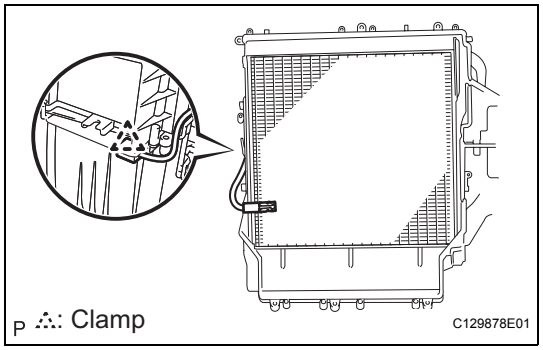


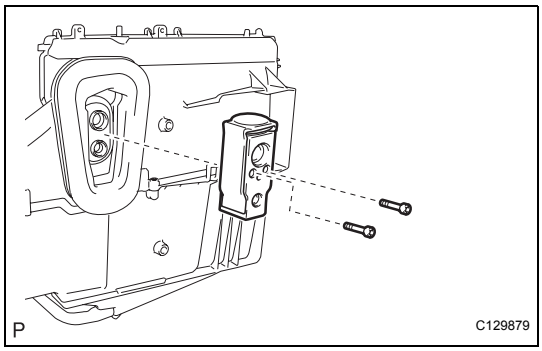
(b) Remove the 6 screws and then the blower assembly with the cooler evaporator sub-assembly.

DISASSEMBLY

1. **REMOVE EVAPORATOR TEMPERATURE SENSOR**

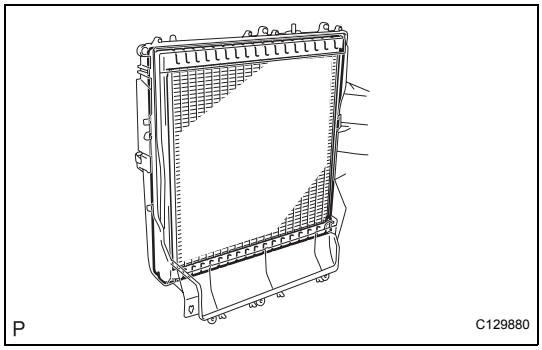
(a) Remove the clamp and evaporator temperature sensor.





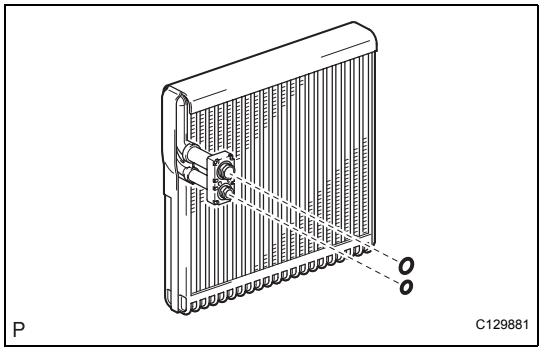
2. REMOVE COOLER EXPANSION VALVE

(a) Using a hexagon wrench 4 mm, remove the 2 hexagon bolts and cooler expansion valve.

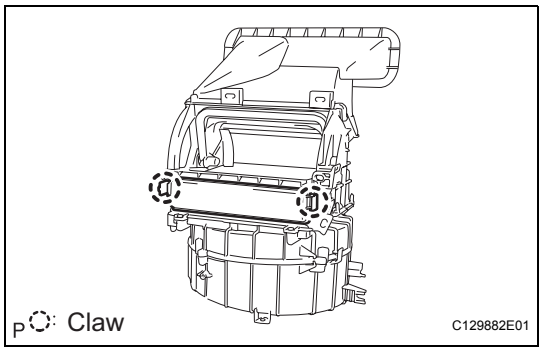


3. REMOVE COOLER EVAPORATOR SUB-ASSEMBLY NO.1

(a) Remove the cooler evaporator sub-assembly No.1.

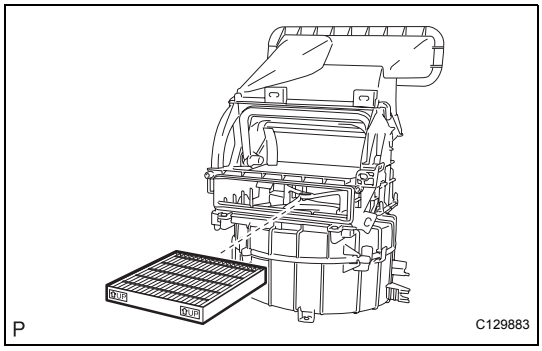


(b) Remove the 2 O-rings from the cooler evaporator sub-assembly No.1.



4. REMOVE AIR FILTER COVER PLATE

(a) Release the 2 claws and remove the air filter cover plate.



5. REMOVE CLEAN AIR FILTER

(a) Remove the clean air filter.

PROBLEM SYMPTOMS TABLE

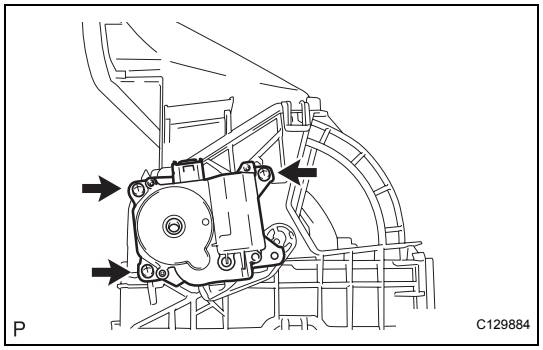
If a normal system code is displayed during the DTC check but the problem still occurs, check the circuits for each problem symptom in the order given in the table below and proceed to the relevant troubleshooting page.
HINT:
Inspect the "Fuse" and "Relay" before confirming the suspected area as shown in the charts below.
Inspect each malfunction circuit in numerical order for the corresponding symptom.
If any malfunction still exists even after checking and confirming that all the circuits are normal, replace the ECU.

AIR CONDITIONING SYSTEM

Symptom	Suspected area	See page
Whole functions of the A/C system does not operate	1. IG power source circuit	AC-127
	2. Heater control panel power source circuit	AC-103
	3. Heater control switch circuit	AC-105
	4. LIN communication circuit	AC-132
	5. Heater control panel LH	AC-182
	6. A/C amplifier	-
Air Flow Control : No blower operation	1. IG power source circuit	AC-127
	2. Blower motor circuit	AC-94
	3. Heater control panel power source circuit	AC-103
	4. Heater control switch circuit	AC-105
	5. LIN communication circuit	AC-132
	6. Heater control panel LH	AC-182
	7. A/C amplifier	-
Air Flow Control : No blower control	1. Blower motor circuit	AC-94
	2. Room temperature sensor circuit	AC-46
	3. Ambient temperature sensor circuit	AC-50
	4. Solar sensor circuit (Driver side)	AC-70
	5. Solar sensor circuit (Passenger side)	AC-58
	6. A/C amplifier	-
Air Flow Control : Insufficient air flow	Blower motor circuit	AC-94
Temperature Control : No cool air comes out	1. Blower motor circuit	AC-94
	2. Air mix control servo motor circuit (Driver side)	AC-80
	3. Air mix control servo motor circuit (Passenger side)	AC-74
	4. Room temperature sensor circuit	AC-46
	5. Ambient temperature sensor circuit	AC-50
	6. Evaporator temperature sensor circuit	AC-55
	7. Pressure switch circuit	AC-66
	8. Compressor circuit	AC-100
	9. Compressor lock sensor circuit	AC-62
	10. Compressor solenoid circuit	AC-82
	11. A/C amplifier	-

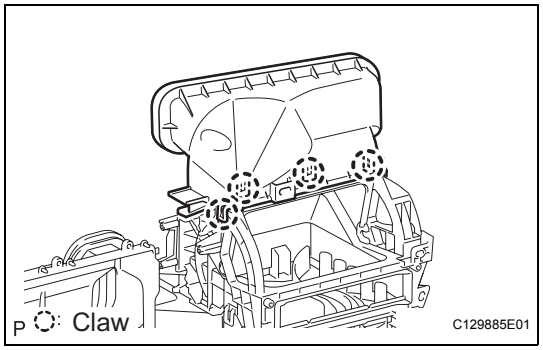
Symptom	Suspected area	See page
Temperature Control : No Warm air comes out	1. Steering pad switch circuit	AC-123
	2. Air mix control servo motor circuit (Driver side)	AC-80
	3. Air mix control servo motor circuit (Passenger side)	AC-74
	4. Room temperature sensor circuit	AC-46
	5. Ambient temperature sensor circuit	AC-50
	6. Evaporator temperature sensor circuit	AC-55
	7. Solar sensor circuit (Driver side)	AC-70
	8. Solar sensor circuit (Passenger side)	AC-58
	9. A/C amplifier	-
Temperature Control : Output is warmer or cooler than the set temperature or response is slow	1. Steering pad switch circuit	AC-123
	2. Air mix control servo motor circuit (Driver side)	AC-80
	3. Air mix control servo motor circuit (Passenger side)	AC-74
	4. Room temperature sensor circuit	AC-46
	5. Ambient temperature sensor circuit	AC-50
	6. Evaporator temperature sensor circuit	AC-55
	7. Solar sensor circuit (Driver side)	AC-70
	8. Solar sensor circuit (Passenger side)	AC-58
	9. A/C amplifier	-
Temperature Control : No temperature control (only Max. cool or Max. warm)	1. Steering pad switch circuit	AC-123
	2. Air mix control servo motor circuit (Driver side)	AC-80
	3. Air mix control servo motor circuit (Passenger side)	AC-74
	4. Room temperature sensor circuit	AC-46
	5. Ambient temperature sensor circuit	AC-50
	6. Evaporator temperature sensor circuit	AC-55
	7. Solar sensor circuit (Driver side)	AC-70
	8. Solar sensor circuit (Passenger side)	AC-58
	9. A/C amplifier	-
No air inlet control	1. Air inlet control servo motor circuit	AC-76
	2. A/C amplifier	-
No air flow mode control	1. Air outlet control servo motor circuit	AC-78
	2. A/C amplifier	-
Blinking of A/C indicator	Compressor solenoid circuit	AC-82
Diagnostic trouble code are not recorded. Set mode is cleared when ignition switch is turned OFF.	Back up power source circuit	AC-130
Engine idle up dose not occur, or is continuous	1. Compressor circuit	AC-100
	2. Compressor lock sensor circuit	AC-62
	3. Compressor solenoid circuit	AC-82
	4. A/C amplifier	-
Set temperature value displayed does not much up with operation of temperature control switch.	1. Heater control panel power source circuit	AC-103
	2. Heater control switch circuit	AC-105
	3. LIN communication circuit	AC-132
	4. Heater control panel LH	AC-182
	5. A/C amplifier	-
The seat heater switch indicator does not come on.	1. Seat heater control power source circuit	AC-114
	2. Seat heater indicator circuit	AC-120
	3. Seat heater control sub-assembly	SE-59
	4. A/C amplifier	-
Unable to access the diagnosis mode.	A/C amplifier	-

Symptom	Suspected area	See page
Unable to control A/C with the steering pad switch	1. Steering pad switch circuit	AC-123
	2. Heater control panel power source circuit	AC-103
	3. LIN communication circuit	AC-132
	4. Heater control panel LH	AC-182
	5. A/C amplifier	-
DTC not recorded. Set mode is cleared when IG switch is turned off.	1.Back up power source circuit	AC-130
	2. A/C amplifier	-
Seat heater does not operate.	1. Seat heater switch circuit	AC-116
	2. Seat heater control power source circuit	AC-114
	3. Seat heater temperature sensor circuit (Driver side)	AC-85
	4. Seat heater temperature sensor circuit (Passenger side)	AC-88
	5. Seat heater control sub-assembly	SE-59
	6. A/C amplifier	-
Seat ventilators do not operate.	1. Seat heater switch circuit	AC-116
	2. Seat heater control power source circuit	AC-114
	3. Seat blower control circuit	AC-108
	4. Seat heater control sub-assembly	SE-59
	5. Seat climate control blower	SE-51



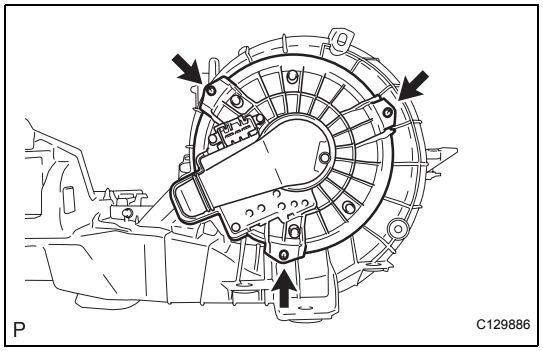
6. REMOVE AIR INLET SERVO MOTOR

(a) Remove the 3 screws and air inlet servo motor.



7. REMOVE AIR DUCT SUB-ASSEMBLY NO.3

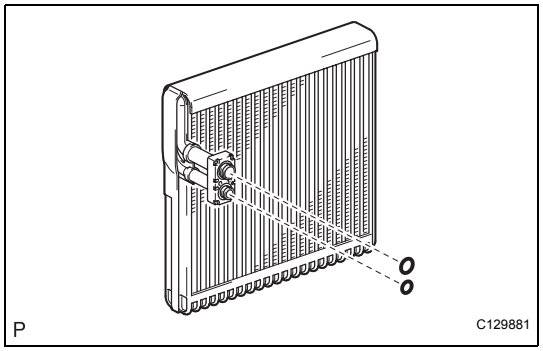
(a) Disengage the 4 claws and then remove the air duct sub-assembly No.3.



8. REMOVE COOLING UNIT MOTOR SUB-ASSEMBLY

(a) Remove the 3 screws and cooling unit motor sub-assembly w/ fan.

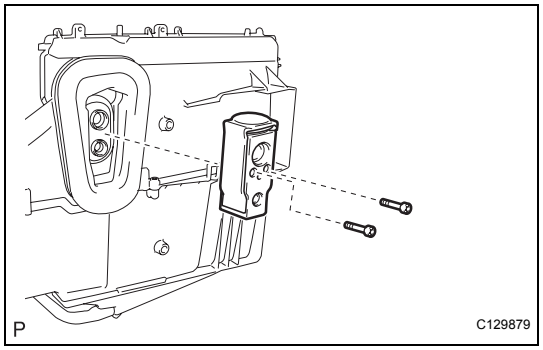
REASSEMBLY



1. INSTALL COOLER EVAPORATOR SUB-ASSEMBLY NO.1

(a) sufficiently apply compressor oil (ND-OIL 8) to 2 new O-rings and the fitting surface. Install the 2 O-rings to the cooler evaporator No.1.

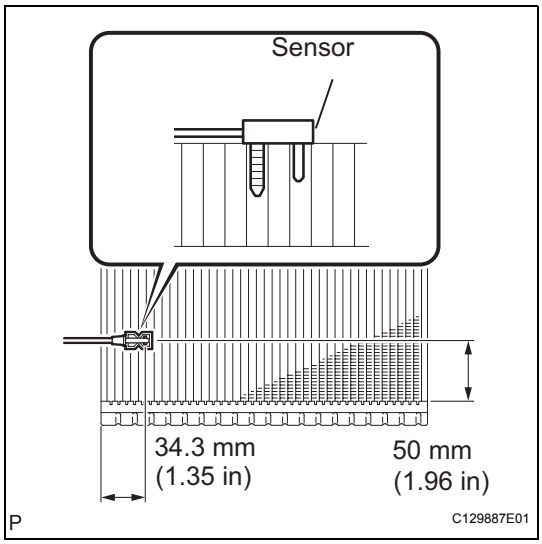
Compressor oil :
ND-OIL 8 or equivalent



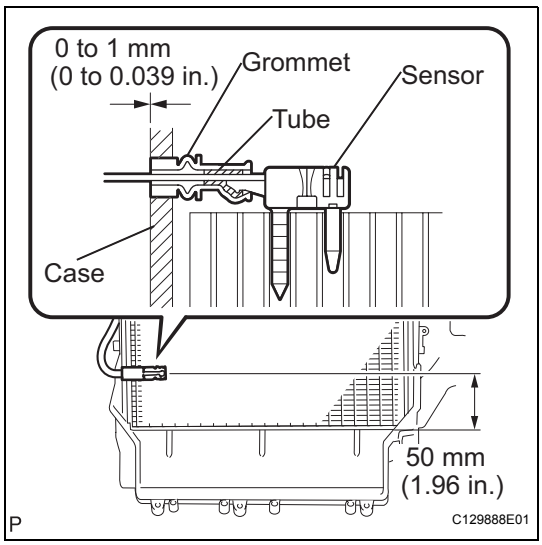
2. INSTALL COOLER EXPANSION VALVE

(a) Using a hexagon wrench 4 mm, install the cooler expansion valve with the 2 hexagon bolts.

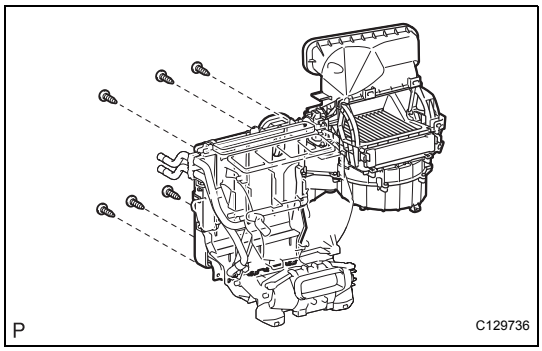
Torque: 3.5 N*m (35 kgf*cm, 30 in.*lbf)



3. **INSTALL EVAPORATOR TEMPERATURE SENSOR**
   (a) If using a mew evaporator:
   Install the sensor to the evaporator as shown in the illustration.



   (b) If reusing the evaporator:
   (1) Install the sensor to the evaporator as shown in the illustration.
   HINT:
   Completely cover the tube with the grommet.



INSTALLATION

1. **INSTALL BLOWER ASSEMBLY**
   (a) Install the blower assembly with the 6 screws.
2. **INSTALL INSTRUMENT PANEL REINFORCEMENT ASSEMBLY (See page AC-150)**
3. **CONNECT STEERING INTERMEDIATE SHAFT ASSEMBLY (See page SR-45)**
4. **INSTALL STEERING COLUMN ASSEMBLY (See page SR-45)**
5. **INSTALL INSTRUMENT PANEL SAFETY PAD SUB-ASSEMBLY (See page IP-17)**
6. **INSTALL AIR CONDITIONER TUBE AND ACCESSORY (See page AC-152)**
7. **INSTALL SUCTION HOSE SUB-ASSEMBLY (See page AC-152)**
8. **CONNECT BATTERY NEGATIVE TERMINAL**

9. **PERFORM SYSTEM INITIALIZE**
   (a) Some systems need initialization when disconnecting the cable from the negative battery terminal.
   HINT:
   See page IN-29

10. **ADD ENGINE COOLANT (See page CO-7)**

11. **CHECK FOR ENGINE COOLANT LEAKS (See page CO-8)**

12. **CHARGE REFRIGERANT (See page AC-138)**

13. **WARM UP ENGINE (See page AC-139)**

14. **CHECK FOR LEAKAGE OF REFRIGERANT (See page AC-139)**

15. **INSTALL WINDSHIELD WIPER MOTOR AND LINK (See page WW-40)**

16. **INSTALL WINDSHIELD WIPER ARM AND BLADE ASSEMBLY RH (See page WW-40)**

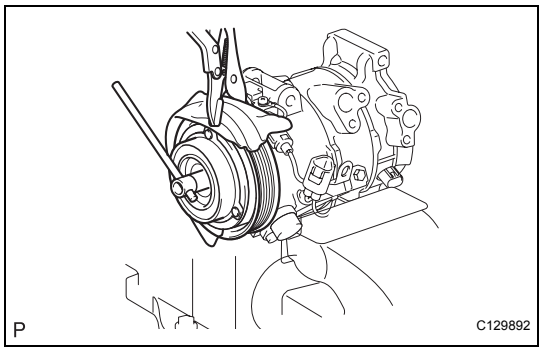
17. **INSTALL WINDSHIELD WIPER ARM AND BLADE ASSEMBLY LH (See page WW-41)**

DISASSEMBLY

1. REMOVE MAGNETIC CLUTCH ASSEMBLY

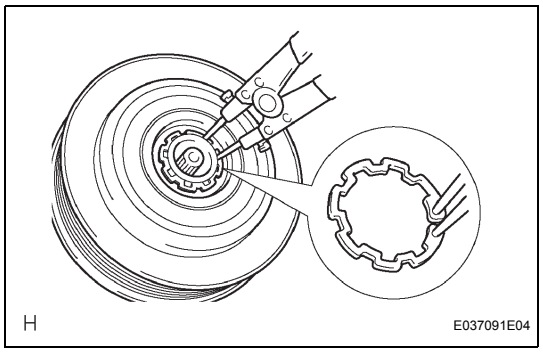
(a) Remove the bolt and bracket.

(b) Place the compressor and magnetic clutch in a vise.



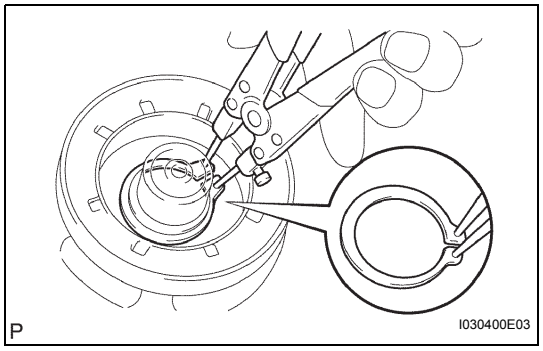
(c) Using vise pliers, hold the magnet clutch hub.

(d) Remove the bolt, magnetic clutch hub and magnetic clutch washer.



(e) Using a snap ring expander, remove the snap ring and magnetic clutch rotor.

(f) Disconnect the connector.



(g) Using a snap ring expander, remove the snap ring and magnetic clutch stator.

INSPECTION

1. INSPECT MAGNETIC CLUTCH CLEARANCE

(a) Set the dial indicator to the magnetic clutch hub.

(b) Connect the battery positive lead to terminal 3 of the magnetic clutch connector and the negative lead to the earth wire. Turn on and off the magnetic clutch and measure the clearance.

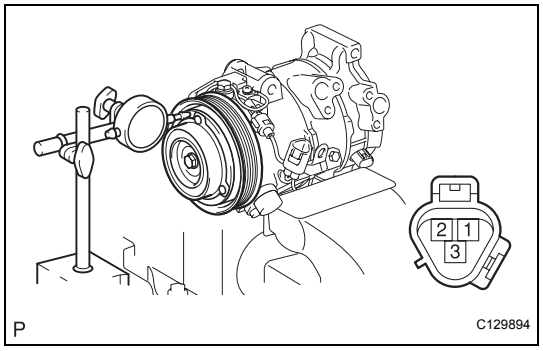
Standard clearance:

0.26 to 0.60 mm (0.010 to 0.024 in.)

If the measured value is out of the standard range, remove the magnetic clutch hub and adjust it with the magnetic clutch washers.

NOTICE:

Adjustment shall be performed with 3 or less magnetic clutch washers.



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(c) Remove the compressor and magnetic clutch from the vise.

2. INSPECT COMPRESSOR OIL

(a) Gradually discharge the refrigerant gas from the service valve when replacing the compressor and magnetic clutch with a new one. Drain the following amount of oil from the new compressor and magnetic clutch before installation.

Standard:

(Oil capacity inside the new compressor and magnetic clutch: 130 + 15 cc (4.6 + 0.51 fl.oz.) - (Remaining oil amount in the removed compressor and magnetic clutch) = (Oil amount to be removed before installation)

NOTICE:

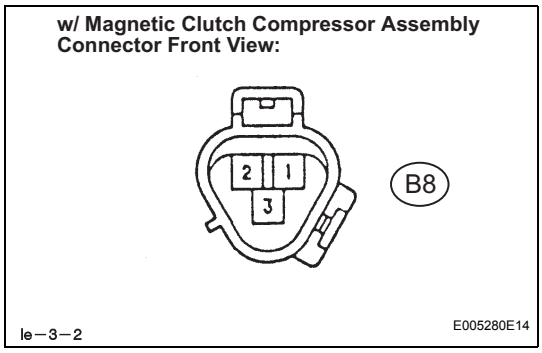
- **When checking the compressor oil level, observe the precautions on the cooler removal / installation.**
- **Because compressor oil remains in the pipes of the vehicle, if anew compressor and magnetic clutch is installed without removing some oil, the oil amount becomes too much, preventing heat exchange in the refrigerant cycle and causing refrigerant failure.**
- **If the remaining oil the removed compressor and magnetic clutch is too small in volume, check for oil leakage.**
- **Be sure to use ND-OIL8 for compressor oil.**

3. INSPECT W/MAGNET CLUTCH COMPRESSOR ASSEMBLY

(a) Disconnect the connector from the w/ magnet clutch compressor assembly.

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

Resistance



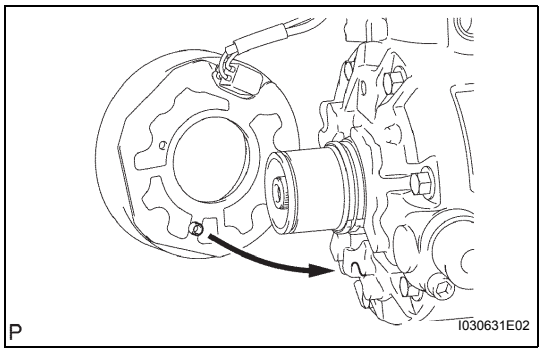
Tester connection	Condition	Specified condition
B8-3 - Body Ground	Always	Below 1 Ω

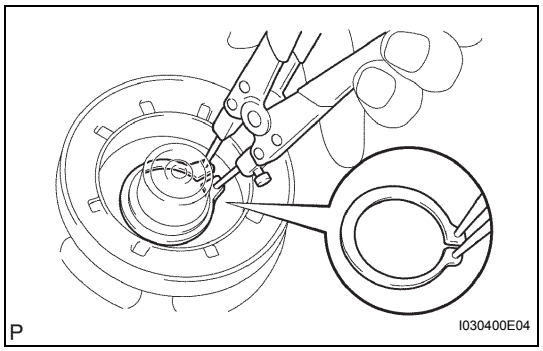
If the resistance is not as specified, replace the w/ magnet clutch compressor assembly.

REASSEMBLY

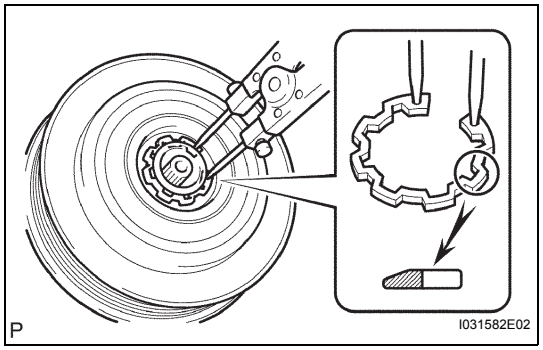
1. INSTALL MAGNETIC CLUTCH ASSEMBLY

(a) Matching the parts shown in the illustration, install the magnetic clutch stator.

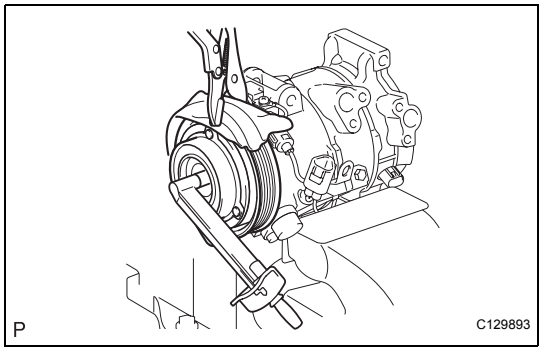




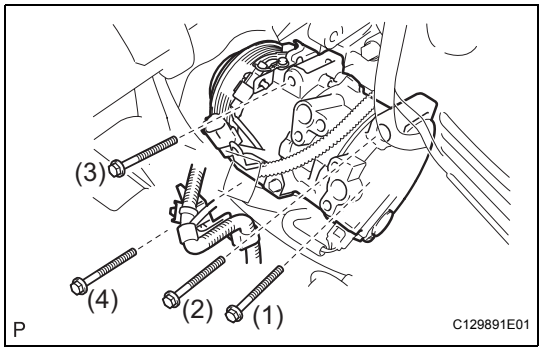
(b) Using a snap ring expander, install a new snap ring with the chamfered side facing up.
(c) Connect the connector.



(d) Using a snap ring expander, install the magnetic clutch rotor and a new snap ring with the chamfered side facing up.
(e) Install the magnetic clutch washer and magnetic clutch hub.
NOTICE:
Do not change the combination of the magnetic clutch washer used before disassembly.



(f) Using vise pliers, hold the magnetic clutch hub and install the bolt.
Torque: 18 N*m (184 kgf*cm, 13 ft.*lbf)



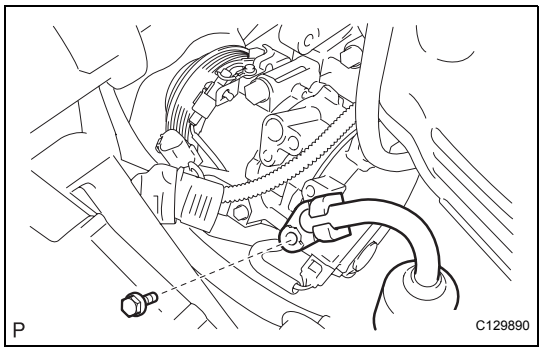
INSTALLATION

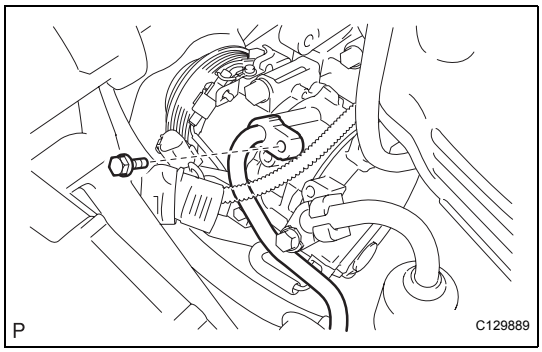
1. INSTALL COMPRESSOR AND MAGNETIC CLUTCH

(a) Install the compressor and magnetic clutch with the 4 bolts.
Torque: 25 N*m (250 kgf*cm, 18 ft.*lbf)
NOTICE:
Tighten the bolts in the order shown in the illustration to install the compressor and magnetic clutch.
(b) Connect the connector.

2. INSTALL SUCTION HOSE SUB-ASSEMBLY

(a) Remove the attached vinyl tape from the hose.
(b) Sufficiently apply compressor oil to a new O-ring and the fitting surface of the compressor and magnetic clutch.
Compressor oil:
ND-OIL 8 or equivalent
(c) Install the O-ring to the suction hose sub-assembly.



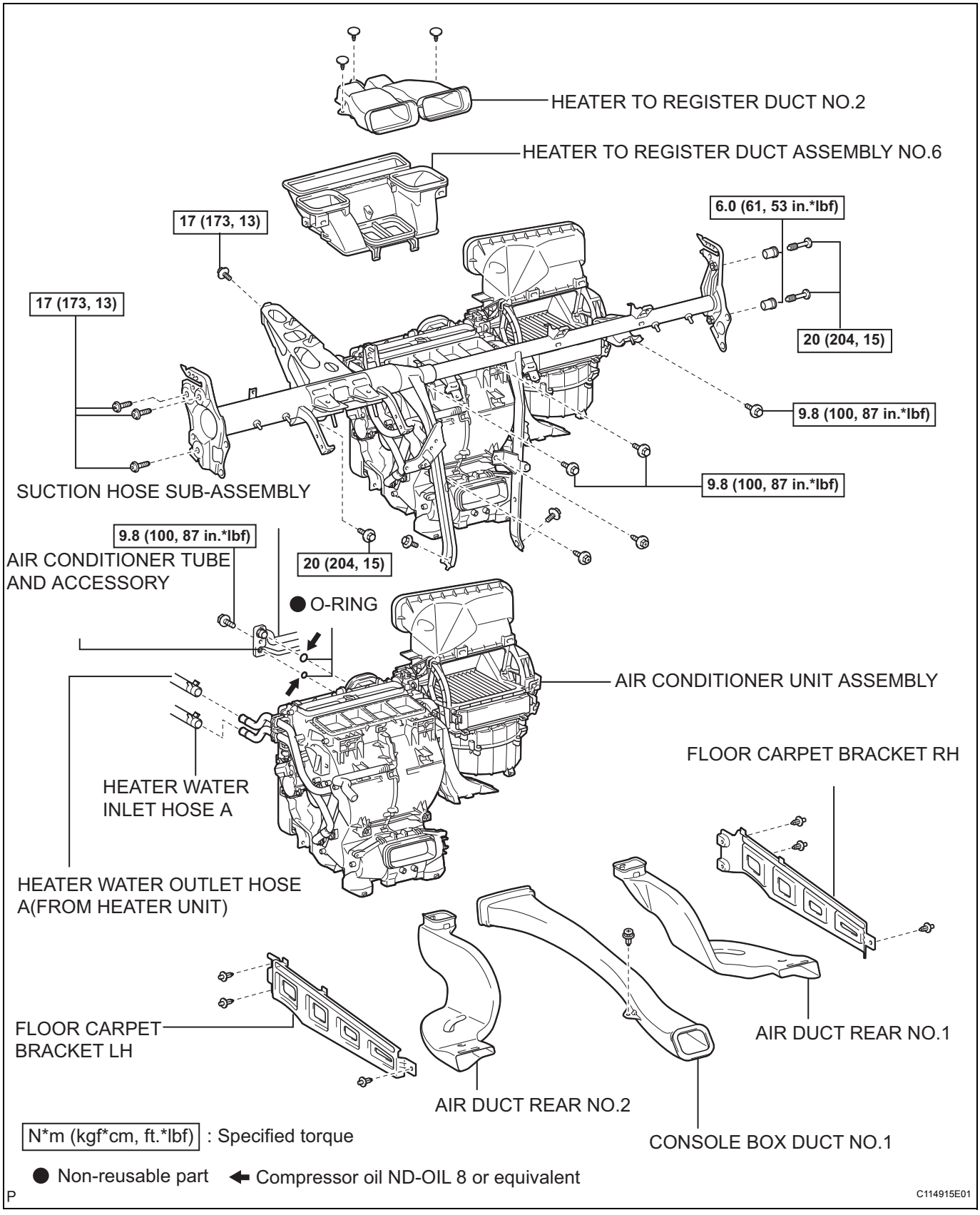


(d) Install the suction hose sub-assembly to the compressor and magnetic clutch with the nut.
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

3. **INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1**
   (a) Remove the attached vinyl tape from the hose.
   (b) Sufficiently apply compressor oil to a new O-ring and the fitting surface of the compressor and magnetic clutch.
   Compressor oil:
   ND-OIL 8 or equivalent
   (c) Install the O-ring to the cooler refrigerant discharge hose No.1.
   (d) Install the cooler refrigerant discharge hose No.1 to the compressor and magnetic clutch with the nut.
   Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)
4. **INSTALL GENERATOR ASSEMBLY (See page CH-15)**
5. **INSTALL FAN AND GENERATOR V BELT (See page EM-46)**
6. **CHARGE REFRIGERANT (See page AC-138)**
7. **WARM UP ENGINE (See page AC-139)**
8. **CHECK FOR LEAKAGE OF REFRIGERANT (See page AC-139)**

AIR CONDITIONING UNIT

COMPONENTS



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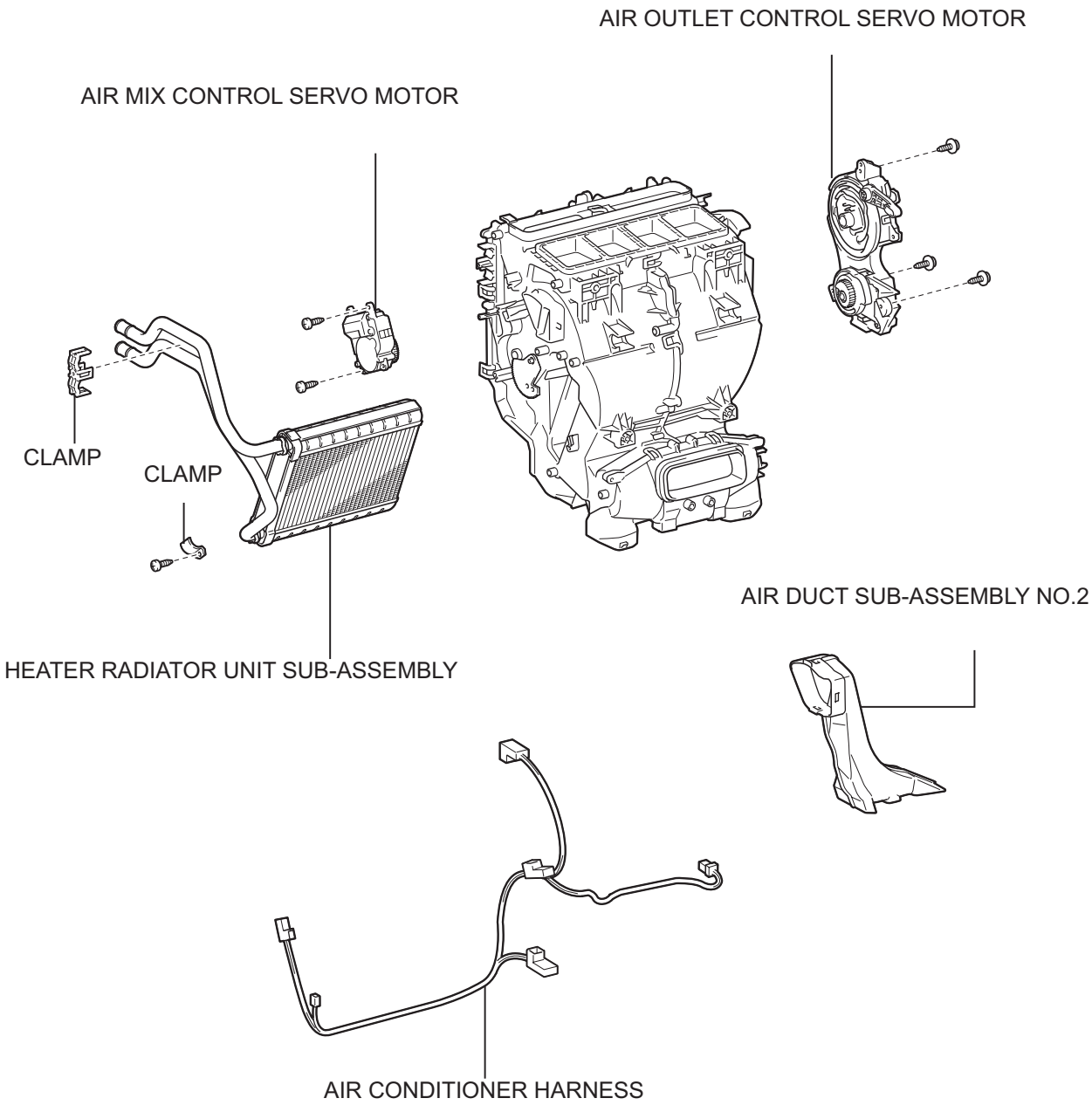

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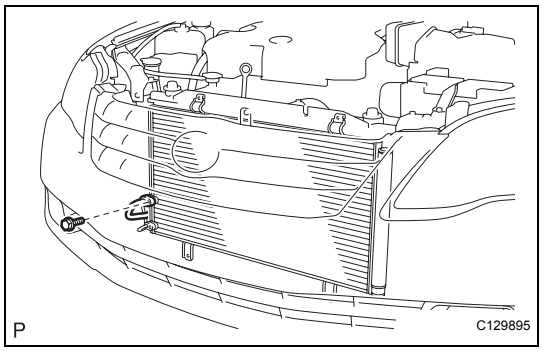
REMOVAL

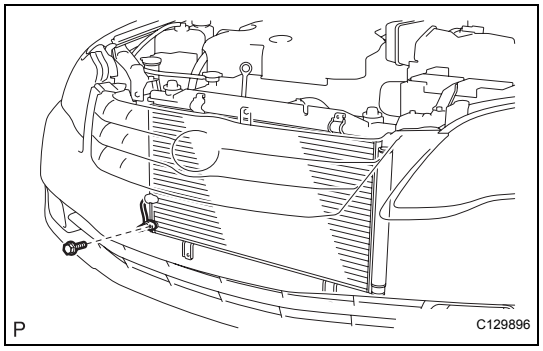
HINT:

- Installation is in the reverse order of removal.

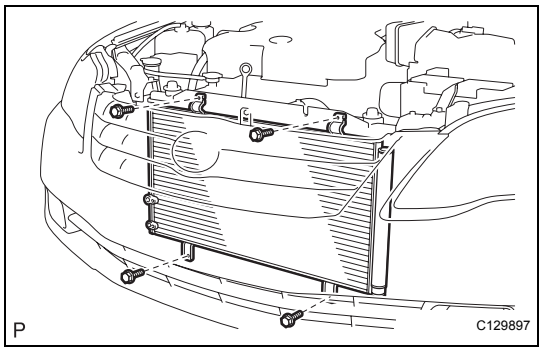
1. **DISCHARGE REFRIGERANT FROM FROM REFRIGERATION SYSTEM (See page AC-138)**
2. **REMOVE AIR CLEANER INLET NO.2 (See page EM-28)**
3. **REMOVE AIR CLEANER INLET NO.1 (See page EM-28)**
4. **DISCONNECT HOOD LOCK ASSEMBLY**
5. **REMOVE RADIATOR SUPPORT UPPER (See page CO-31)**
6. **DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1**
   (a) Remove the bolt and disconnect the cooler refrigerant discharge hose No.1 from the cooler condenser assembly.
   (b) Remove the O-ring from the cooler refrigerant discharge hose No.1.
   NOTICE:
   Seal the openings of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

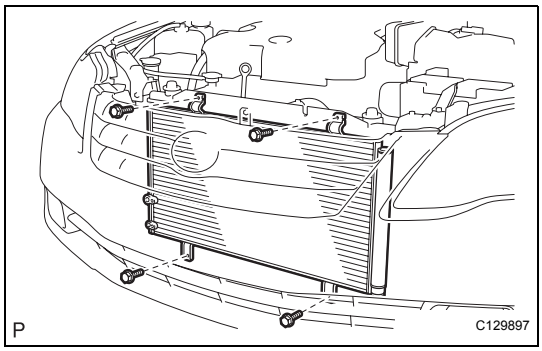


7. **DISCONNECT AIR CONDITIONER TUBE AND ACCESSORY**
   (a) Remove the bolt and disconnect the air conditioner tube & accessory from the cooler condenser assembly.
   NOTICE:
   Seal the openings of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



8. **REMOVE COOLER CONDENSER ASSEMBLY**
   (a) Remove the 4 bolts and cooler condenser assembly.

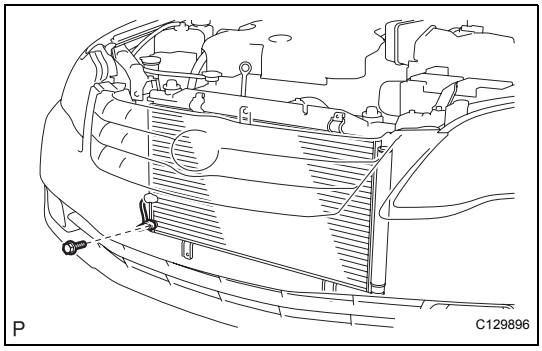




INSTALLATION

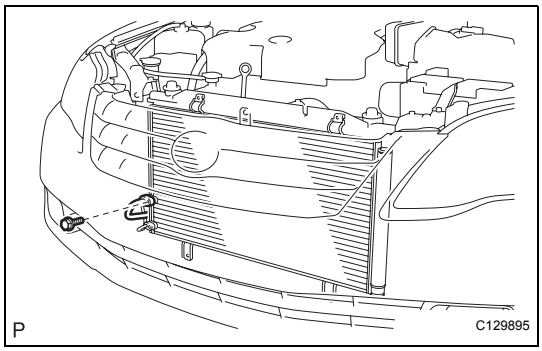
1. **INSTALL COOLER CONDENSER ASSEMBLY**
   (a) Install the cooler condenser assembly with the 4 bolts.
   Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

2. **INSTALL AIR CONDITIONER TUBE AND ACCESSORY**
   (a) Remove the attached vinyl tape from the tube and the connecting part of the cooler condenser assembly.
   (b) Sufficiently apply compressor oil to a new O-ring and the fitting surface of the hose joint.
   Compressor oil:
   ND-OIL 8 or equivalent
   (c) Install the O-ring on the air conditioning tube assembly.



   (d) Install the air conditioner tube & accessory on the cooler condenser assembly with the bolt.
   Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

3. **INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1**
   (a) Remove the attached vinyl tape from the pipe and the connecting part of the cooler condenser assembly.
   (b) Sufficiently apply compressor oil to a new O-ring and the fitting surface of the pipe joint.
   Compressor oil:
   ND-OIL 8 or equivalent
   (c) Install the O-ring on the cooler refrigerant discharge hose No.1.

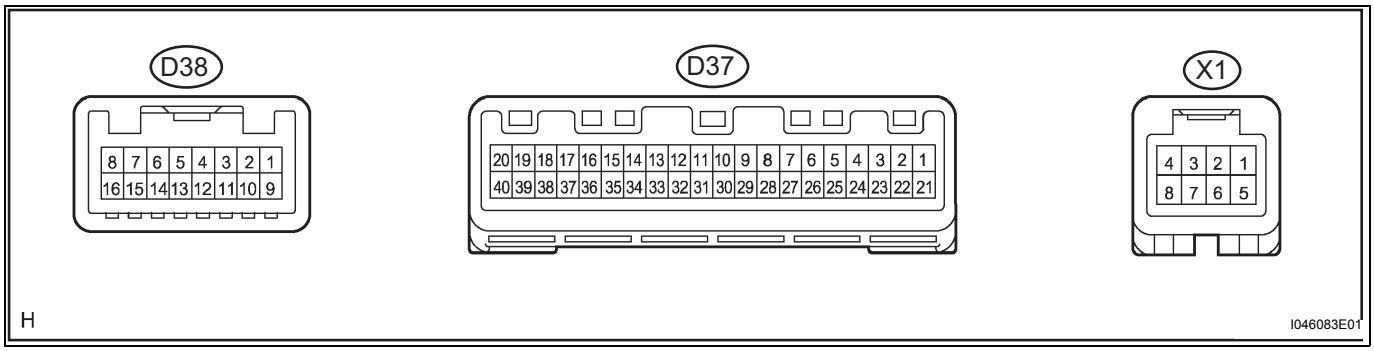


   (d) Install the cooler refrigerant discharge hose No.1.
   Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

4. **INSTALL RADIATOR SUPPORT UPPER (See page CO-31)**
5. **INSTALL HOOD LOCK ASSEMBLY**
6. **CHARGE REFRIGERANT (See page AC-138)**
7. **WARM UP ENGINE (See page AC-139)**
8. **CHECK FOR LEAKAGE OF REFRIGERANT (See page AC-139)**

TERMINALS OF ECU

1. Air Conditioning Amplifier



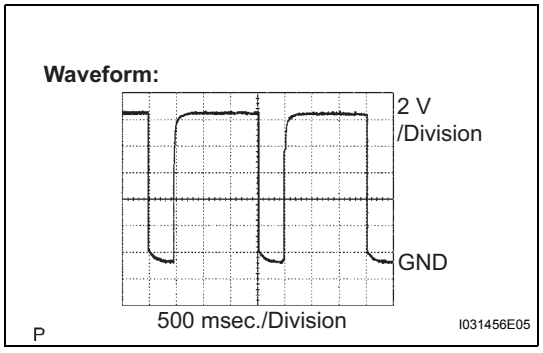
Terminal No. (Symbols)	Wiring color	Terminal Description	Condition	Specification
D37-1 (B) - D37-20 (GND)	SB - W-B	Power source (Back-up)	Always	10 to 14 V
D37-2 (SHR) - D37-20 (GND)	R - W-B	Seat heater operation signal (Passenger side)	Ignition switch on (IG). Seat heater switch: OFF	10 to 14 V
D37-2 (SHR) - D37-20 (GND)	R - W-B	Seat heater operation signal (Passenger side)	Ignition switch on (IG). Seat heater switch: ON	Below 1 V
D37-3 (MGC) - Body ground	V - Body ground	Compressor operation signal	Ignition switch on (IG). Magnetic clutch: ON	Below 1 V
D37-3 (MGC) - Body ground	V - Body ground	Compressor operation signal	Ignition switch on (IG). Magnetic clutch: OFF	10 to 14 V
D37-4 (SCL1) - D37-20 (GND)	P - W-B	Illumination signal	Ignition switch on (IG). Seat heater switch: ON	Below 1 V
D37-4 (SCL1) - D37-20 (GND)	P - W-B	Illumination signal	Ignition switch on (IG). Seat heater switch: OFF	10 to 14 V
D37-5 (SOL+) - Body ground	L - W-B	External variable control solenoid current value signal	Ignition switch on (IG). AUTO switch: NO	Pulse generation
D37-6 (SCR1) - D37-20 (GND)	B - W-B	Illumination signal	Ignition switch on (IG). Seat heater switch: ON	Below 1 V
D37-6 (SCR1) - D37-20 (GND)	B - W-B	Illumination signal	Ignition switch on (IG). Seat heater switch: OFF	10 to 14 V
D37-9 (LOCK) - D37-17 (SG-3)	B - R	A/C lock sensor signal	Engine running. Magnetic clutch: ON Blower switch: ON	Pulse generation (See waveform 2)
D37-11 (BLW) - D37-20 (GND)	R - W-B	Blower motor speed control signal	Ignition switch on (IG). Blower switch: ON	Pulse generation (See waveform 1)
D37-13 (BLW) - D7-38 (SG-2)	G - R	A/C pressure sensor signal	Start engine Operate A/C system Refrigerant pressure: Abnormal pressure (More than 3,030 kPa (31.0 kgf/cm, 440 psi))	4.7 V or higher
D37-13 (BLW) - D7-38 (SG-2)	G - R	A/C pressure sensor signal	Start engine Operate A/C system Refrigerant pressure: Abnormal pressure (Less than 180 kPa (1.9 kgf/cm, 27 psi))	Below 0.7 V
D37-13 (BLW) - D7-38 (SG-2)	G - R	A/C pressure sensor signal	Start engine Operate A/C system Refrigerant pressure: Abnormal pressure (Less than 3,030 kPa (31.0 kgf/cm, 440 psi) and more than 180 kPa (1.9 kgf/cm, 27 psi))	0.7 to 4.7 V
D37-14 (TSP) - D37-20 (GND)	Y - W-B	Solar sensor signal (Passenger side)	Ignition switch on (IG). Solar sensor subjected to electric light.	0.8 to 4.3 V
D37-14 (TSP) - D37-20 (GND)	Y - W-B	Solar sensor signal (Passenger side)	Ignition switch on (IG). Solar sensor covered by cloth.	Below 0.8 V

Terminal No. (Symbols)	Wiring color	Terminal Description	Condition	Specification
D37-16 (TR) - D37-19 (SG-1)	BR - LG	Room temperature sensor signal	Ignition switch on (IG). Cabin temperature 25°C (77°F).	1.8 to 2.2 V
D37-16 (TR) - D37-19 (SG-1)	BR - LG	Room temperature sensor signal	Ignition switch on (IG). Cabin temperature 40°C (104°F).	1.2 to 1.6 V
D37-20 (GND) - Body ground	W-B - Body ground	Ground for main power supply	Always	Below 1 V
D37-21 (IG+) - D37-20 (GND)	G - W-B	Power source (IG)	Ignition switch on (IG).	10 to 14 V
D37-21 (IG+) - D37-20 (GND)	G - W-B	Power source (IG)	Ignition switch off.	Below 1 V
D37-22 (LIN1) - D37-20 (GND)	GR - W-B	LIN communication signal	Ignition switch on (IG).	Pulse generation
D37-24 (SHL) - D37-20 (GND)	V - W-B	Seat heater operation signal (Driver side)	Ignition switch on (IG). Seat heater switch: OFF	10 to 14 V
D37-24 (SHL) - D37-20 (GND)	V - W-B	Seat heater operation signal (Driver side)	Ignition switch on (IG). Seat heater switch: ON	Below 1 V
D37-26 (S5-2) - D37-38 (SG-2)	BR - R	Pressure sensor operation voltage	Ignition switch on (IG).	4.5 to 5.5 V
D37-28 (TACO) - D37-20 (GND)	V - W-B	Engine speed signal	Engine running. A/C switch: OK	Pulse generation (See waveform 3)
D37-30 (MPX+) - D37-20 (GND)	(*1) LG - W-B, (*2) B - W-B	Multiplex communication system	Multiplex communication circuit	Pulse generation
D37-31 (MPX-) - D37-20 (GND)	L - W-B	Multiplex communication system	Multiplex communication circuit	Pulse generation
D37-35 (TSD) - D37-20 (GND)	O - W-B	Solar sensor signal (Driver side)	Ignition switch on (IG). Solar sensor subjected to electric light.	0.8 to 4.3 V
D37-35 (TSD) - D37-20 (GND)	O - W-B	Solar sensor signal (Driver side)	Ignition switch on (IG). Solar sensor covered by cloth.	Below 0.8 V
D38-2 (SW5) - D38-11 (SG-4)	O - R	Seat heater control signal (Passenger side)	Seat heater switch: COOL (HI)	0.17 V
D38-2 (SW5) - D38-11 (SG-4)	O - R	Seat heater control signal (Passenger side)	Seat heater switch: COOL (MID)	0.48 to 1.17 V
D38-2 (SW5) - D38-11 (SG-4)	O - R	Seat heater control signal (Passenger side)	Seat heater switch: COOL (LO)	1.31 to 2.01 V
D38-2 (SW5) - D38-11 (SG-4)	O - R	Seat heater control signal (Passenger side)	Seat heater switch: OFF	2.15 to 2.83 V
D38-2 (SW5) - D38-11 (SG-4)	O - R	Seat heater control signal (Passenger side)	Seat heater switch: HOT (LO)	2.97 to 3.67 V
D38-2 (SW5) - D38-11 (SG-4)	O - R	Seat heater control signal (Passenger side)	Seat heater switch: HOT (MID)	3.81 to 4.49 V
D38-2 (SW5) - D38-11 (SG-4)	O - R	Seat heater control signal (Passenger side)	Seat heater switch: HOT (HI)	4.8 V
D38-3 (SW4) - D38-11 (SG-4)	BR - R	Seat heater control signal (Driver side)	Seat heater switch: COOL (HI)	0.17 V
D38-3 (SW4) - D38-11 (SG-4)	BR - R	Seat heater control signal (Driver side)	Seat heater switch: COOL (MID)	0.48 to 1.17 V
D38-3 (SW4) - D38-11 (SG-4)	BR - R	Seat heater control signal (Driver side)	Seat heater switch: COOL (LO)	1.13 to 2.01 V
D38-3 (SW4) - D38-11 (SG-4)	BR - R	Seat heater control signal (Driver side)	Seat heater switch: OFF	2.15 to 2.83 V
D38-3 (SW4) - D38-11 (SG-4)	BR - R	Seat heater control signal (Driver side)	Seat heater switch: HOT (LO)	2.97 to 3.67 V
D38-3 (SW4) - D38-11 (SG-4)	BR - R	Seat heater control signal (Driver side)	Seat heater switch: HOT (MID)	3.81 to 4.49 V
D38-3 (SW4) - D38-11 (SG-4)	BR - R	Seat heater control signal (Driver side)	Seat heater switch: HOT (HI)	4.8 V

Terminal No. (Symbols)	Wiring color	Terminal Description	Condition	Specification
D38-4 (TSHR) - D38-11 (SG-7)	L - O	Seat heater temperature sensor signal (Passenger side)	Ignition switch on (IG). Temperature of seat heater sensor: 30°C (86°F).	2.6 to 3.0 V
D38-4 (TSHR) - D38-11 (SG-7)	L - O	Seat heater temperature sensor signal (Passenger side)	Ignition switch on (IG). Temperature of seat heater sensor: 50°C (122°F).	1.8 to 2.2 V
D38-5 (TSHR) - D38-12 (SG-8)	LG - R	Seat heater temperature sensor signal (Driver side)	Ignition switch on (IG). Temperature of seat heater sensor: 30°C (86°F).	2.6 to 3.0 V
D38-5 (TSHR) - D38-12 (SG-8)	LG - R	Seat heater temperature sensor signal (Driver side)	Ignition switch on (IG). Temperature of seat heater sensor: 50°C (122°F).	1.8 to 2.2 V
D38-7 (S5-4) - D38-11 (SG-4)	L - R	Seat heater switch position sensor signal	Ignition switch on (IG).	4.5 to 5.5 V
D38-5 (ROUT) - D37-20 (GND)	W - W-B	Seat climate blower control signal (Passenger side)	Ignition switch on (IG). Seat climate control blower dial (Passenger side): Minimum → Maximum	Pulse generation (See waveform)
D38-11 (SG-7) - D37-20 (GND)	O - W-B	Ground for seat heater	Always	Below 1 V
D38-12 (SG-8) - D37-20 (GND)	R - W-B	Ground for seat heater (Driver side)	Always	Below 1 V
D38-5 (LOUT) - D37-20 (GND)	GR - W-B	Seat climate blower control signal (Driver side)	Ignition switch on (IG). Seat climate control blower dial (Driver side): Minimum → Maximum	Pulse generation (See waveform)
X1-2 (BUSG) - Body ground	-	Ground for BUS IC	Always	Below 1 V
X1-3 (BUS) - X1-2 (BUSG)	-	BUS IC control signal	Ignition switch off → on (IG)	Pulse generation
X1-4 (BBUS) - X1-2 (BUSG)	-	Power supply for BUS IC	Ignition switch off.	Below 1 V
X1-4 (BBUS) - X1-2 (BUSG)	-	Power supply for BUS IC	Ignition switch on (IG).	10 to 14 V
X1-6 (TEA) - X1-5 (SGA)	-	Evaporator temperature sensor signal	Ignition switch on (IG). Evaporator temperature 0°C (32°F).	2.0 to 2.4 V
X1-6 (TEA) - X1-5 (SGA)	-	Evaporator temperature sensor signal	Ignition switch on (IG). Evaporator temperature 15°C (59°F).	1.4 to 1.8 V

(*1): w/ Smart Key System

(*2): w/o Smart Key System



(a) waveform 1:

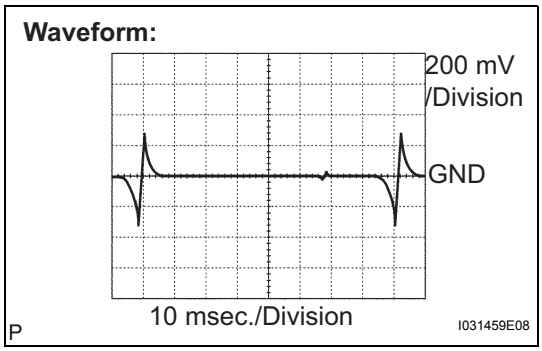
(1) Measure the waveform between terminal D37-11 (BLW), D38-16 (LOUT), D38-8 (ROUT) and body ground or air conditioning amplifier.

OK:

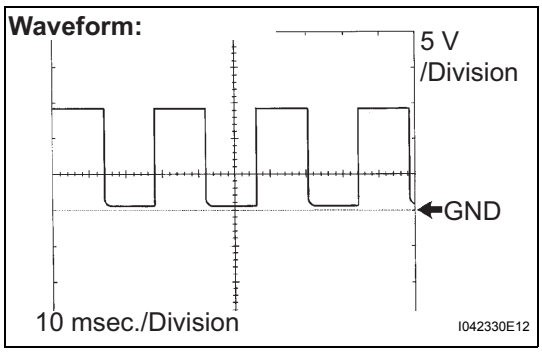
Waveform appears as shown in the illustration.

HINT:

As the air flow amount increases, the waveform gets narrow.

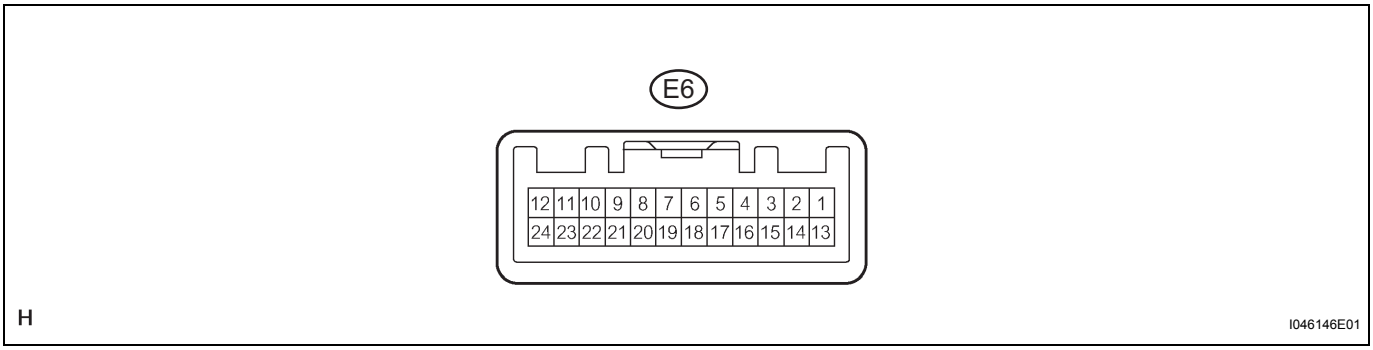


(b) waveform 2:
(1) Measure the waveform between terminal D37-9 (LOCK) and body ground of air conditioning amplifier
OK:
Waveform appears as shown in the illustration.



(c) waveform 3:
(1) Measure the waveform between terminal D37-28 (TACO) and body ground of air conditioning amplifier
OK:
Waveform appears as shown in the illustration.
HINT:
As the engine speed becomes faster, the waveform gets narrow.

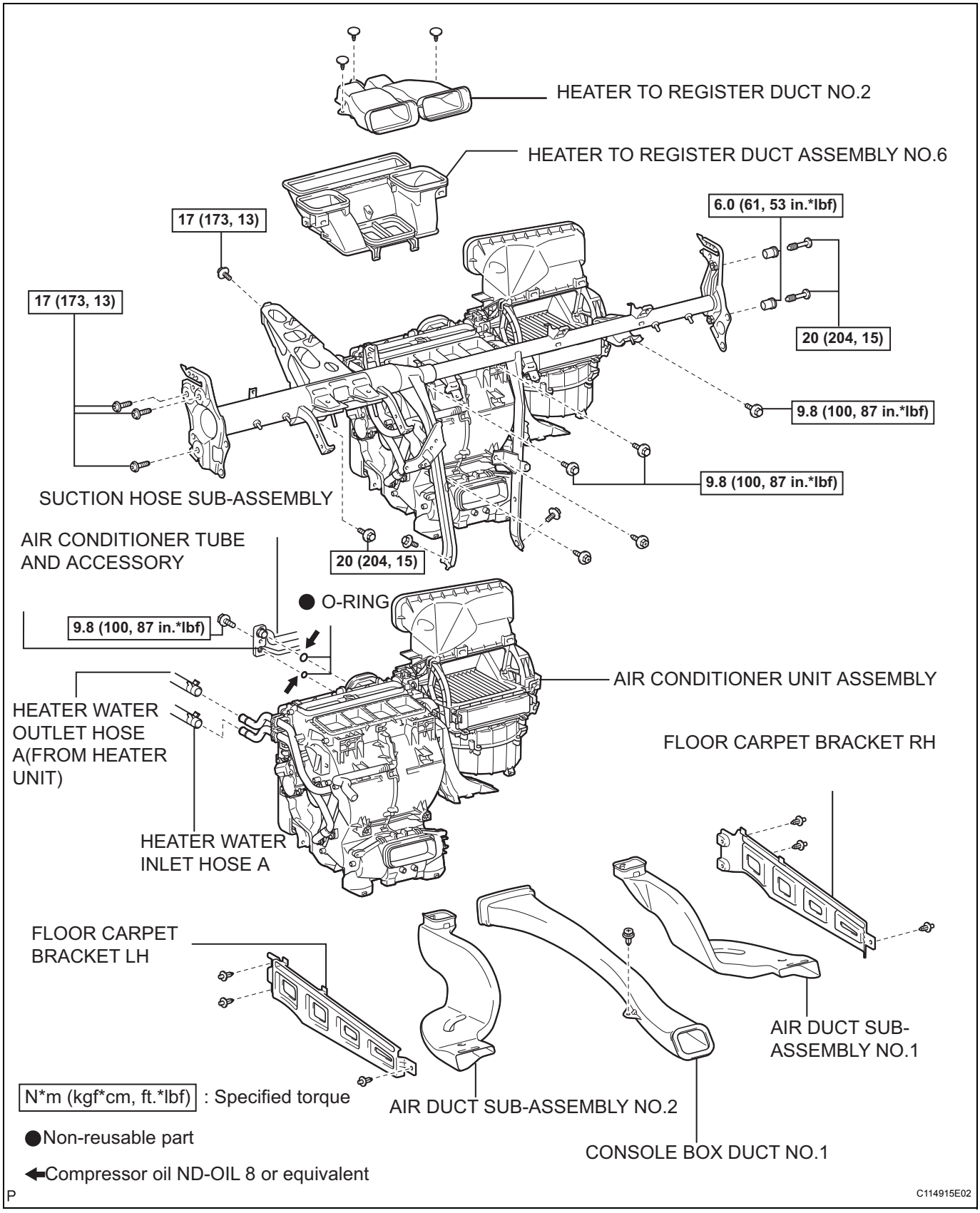
2. Heater Control Panel LH



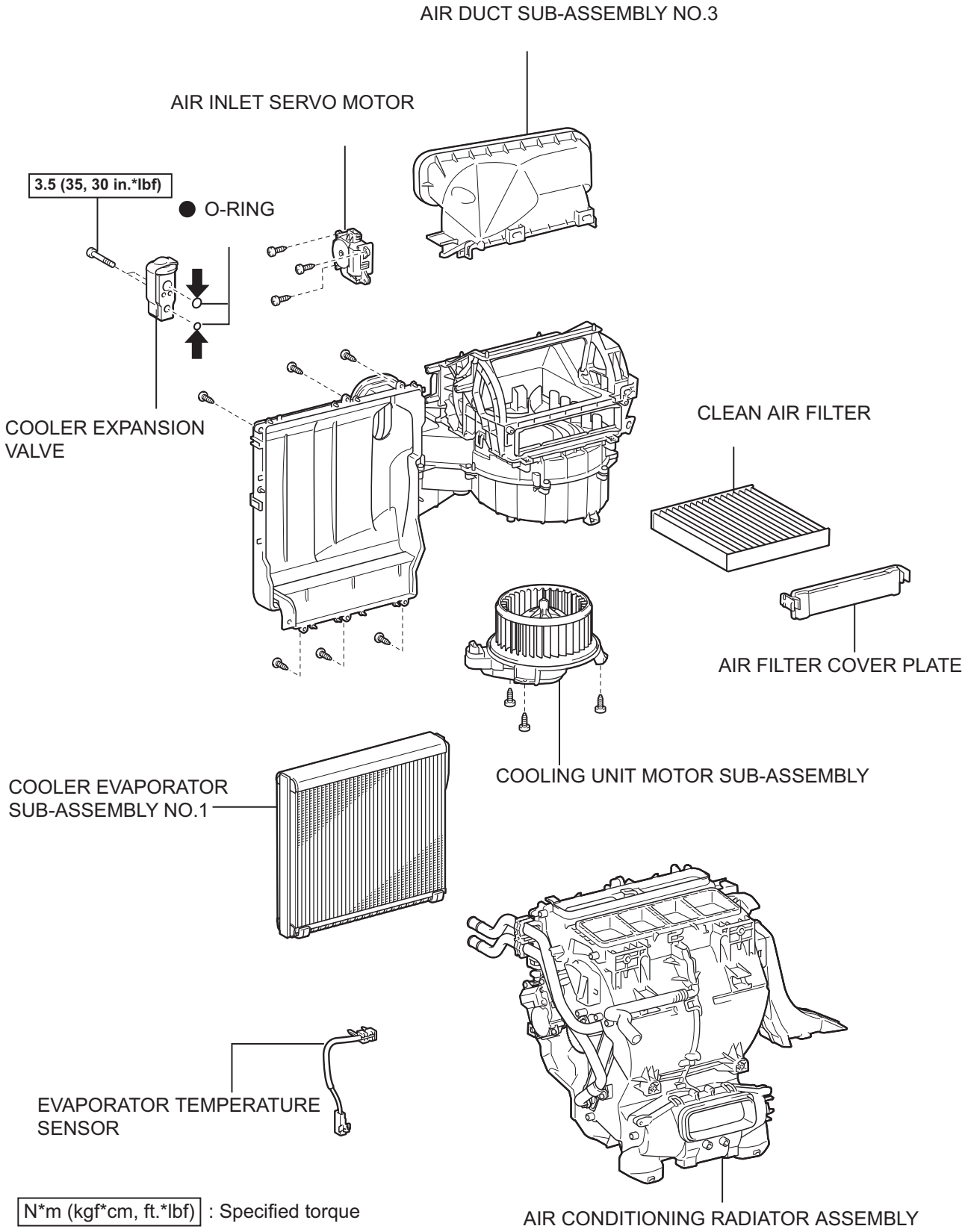
Terminal No. (symbols)	Wiring color	Terminal Description Condition	Condition	Specification
E6-1 (IG+) - E6-24 (GND)	B - W-B	Power source (IG)	Ignition switch on (IG).	10 to 14 V
E6-2 (PIL+) - E6-22 (PIL-)	G - B	Illumination signal	Ignition switch on (IG).	10 to 14 V
E6-11 (PSE) - Body ground	W - Body ground	Ground for Illumination	Always	Below 1 V
E6-13 (ILL+) - E6-21 (ILL-)	W - V	Illumination signal	Ignition switch on (IG). Light control switch: TAIL or HEAD	10 to 14 V
E6-14 (LED+) - E6-24 (GND)	O - W-B	Illumination signal	Ignition switch on (IG).	10 to 14 V
E6-14 (LED+) - E6-8 (LREC)	O - L	Illumination signal	Ignition switch on (IG). REC switch: ON	10 to 14 V
E6-14 (LED+) - E6-10 (LAUT)	O - P	Illumination signal	Ignition switch on (IG). AUTO switch: ON	10 to 14 V
E6-14 (LED+) - E6-9 (L A/C)	O - GR	Illumination signal	Ignition switch on (IG). A/C switch: ON	10 to 14 V
E6-19 (TX+) - E6-24 (GND)	L - W-B	LIN communication signal	Ignition switch on (IG).	Pulse generation
E6-24 (GND) - Body ground	W-B - Body ground	Ground for heater control panel	Always	Below 1 V

BLOWER UNIT

COMPONENTS



AC

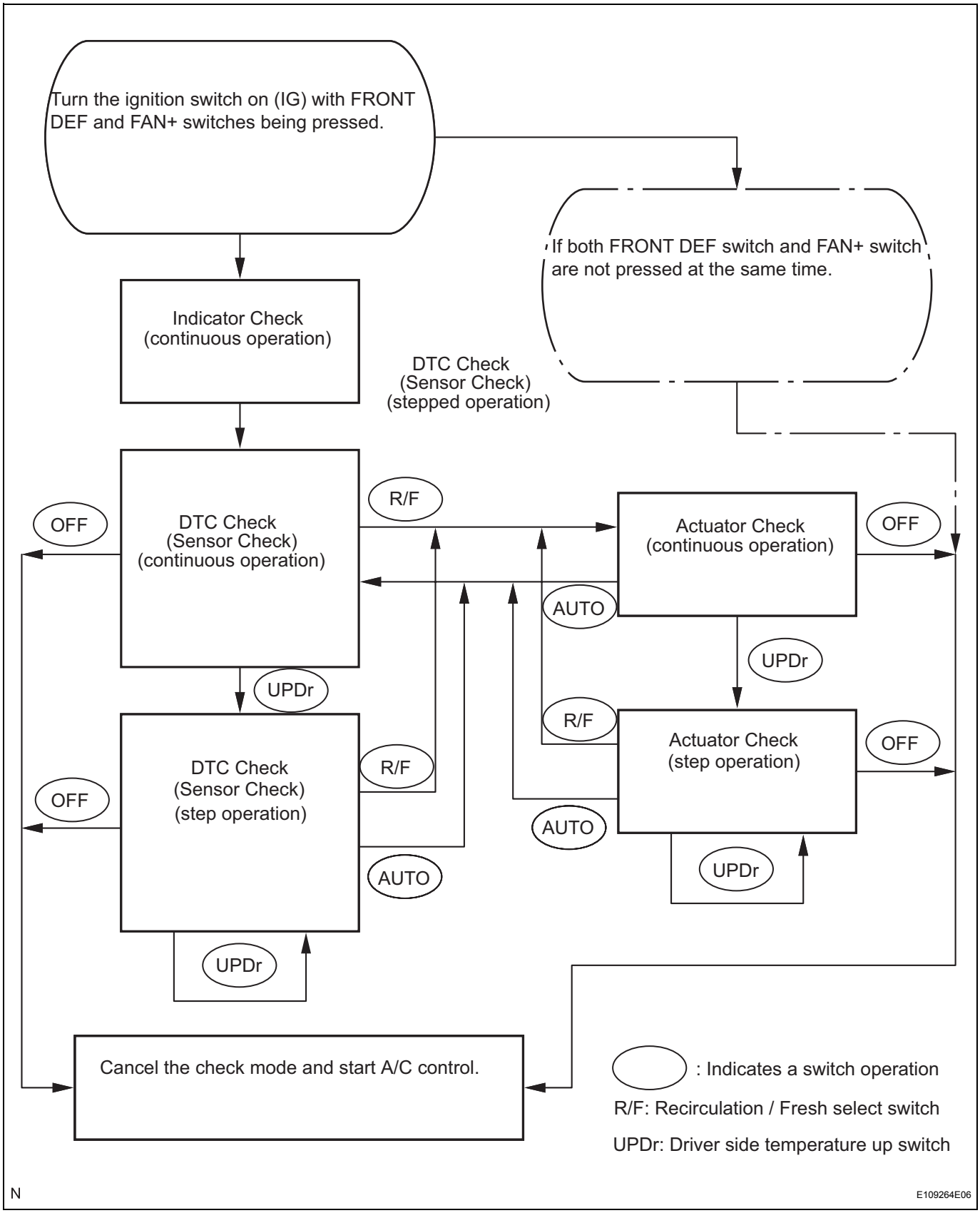

AIR DUCT SUB-ASSEMBLY NO.3
AIR INLET SERVO MOTOR
3.5 (35, 30 in.*lbf)
● O-RING
COOLER EXPANSION VALVE
CLEAN AIR FILTER
AIR FILTER COVER PLATE
COOLING UNIT MOTOR SUB-ASSEMBLY
COOLER EVAPORATOR SUB-ASSEMBLY NO.1
EVAPORATOR TEMPERATURE SENSOR
AIR CONDITIONING RADIATOR ASSEMBLY
N*m (kgf*cm, ft.*lbf) : Specified torque
● Non-reusable part
⬅ Compressor oil ND-OIL 8 or equivalent
P
C114917E01

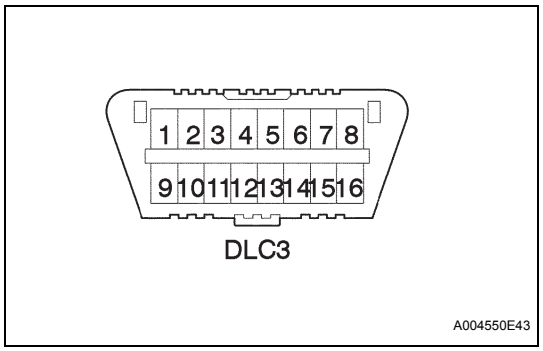
AC

DIAGNOSIS SYSTEM

1. LIST OF OPERATION METHODS

(a) By operating each of the A/C control switches as shown in the diagram below, it is possible to enter the diagnostic check mode.


Turn the ignition switch on (IG) with FRONT DEF and FAN+ switches being pressed.
If both FRONT DEF switch and FAN+ switch are not pressed at the same time.
Indicator Check (continuous operation)
DTC Check (Sensor Check) (stepped operation)
DTC Check (Sensor Check) (continuous operation)
R/F
OFF
Actuator Check (continuous operation)
OFF
AUTO
UPDr
UPDr
R/F
Actuator Check (step operation)
OFF
DTC Check (Sensor Check) (step operation)
R/F
OFF
AUTO
AUTO
UPDr
UPDr
Cancel the check mode and start A/C control.
: Indicates a switch operation
R/F: Recirculation / Fresh select switch
UPDr: Driver side temperature up switch
N
E109264E06



2. CHECK DLC3

(a) The vehicle's ECM uses CAN and the ISO 9141-2 for communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and meets the ISO 9141-2 format.

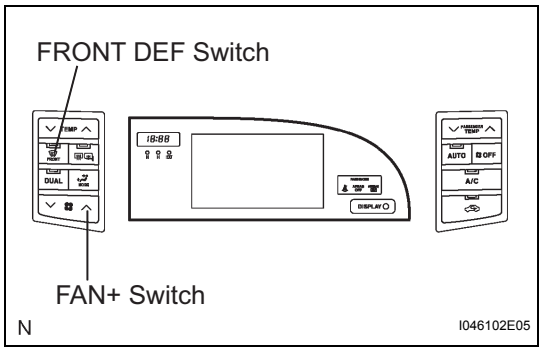
Symbols (Terminal No.)	Terminal Description	Condition	Specified condition
SIL (7) - SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery positive	Always	11 to 14 V
CANH (6) - CANL (14)	HIGH-level CAN bus line	IG switch OFF	54 to 67 Ω
CANH (6) - Battery positive	HIGH-level CAN bus line	IG switch OFF	1MΩ or Higher
CANH (6) - CG (4)	HIGH-level CAN bus line	IG switch OFF	3kΩ or Higher
CANL (14) - Battery positive	LOW-level CAN bus line	IG switch OFF	1MΩ or Higher
CANL (14) - CG (4)	LOW-level CAN bus line	IG switch OFF	3kΩ or Higher

HINT:

If the display shows a communication error message when you have connected the cable of the intelligent tester to the DLC3, turned the ignition switch ON and operated the tester, there is a problem on the vehicle side or tool side.

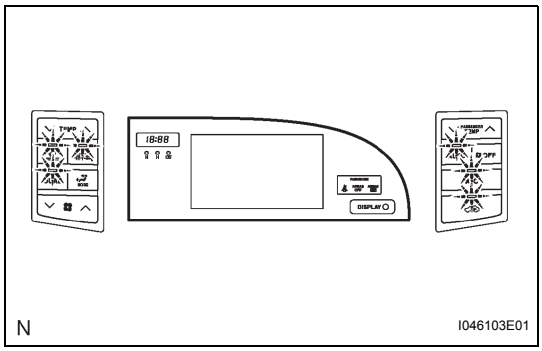
- If the communication is normal when the tool is connected to another vehicle, inspect the DLC3 on the original vehicle.
- If the communication is still impossible when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Department listed in the tool's instruction manual.

DTC CHECK / CLEAR

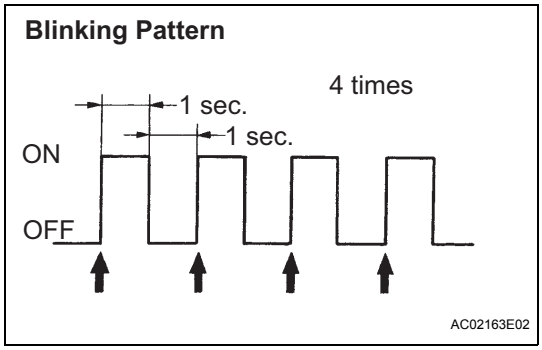


1. INDICATOR CHECK

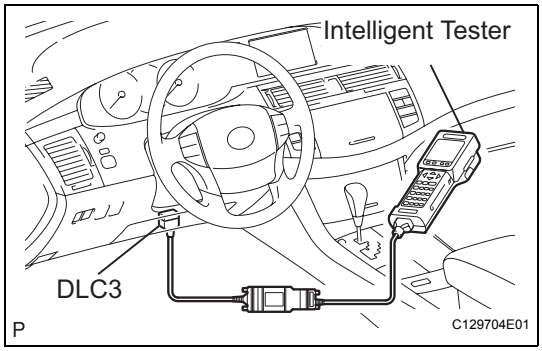
(a) Turn the ignition switch on (IG) while pressing the FRONT DEF switch and FAN+ switch simultaneously.



(b) Check that the all indicators come on.



(c) The all indicators go off 4 times in succession at 1 second intervals.
HINT:
- After the indicator check is completed, the system enters the DTC mode automatically.
- Press the "OFF" switch to cancel the indicator mode.



2. DTC CHECK USING INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG).
(c) Read the DTC following the prompts on the tester screen. Please refer to the intelligent tester operator's manual for further details.
(d) Clear the DTCs.
HINT:
After repairing the malfunctions, clear the DTC.
(1) Connect the intelligent tester to the DLC3.
(2) Turn the ignition switch on (IG).
(3) Erase the DTCs following the prompts in the tester screen.
HINT:
Refer to the intelligent tester operator's manual for further details.

BLOWER MOTOR

INSPECTION

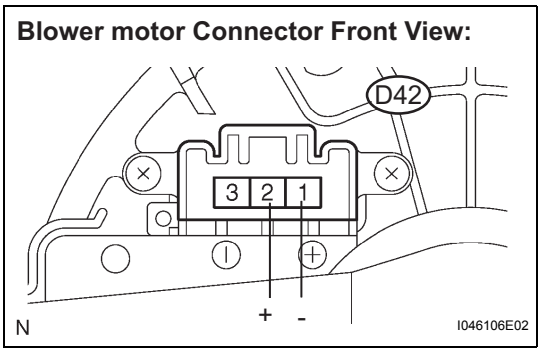
1. INSPECT BLOWER MOTOR

(a) Remove the blower motor.

(b) Disconnect the connector from the cooling unit motor sub-assembly w/ fan.

(c) Connect the positive (+) lead to terminal 2 of the blower motor connector, and the negative (-) lead to terminal 1.

Blower motor Connector Front View:



DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

From the DATA LIST displayed on the intelligent tester, you can read the values of the displays, sensors, actuators and so on without parts removal. Reading the DATA LIST as the first step of troubleshooting is one way to shorten labor time.

(a) Connect intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG).
(c) From the display on the tester, select the "DATA LIST".

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
ROOM TEMP	Room temperature sensor / min.: -6.5°C(20.3°F) max.: 57.25°C(135.05°F)	Actual cabin temperature is displayed	-
AMBI TEMP SENS	Ambient temperature sensor / min.: -23.3°C(-9.94°F) max.: 65.95°C(150.71°F)	Actual cabin temperature is displayed	-
SOLAR SENS-D	Solar sensor (Driver side) / min.: 0 max.: 255	Increases as brightness increases	-
SOLAR SENS-P	Solar sensor (Passenger side) / min.: 0 max.: 255	Increases as brightness increases	-
COOLANT TEMP	Room temperature sensor / min.: 1.3°C(34.34°F) max.: 90.55°C(194.99°F)	Actual engine coolant temperature is displayed while the engine is displayed warmed up	-
SET TEMP-D	Set temperature (Driver side) / min.: 0 max.: 255	Actual set temperature is displayed (driver side)	-
SET TEMP-P	Set temperature (Passenger side) / min.: 0 max.: 255	Actual set temperature is displayed (Passenger side)	-
ESTIMATE TEMP-D	Estimated temperature (driver side) / min.: -358.4°C(-613.12°F) max.: 358.4°C(677.12°F)	Actual estimated temperature is displayed (driver side)	-
ESTIMATE TEMP-P	Estimated temperature (Passenger side) / min.: -358.4°C(-613.12°F) max.: 358.4°C(677.12°F)	Actual estimated temperature is displayed (Passenger side)	-
BLOWER LEVEL	Blower motor speed level / min.: 0 level max.: 31 level	Increases in the range between 0 and 31 as the speed increases	-
AMBI TEMP	Adjusted ambient temperature (Passenger side) / min.: -30.8°C(-23.44°F) max.: 50.8°C(123.44°F)	-	-
SET TEMP SHIFT	Shift set temperature / +2C, +1C, NORMAL, -1C, -2C	Customized value will be displayed	-
AIR INLET MODE	Air inlet mode / AUTO, MANUAL	Customized value will be displayed	-
COMPRESSOR MODE	Compressor mode / AUTO, MANUAL	Customized value will be displayed	-
COMPRS / DEF OPER	Compressor / DEF operation mode / LINK, NORMAL	Customized value will be displayed	-
EVAP CTRL	Evaporator control / AUTO, MANUAL	Customized value will be displayed	-
BUTTON PRS BUZ	Button press buzzer / ON, OFF	Customized value will be displayed	-

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
FOOT AIR LEAK	Foot air leak / ON, OFF	Customized value will be displayed	-
AUTO BLOW UP	Foot / DEF automatic blow up function /ON, OFF	Customized value will be displayed	-
FOOT / DEF MODE	Foot / DEF mode / ON, OFF	Customized value will be displayed	-
AMBIENT TMP SFT	Ambient temperature Shift / +3C, +2C, +1C, Normal, -1C, -2C, -3C	Customized value will be displayed	-
DESTINATION	Destination / DOMEST, USA, EUROPE, AUSTRAL, MIDEAST, NO INFO	Changes with destinations	-
REG PRESS SENS	Regulator pressure sensor / min.: 0 max.: 255	Actual regulator Pressure is displayed	-
REG CTRL CURRNT	Regulator control current / min.: 0 A max.: 255 A	-	-
AIR MIX PULSE-D	Air mix servomotor target pulse (D side) / min.: 0, max.: 255	Damper is at "MAX. COOL" : 5 (pulse) Damper is at "MAX. HOT" : 103 (pulse)	-
AIR MIX PULSE-P	Air mix servomotor target pulse (P side) / min.: 0, max.: 255	Damper is at "MAX. COOL" : 105 (pulse) Damper is at "MAX. HOT" : 7 (pulse)	-
ARI OUTLET PULSE-D	Air outlet servomotor target pulse (D side) / min.: 0, max.: 255	Damper is at "FACE" : 8 (pulse) Damper is at "B/L" : 30 (pulse) Damper is at "FOOT" : 67 (pulse) Damper is at "F/D" : 80 (pulse) Damper is at "DEF" : 97 (pulse)	-
A/I DAMP PLS	Air inlet damper target pulse / min.: 0, max.: 255	Damper is at "RECIRCULATION" : 7 (pulse) Damper is at "FRESH" : 28 (pulse)	-
EVAP FIN TEMP	Evaporator Fin Thermistor / min.: 0, max.: 255	-	-
#COES	Number of Trouble / min.: 0, max.: 255	Number of DTCs will be displayed	-

2. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the intelligent tester allows the relays, VSV, actuators and so on to operate without parts removal. Performing the ACTIVE TEST as the first step of troubleshooting is one way to shorten labor time.

It is possible to display the DATA LIST on the intelligent tester during the ACTIVE TEST.

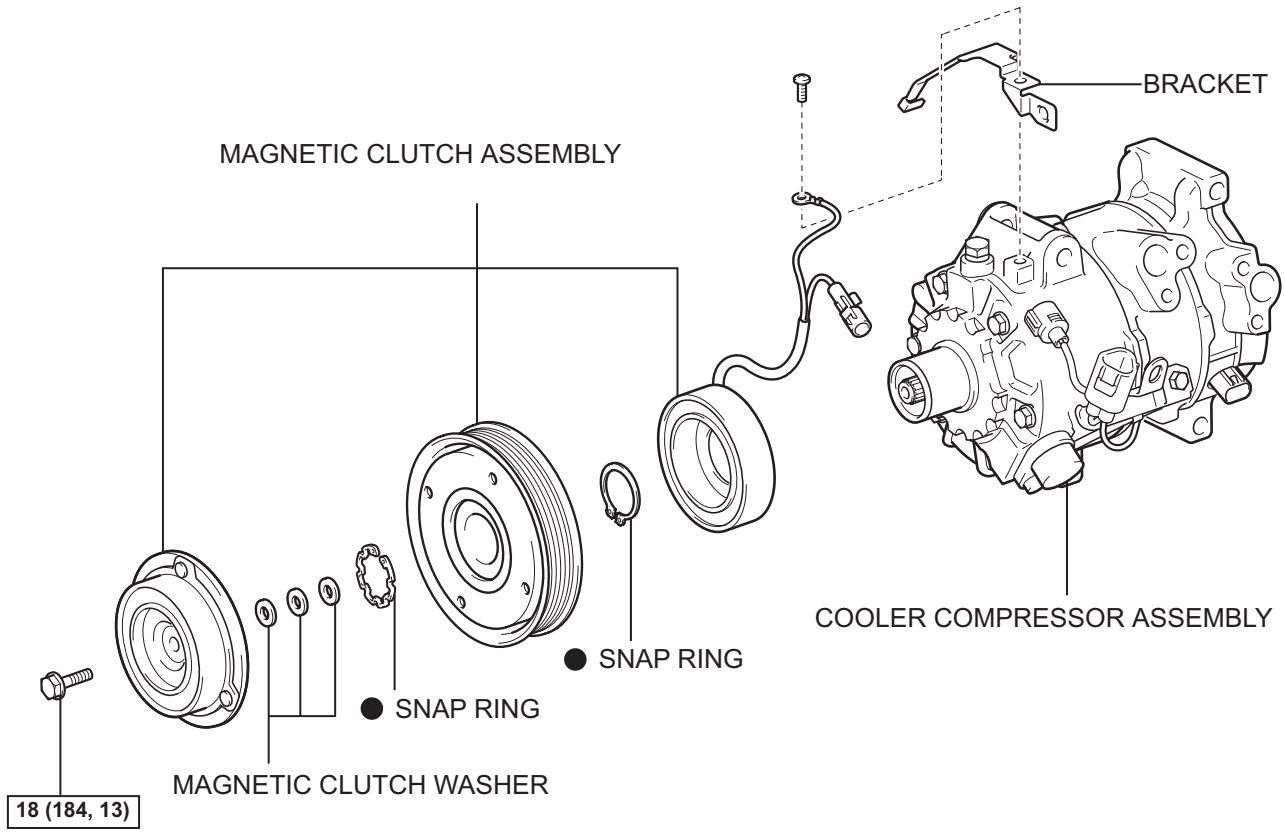
(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG).
(c) From the display on tester, perform the "ACTIVE TEST".

Item	Test Details / Display (Range)	Diagnostic Note
BLOWER MOTOR	Blower motor / min.:0, max.: 31 level	-
A/C MAG CLUTCH	Magnetic clutch relay / OFF, ON	-
DEFOGGER RLY-R	Defogger relay (Rear) / OFF, ON	-
AIR MIX PULSE-D	Air mix servomotor pulse (D side) / min.: 0, max.: 255	-

Item	Test Details / Display (Range)	Diagnostic Note
AIR MIX PULSE-P	Air mix servomotor pulse (P side) / min.: 0, max.: 255	-
AIR OUT PULSE-D	Air outlet servomotor pulse (D side) / min.: 0, max.: 255	-
A/I DAMP PLS	Air inlet damper tamper target pulse / min.: 0, max.: 255	-

COMPRESSOR AND MAGNETIC CLUTCH

COMPONENTS



N*m (kgf*cm, ft.*lbf) : Specified torque

● Non-reusable part

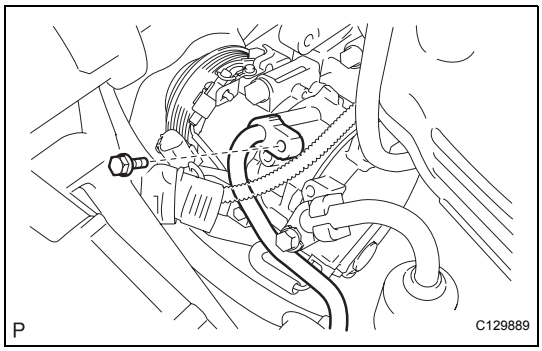
P

C114918E02

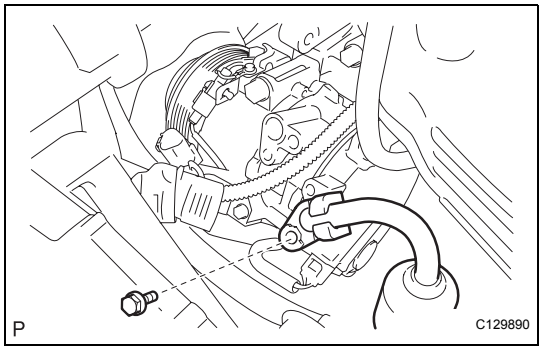
AC

REMOVAL

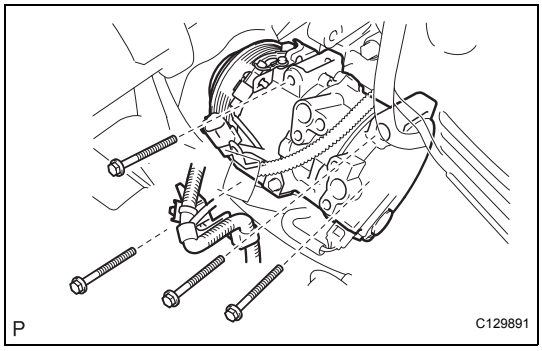
1. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM (See page AC-138)**
2. **REMOVE FAN AND GENERATOR V BELT (See page EM-28)**
3. **REMOVE GENERATOR ASSEMBLY (See page CH-9)**
4. **DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1**
   (a) Remove the bolt and disconnect the cooler refrigerant discharge hose No.1.
   (b) Remove the O-ring from the cooler refrigerant discharge hose No.1.
   NOTICE:
   Seal the openings of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



5. **DISCONNECT SUCTION HOSE SUB-ASSEMBLY**
   (a) Remove the bolt and disconnect the suction hose sub-assembly.
   (b) Remove the O-ring from the suction hose No.1.
   NOTICE:
   Seal the openings of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



6. **REMOVE COMPRESSOR AND MAGNETIC CLUTCH**
   (a) Disconnect the connector.
   (b) Remove the 4 bolts and compressor and magnetic clutch.



DIAGNOSTIC TROUBLE CODE CHART

If a trouble code is displayed during the DTC check (sensor check), check the circuit listed for that code in the table below (proceed to the page given for that circuit).

AIR CONDITIONING SYSTEM

DTC No.	Detection Item	Trouble Area	Memory*6	See page
B1411/11 *1	Room Temperature Sensor Circuit	1. A/C room temperature sensor 2. Harness or connector between A/C room temperature sensor and A/C amplifier 3. A/C amplifier	Memorized (8.5 min. or more)	AC-46
B1412/12 *2	Ambient Temperature Sensor Circuit	1. A/C ambient temperature sensor 2. Harness or connector between A/C ambient temperature sensor and engine room J/B assembly 3. Engine room J/B assembly	Memorized (8.5 min. or more)	AC-50
B1413/13	Evaporator Temperature Sensor Circuit	1. A/C evaporator temperature sensor 2. Harness or connector between A/C evaporator temperature sensor and A/C amplifier 3. A/C amplifier	Memorized (8.5 min. or more)	AC-55
B1421/21 *3	Solar Sensor Circuit (Passenger Side)	1. A/C solar sensor 2. Harness or connector between A/C solar sensor and A/C amplifier 3. A/C amplifier	Memorized (8.5 min. or more) (Only when circuit is shorted)	AC-58
B1422/22 *4	Compressor Lock Sensor Circuit	1. A/C lock sensor (w/ magnet clutch compressor assembly) 2. Compressor drive belt 3. Harness or connector between A/C amplifier and ECM 4. Harness or connector between A/C lock sensor (w/ magnet clutch compressor assembly) and A/C amplifier 5. ECM 6. A/C amplifier	-	AC-62
B1423/23	Pressure Switch Circuit	1. A/C Pressure sensor 2. Harness or connector between A/C pressure sensor and A/C amplifier 3. Refrigerant pipe line 4. A/C amplifier	-	AC-66
B1424/24 *3	Solar Sensor Circuit (Driver Side)	1. A/C solar sensor 2. Harness or connector between A/C solar sensor and A/C amplifier 3. A/C amplifier	Memorized (8.5 min. or more) (Only when circuit is shorted)	AC-70
B1441/41	Air Mix Damper Control Servo Motor Circuit (Passenger Side)	1. Air mix control servomotor 2. Air conditioning harness assembly 3. A/C amplifier	Memorized (30 sec. or more)	AC-74

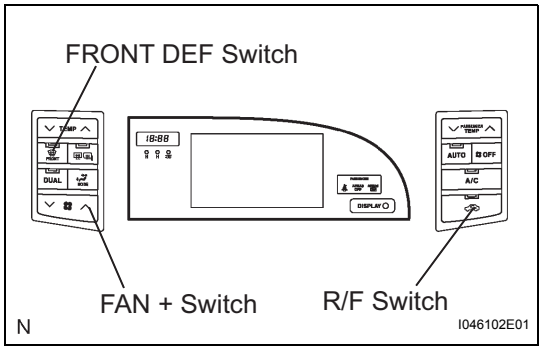
DTC No.	Detection Item	Trouble Area	Memory*6	See page
B1442/42	Air Inlet Damper Control Servo Motor Circuit	1. Air inlet control servomotor 2. Air conditioning harness assembly 3. A/C amplifier	Memorized (30 sec. or more)	AC-76
B1443/43	Air Outlet Damper Control Servo Motor Circuit	1. Air outlet control servomotor 2. Air conditioning harness assembly 3. A/C amplifier	Memorized (30 sec. or more)	AC-78
B1446/46	Air Mix Damper Control Servo Motor Circuit (Driver Side)	1. Air mix control servomotor 2. Air conditioning harness assembly 3. A/C amplifier	Memorized (30 sec. or more)	AC-80
B1451/51	Compressor Solenoid Circuit	1. w/ magnet clutch compressor assembly 2. Harness and connector between A/C amplifier and solenoid of the externally changeable compressor 3. A/C amplifier	-	AC-82
B1463/63 *5	Driver Side Seat Heater Temperature Sensor Circuit	1. Seat heater control sub-assembly 2. Seat heater LH (Seat cushion) 3. Harness or connector between seat heater control sub-assembly and A/C amplifier 4. A/C amplifier	-	AC-85
B1464/64 *5	Front Passenger Side Seat Heater Temperature Sensor Circuit	1. Seat heater control sub-assembly 2. Seat heater LH (Seat cushion) 3. Harness or connector between seat heater control sub-assembly and A/C amplifier 4. A/C amplifier	-	AC-88
B1497/97	BUS IC Communication Malfunction	1. Air conditioning harness assembly 2. A/C amplifier	Memorized (10 sec. or more)	AC-91
B1499/99	Multiplex Communication Circuit	Open in multiplex communication circuit	-	AC-93

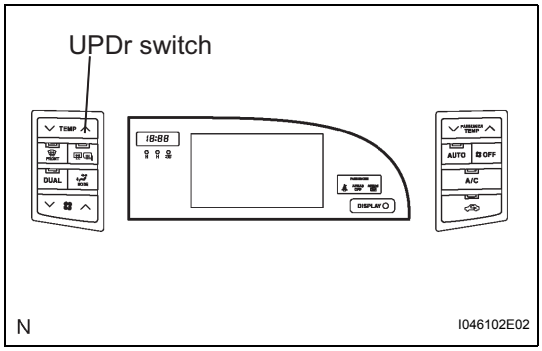
HINT:

- *1: If the cabin temperature is approx. -18.6°C (-1.48°F) or lower, DTC B1411/11 may be output even though the system is normal.
- *2: If the ambient temperature is approx. -52.9°C (-63.22°F) or lower, a malfunction code may be output even though the system is normal.
- *3: If the check is performed in a dark place, DTC B1421/21 or B1424/24 (solar sensor circuit abnormal) could be displayed.
- *4: Compressor lock (DTC B1422/22) is indicated only for a current occurring malfunction.
  To confirm DTC B1422/22, perform the following steps:
  (a)With engine ON, enter the DTC check mode.

(b) Press the R/F (Recirculation / Fresh) switch to enter actuator check mode, and set the operation to Step No.3.
(c) Press the AUTO switch to return to DTC check mode.
(d) The DTC is displayed after approx. 3 sec.

- *5: Even though the system is in good condition, DTC is output when the seat sensor temperature senses -40°C (-40°F) and over 99°C (210.2°F).
- *6: The A/C amplifier memorizes the DTC of the respective malfunction that has occurred for a period of the time indicated in the brackets.





ACTUATOR CHECK

1. ACTUATOR CHECK

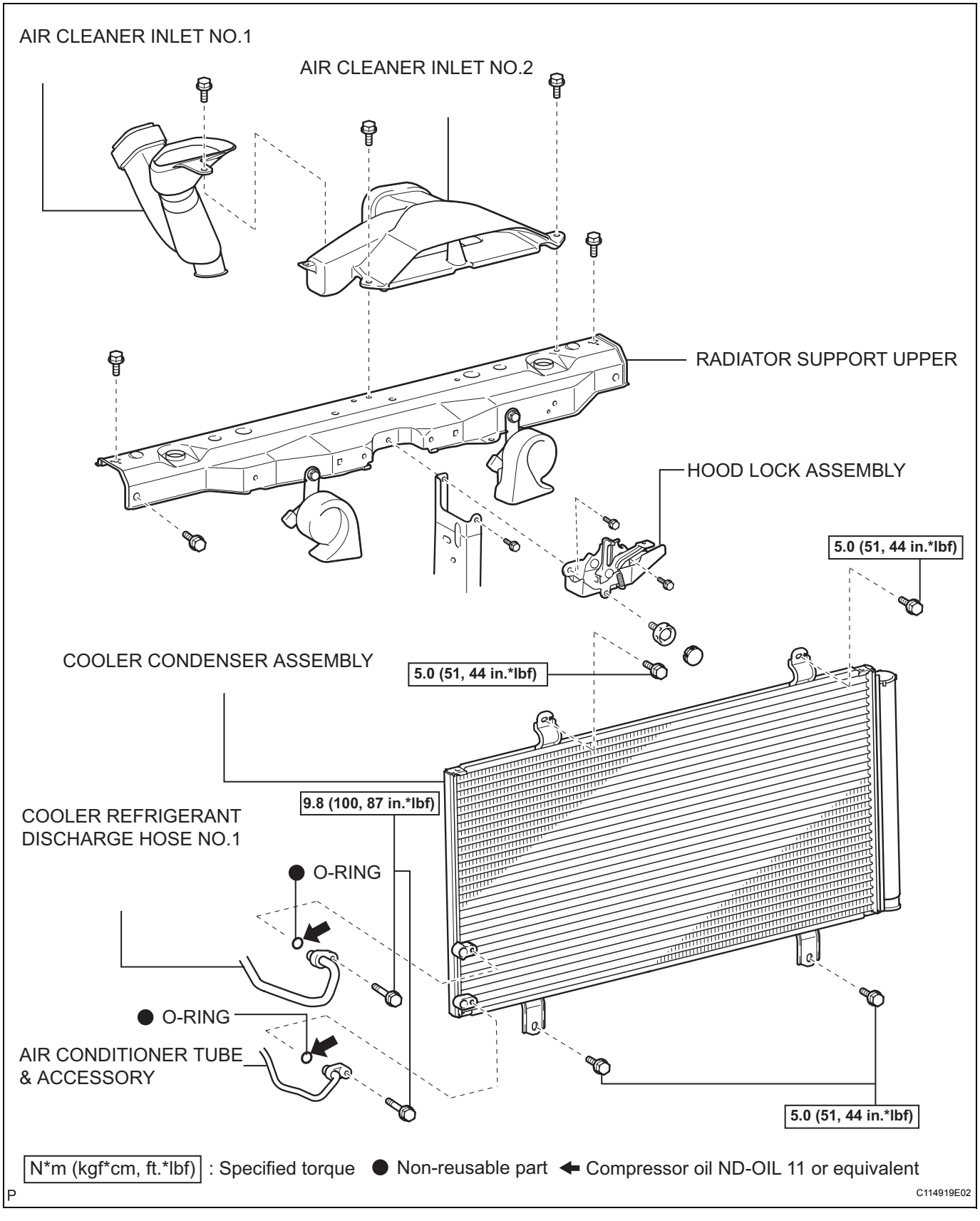
(a) Turn the ignition switch on (IG) while pressing the FRONT DEF switch and FAN+ switch simultaneously.
(b) Press the R/F (Recirculation / Fresh) switch.
(c) As each damper, motor and relay automatically operate the actuator check at 1 second intervals from step No.1 to No.10 continuously check the temperature and air flow visually and by hand.
(d) If a slower display is desired, press the driver temperature up (UPDr) switch and change the display in the step operation. Each time the driver temperature up (UPDr) switch is pressed, the display changes by 1 step.
HINT:
- The buzzer sounds when the displayed trouble code changes.
- Codes are displayed from the smaller to the larger numbers in order.

(e) To cancel the check mode, press the "OFF" switch.

Step No.	Display code	Conditions				
		Blower level	Air outlet damper	Air inlet damper	Air mix damper (Dr, Pa)	A/C compressor
1	0	0	FACE	FRESH	"COOL" side (0 %)	OFF
2	1	1	FACE	FRESH	"COOL" side (0 %)	OFF
3	2	17	FACE	R/F	"COOL" side (0 %)	A/C ON
4	3	17	FACE	RECIRCULATION	"COOL" side (0 %)	A/C ON
5	4	17	B/L	RECIRCULATION	"COOL" / "HOT" (50.0 % opened)	A/C ON
6	5	17	B/L	RECIRCULATION	"COOL" / "HOT" (50.0 % opened)	A/C ON
7	6	17	FOOT	FRESH	"COOL" / "HOT" (50.0 % opened)	A/C ON
8	7	17	FOOT	FRESH	"HOT" side (100 %)	A/C ON
9	8	17	F/D	FRESH	"HOT" side (100 %)	A/C ON
10	9	31	DEF	FRESH	"HOT" side (100 %)	A/C ON

CONDENSER

COMPONENTS



AC

ON-VEHICLE INSPECTION

1. INSPECT COOLER CONDENSER ASSEMBLY

(a) If the fins of the cooler condenser assembly are dirty, clean them with water and dry them with compressed air.

NOTICE:

Do not damage the fins of the condenser assembly.

(b) If the fins of the cooler condenser assembly are bent, straighten them using a screwdriver or pliers.

2. CHECK CONDENSER FOR LEAKAGE OF REFRIGERANT

(a) Check the pipe joints for gas leakage using a halogen leak detector.

(b) Check the tightening torque of the joints if gas leakage is detected in any of the pipe joints.

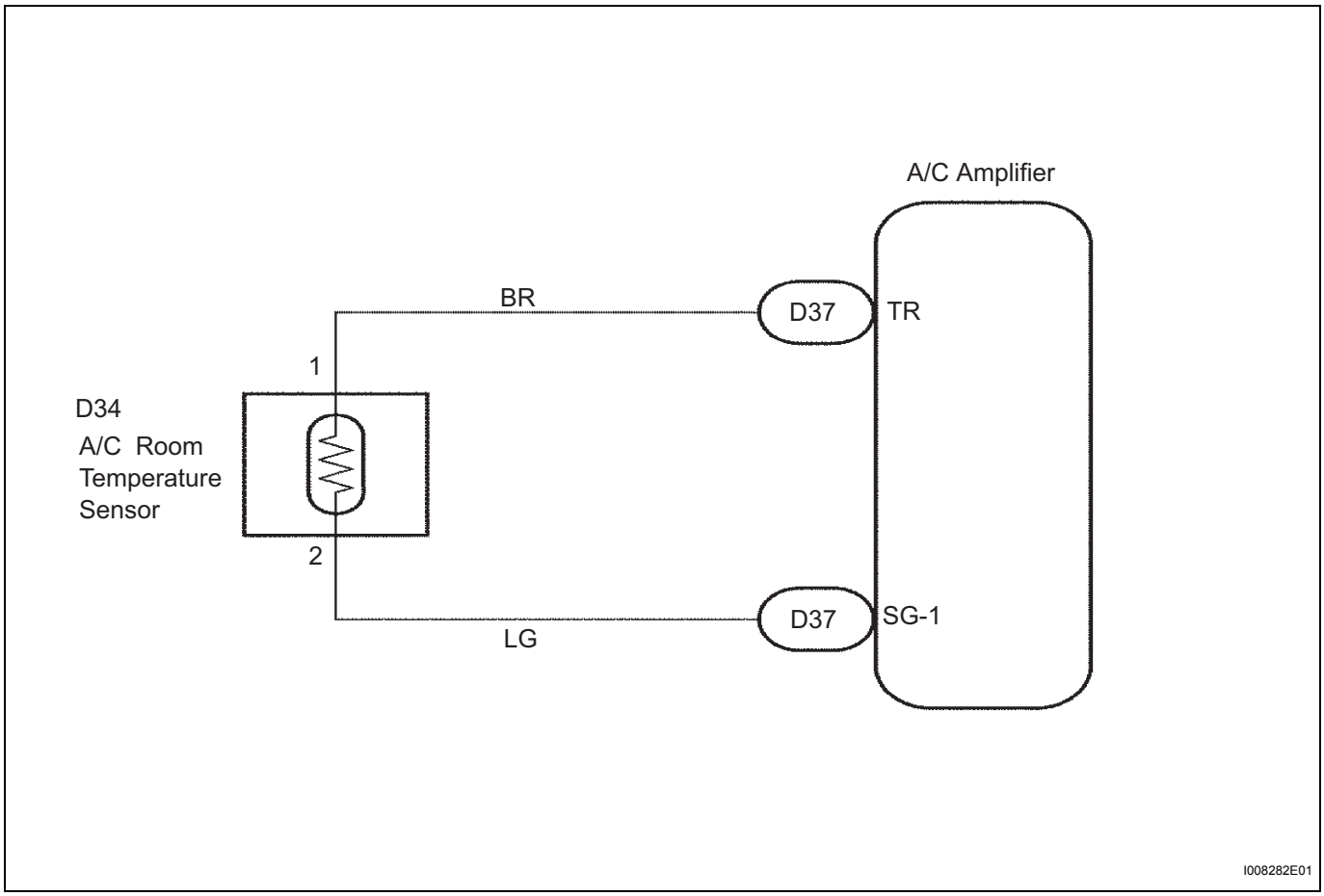
DTC	B1411/11	Room Temperature Sensor Circuit

DESCRIPTION

This sensor detects the cabin temperature that is used as the basis for temperature control and sends appropriate signals to the A/C amplifier.

DTC No.	Detection item	Trouble Area
B1411/11	Room temperature sensor circuit (Open or short)	• A/C room temperature sensor • Harness or connector between A/C room temperature sensor and A/C amplifier • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG) and push the intelligent tester main switch on.

AC

(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

Item	Measure Item / Display (Range)	Normal Condition	Diagnostic Note
ROOM TEMP	Room temperature sensor / min.: -6.5°C (20.3°F) max.: 57.25°C (135.05°F)	Actual cabin temperature is displayed	-

OK:

The display is as specified in the normal condition.

Result

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

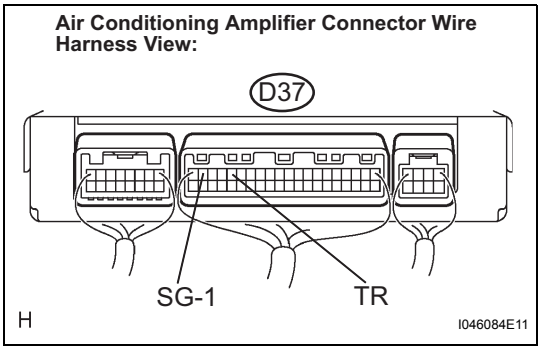
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

2 INSPECT AIR CONDITIONING AMPLIFIER (TR - SG-1)

Air Conditioning Amplifier Connector Wire Harness View:



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

(b) Turn the ignition switch on (IG)

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

Voltage

Tester connection	Condition	Specified condition
D37-16 (TR) - D37-19 (SG-1)	Ignition switch on (IG) at 25°C (77°F)	1.8 to 2.2 V
D37-16 (TR) - D37-19 (SG-1)	Ignition switch on (IG) at 40°C (104°F)	1.2 to 1.6 V

HINT:

As the temperature increases, the voltage decreases.

Result

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

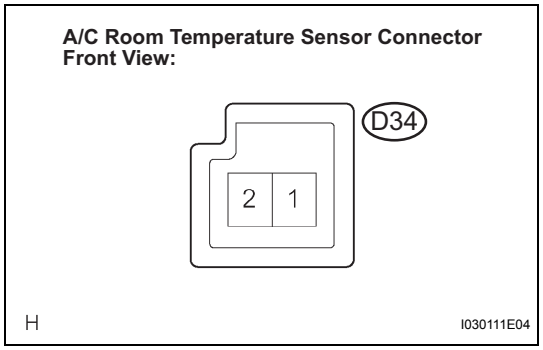
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

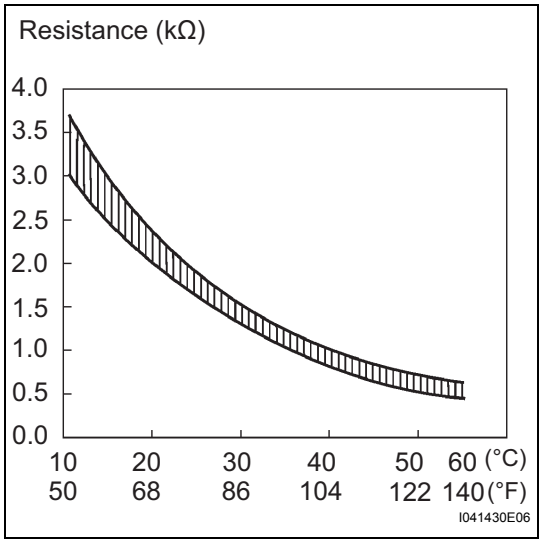
A

AC

3	INSPECT A/C ROOM TEMPERATURE SENSOR



(a) Remove the A/C room temperature sensor.



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

Resistance

Tester connection	Condition	Specified condition
D34-1 - D34-2	10°C (50°F)	3.00 to 3.73 kΩ
D34-1 - D34-2	15°C (59°F)	2.45 to 2.88 kΩ
D34-1 - D34-2	20°C (68°F)	1.95 to 2.30 kΩ
D34-1 - D34-2	25°C (77°F)	1.60 to 1.80 kΩ
D34-1 - D34-2	30°C (86°F)	1.28 to 1.47 kΩ
D34-1 - D34-2	35°C (95°F)	1.00 to 1.22 kΩ
D34-1 - D34-2	40°C (104°F)	0.80 to 1.00 kΩ
D34-1 - D34-2	45°C (113°F)	0.65 to 0.85 kΩ
D34-1 - D34-2	50°C (122°F)	0.50 to 0.70 kΩ
D34-1 - D34-2	55°C (131°F)	0.44 to 0.60 kΩ
D34-1 - D34-2	60°C (140°F)	0.36 to 0.50 kΩ

NOTICE:

- **Only hold the sensor at its connector. Touching the sensor may change the resistance value.**
- **When measuring, the sensor temperature must be the same as the ambient temperature.**

HINT:

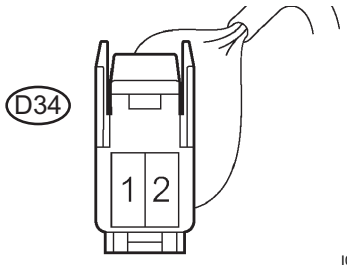
As the temperature increases, the resistance decreases (See the graph).

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

OK

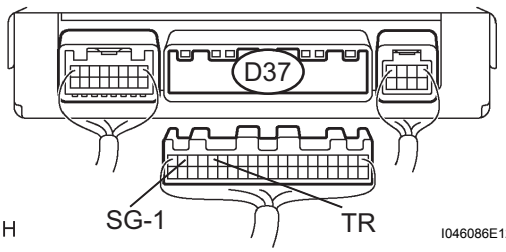
4	CHECK HARNESS AND CONNECTOR (A/C ROOM TEMPERATURE SENSOR - AIR CONDITIONING AMPLIFIER)

A/C Room Temperature Sensor Connector Front View:



(a) Disconnect the connector from A/C room temperature sensor.

Air Conditioning Amplifier Connector Wire Harness View:



(b) Disconnect the connector from A/C amplifier.
(c) Measure the resistance according to the value(s) in the table below.

Resistance

Tester connection	Condition	Specified condition
D37-16 (TR) - D34-1	Always	Below 1 Ω
D37-19 (SG-1) - D34-2	Always	Below 1 Ω
D37-16 (TR) - Body ground	Always	10 kΩ or higher
D37-19 (SG-1) - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

ROOM TEMPERATURE SENSOR

ON-VEHICLE INSPECTION

1. INSPECT A/C ROOM TEMPERATURE SENSOR

(a) Remove the A/C room temperature sensor.

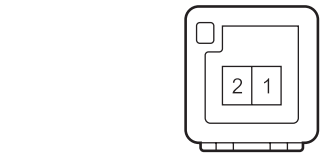
(b) Disconnect the connector from the A/C room temperature sensor.

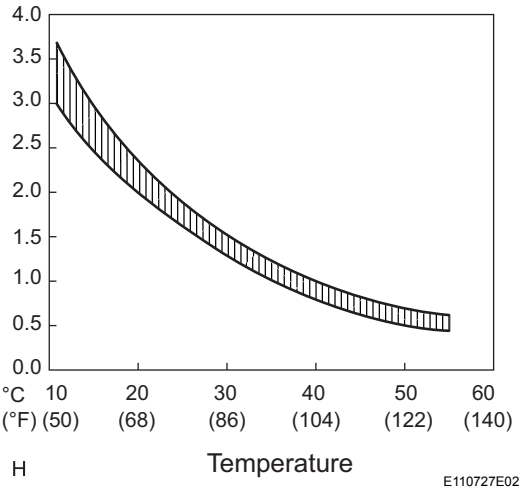
(c) Measure the resistance according to the value(s) in the table below.

Resistance

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

A/C Room Temperature Sensor Connector Front View:





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).

If the resistance value is not as specified, replace the sensor.

REASSEMBLY

1. INSTALL AIR CONDITIONING CONTROL ASSEMBLY

INSTALLATION

1. **INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY CENTER**
2. **INSTALL INSTRUMENT PANEL SUB-ASSEMBLY**
3. **INSTALL INSTRUMENT CLUSTER FINISH PANEL GARNISH NO.2**
4. **CONNECT BATTERY NEGATIVE TERMINAL**
5. **PERFORM SYSTEM INITIALIZE**
   (a) Some systems need initialization when disconnecting the cable from the negative battery terminal.
   HINT:
   See page IN-29.

REASSEMBLY

1. INSTALL TEMPERATURE CONTROL SWITCH ASSEMBLY

INSTALLATION

1. **INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY CENTER**
2. **INSTALL INSTRUMENT PANEL SUB-ASSEMBLY**
3. **INSTALL INSTRUMENT CLUSTER FINISH PANEL GARNISH NO. 2**
4. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
5. **PERFORM SYSTEM INITIALIZE**
   (a) Some systems need initialization when disconnecting the cable from the negative battery terminal.

AMBIENT TEMPERATURE SENSOR

ON-VEHICLE INSPECTION

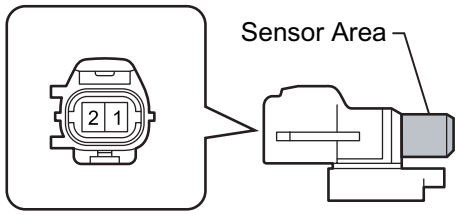
1. INSPECT A/C ROOM TEMPERATURE SENSOR

(a) Remove the A/C room temperature sensor.

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

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

A/C Ambient Temperature Sensor Connector Front View:



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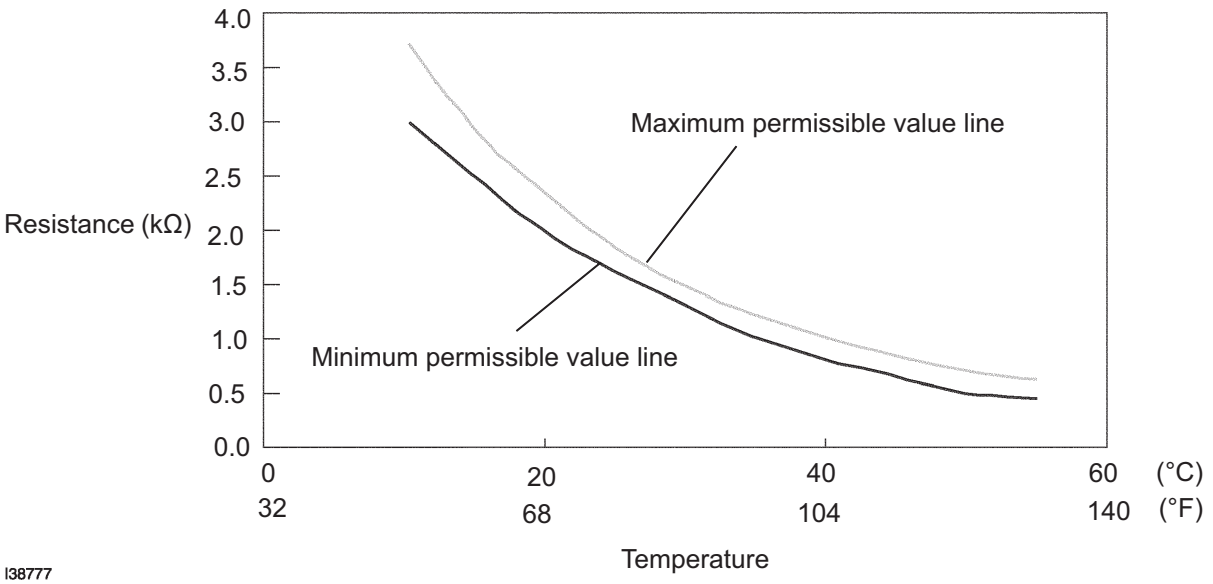

I38777

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I040673E07

Resistance

Tester connection	Condition	Specified condition
1 - 2	10°C (50°F)	3.00 to 3.73 kΩ
1 - 2	15°C (59°F)	2.45 to 2.88 kΩ
1 - 2	20°C (68°F)	1.95 to 2.30 kΩ
1 - 2	25°C (77°F)	1.60 to 1.80 kΩ
1 - 2	30°C (86°F)	1.28 to 1.47 kΩ
1 - 2	35°C (95°F)	1.00 to 1.22 kΩ

AC

Tester connection	Condition	Specified condition
1 - 2	40°C (104°F)	0.80 to 1.00 kΩ
1 - 2	45°C (113°F)	0.65 to 0.85 kΩ
1 - 2	50°C (122°F)	0.50 to 0.70 kΩ
1 - 2	55°C (131°F)	0.44 to 0.60 kΩ
1 - 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:

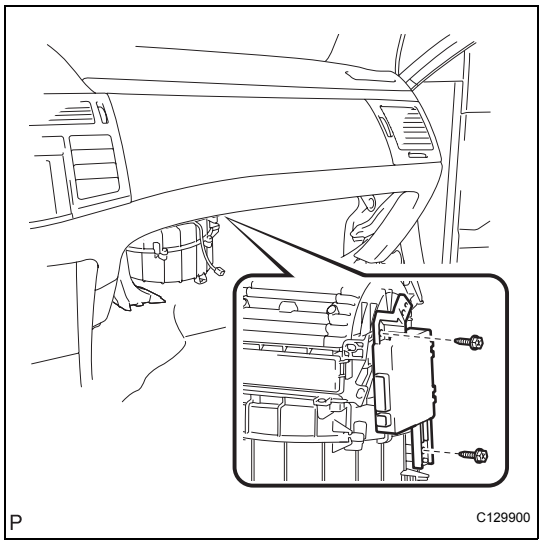
As the temperature increases, the resistance decreases (See the graph).

If the resistance value is not as specified, replace the sensor.

REMOVAL

HINT:
Installation is in the reverse order of removal.

1. **DISCONNECT BATTERY NEGATIVE TERMINAL**
   (a) Wait for 90 seconds after disconnecting the cable to prevent the airbag working.
2. **REMOVE INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY NO.2 (See page IP-11)**
3. **REMOVE INSTRUMENT PANEL FINISH LOWER PANEL RH (See page IP-11)**
4. **REMOVE AIR CONDITIONING AMPLIFIER ASSEMBLY**
   (a) Disconnect the connector.
   (b) Remove the 2 screws and air conditioning amplifier assembly.



INSTALLATION

1. CONNECT BATTERY NEGATIVE TERMINAL

2. PERFORM SYSTEM INITIALIZE

(a) Some systems need initialization when disconnecting the cable from the negative battery terminal.
HINT:
See page IN-29.

EVAPORATOR TEMPERATURE SENSOR

ON-VEHICLE INSPECTION

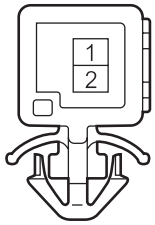
1. INSPECT A/C EVAPORATOR TEMPERATURE SENSOR

(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.

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



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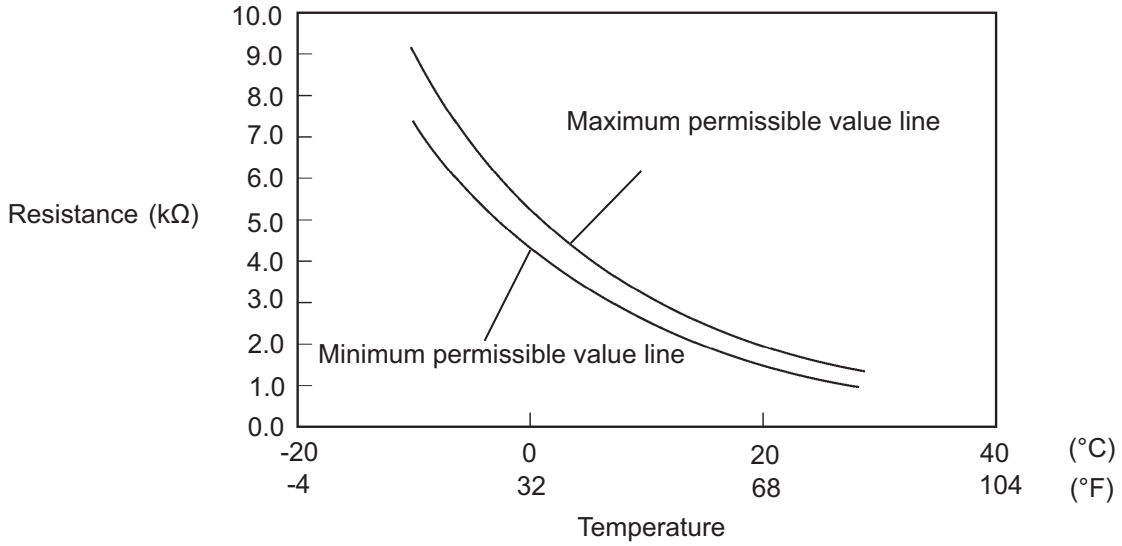

C

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Resistance

Tester connection	Condition	Specified condition
1 - 2	-10°C (14°F)	7.30 to 9.10 kΩ
1 - 2	-5°C (23°F)	5.65 to 6.95 kΩ
1 - 2	0°C (32°F)	4.40 to 5.35 kΩ
1 - 2	5°C (41°F)	3.40 to 4.15 kΩ

AC

Tester connection	Condition	Specified condition
1 - 2	10°C (50°F)	2.70 to 3.25 kΩ
1 - 2	15°C (59°F)	2.14 to 2.58 kΩ
1 - 2	20°C (68°F)	1.71 to 2.05 kΩ
1 - 2	25°C (77°F)	1.38 to 1.64 kΩ
1 - 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).

If the resistance value is not as specified, replace the sensor.

AIR CONDITIONING PRESSURE SENSOR

ON-VEHICLE INSPECTION

1. INSPECT A/C PRESSURE SENSOR

(a) Start the engine.

(b) Operate the air conditioning system.

(c) Disconnect the connector from A/C pressure sensor.

(d) Install the manifold gauge set (See page AC-134).

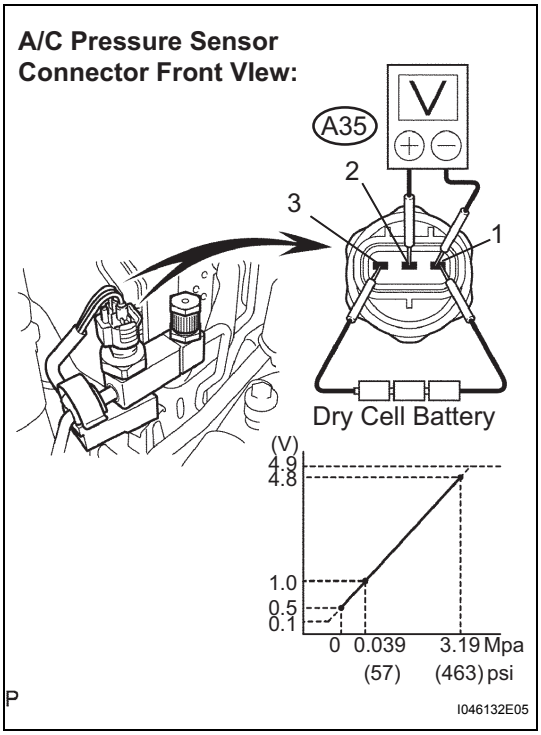
(e) Connect the positive (+) lead from the three 1.5 V dry cell batteries to terminal 3 and negative (-) lead to terminal 1.

(f) Check the voltage between terminals 2 and 1 of A/C pressure sensor.

Voltage:

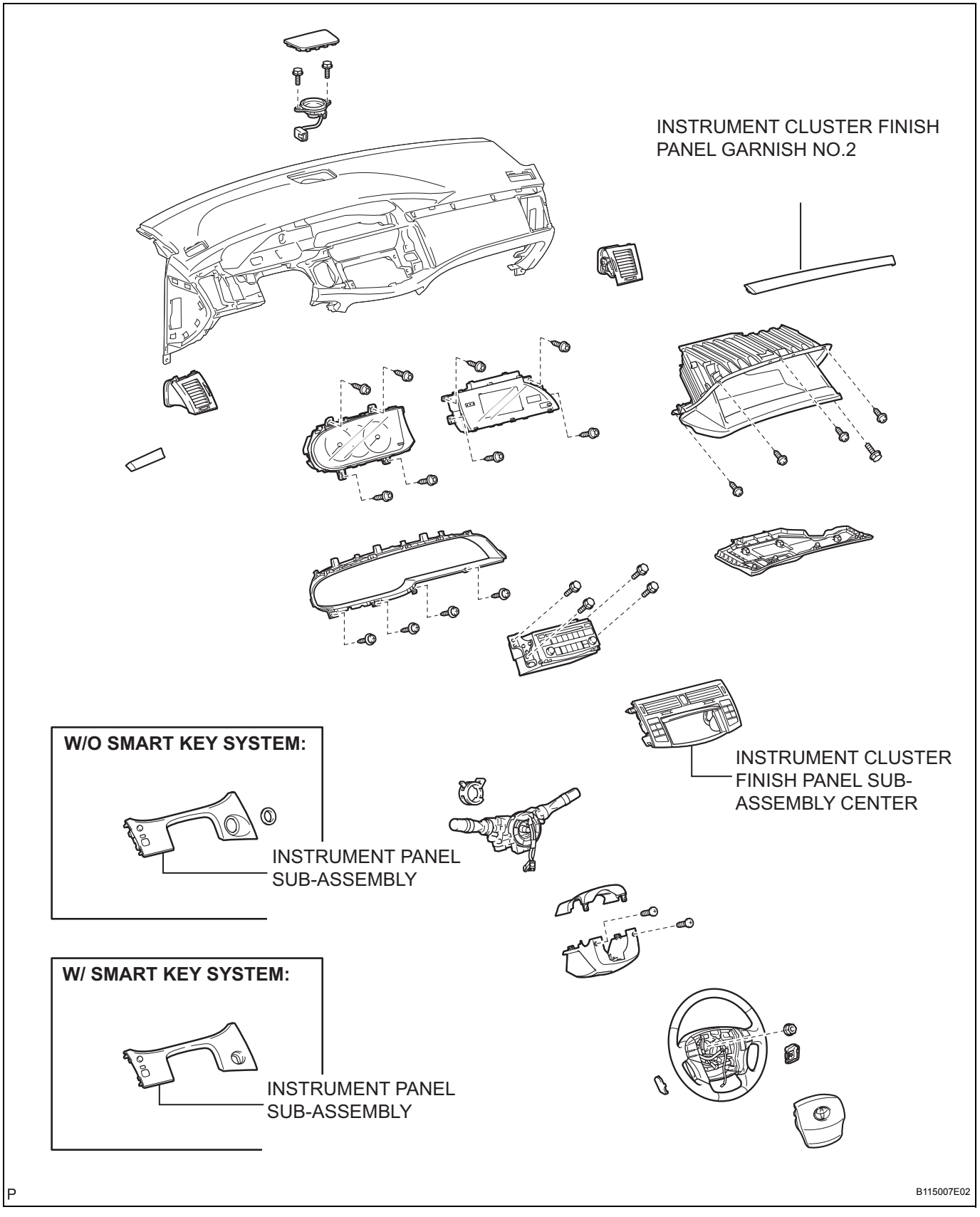
The voltage depends on the refrigerant pressure as shown in the chart.

If the voltage is not as specified, replace the sensor.



AIR CONDITIONING CONTROL ASSEMBLY

COMPONENTS

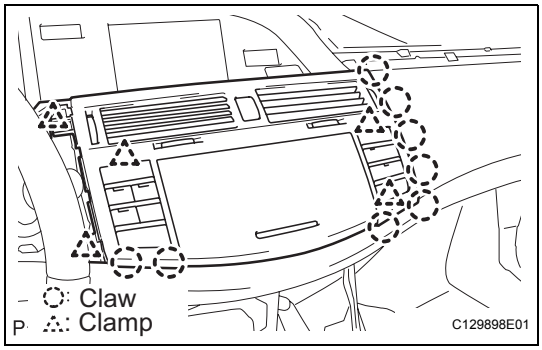


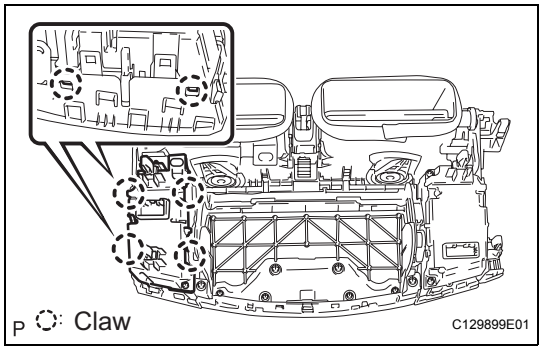
AC

REMOVAL

HINT:
Installation is in the reverse order of removal.

1. **DISCONNECT BATTERY NEGATIVE TERMINAL**
   (a) Wait for 90 seconds after disconnecting the cable to prevent the airbag working.
2. **REMOVE INSTRUMENT CLUSTER FINISH PANEL GARNISH NO.2 (See page IP-9)**
3. **REMOVE INSTRUMENT PANEL SUB-ASSEMBLY (See page IP-9)**
4. **REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY CENTER**
   (a) Release the 8 claws and 5 clips and instrument cluster finish panel sub-assembly center.
   (b) Disconnect the connector and remove the instrument cluster finish panel sub-assembly center.



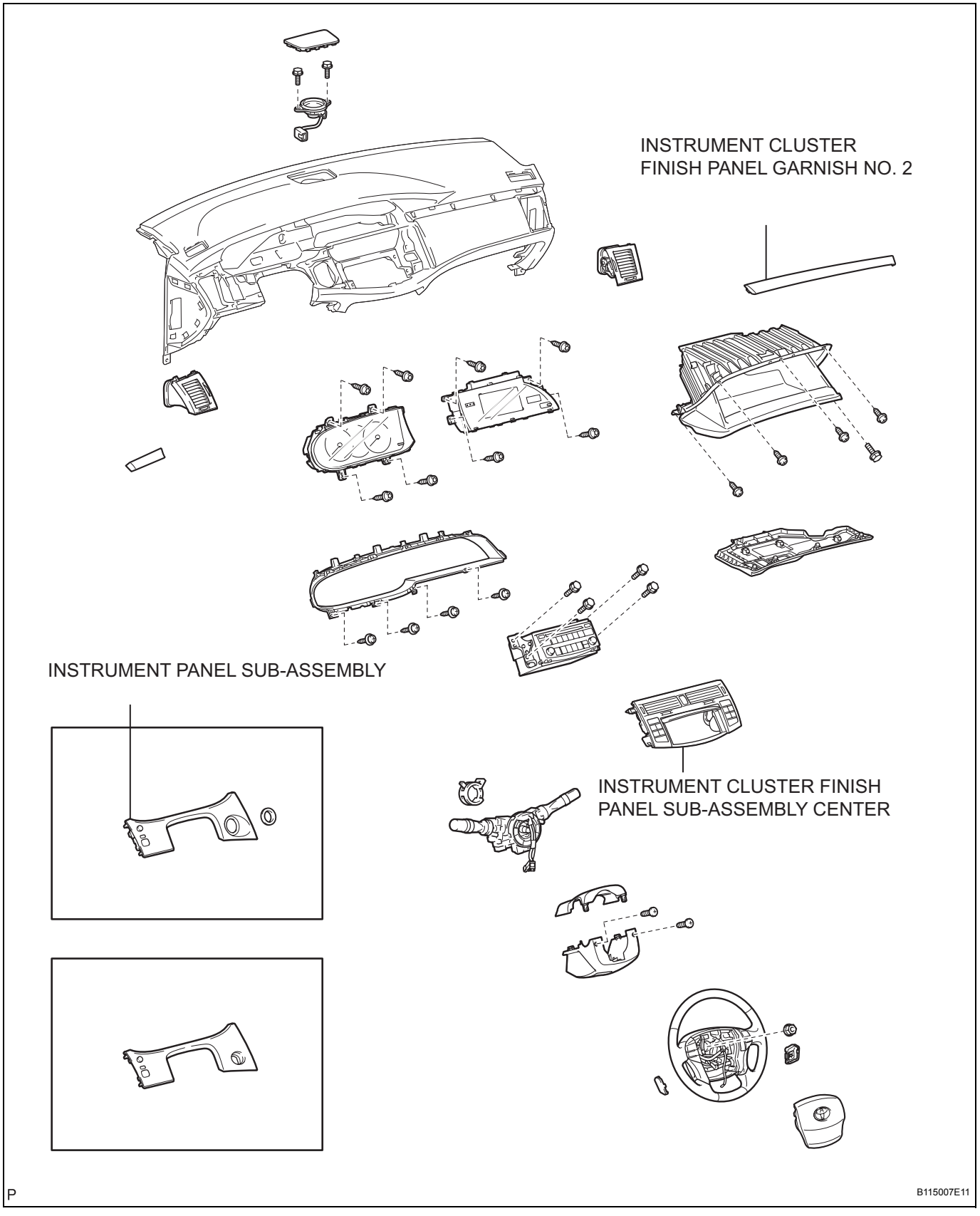


DISASSEMBLY

1. **REMOVE AIR CONDITIONING CONTROL ASSEMBLY**
   (a) Release the 4 claws and remove the air conditioning control assembly.

TEMPERATURE CONTROL SWITCH

COMPONENTS

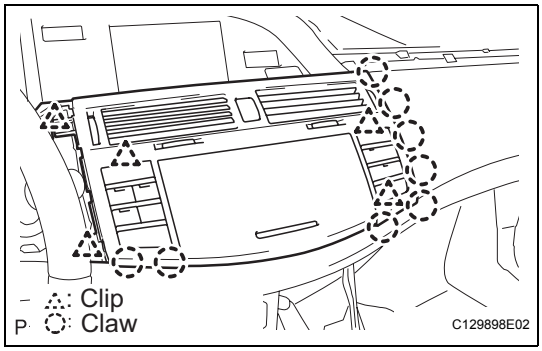


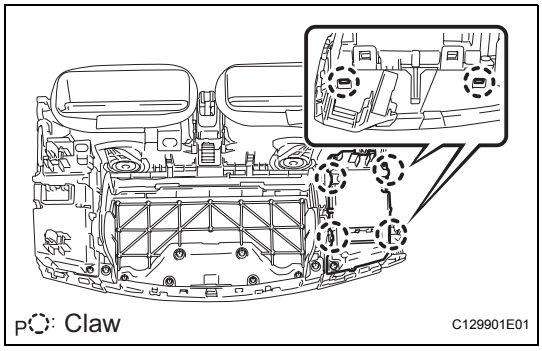
AC

REMOVAL

HINT:
Installation is in the reverse order of removal.

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
   (a) Wait for 90 seconds after disconnecting the cable to prevent the airbag working.
2. **REMOVE INSTRUMENT CLUSTER FINISH PANEL GARNISH NO. 2 (See page IP-9)**
3. **REMOVE INSTRUMENT PANEL SUB-ASSEMBLY (See page IP-9)**
4. **REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY CENTER**
   (a) Release the 8 claws and 5 clips and instrument cluster finish panel sub-assembly center.
   (b) Disconnect the connector and remove the instrument cluster finish panel sub-assembly center.



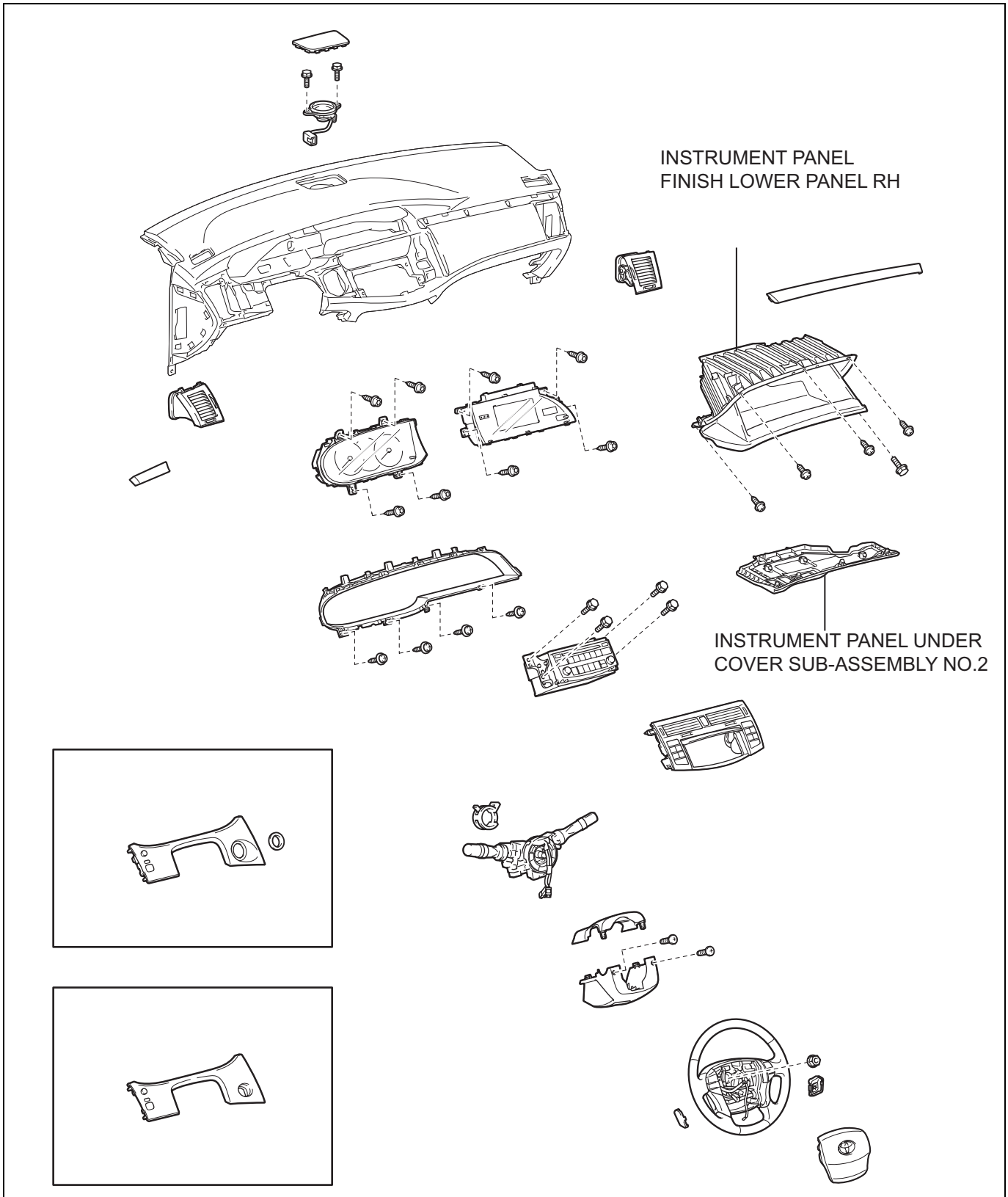


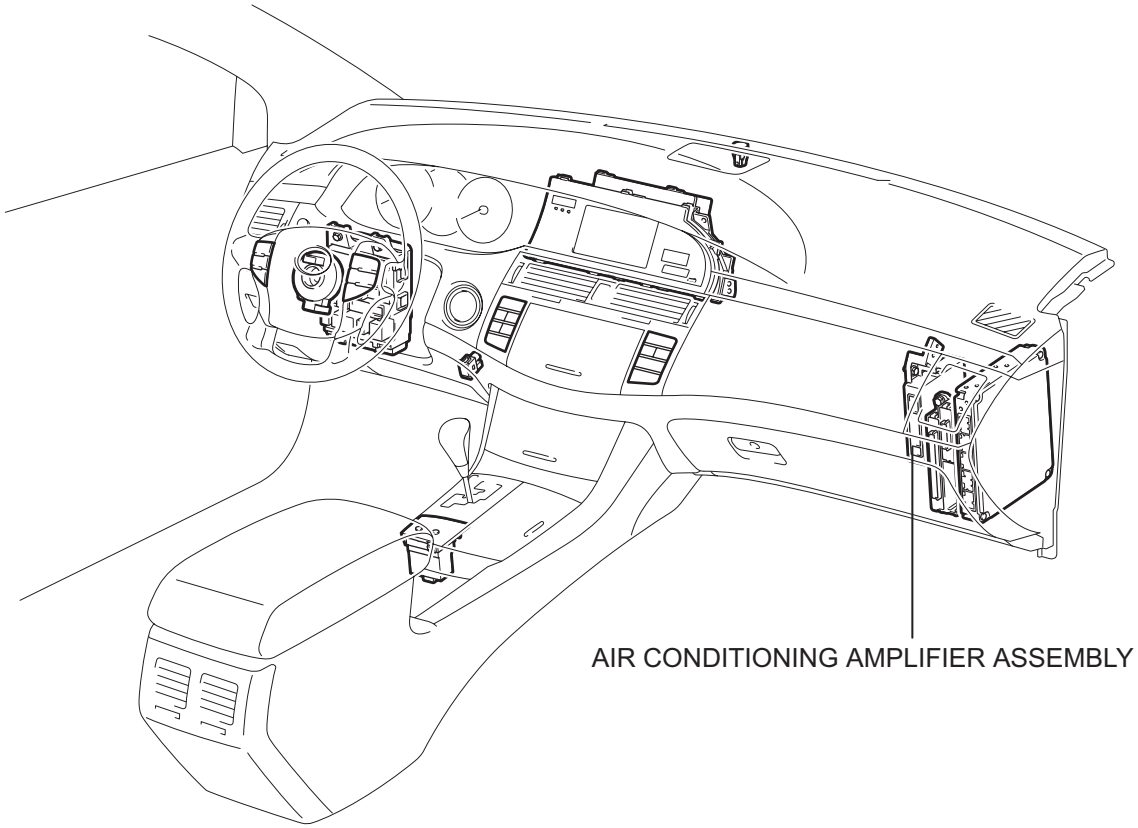
DISASSEMBLY

1. **REMOVE TEMPERATURE CONTROL SWITCH ASSEMBLY**
   (a) Release the 4 claws and remove the temperature control switch assembly.

AIR CONDITIONING AMPLIFIER

COMPONENTS





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