TO INDEX

K1 HEATER & AIR CONDITIONER

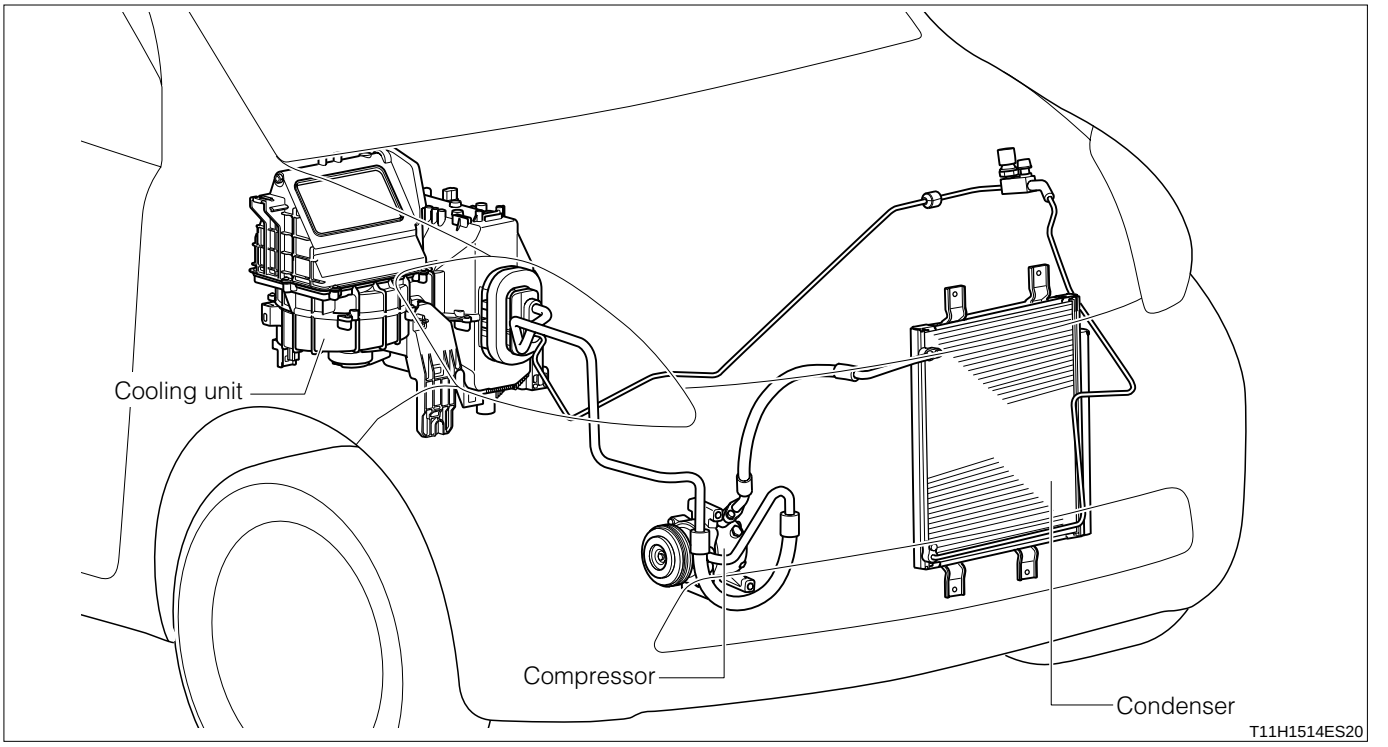
HEATER AND AIR CONDITIONER ---------- K1 - 1
OUTLINE ---------- K1 - 1
CONSTRUCTION AND OPERATION ---- K1 - 4
REFRIGERANT ---------- K1 - 4
DISCHARGE PORT ---------- K1 - 4
CONTROL PANEL ---------- K1 - 5
HEATER CORE ---------- K1 - 5
EVAPORATOR ---------- K1 - 6
COMPRESSOR ---------- K1 - 6
CONDENSER ---------- K1 - 6
MANUAL AIR CONDITIONER SYSTEM ---- K1 - 7
OUTLINE ---------- K1 - 7
SYSTEM WIRING DIAGRAM ---------- K1 - 7
LOCATION OF COMPONENTS --------- K1 - 9
LOCATION OF COMPONENTS ------- K1 - 11
CONTROL ---------- K1 - 13
AIR CONDITIONER CONTROL BY ENGINE CONTROL COMPUTER ---- K1 - 13
COMPONENTS ---------- K1 - 14
ENGINE CONTROL COMPUTER ---- K1 - 14
BLOWER RESISTOR ---------- K1 - 14
PRESSURE SWITCH ---------- K1 - 14
EVAPORATOR TEMPERATURE SENSOR ---------- K1 - 15
CONTROL PANEL ---------- K1 - 15

HEATER AND AIR CONDITIONER

1 OUTLINE

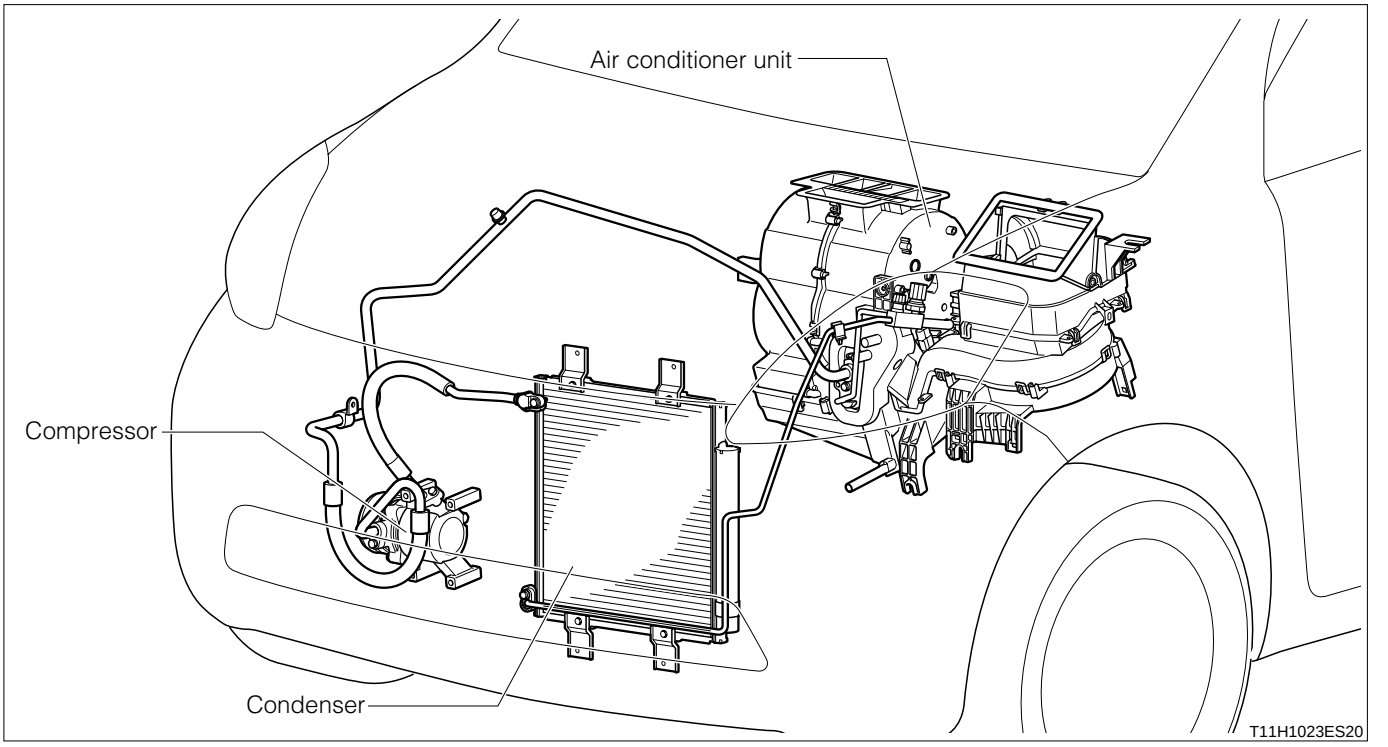
1.Some specifications have an air conditioner with manual controls.
2.A Three-dial control panel has been set.
3.The evaporator employs a small, lightweight type RS Evaporator (RS: Revolutionary Super Slim) which improves the evaporator's heat exchange efficiency when the air conditioner is running.
4.The heater core employs a small, lightweight SFA heater core Ⅱ (SFA: straight flow aluminum) which should give superior heat transmission performance when the system is heating.
5.The refrigerant HFC-134a (R-134a) that contains no chlorine has been adopted as the air conditioner refrigerant, taking into consideration the need to prevent ozone layer depletion.

Front section (LHD vehicle)



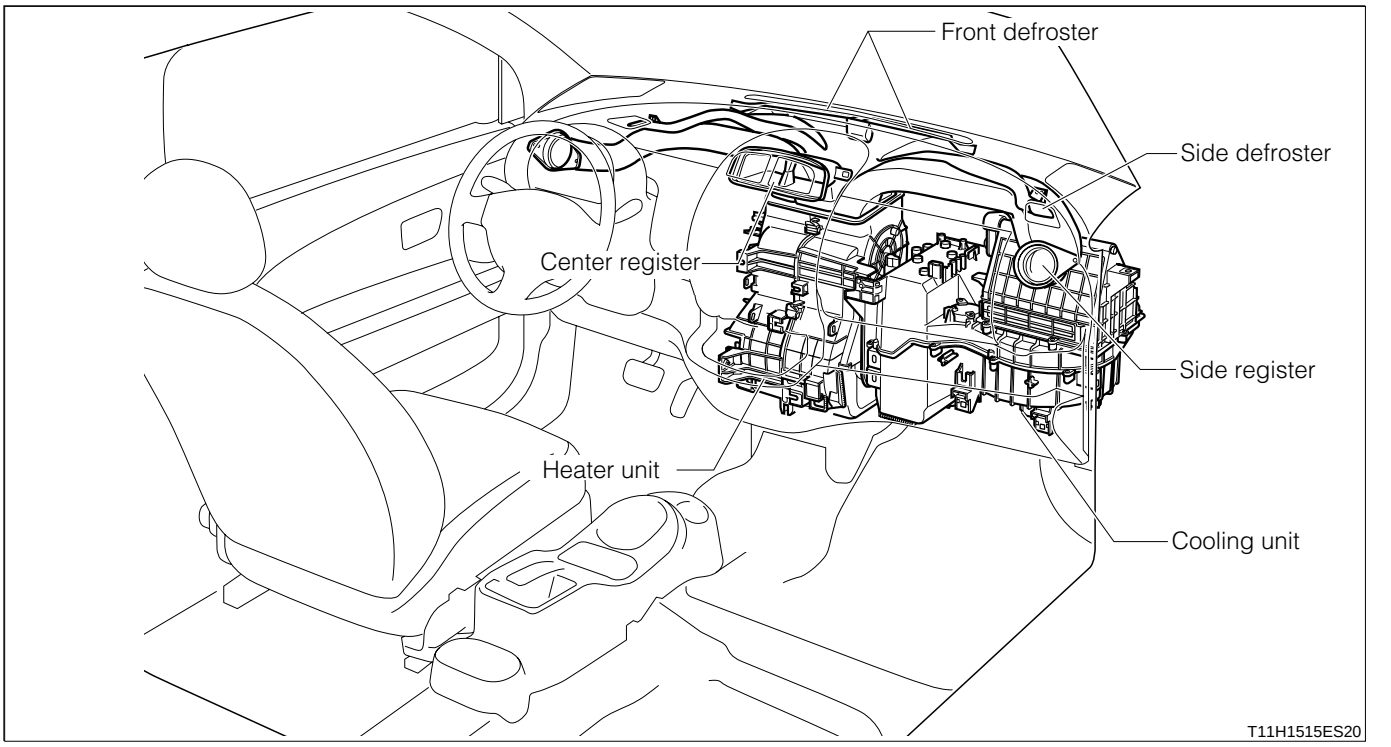
The illustration shows a typical example.

Front section (RHD vehicle)



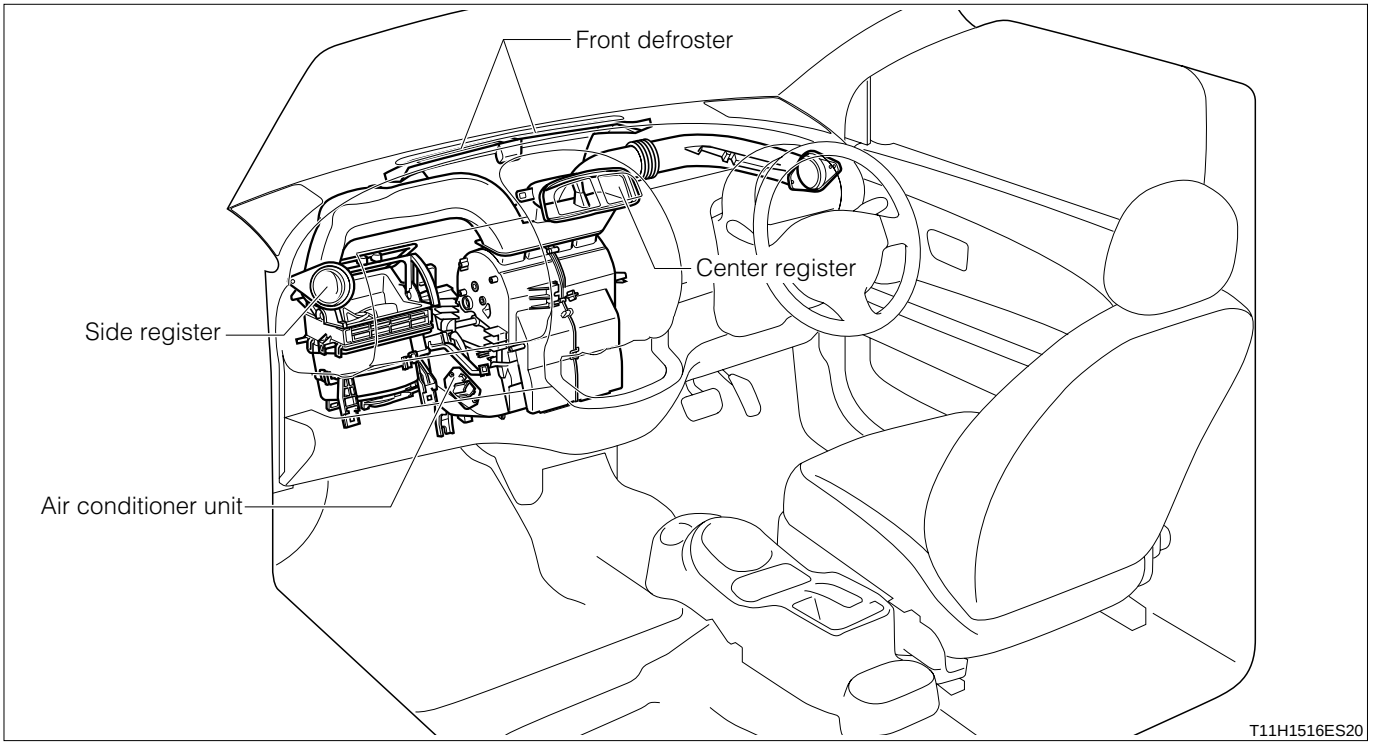
The illustration shows a typical example.

Instrument panel section (LHD vehicle)



The illustration shows a typical example.

Instrument panel section (RHD vehicle)



The illustration shows a typical example.

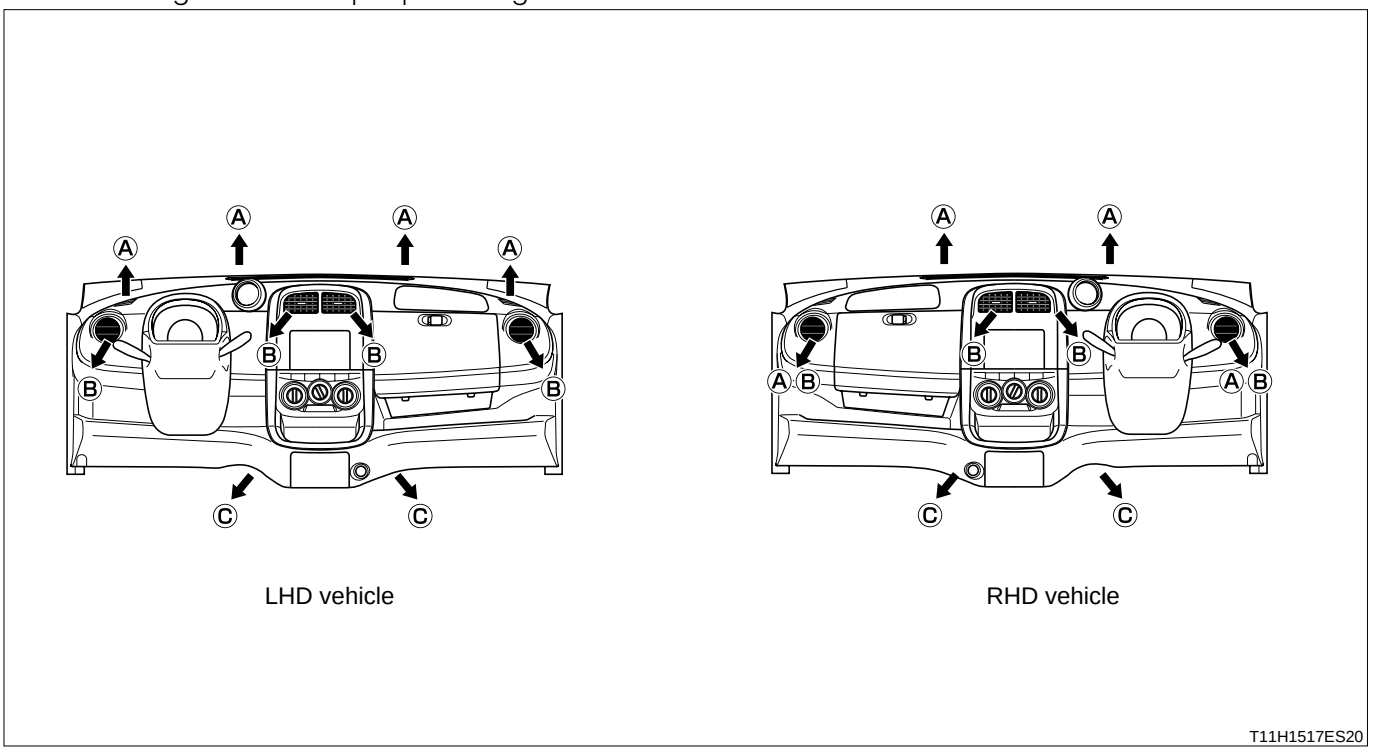
2 CONSTRUCTION AND OPERATION

2-1 REFRIGERANT

The refrigerant HFC-134a (R-134a) that contains no chlorine has been adopted as the air conditioner refrigerant, taking into consideration the prevention of deletion of ozone layer.

2-2 DISCHARGE PORT

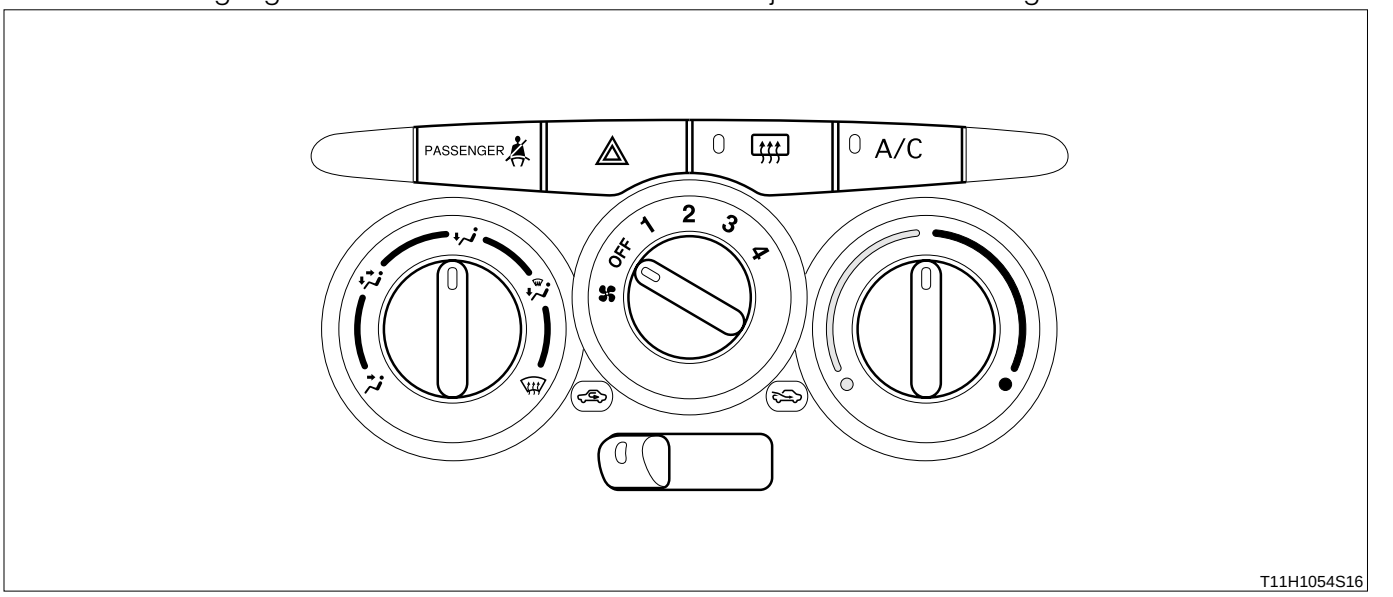
The air outlets are located in the center of the instrument panel, on both side-sections, on the defroster and on the leg sections of people sitting in front seats.



Air outlets according to mode

2-3 CONTROL PANEL

A three-dial type control panel is employed. The dial pointer adopts night illumination to assure easy operation and reading night time. The blower switch can be adjusted over four stages.

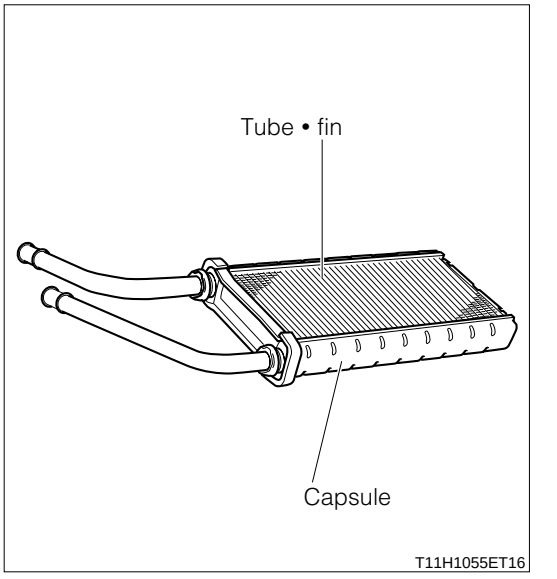


The illustration shows a typical example.

2-4 HEATER CORE

The heater core employs a small, lightweight SFA heater core Ⅱ (SFA: straight flow aluminum).

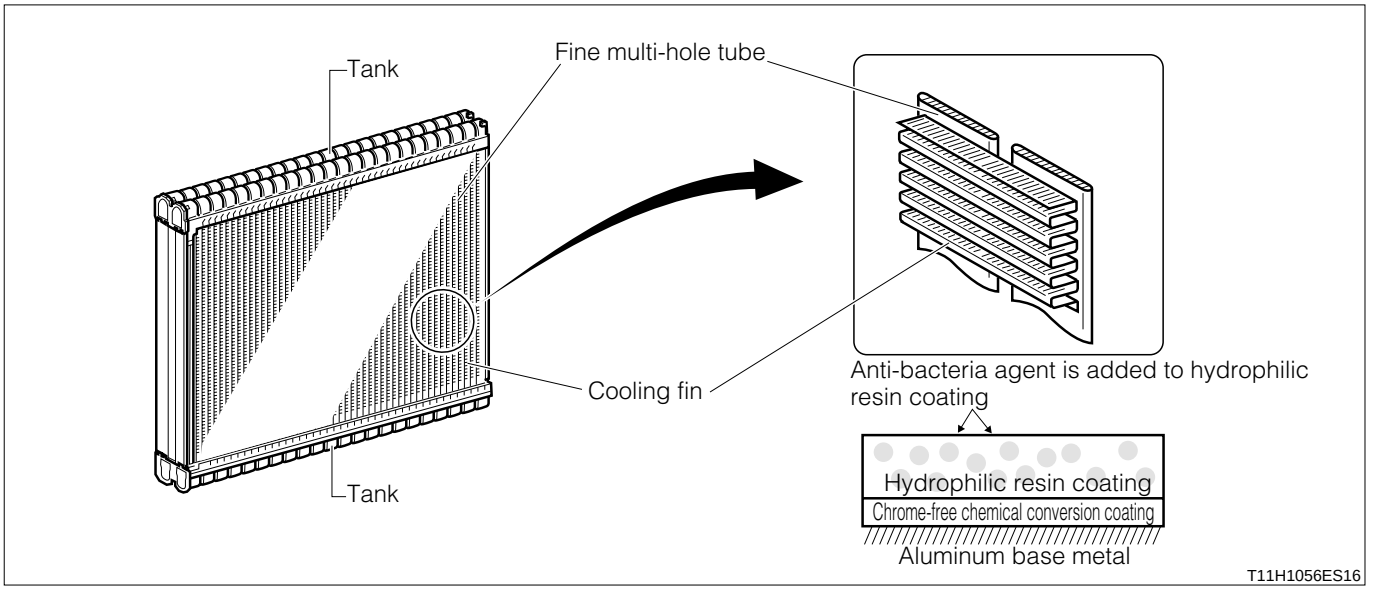
The SFA heater core Ⅱ is more compact than conventional SFA heater cores because of the reduction in tank width and height/miniaturization of the core (core area expansion). This has achieved increased air flow, noise reduction, and an improvement in heating capacity. The SFA heater core Ⅱ is constructed from tubes, fins and capsules and the result has been that by flattening the tubes the heat transfer rate has been improved as well as producing a lightweight, small size heater. Further, the use of aluminum makes the heater more environmentally friendly.



2-5 EVAPORATOR

The evaporator employs a small, lightweight type RS Evaporator (RS: Revolutionary Super Slim).

The RS evaporator consists of a tank, tubes and cooling fins. Thanks to the press molding of the tube, minute flow paths have been formed and this leads to improved heat transfer capability and very thin dimensions. Further, the RS evaporator has improved heat transfer due to the reduced fin height, tube thickness, and fin pitch, and the unit is much reduced in size and weight due to the reduced stock thickness of the core material. The evaporator is coated with a hydrophilic plastic film which contains anti-bacteria agent to control the breeding of germs and bacteria which can lead to unpleasant smells. In consideration of the environment the surface treatment is chrome-free.



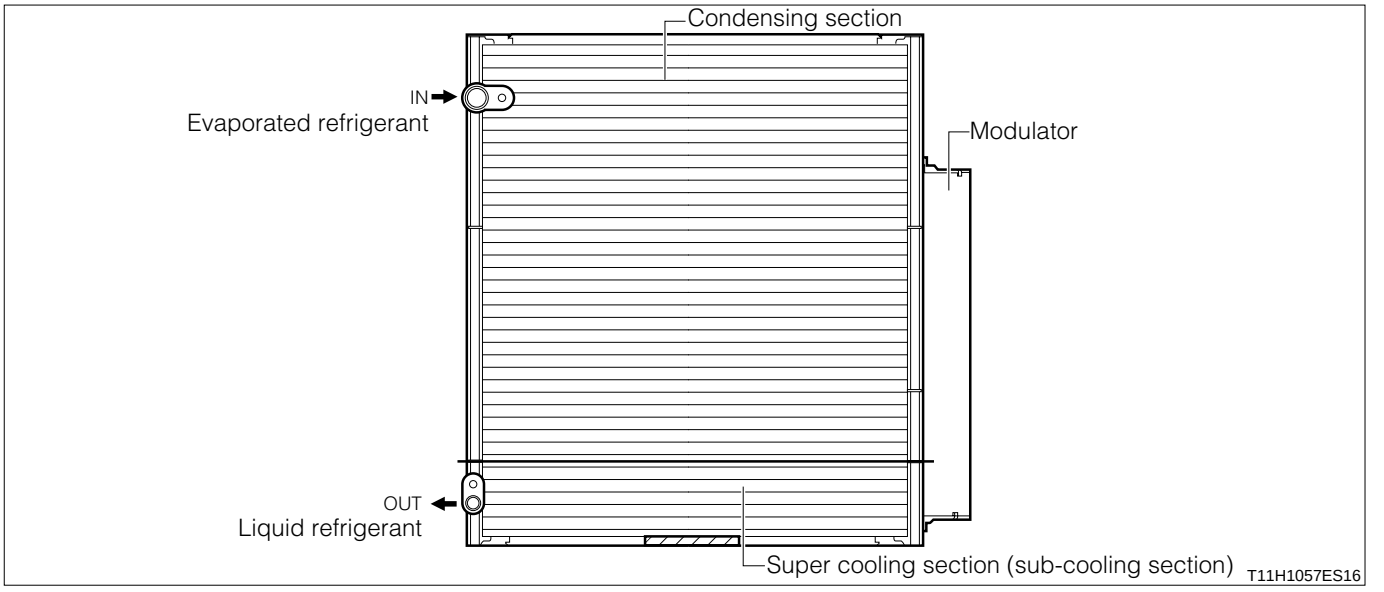
2-6 COMPRESSOR

Vane type compressor is employed.

2-7 CONDENSER

A new type of sub cooling condenser is used which has improved performance with its miniaturized core and an increased effective surface area, compared with the conventional ones. Inside the sub cooling condenser are provided the condensing section, the modulator and the over cooling section (sub cooling section). The refrigerant vapor goes through a 2-stage condensation process which lead to nearly 100% liquidizing.

Further, the modulator separates the gas and liquid.

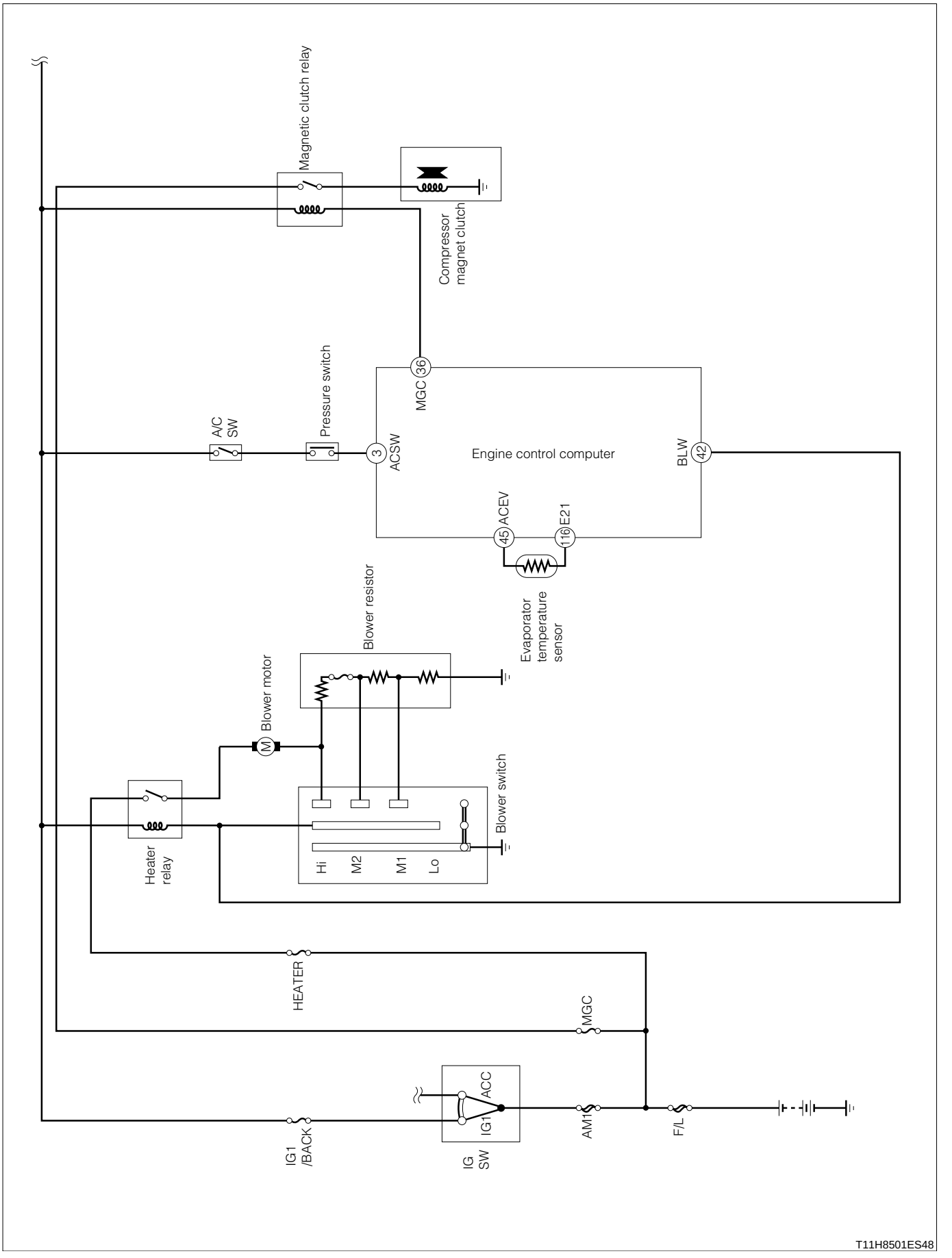


The illustration shows a typical example.

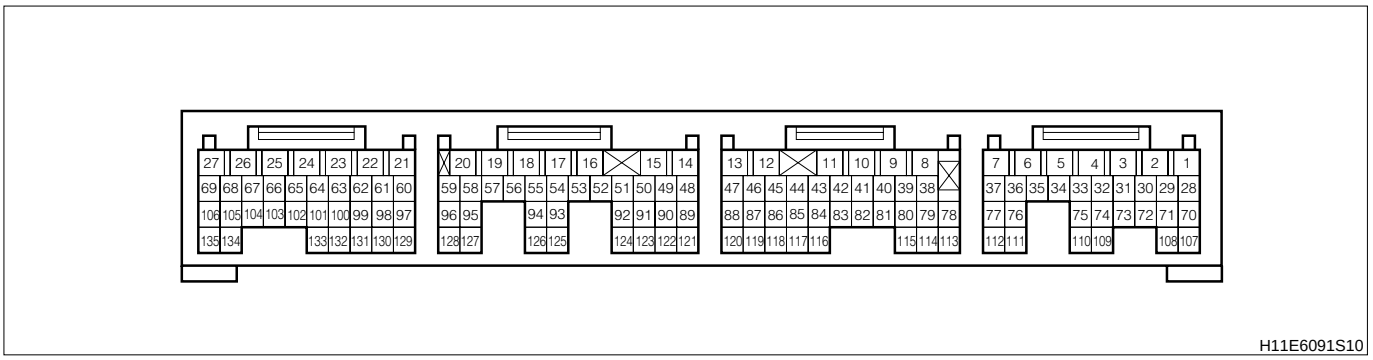
MANUAL AIR CONDITIONER SYSTEM

1 OUTLINE

1-1 SYSTEM WIRING DIAGRAM



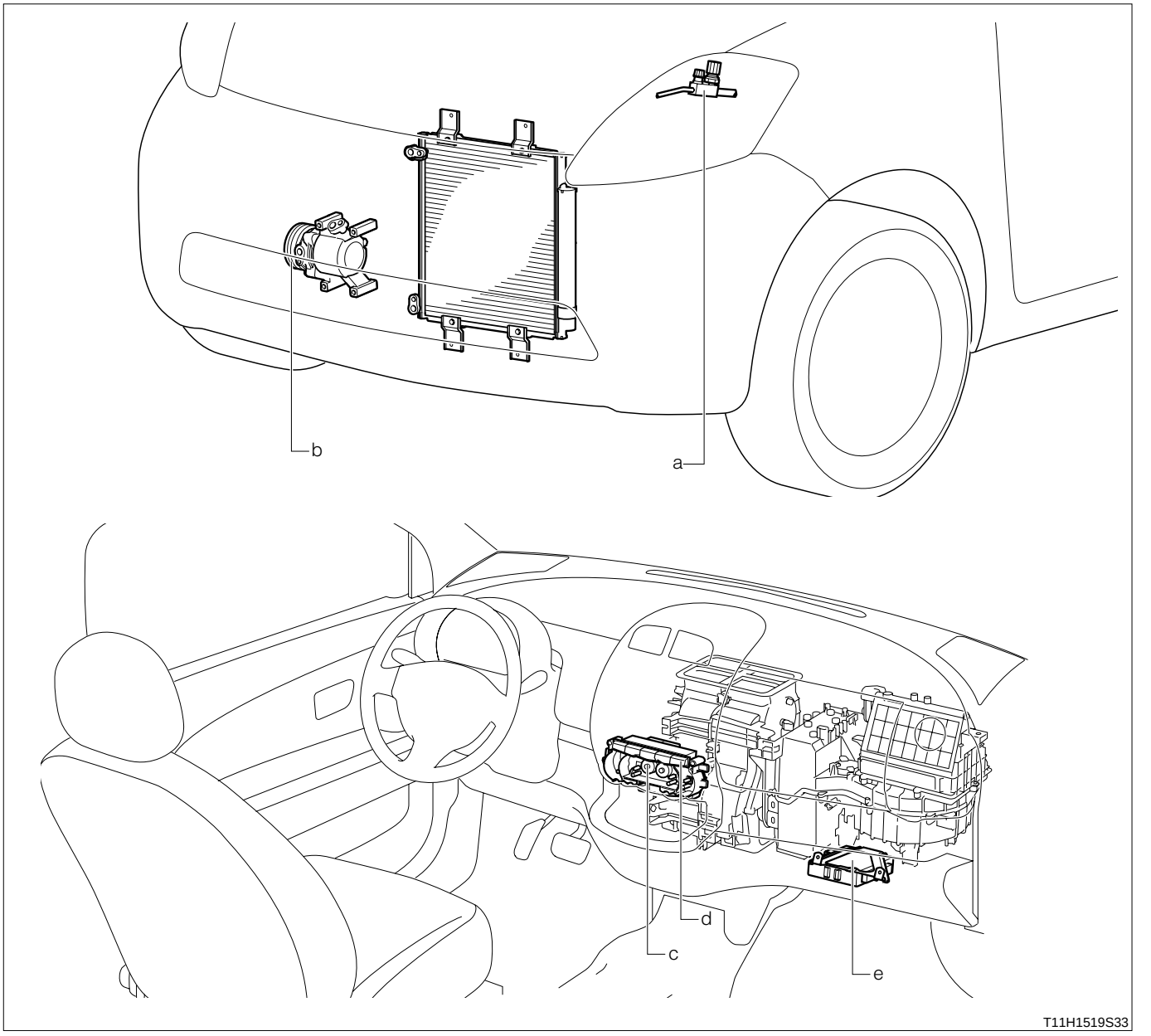
Arrangement of ECU terminal



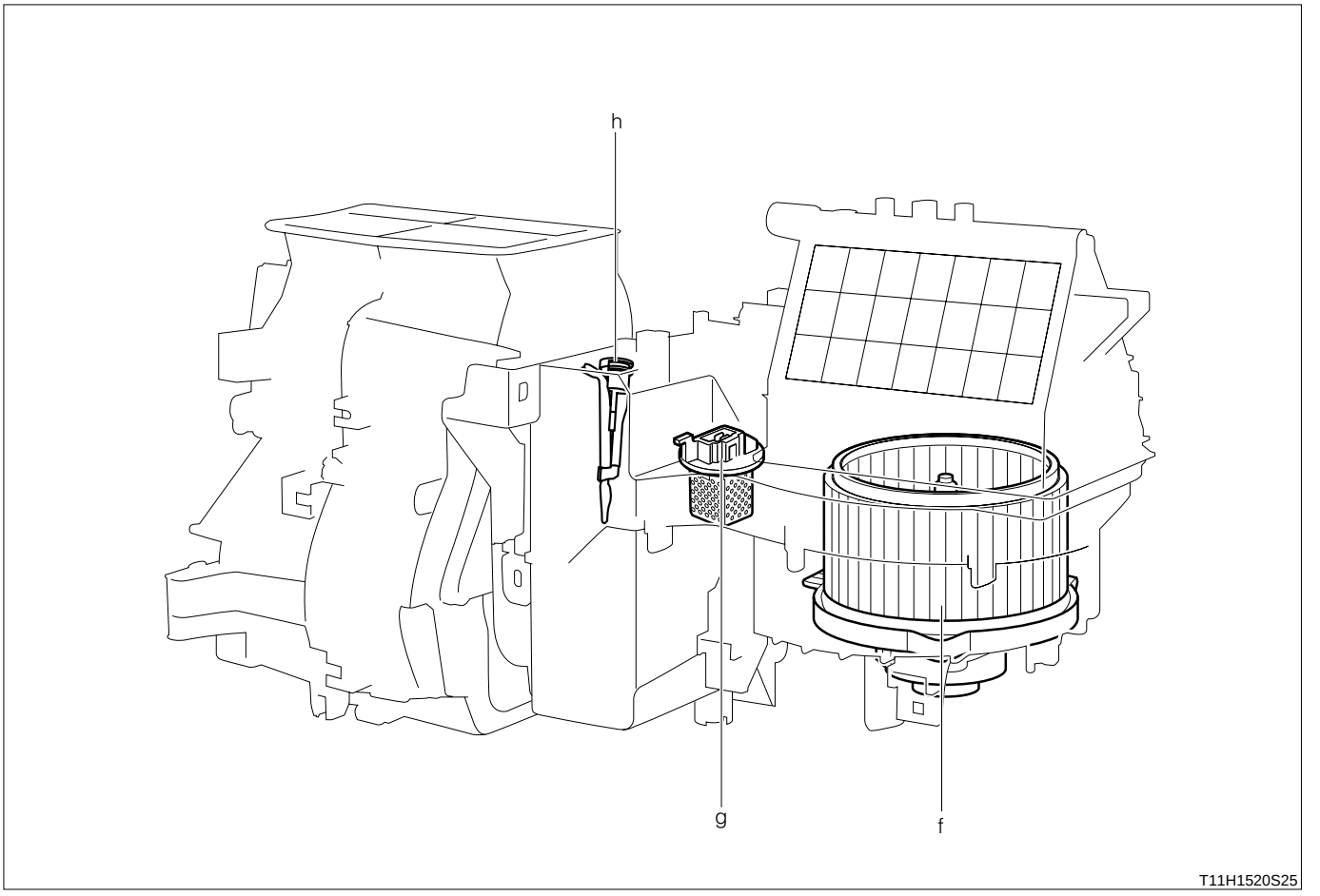
Engine Control Computer terminal name

Terminal No.	Terminal code	Terminal name
3	ACSW	A/C switch input
36	MGC	Magnet clutch drive output
42	BLW	Heater blower operation input
45	ACEV	Evaporator temperature sensor input
116	E21	Sensor earth

1-2 LOCATION OF COMPONENTS

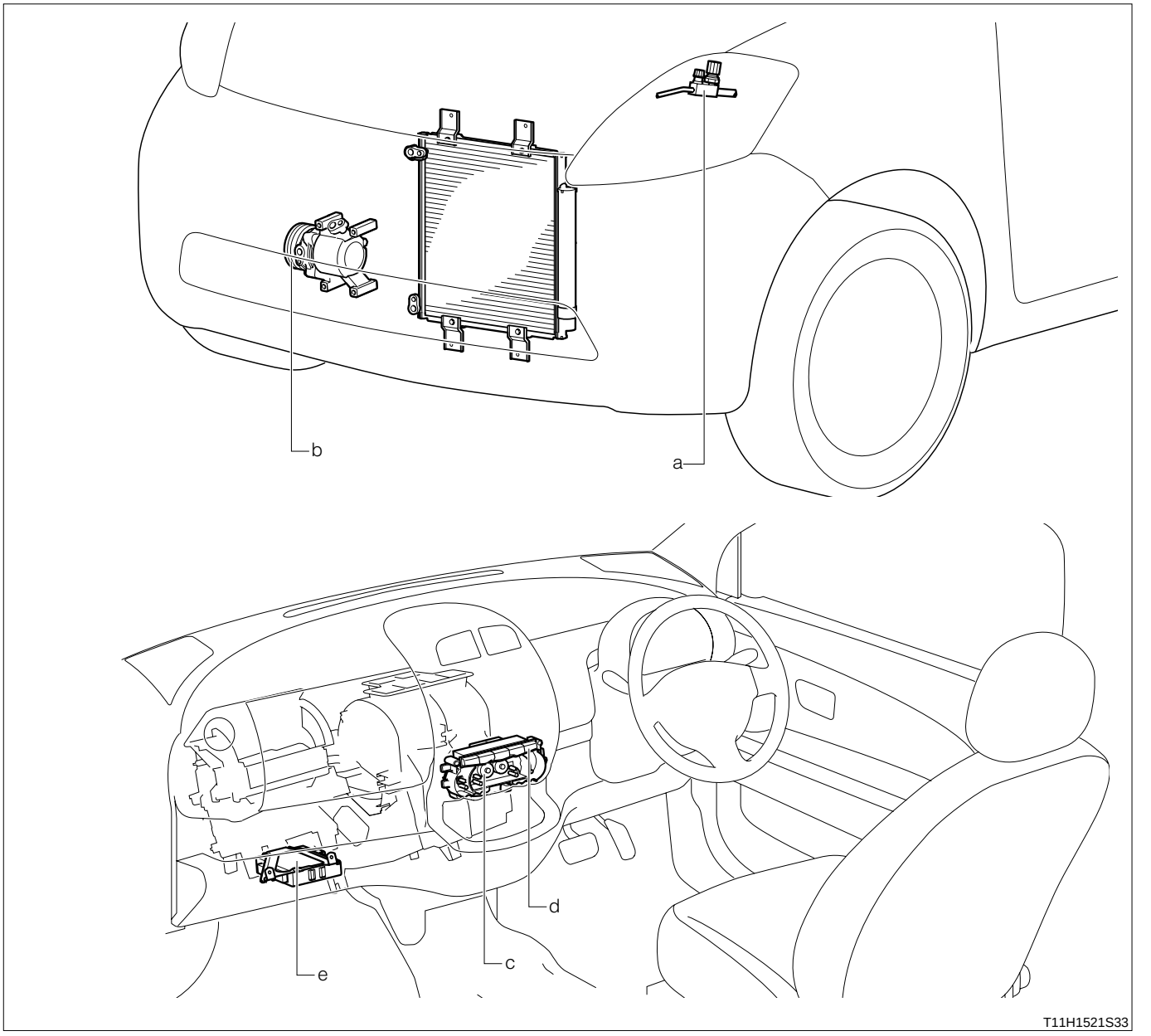


a	Pressure switch
b	Compressor magnet clutch
c	Blower switch
d	A/C switch
e	Engine control computer

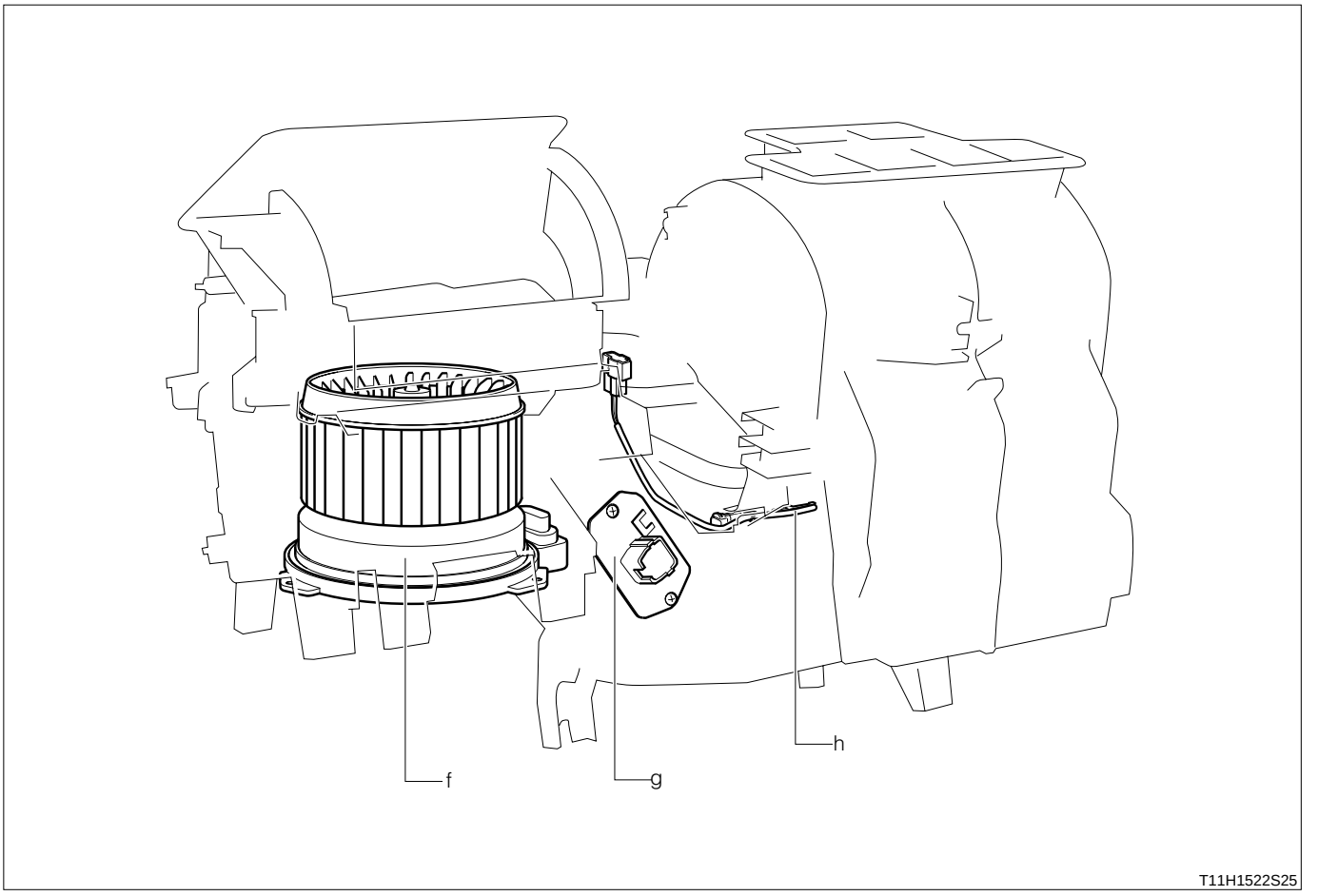


f	Blower motor
g	Blower resistor
h	Evaporator temperature sensor

1-3 LOCATION OF COMPONENTS



a	Pressure switch
b	Compressor magnet clutch
c	Blower switch
d	A/C switch
e	Engine control computer



f	Blower motor
g	Blower resistor
h	Evaporator temperature sensor

2 CONTROL

2-1 AIR CONDITIONER CONTROL BY ENGINE CONTROL COMPUTER

2-1-1 AIR CONDITIONER CUT CONTROL

Type 1KR-FE engine mounted vehicles

Refer to Page B8-16.

Type K3-VE engine mounted vehicles

Refer to Page B8-44.

2-1-2 RADIATOR FAN MOTOR CONTROL

Type 1KR-FE engine mounted vehicles

Refer to Page B8-17.

Type K3-VE engine mounted vehicles

Refer to Page B8-45.

2-1-3 AIR CONDITIONER IDLE-UP CONTROL

Type 1KR-FE engine mounted vehicles

Refer to Page B8-17.

Type K3-VE engine mounted vehicles

Refer to Page B8-45.

2-1-4 MAGNETIC CLUTCH CONTROL

Type 1KR-FE engine mounted vehicles

Refer to Page B8-17.

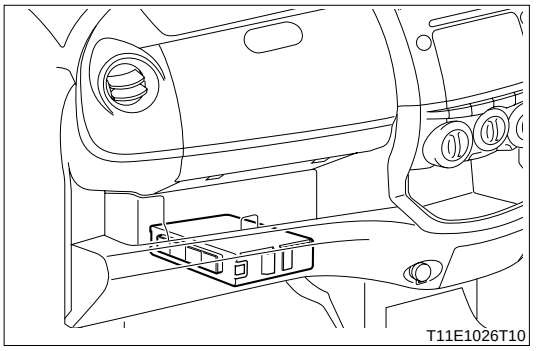
Type K3-VE engine mounted vehicles

Refer to Page B8-45.

3 COMPONENTS

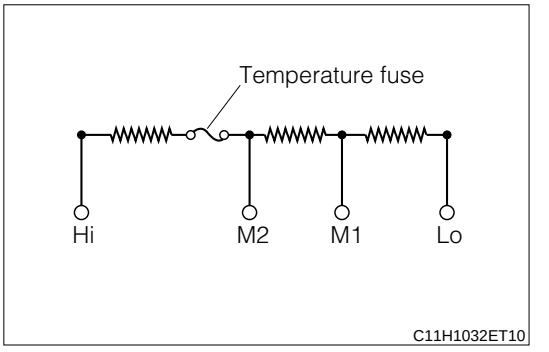
3-1 ENGINE CONTROL COMPUTER

This is attached below the air conditioning unit. It controls the compressor magnetic clutch ON/OFF function depending on the state of the A/C switch, vehicle conditions and each sensor's input.



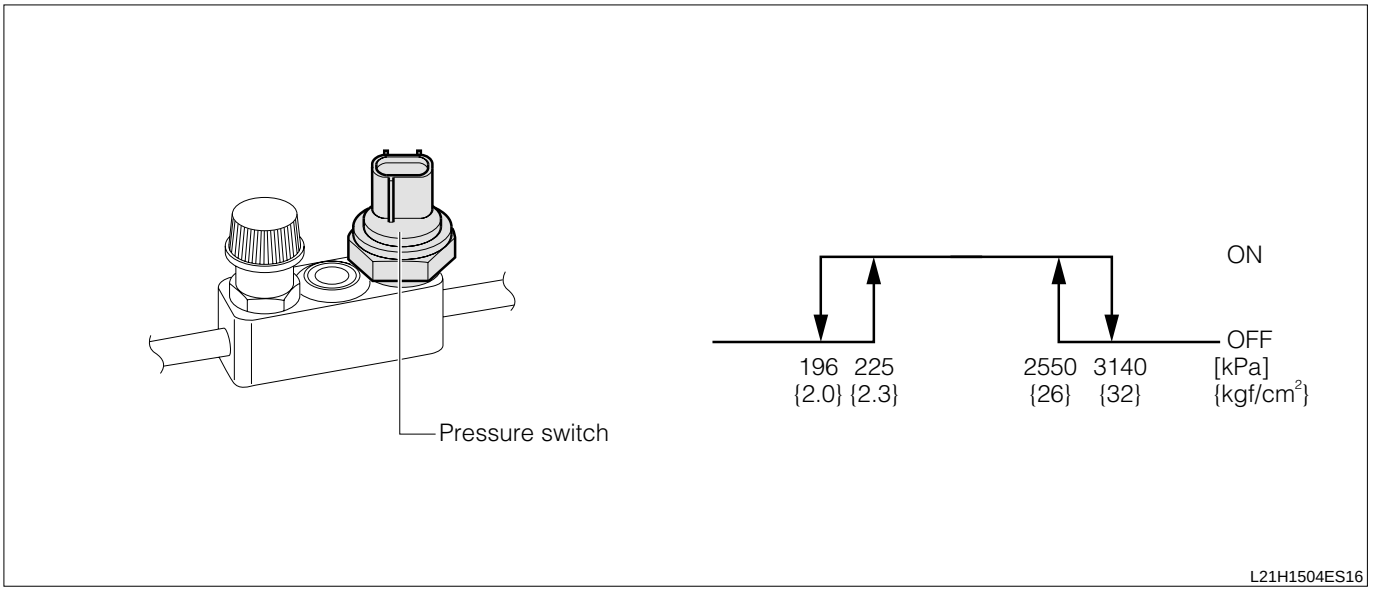
3-2 BLOWER RESISTOR

The blower resistor controls the speed of the blower motor. A temperature fuse is fitted. The mounting location is on the air conditioning unit.



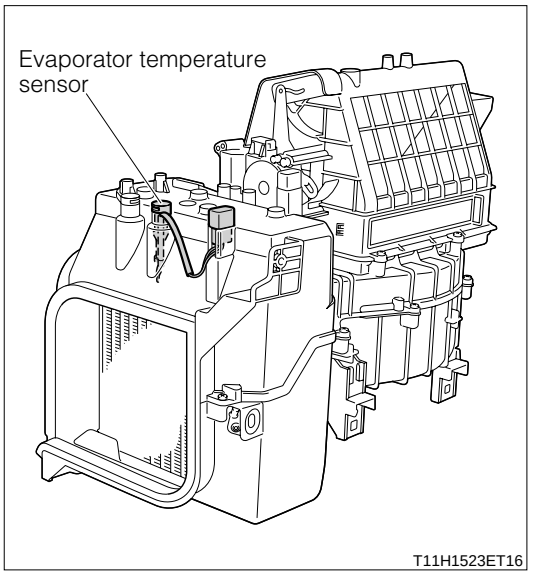
3-3 PRESSURE SWITCH

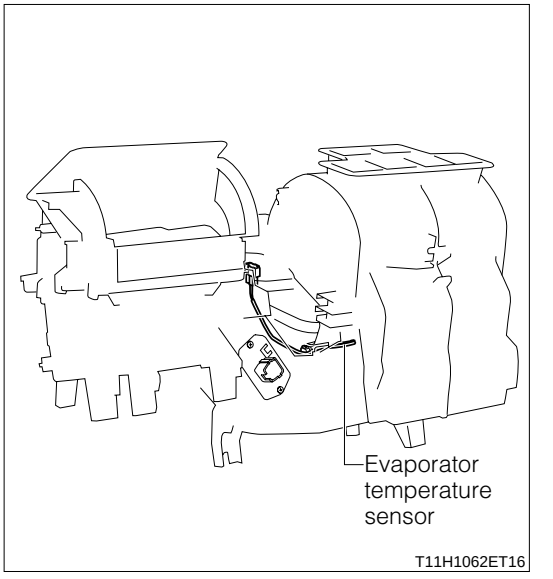
A pressure switch, which corresponds to abnormal pressure variation inside the liquid tube, is provided inside the liquid tube. When the pressure inside the liquid tube becomes excessively high or low, the wire between the A/C switch and the engine control computer is interrupted, thus stopping the rotation of the compressor.



3-4 EVAPORATOR TEMPERATURE SENSOR

This sensor detects the air temperature at a point immediately downstream of the evaporator as a change in resistance. Thus, the outputted value is sent to the engine control computer.





3-5 CONTROL PANEL

Refer to Page K1-5.