HEATING AND VENTILATION

008 GB

Ref. 55 IR 01

505

→ 86 MY

Checks
Repairs
Adjustments

FILE IN THE CHECKS–REPAIRS–ADJUSTMENTS BINDER

AUTOMOBILES PEUGEOT

direction des pièces et services

HEATING AND VENTILATION

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FOREWORD

This brochure covers the HEATING AND VENTILATION equipment fitted to 505 vehicles ├──> 86 MY, including a description, checks and repairs.

A modification can affect some checks (new sensors, altered positions ...) and repair operations.

To maintain this brochure up-to-date, please enter below the source of information (Service Information, Info Flash, etc.), the type and subject of the modification and the brochure page affected.

INFORMATION TYPE AND REFERENCE	MODIFICATION	SEE PAGE
Example : SI N°.		

PASSENGER COMPARTMENT TEMPERATURE REGULATION

SYMPTOM	FAULT DETECTION	FAULT
Rapid and large temperature variations in the blown air when stabilised. HEATING distribution	Does the blown air temperature become stable if the blower runs fast ≈ 4000 à 5000 rpm	Solenoid valve faulty : the valve opening time is too long under low coolant pressure
High temperature rise when moving to HEATING	Blower at maximum, check with cigarette smoke if the passenger compartment sensor draws in correctly	Check the passenger compartment sensor ventilation circuit .Pipes not connected trapped, blocked... .Take off on heater can be seen from above the central ventilation pipe behind the fascia .Take off on sensor can be seen with glove box lamp removed .Take offs on venturi can be seen with centre fascia removed
Heating distribution, blower at half speed steady road speed (minimum 1 hour), exterior at + 15° C . Temperature control above 26° C or below 20° C		
Temperature control altered considerably in relation to heating of vehicle		
Temperature control reversed FULL HOT instead of FULL COLD	In full HOT the solenoid valve is closed	Wires reversed in the electrical harness
Very hot air produced constantly from the demister or heater outlets whatever the temperature setting	Check for possible reversal of full hot and full cold	
	If no difference found check the fuses, the electrical harness and correct connection of the connector on the solenoid valve	If there is no electrical supply to the solenoid valve it will not close and heating will not stop. Another less likely cause : solenoid valve coil failure. Its resistance should be approx. 11 Ω at ambient
Air conditioning compressor not working		Lack of freon in the system

PASSENGER COMPARTMENT TEMPERATURE REGULATION

SYMPTOM	FAULT DETECTION	FAULT
Air treatment inoperative in the 3 distribution positions, demisting, demisting/heating, heating	ECO button out, blower maximum speed, control 24° C, HEATING distribution. Check compressor cycling with a positive ambient	Wires in harness reversed between air treatment and the ECO button
Compressor not declutching when the ECO button is pressed and operation on MAX cold	Set on full HOT, blower on MAX. Normally pressing the ECO button declutches the air conditioning compressor air de-humidified	
At steady speed : control not centred around 24° C and chance variations in passenger compartment temperature	Test with an ohmmeter at the temperature control potentiometer	Accidental contact in the potentiometer resistor (faulty riveting of the carbon track)
Passenger compartment temperature always too high does not react to the temperature control Only the full cold position operates (slider on the blue mark at the bottom)	Test with an ohmmeter at the temperature control potentiometer harness	Reversal of wires at the electronic control unit connector

From 1986 model year, three levels of heater equipment are offered on the 505, each identifiable by its control panel.

A - Ventilation / heating

B - Ventilation / heating with electronic temperature regulation

C - Ventilation / heating, air conditioning with electronic temperature regulation

Description

1 - Windscreen demisting / defrosting nozzles

2 - Front window defrosting vents

3 - Side ventilators (direction and output adjustable)

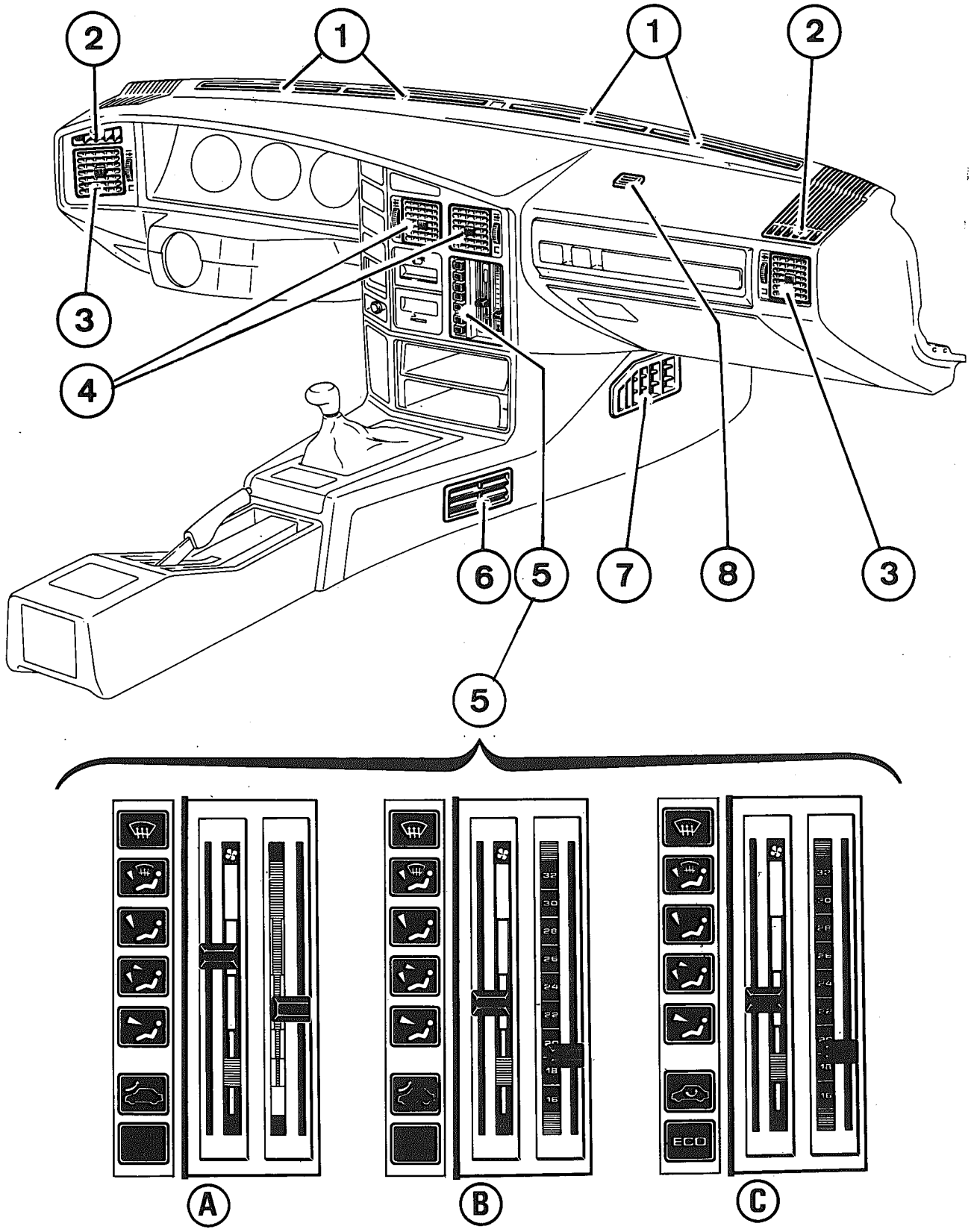
4 - Central ventilators (direction and output adjustable)

5 - Control panel

6 - Air outlet for rear passengers

7 - Air outlet for driver and front passenger

8 - Passenger compartment temperature sensor or blanking plug (according to specification)


2
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ECO
A
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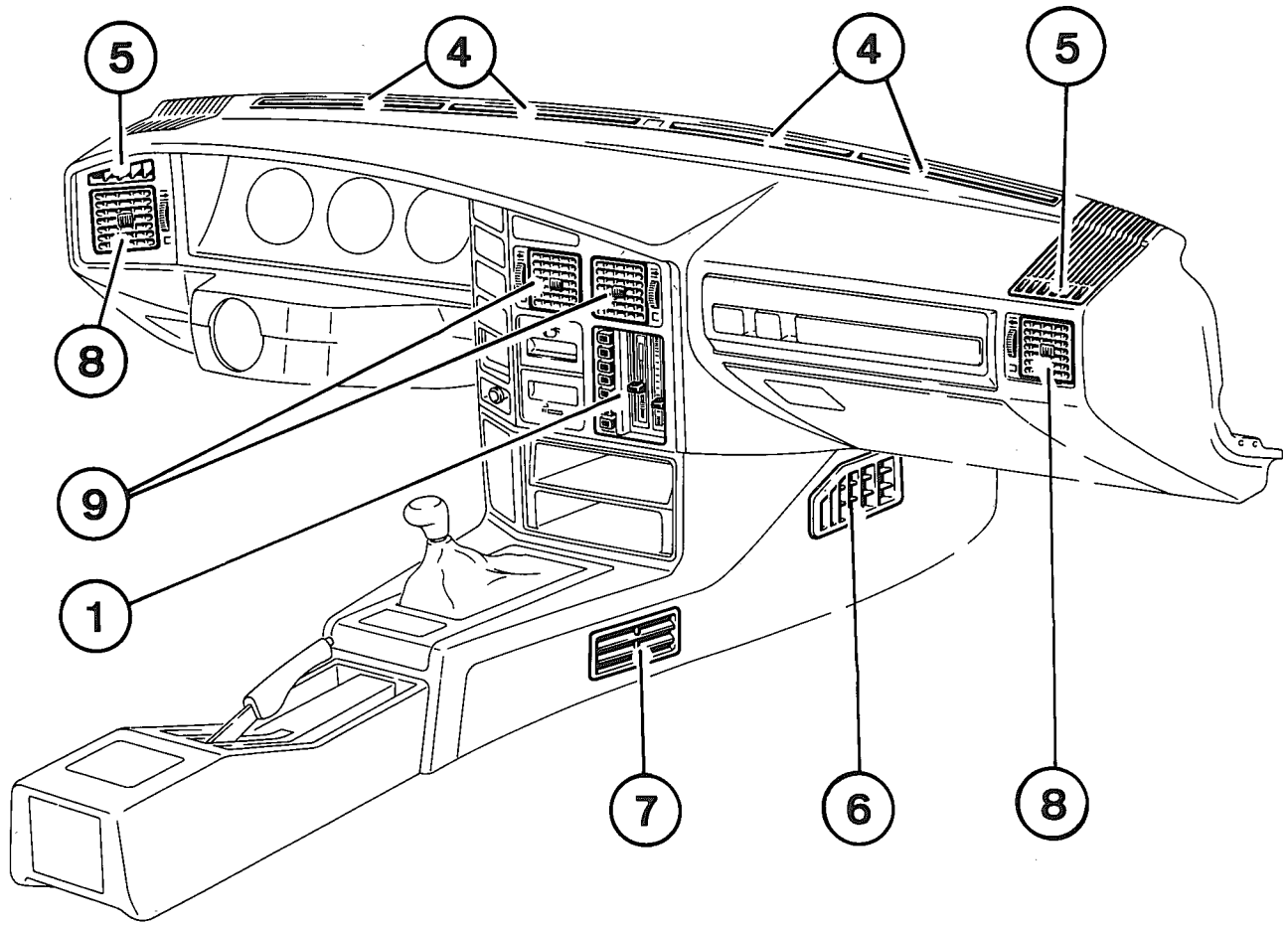
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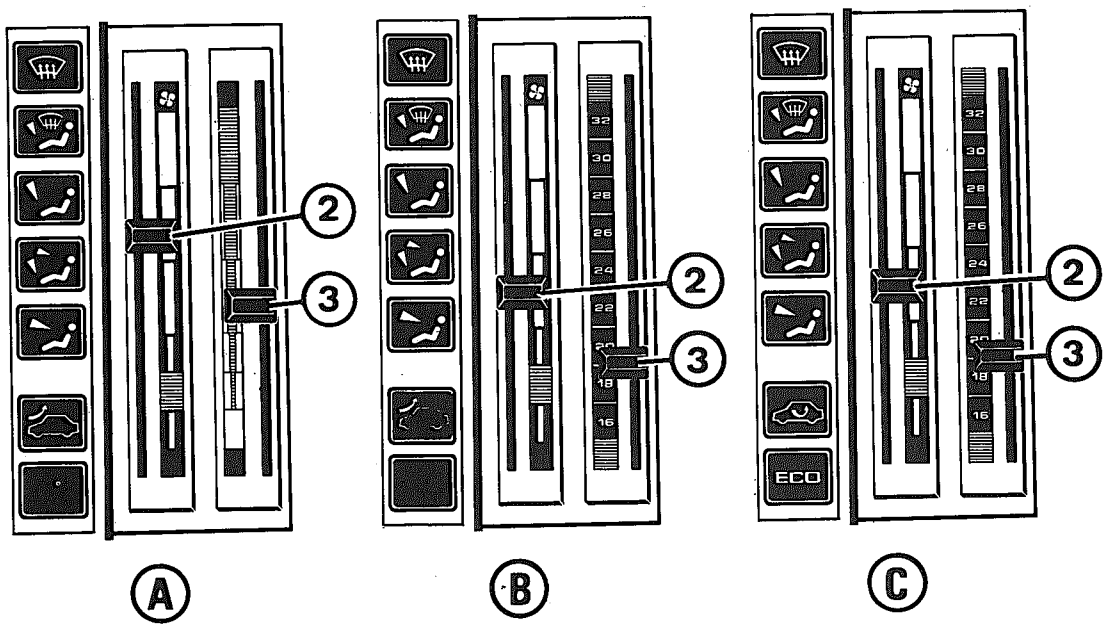
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ECO
A
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Air is distributed to the various outlets and ventilators through the medium of buttons on the control panel **(1)**.
Air distribution depends on the equipment level **(A), (B) or (C)**, the output volume being adjusted by the slider **(2)** and the temperature by the slider **(3)**.

- Controls common to all three equipment levels A - B - C

Button pressed	Function	Air distributed to :
	-Demisting, defrosting (maximum performance obtained with the side ventilators closed)	-windscreen, nozzles **(4)** -front door windows, vents **(5), (8)**
	-Demisting, defrosting -Heating, ventilation passenger compartment	-windscreen, nozzles **(4)** -front door windows, vents **(5), (8)** -passengers' feet, outlets **(6), (7)**
	-Heating, ventilation passenger compartment	-passenger's feet, outlets **(6), (7)**
	-Ventilation (outside air)	-passenger's faces, ventilators **(8), (9)**
	-Heating	-passenger's feet, outlets **(6), (7)**
	-Maximum ventilation (outside air)	-passenger's faces, ventilators **(8), (9)**

- Controls specific to equipment levels A - B

	-Outside air inlet closed	-none; heating/ventilation inoperative

- Controls specific to level C

	-Re-circulation -Outside air inlet closed	-speeds up cooling or heating/demisting of the passenger compartment
	-Stops air conditioning compressor	-temperature regulation still operates

VENTILATION / HEATING

Description

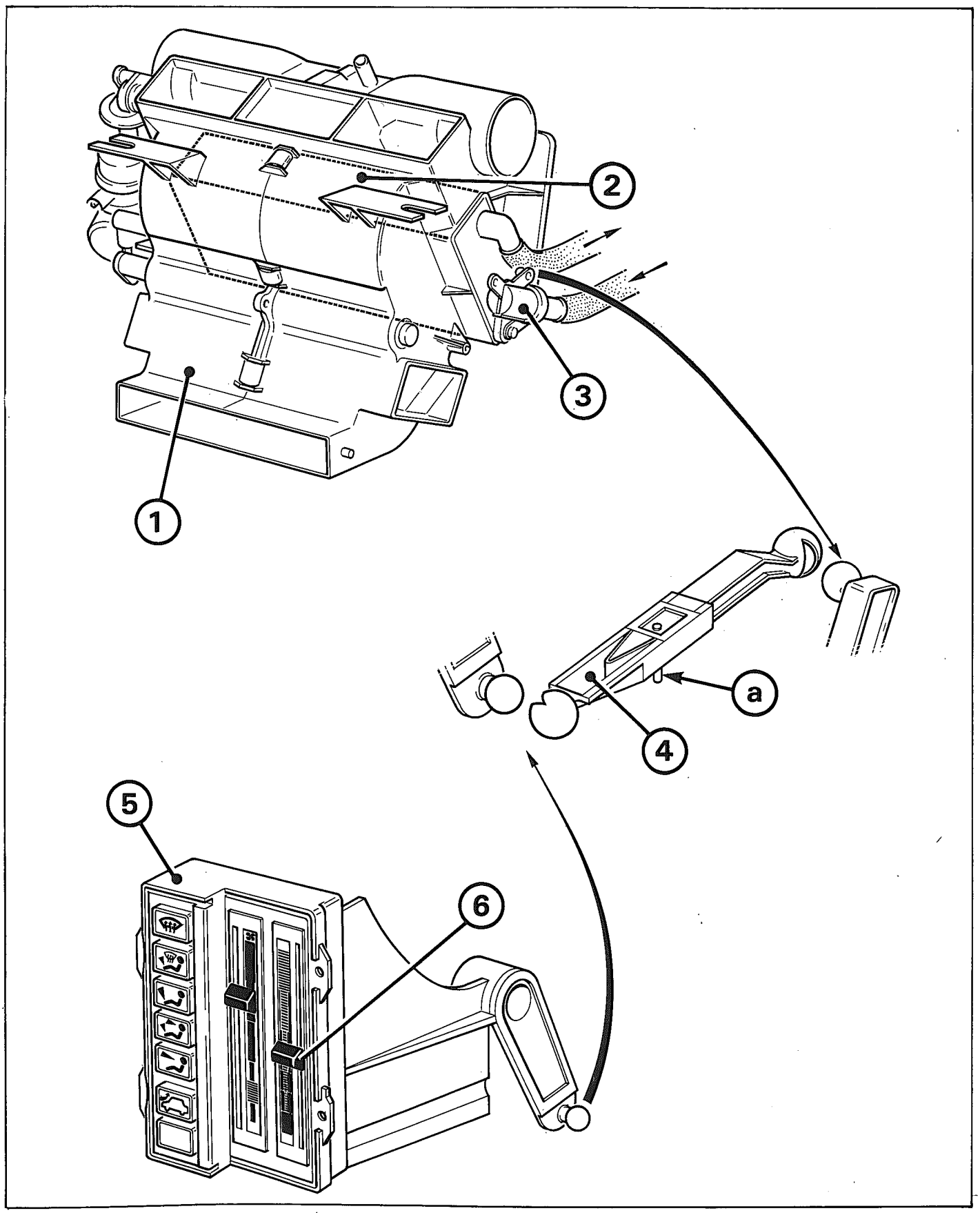
1 - Heater unit
2 - Heater matrix
3 - Thermostatic valve
4 - Thermostatic valve control rod
5 - Control panel
6 - Temperature control slider

Principle of operation

The water circuit for the heater is taken from the engine cooling system and is regulated at the inlet to the heater matrix **(2)** by the thermostatic valve **(3)**.
This valve **(3)** is controlled by the slider **(6)**, and is connected to the control panel **(5)** by the adjustable rod **(4)**.

Checks - Repairs

Fault reported	Repair
Heating inefficient or non-existent	- Bleed the cooling system - Check that the matrix is not clogged
No heating Heating always at maximum	Check the connection between the control panel **(5)** and the valve **(3)** through rod **(4)**, proceeding as follows : - disconnect the rod **(4)** which is clipped to the ball joints on the heater unit **(1)** and the control panel **(5)** - set the slider **(6)** to its lowest position - completely close the thermostatic valve **(3)** by pushing its lever to the rear - refit the rod **(4)** and secure it with the locking pin **(a)** If the heater is still faulty, replace the thermostatic valve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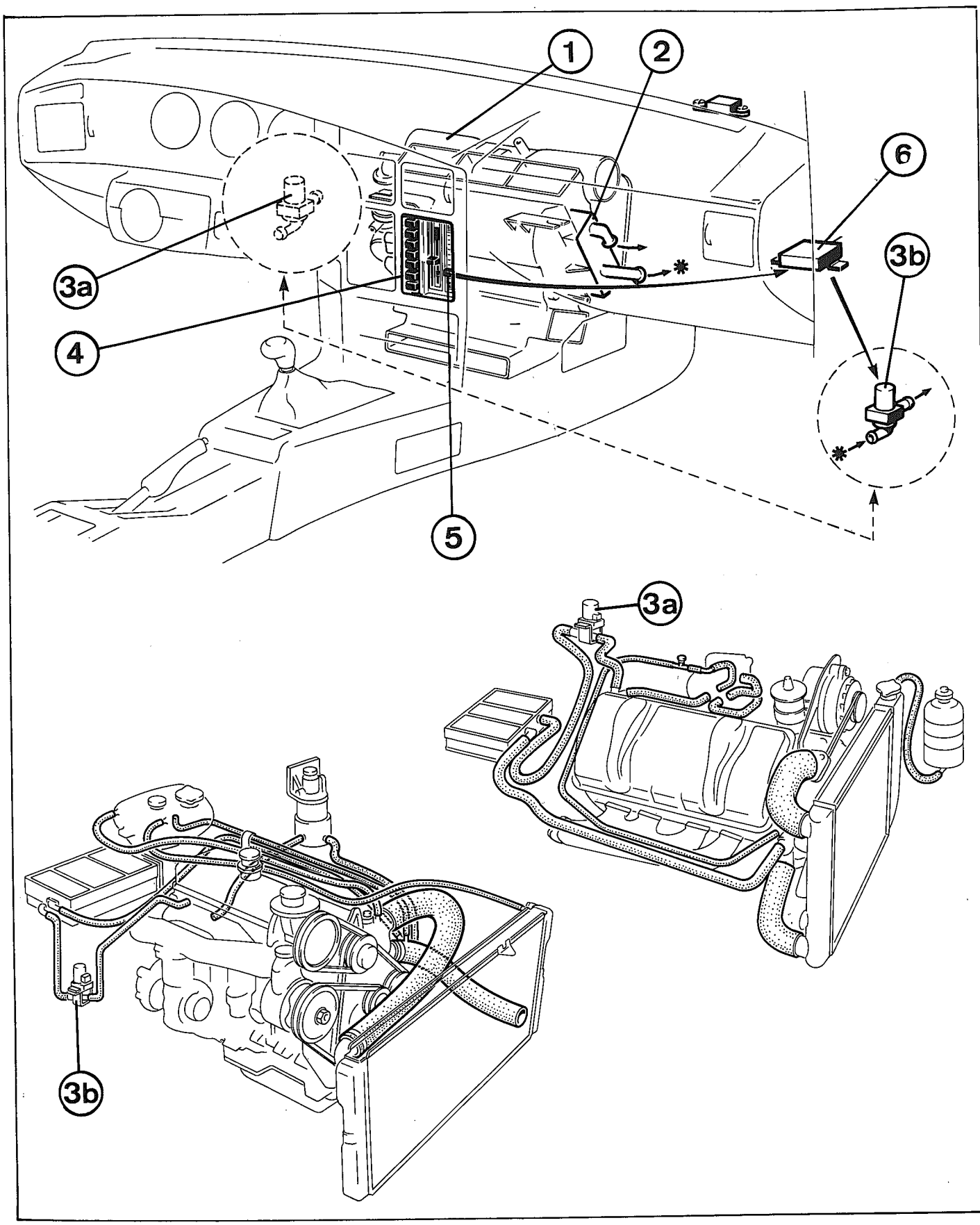
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VENTILATION / HEATING WITH ELECTRONIC REGULATION (with or without air conditioning)

Description

1 - Heater unit
2 - Heater matrix
3 - Solenoid valve : - 3a location on XN1/XN6/XM7/N9T
- 3b location on ZDJL/ZN3J/XD3 all models
4 - Control panel
5 - Temperature control slider
6 - Electronic control unit

Principle of operation

The water circuit for the heater is taken from the engine cooling system and is regulated at the inlet to the heater matrix **(2)** by the thermostatic valve **(3)**. This valve is open as soon as water circulation is established.

To achieve this, it is essential that the solenoid valve is fitted the right way round, with the arrow on the body pointing in the direction of water circulation.

The electronic control unit **(6)** transmits electrical impulses to open or close the solenoid valve **(3)**.

If there is an electrical failure, the solenoid valve, not excited, remains open to allow water circulation.

Checks - Repairs

Fault reported	Repair
Heating inefficient	- Bleed the cooling system
No heating	Check : - the direction of fitting of the solenoid valve - the electrical circuit (see pages 26 and 30) If these checks are satisfactory, test with a new output regulation solenoid valve.

VENTILATION / HEATING WITH OR WITHOUT ELECTRONIC REGULATION

Description

1 - Blower

2 - Outside air inlet

3 - Matrix

4 - Side ventilator flap control ram

5 - Side ventilator flap

6 - Central ventilator flap control ram

7 - Central ventilator flap

8 - Air distribution control ram

9 - Air distribution flap

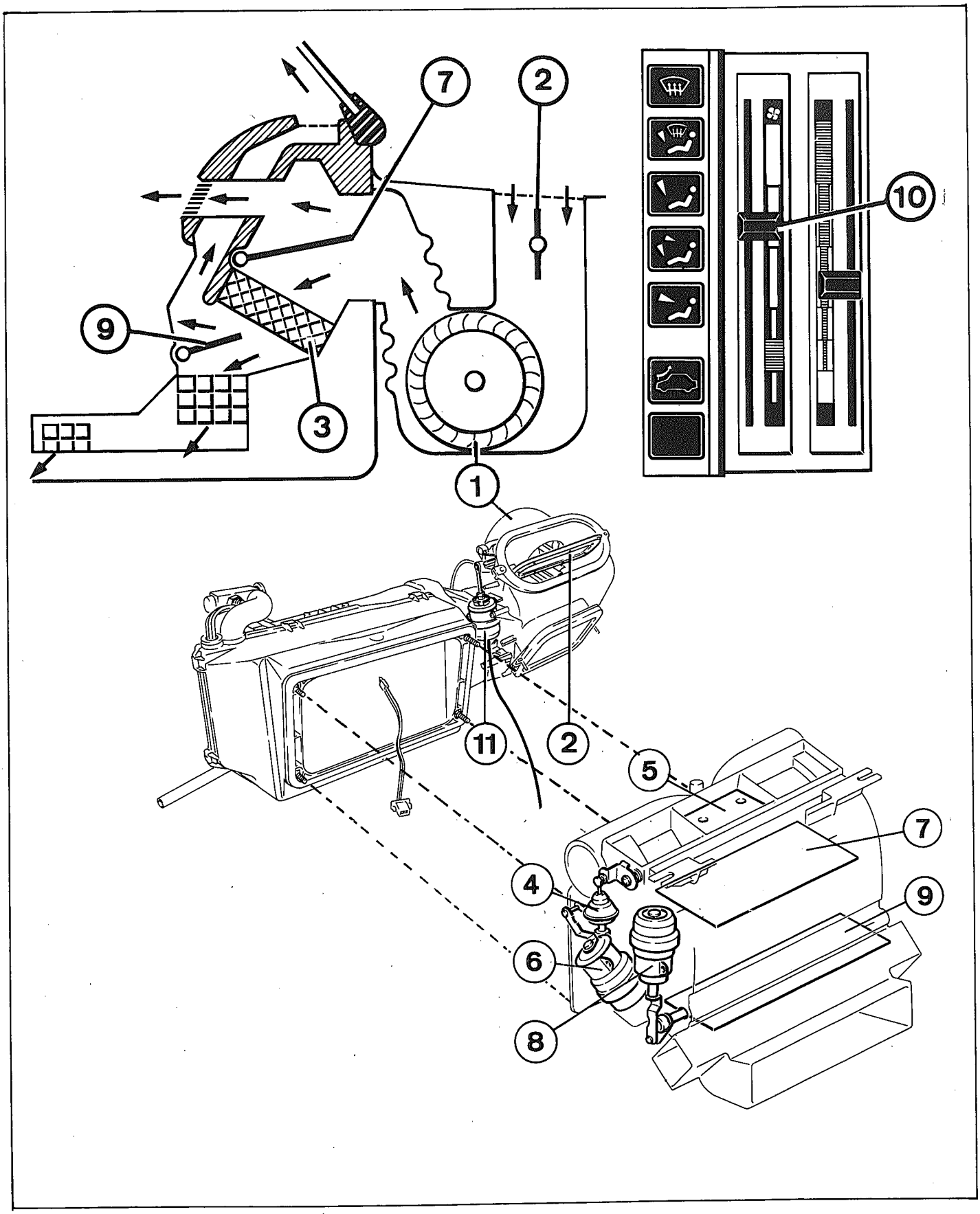
10 - Output adjustment slider

11 - Outside air inlet control ram

Principle of operation

The blower motor **(1)** runs as soon the ignition key is in the + Acc (+accessories) position. Its speed is controlled by the output adjustment slider **(10)**. It should be noted that the blower motor is designed to run even when the slider is in its lowest position.

Each of the buttons on the control panel connects one or several rams **(4, 6, 8, 11)** with the vacuum supply. The flaps **(2, 5, 7, 9)** are thus operated - opened or closed - to allow or prevent the passage of air for the function selected.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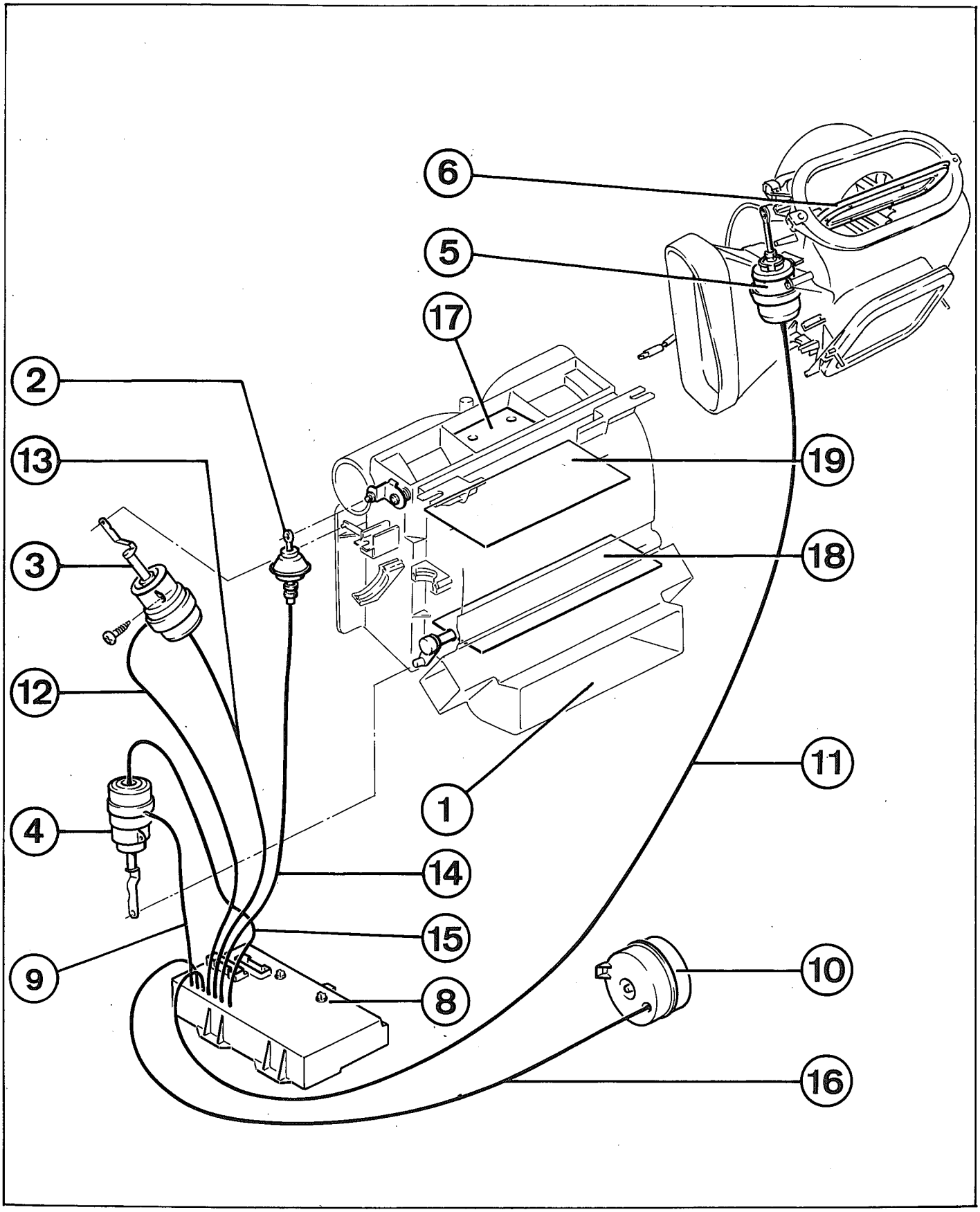
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Checks - Repairs

Using the table below, press each button on the control panel **(8)** in turn, and check the operation of the rams and flaps as follows :

- check that vacuum is present
- check the connections of the pipes between the control panel and the rams
- check the free operation of the flaps

- If necessary, replace any faulty rams

Button pressed	Function	Rams contrl	Flaps operated	Pneumatic pipe connections
	Demisting Defrosting	None	Passage of outside air through the blower	Black pipe **(16)** between control **(8)** and take off on vacuum reservoir **(10)**
	Deminsting Defrosting Heating	**(4)**	Flap **(18)** in mid position	Blue pipe **(15)** between control panel **(8)** and take off at rear of ram **(4)**
	Heating	**(4)**	Flap **(18)** fully closed	Blue pipe **(15)** and yellow pipe **(9)** between control panel **(8)** and take off in middle of ram **(4)**
	Ventilation Heating	**(4)** **(3)** **(2)**	Flap **(18)** in mid position Flap **(19)** in mid position Flap **(17)** closed	Blue pipe **(15)**, green pipe **(13)** between control panel **(8)** and rear of ram **(3)**, and white pipe **(14)** between control panel **(8)** and ram **(2)**
	Ventilation	**(4)** **(3)** **(2)**	Flap **(18)** closed Flap **(19)** closed Flap **(17)** closed	Blue pipe **(15)**, yellow pipe **(9)** Green pipe **(13)**, white pipe **(14)** and brown pipe **(12)** between control panel **(8)** and take off in middle of ram **(3)**
	Stopping entry of outside air	**(5)**	Flap **(6)** closed	Red pipe **(11)** between control panel **(8)** and rear take off on ram **(5)**

VENTILATION / HEATING AIR CONDITIONING WITH ELECTRONIC REGULATION

Description

20 - Recirculation button - closes outside air inlet
- speeds passenger compartment cooling or heating / demisting

21 - ECO button - stops/starts the air conditioning compressor

22 - Control potentiometer slider (range 16 to 32 or 60 to 90)

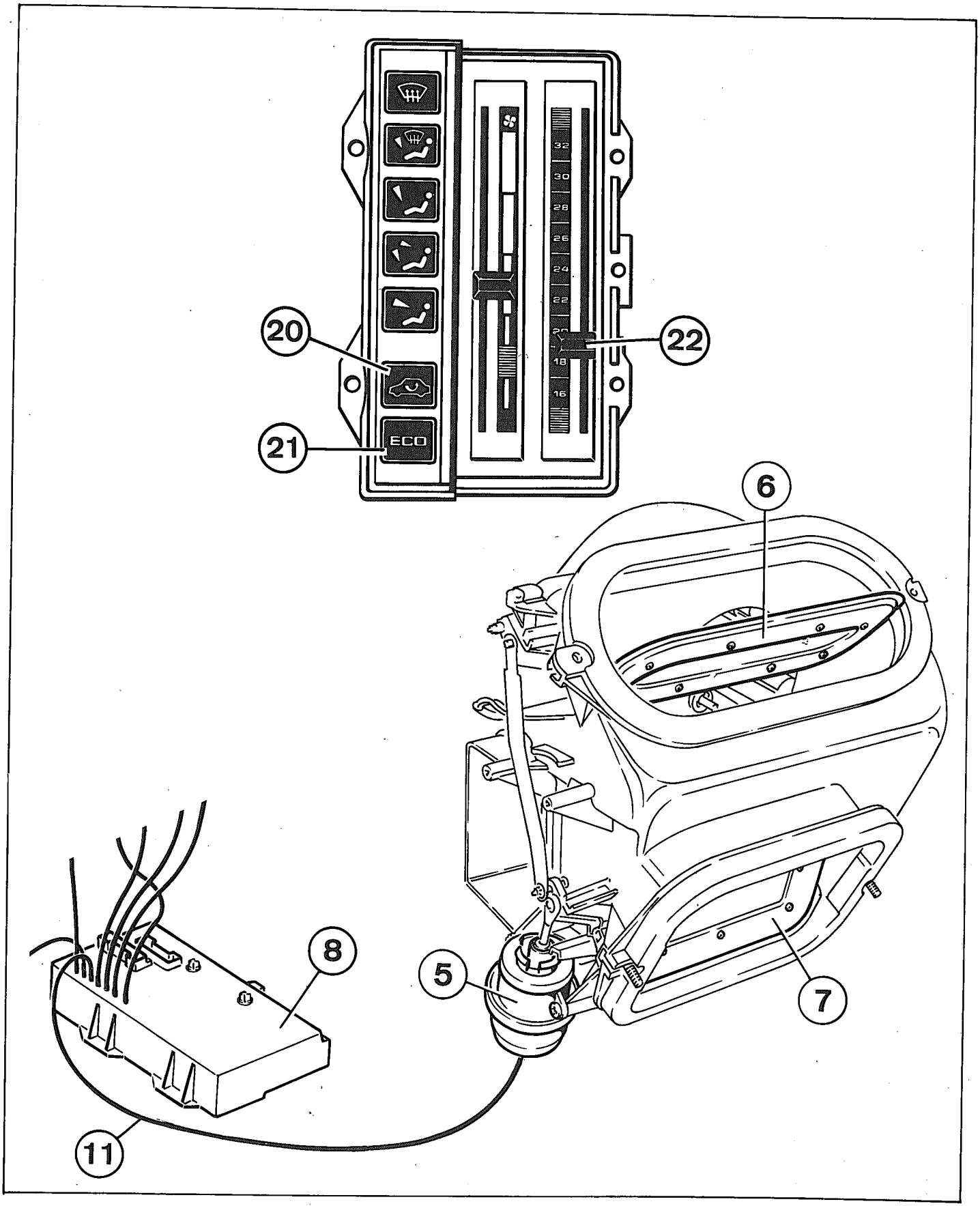
Principle of operation

The principle of operation is the same as for ventilation/heating with electronic regulation; outside air entry is stopped by means of button **(20)**. When the ECO button **(21)** is not depressed, the air conditioning compressor is operational.

The user sets a temperature by means of the slider **(22)**. An electronic control unit opens the heating solenoid valve if the passenger compartment needs to be heated, or starts the compressor if it needs to be cooled.

Checks - Repairs

Button pressed	Function	Rams contrl	Flaps operated	Pneumatic pipe connections
	Entry of outside air stopped Speeds heating or cooling	**(5)**	Flap **(6)** closed Flap **(7)** open	Red pipe **(11)** between control panel **(8)** and rear take off on ram **(5)**
	Pressed : air condi-tioning compressor stopped	-	-	-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ECO
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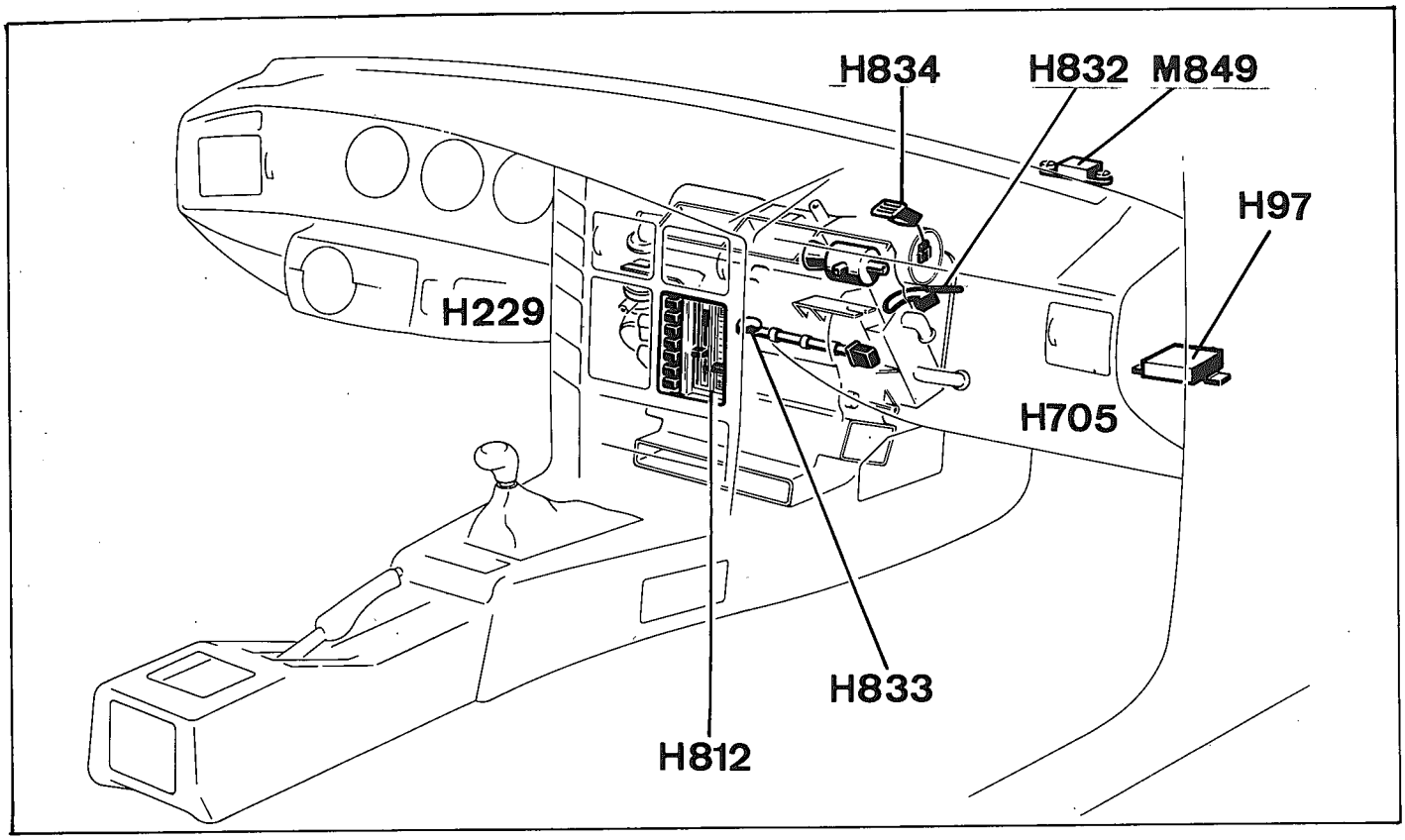
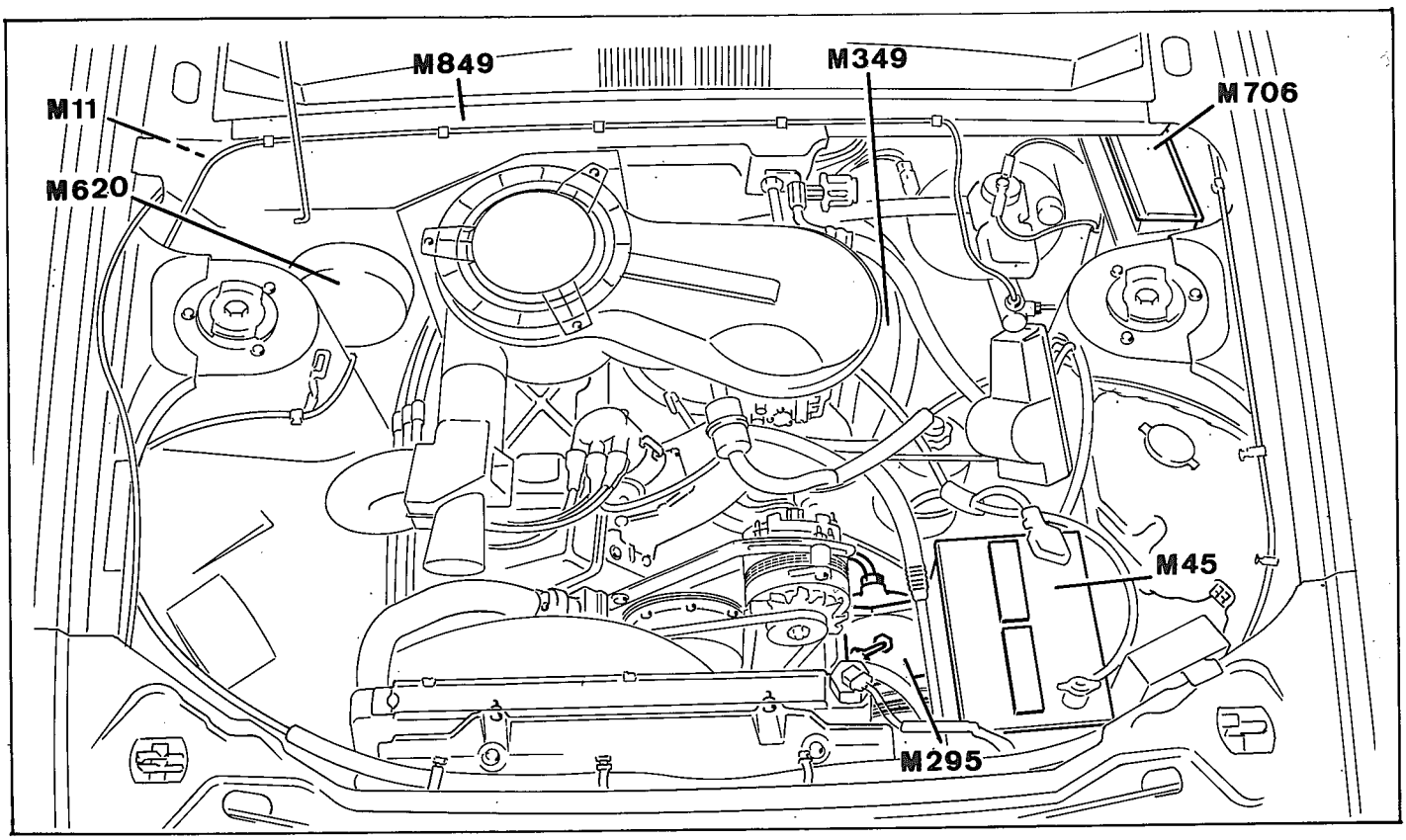
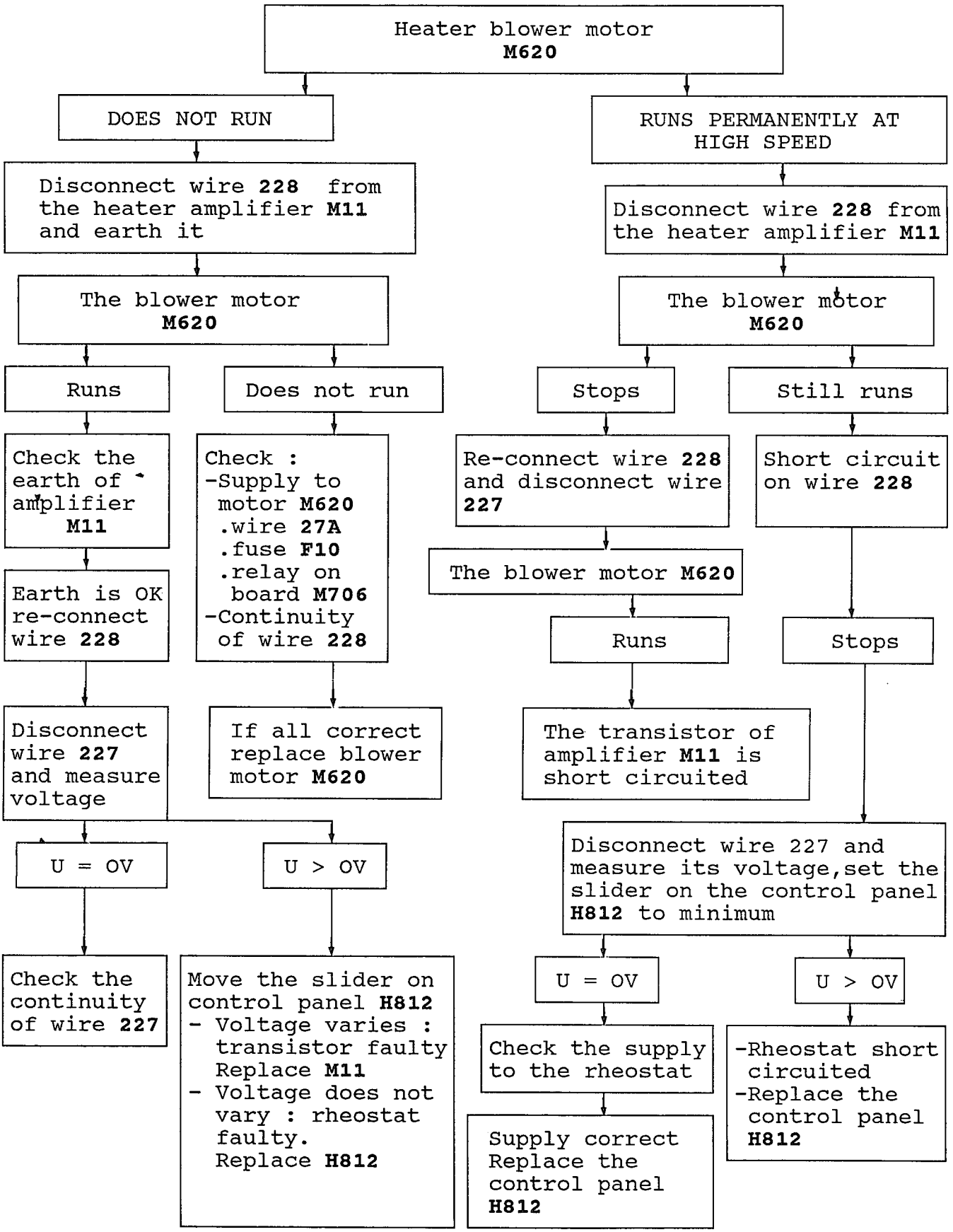

H834
H832
M849
H97
H229
H705
H833
H812

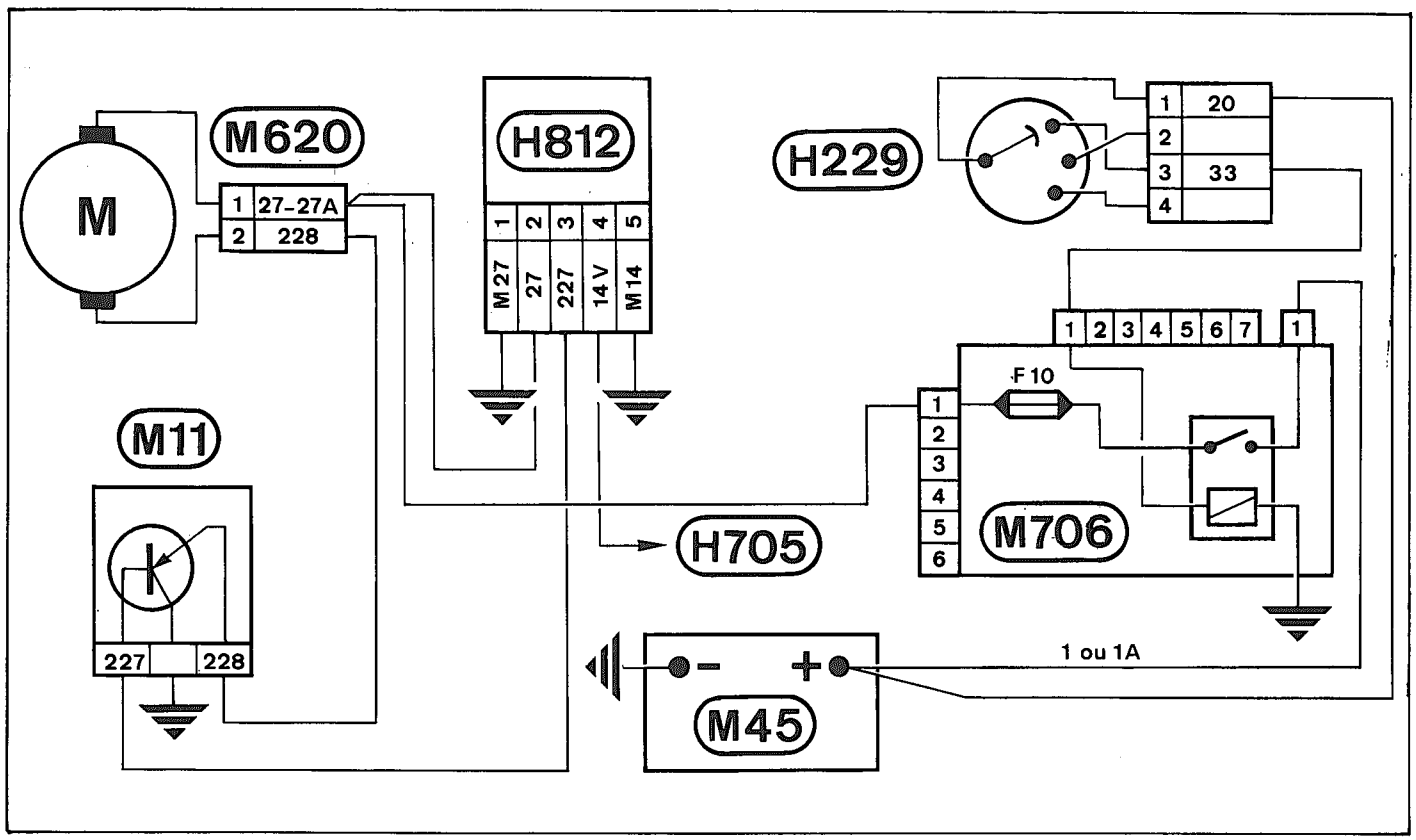

M849
M349
M706
M11
M620
M45
M295

DESCRIPTION - INSTALLATION

KEY	DESCRIPTION	EQUIPMENT LEVEL		
		A	B	C
M11	Heater amplifier (power transistor)	X	X	X
M45	Battery	X	X	X
H97	Temperature regulation unit (passenger compartment) (located behind the lower parcel shelf on the passenger's side)		X	X
H229	Ignition switch	X	X	X
M295	Compressor			X
M349	Temperature regulation solenoid valve		X	X
M620	Heater blower motor	X	X	X
H705	Connection board (located behind the lower parcel shelf on the passenger's side)	X		X
M706	Connection board	X	X	X
H812	Temperature setting rheostat	X	X	X
H832	Evaporator sensor			X
H833	Blow air sensor		X	X
H834	Passenger compartment air sensor		X	X
M849	Exterior air sensor		X	X

VENTILATION / HEATING




M620
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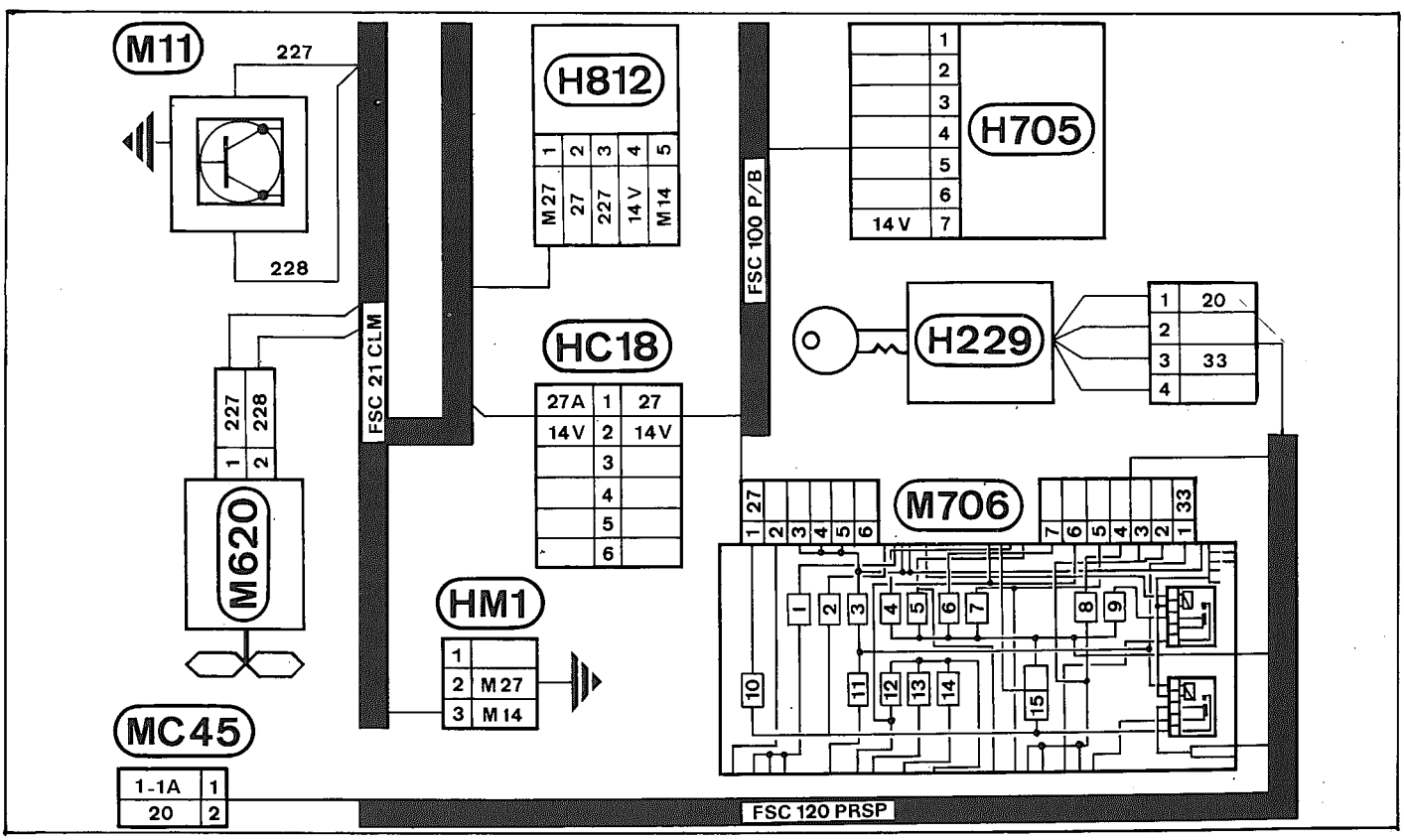
M11
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M27 27 227 14 V M14
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FSC 100 P/B
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227 228
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M620
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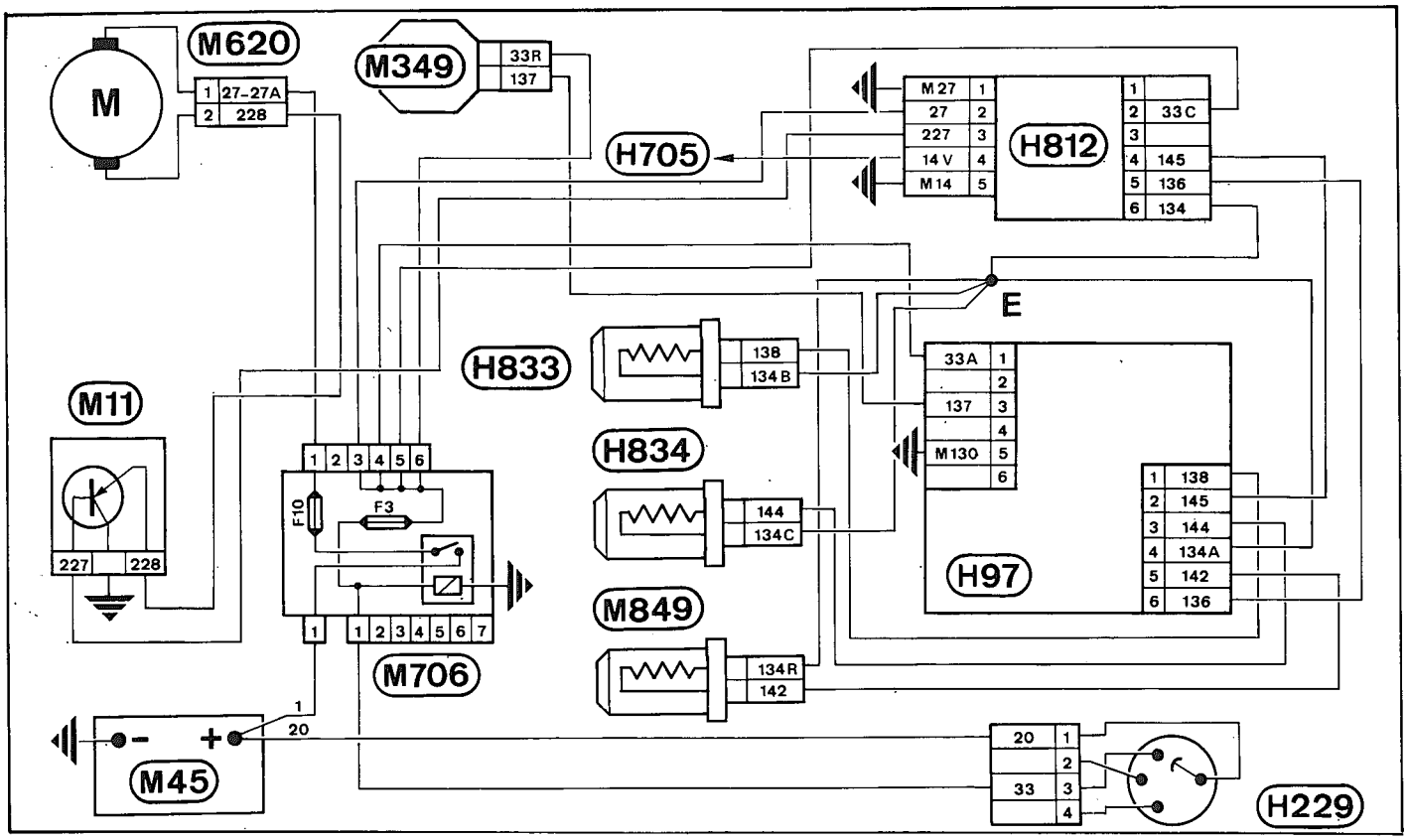
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134B
33A 1
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137 3
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M130 5
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H834
144
134C
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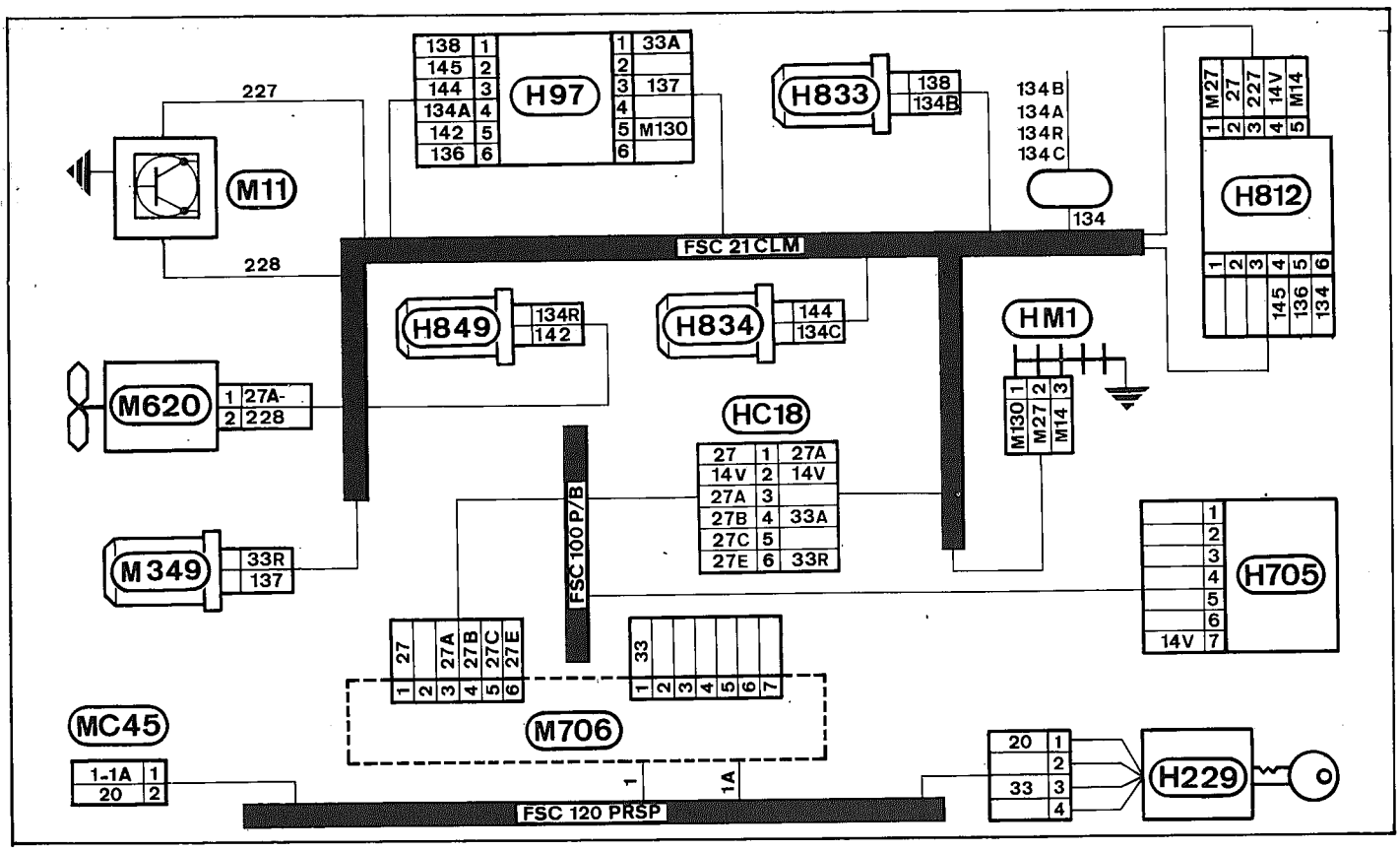
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H229

VENTILATION / HEATING WITH ELECTRONIC REGULATION

Principle of operation

The electronic regulation of the ventilation / heating is controlled by the electronic control unit **H97.**

The various parameters which it receives are as follows :

- exterior air temperature - sensor **M849**
- passenger compartment air temperature - sensor **H834**
- blow air temperature at heater inlet **H833**
- temperature instruction set by the user by means of a slider on the control panel **H812**

This control unit continuously compares the temperature set by the user with the passenger compartment temperature, and controls the solenoid valve **M349.** The signals are weighted by the exterior temperature and the blown air temperature.

I

PASSENGER COMPARTMENT AIR SENSOR- H834

- clipped to the fascia above the upper parcel tray
- connector accessible by releasing the lower parcel tray

Resistance check

T (° C)	R (Ω)
0	32470 to 37740
5	24890 to 28930
10	19450 to 22120
15	15140 to 17210
20	12000 to 13350
25	9500 to 10500
30	7500 to 8400
35	5900 to 6770
40	4770 to 5440

II

BLOWN AIR SENSOR - H833

- clipped to the matrix outlet
- connector accessible on releasing the lower parcel tray

Resistance check

T (° C)	R (Ω)
-10	48580 to 62080
- 5	37165 to 47495
0	28895 to 36405
5	22470 to 28310
10	17750 to 22050
15	14010 to 17405
20	11215 to 13765
25	9000 to 11000
30	7215 to 8895
35	5810 to 7250
40	4740 to 5915
45	3865 to 4875
50	3185 to 4020

III

EXTERIOR AIR SENSOR - M849

- screwed to the scuttle panel in the blower air inlet neck
- connector accessible under the blower sound insulation in the centre part

Resistance check

T (° C)	R (Ω)
0	32470 to 37740
5	24890 to 28930
10	19450 to 22120
15	15140 to 17210
20	12000 to 13350
25	9500 to 10500
30	7500 to 8400
35	5900 to 6770
40	4770 to 5440

IV

TEMPERATURE REGULATION SOLENOID VALVE - M349

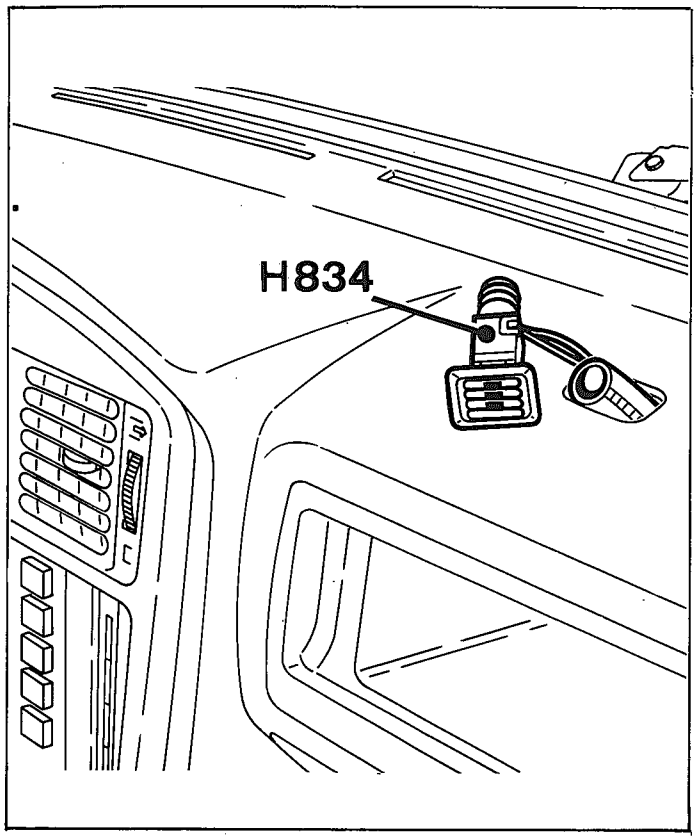
- located in the engine compartment (see page 11, installation according to model)
- controlled by the electronic control unit, which earths the solenoid valve

Internal resistance check
- connector disconnected
- ambient temperature

$R \approx 11\ \Omega$

Electrical circuit continuity
- set the temperature slider :
  - at maximum
    U = O V between the two terminals of the connector
  - at minimum
    U = 12 V between the two terminals of the connector

I



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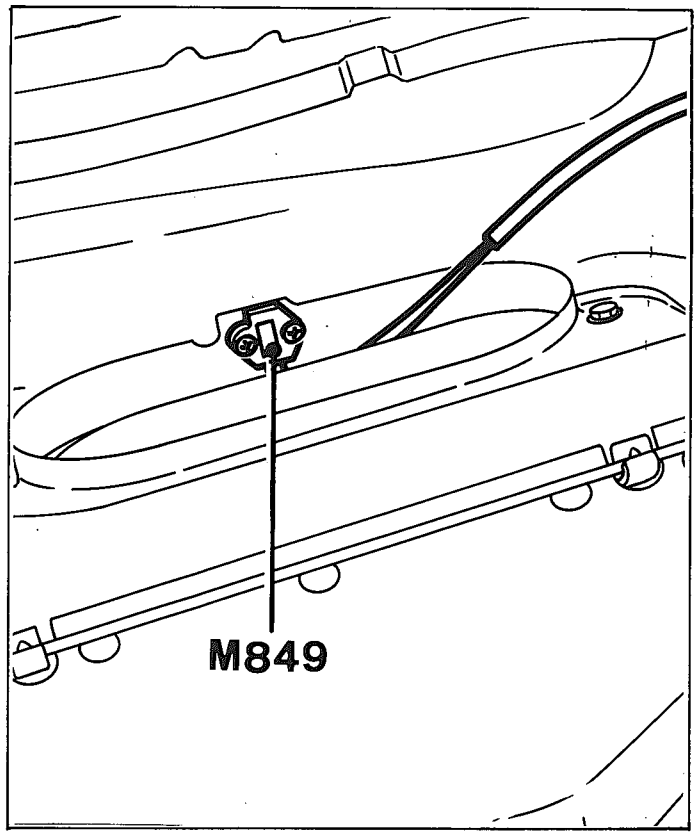

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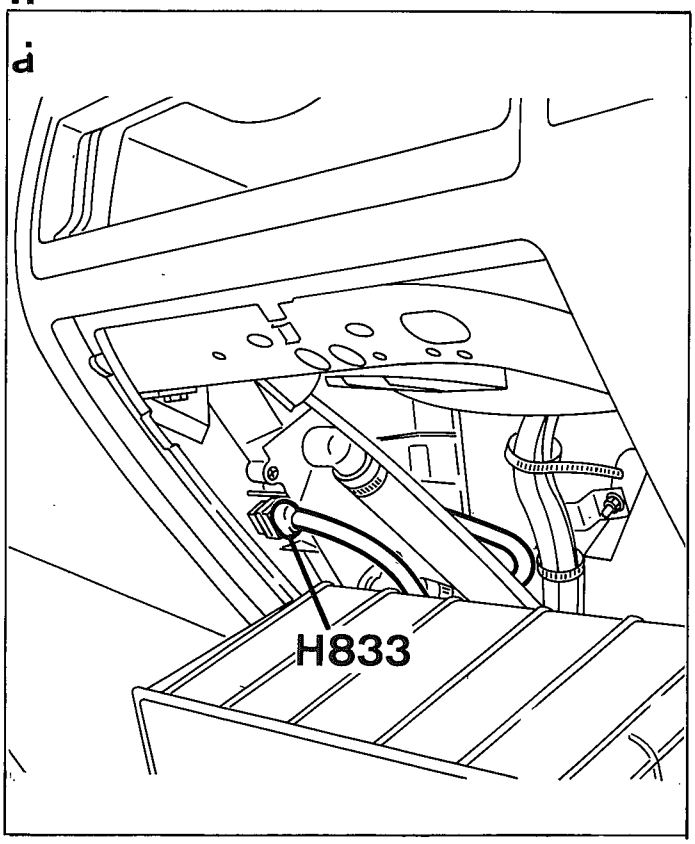

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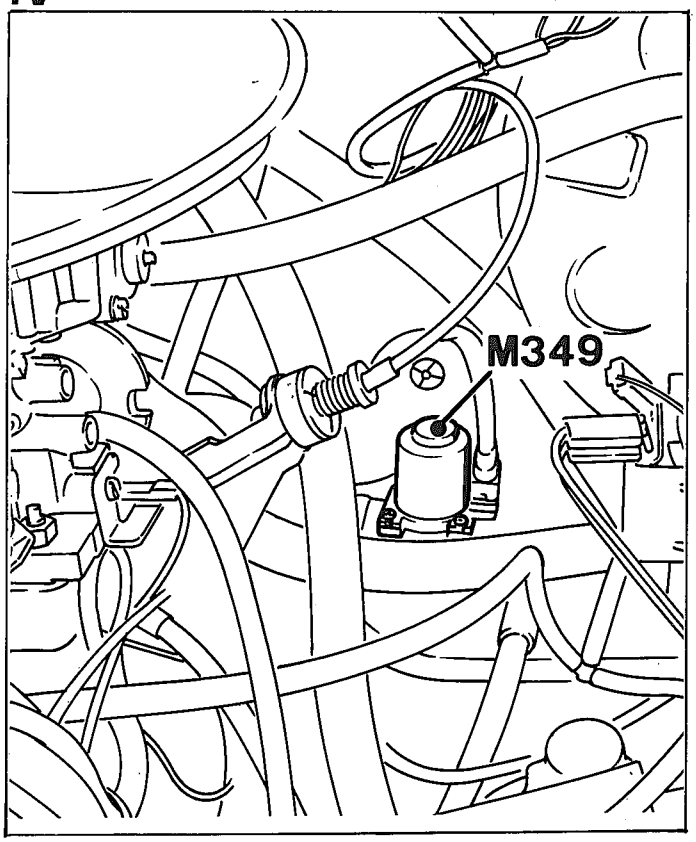

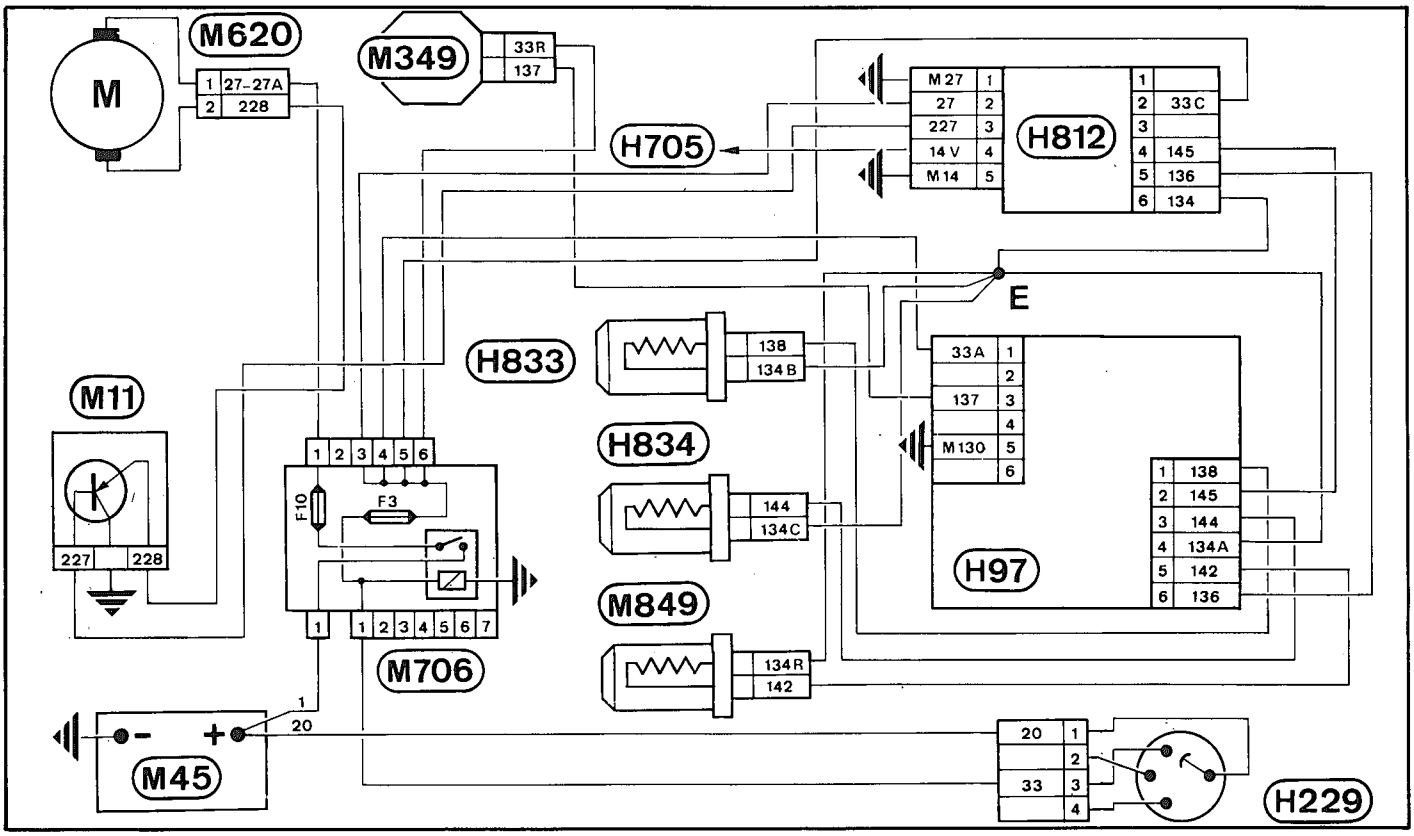
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2 228
M349
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H705
M27 1
27 2
227 3
14V 4
M14 5
H812
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2 33C
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4 145
5 136
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H833
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134B
33A 1
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137 3
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M130 5
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1 2 3 4 5 6
F10
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M706
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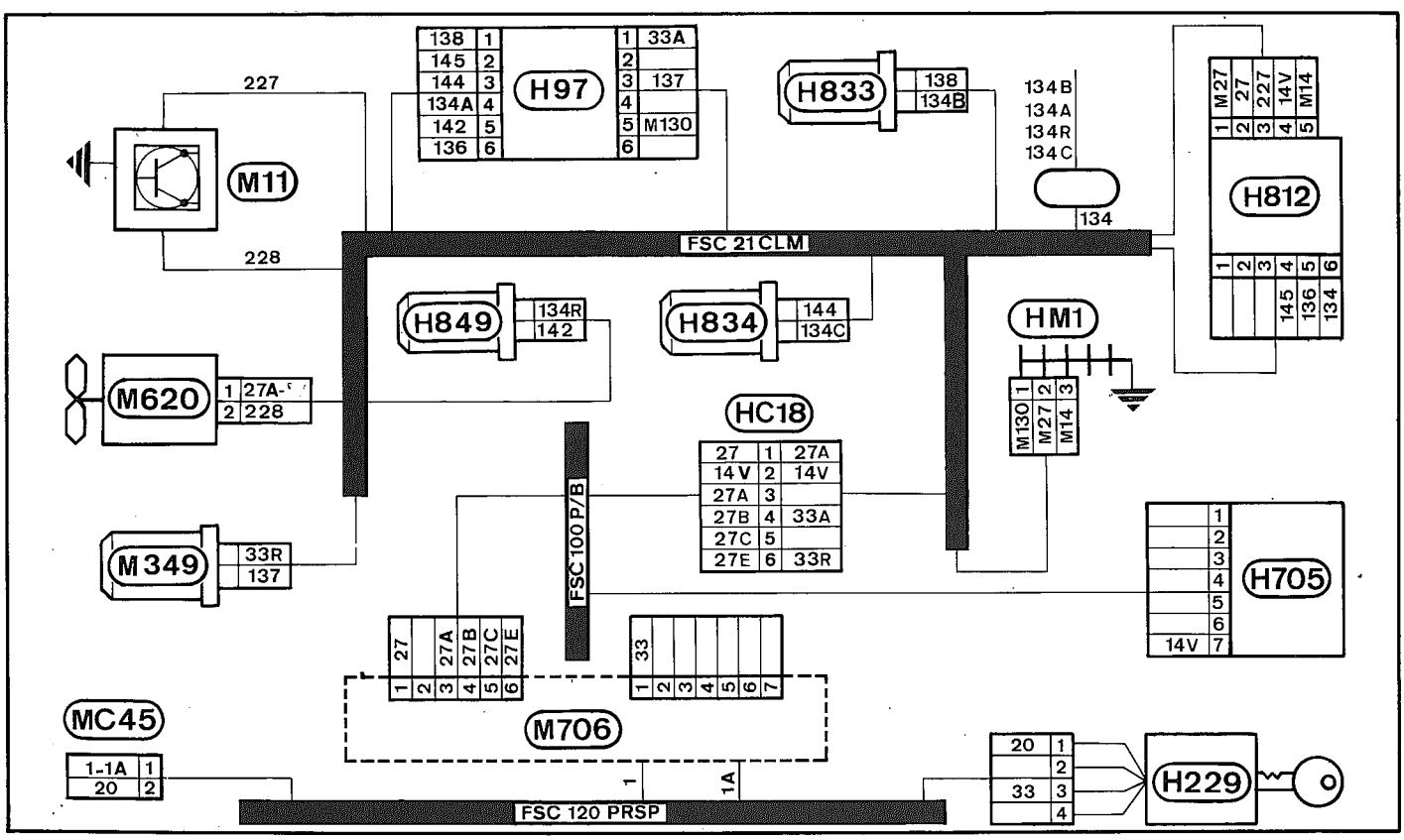
138 1
145 2
144 3
134A 4
142 5
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134R
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1 M27
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3 227
4 14V
5 M14
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1 2 3 4 5 6
145 136 134
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M11
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FSC 21CLM
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HM1
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M14 3
M620
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2 228
HC18
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14V 2 14V
27A 3
27B 4 33A
27C 5
27E 6 33R
FSC 100 P/B
M349
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137
H705
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27C
27E
1 2 3 4 5 6
33
1 2 3 4 5 6 7
M706
MC45
1-1A 1
20 2
1
1A
FSC 120 PRSP
20 1
2
33 3
4
H229

CHECKS

A/ Serviceability check : - battery voltage
- operation of ignition switch
- fuse 10 (25A ignition-controlled accessories positive)
- fuse 3 (20 A ignition-controlled accessories positive)

B/ Heaterblower motor - M620

- see ventilation / heating (page 20)

C/ Temperature regulation control unit H97 : attached to the bulkhead behind the lower parcel tray; it has only two connectors and is recognisable by its red label

Check	Wire reference	Test conditions and readings
Supply voltage of control unit **H97**	33A and M130	Ignition on U ≥ 12 V
Voltage at temperature regulation solenoid valve **M349**	137 and earth	Ignition on U ≥ 12 V
Resistance of passenger compartment air sensor **H834**	134A and 144	Ignition off R ≈ 14 KΩ *
Resistance of exterior air sensor **M849**	134A and 142	Ignition off R ≈ 14,2 KΩ *
Resistance of blown air sensor **H833**	134A and 138	Ignition off R ≈ 13,6 KΩ *
Total resistance of temperature setting rheostat	134A and 145	Ignition off R ≈ 9,3 KΩ *
Partial resistance of temperature setting rheostat	134A and 136	Ignition off. R varies from 0 KΩ (slider in minimum position) to 9,3 KΩ(slider in maximum position)

If the readings are incorrect, check the continuity of the various electrical circuits and the related components.

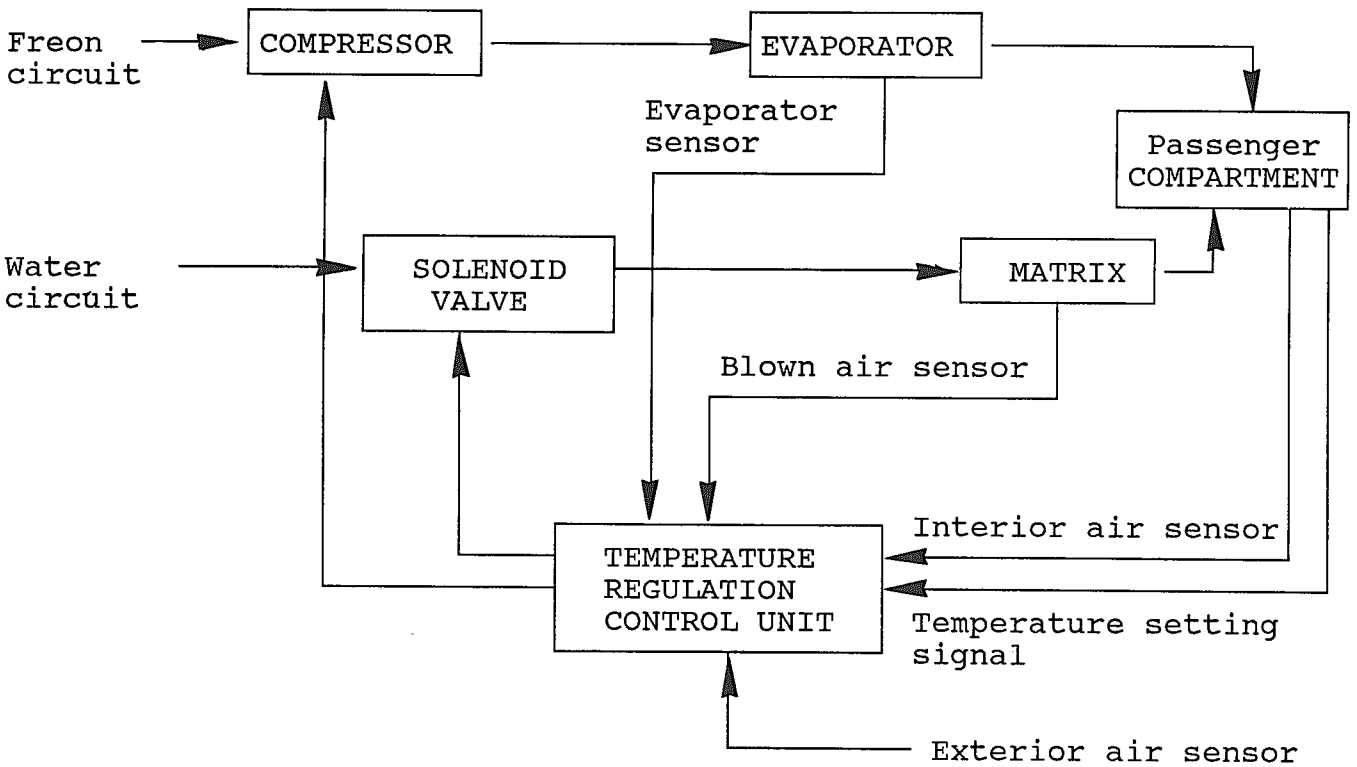
* These values are examples for an ambient temperature of 18° C. To check if the sensors perform correctly, refer to the appropriate tables.

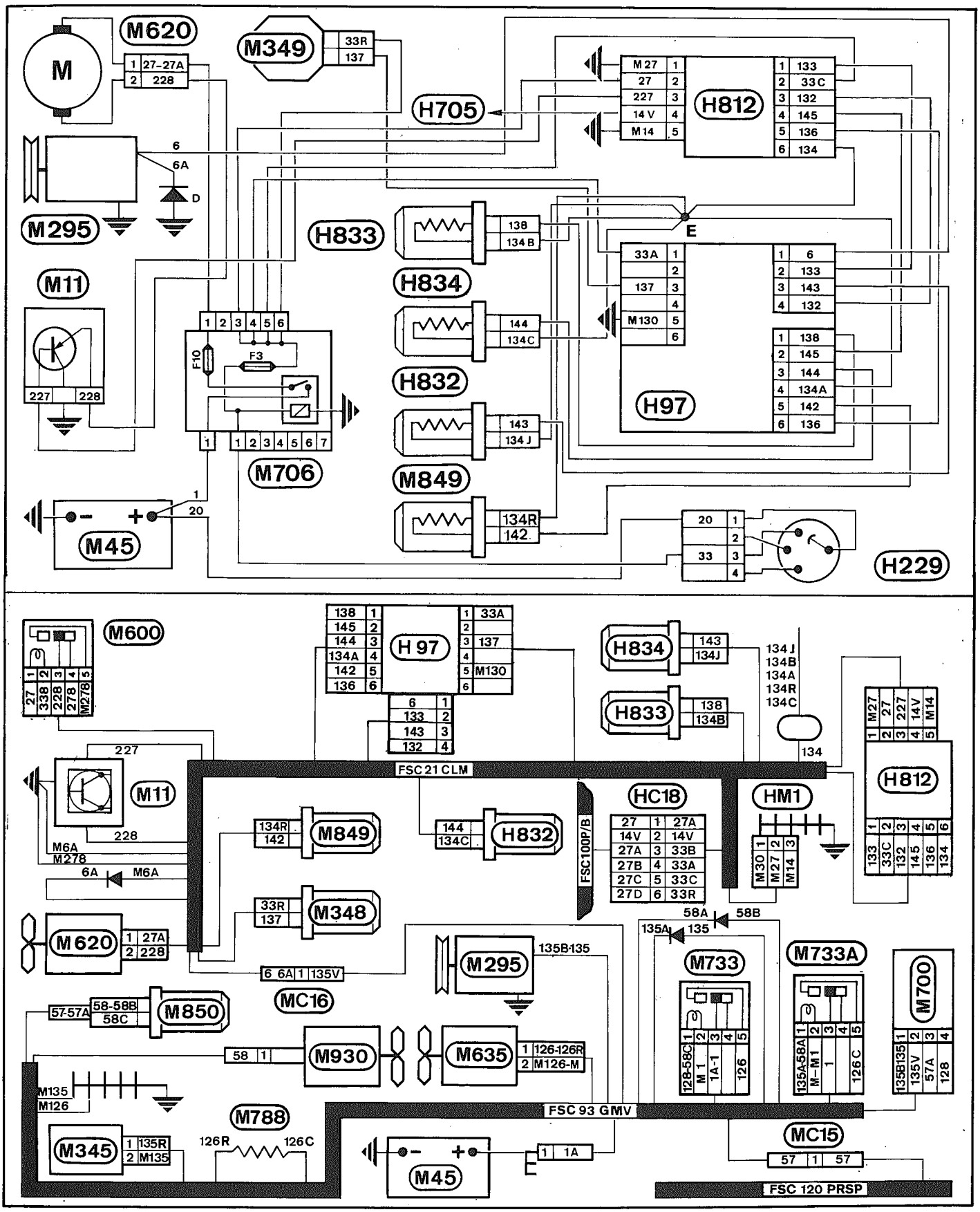
VENTILATION / HEATING AIR CONDITIONING WITH ELECTRONIC REGULATION

Principle of operation

The electronic regulation of ventilation/heating air conditioning is controlled by the electronic unit **(H97)** which receives an additional signal : evaporator **(H832)** air temperature which causes the engagement or disengagement of a compressor **(M295)**.

Block diagram

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227 3
14V 4
M14 5
H812
1 133
2 33C
3 132
4 145
5 136
6 134
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6A
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M295
H833
138
134B
E
H834
144
134C
H832
143
134J
M849
134R
142
H97
33A 1
137 3
M130 5
1 6
2 133
3 143
4 132
1 138
2 145
3 144
4 134A
5 142
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227 228
F10
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1 2 3 4 5 6
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M706
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20 1
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H229
M600
27 1
338 2
228 3
278 4
M278 5
138 1
145 2
144 3
134A 4
142 5
136 6
H 97
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3 137
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5 M130
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6 1
133 2
143 3
132 4
H834
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134J
H833
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M27 1
27 2
227 3
14V 4
M14 5
H812
133 1
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132 3
145 4
136 5
134 6
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M11
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FSC 21 CLM
M6A
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6A
M6A
134R
142
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H832
FSC100P/B
HC18
27 1 27A
14V 2 14V
27A 3 33B
27B 4 33A
27C 5 33C
27D 6 33R
HM1
M30 1
M27 2
M14 3
33R
137
M348
M620
1 27A
2 228
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MC16
M295
135B-135
58A
58B
135A
135
M733
M733A
M700
57-57A
58-58B
58C
M850
58 1
M930
M635
1 126-126R
2 M126-M
M135
M126
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M345
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126C
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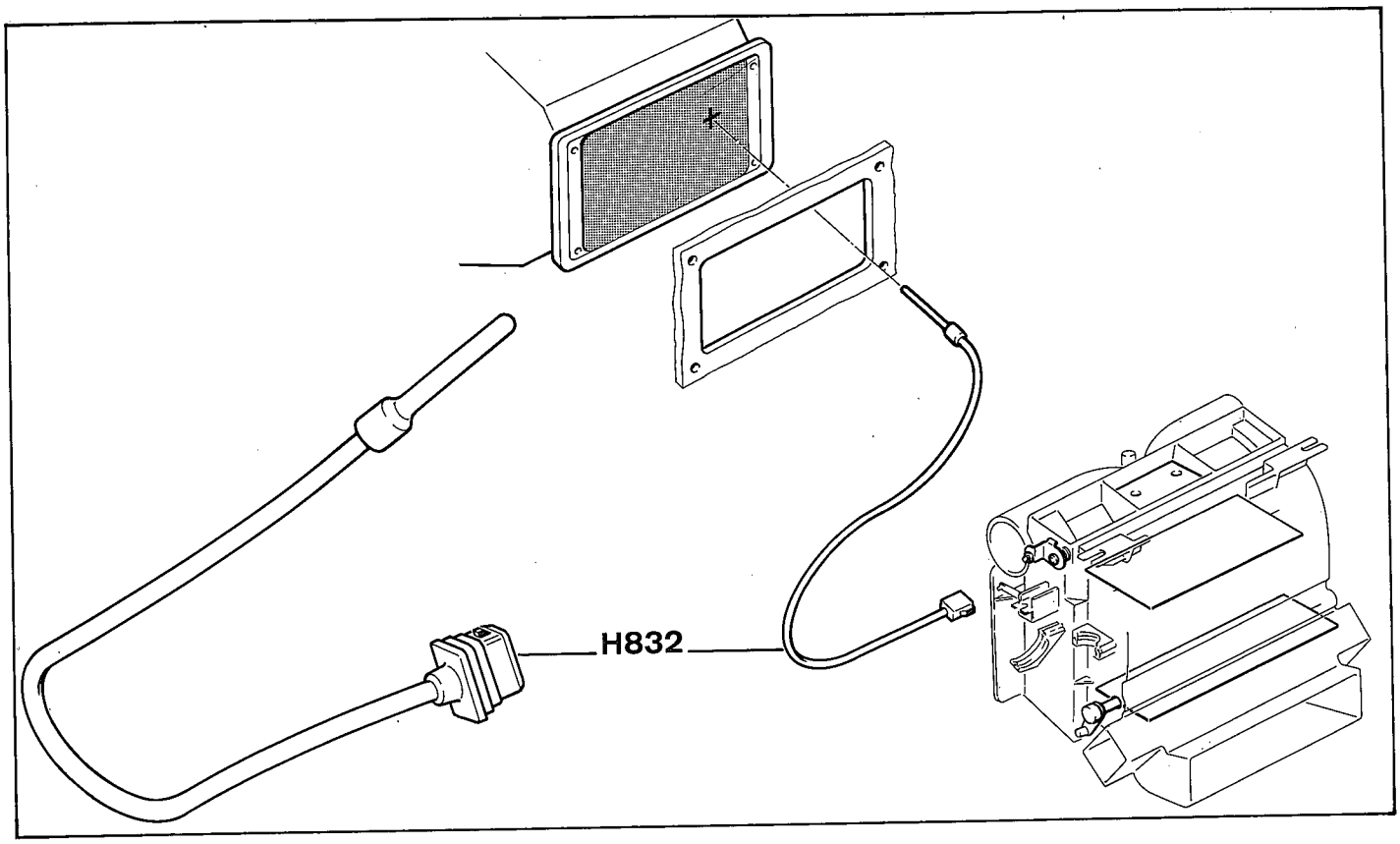
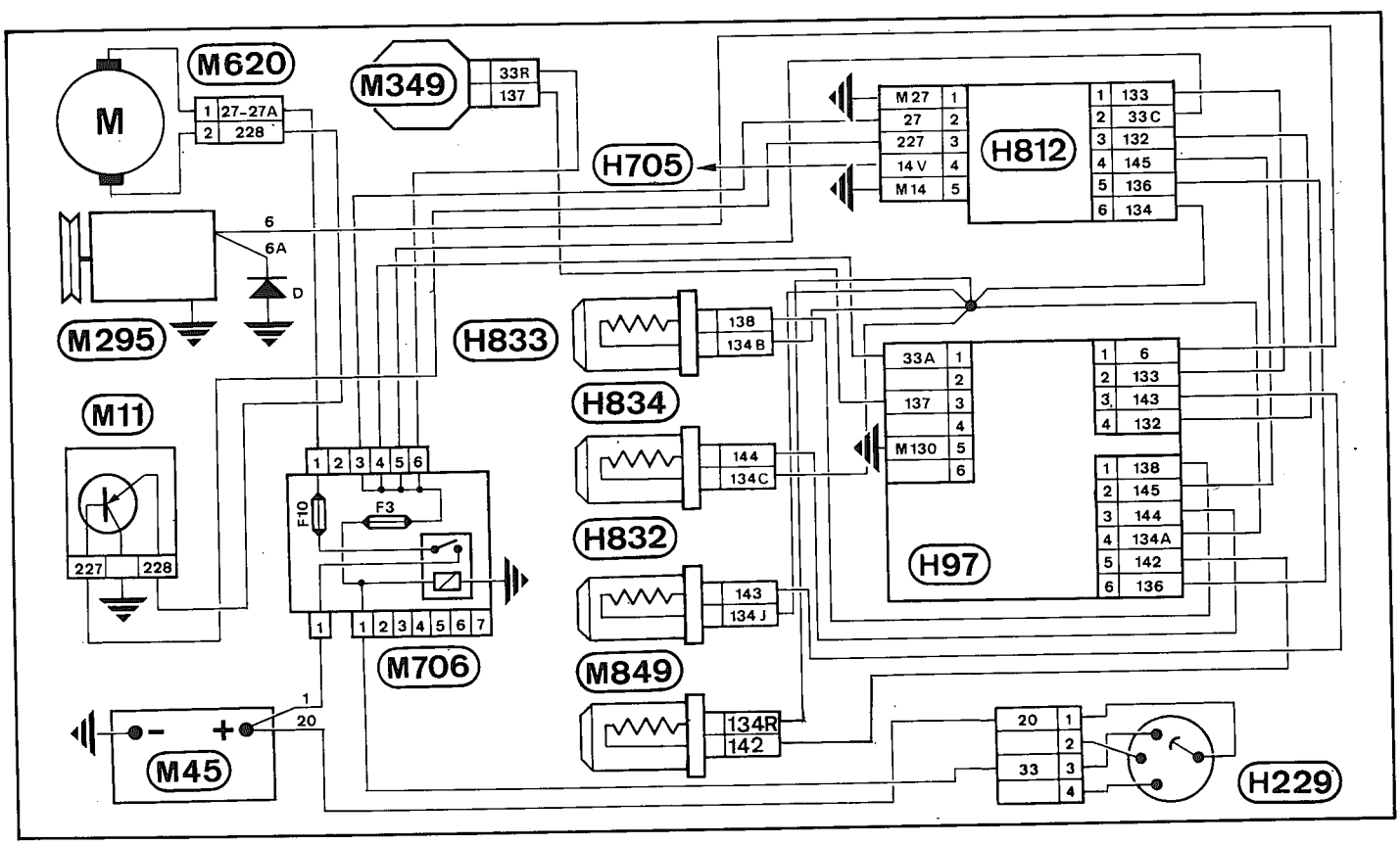
MC15
57 1 57
FSC 120 PRSP


H832


M620
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M349
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M14 5
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5 136
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6A
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5 142
6 136
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F10
F3
1 1 2 3 4 5 6 7
M706
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M45
20 1
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33 3
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H229

EVAPORATOR SENSOR - H832

- pinned in the evaporator between two fins
- connector clipped to the heater casing

Resistance check

T (° C)	R (Ω)
-5	19820 to 22450
0	15300 to 17300
5	11850 to 13500
10	9250 to 10600
15	7300 to 8400
20	5750 to 6700
25	4600 to 5400

CHECKS

A/ General checks (see pages 20 and 27)

B/ Temperature regulation control unit - H97 : it has on additional connector (4 pins) and is recognosisable by its green label

Check	Wire reference	Test conditions and reading
Cooling circuit supply voltage	132 and earth	Ignition on "ECO" button not pressed U ± 0 V "ECO" button pressed U = 12 V
	133 and earth	Ignition on "demist" or "demist/heating" or "heating" pressed U ≥ 12 V buttons not pressed U = 0 V
Resistance of evaporator sensor **H832**	134A and 143	Ignition off R ≈ 6,8 KΩ (ambient temperature 18° C)

C/ Compressor - M295

- Ignition on
- Move the temperature setting slider
- Listen for engagement and disengagement of the compressor

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