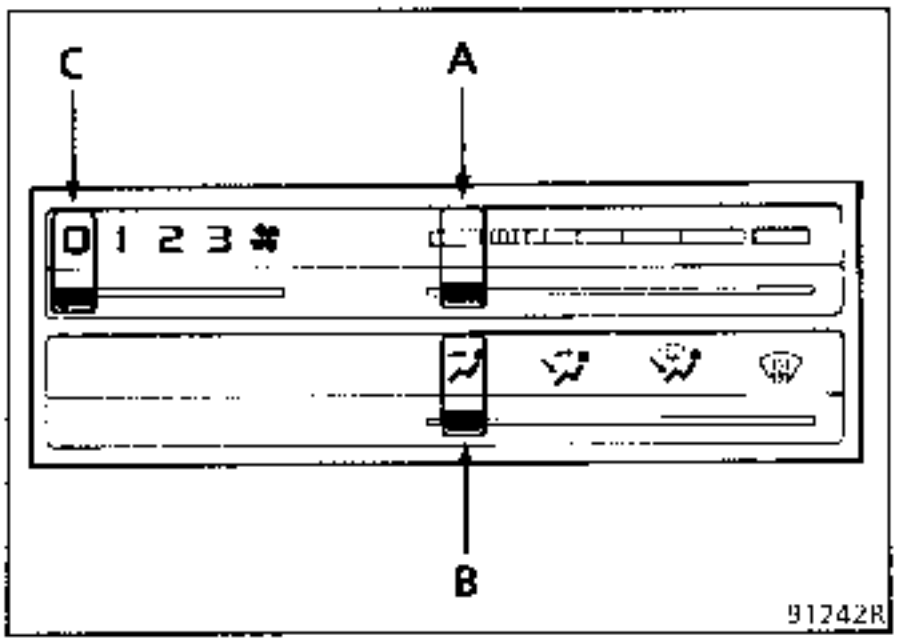
UP TO MODEL YEAR 1989

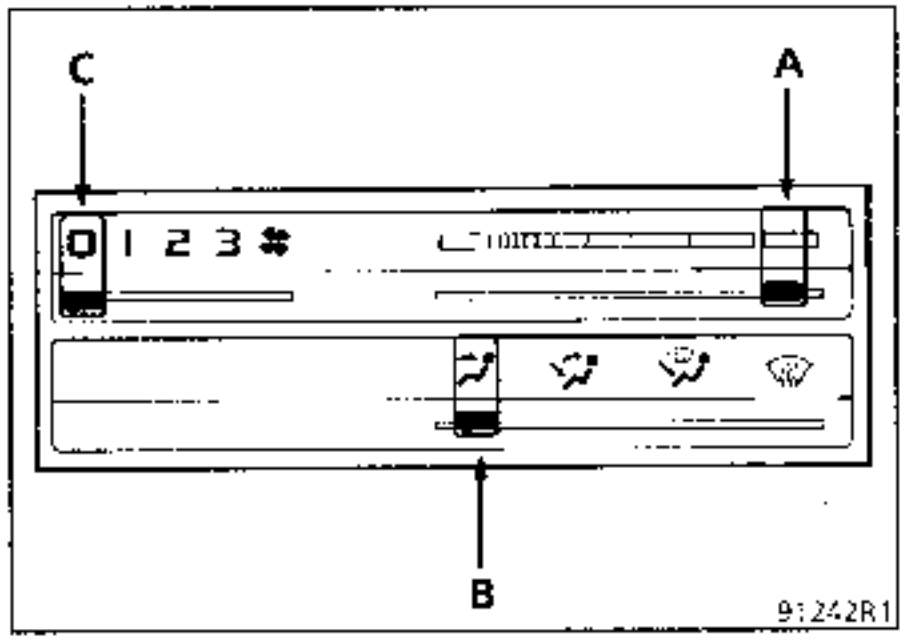
Temperature control slide (A)

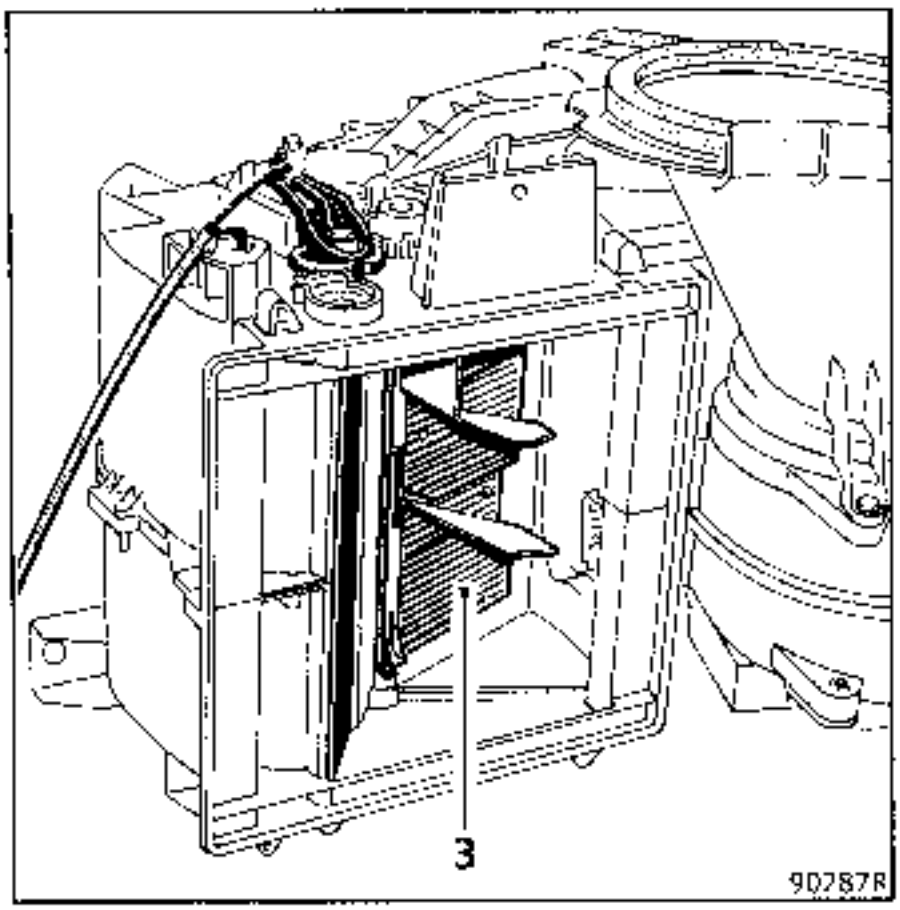
Controls hot air / cold air flap (3).

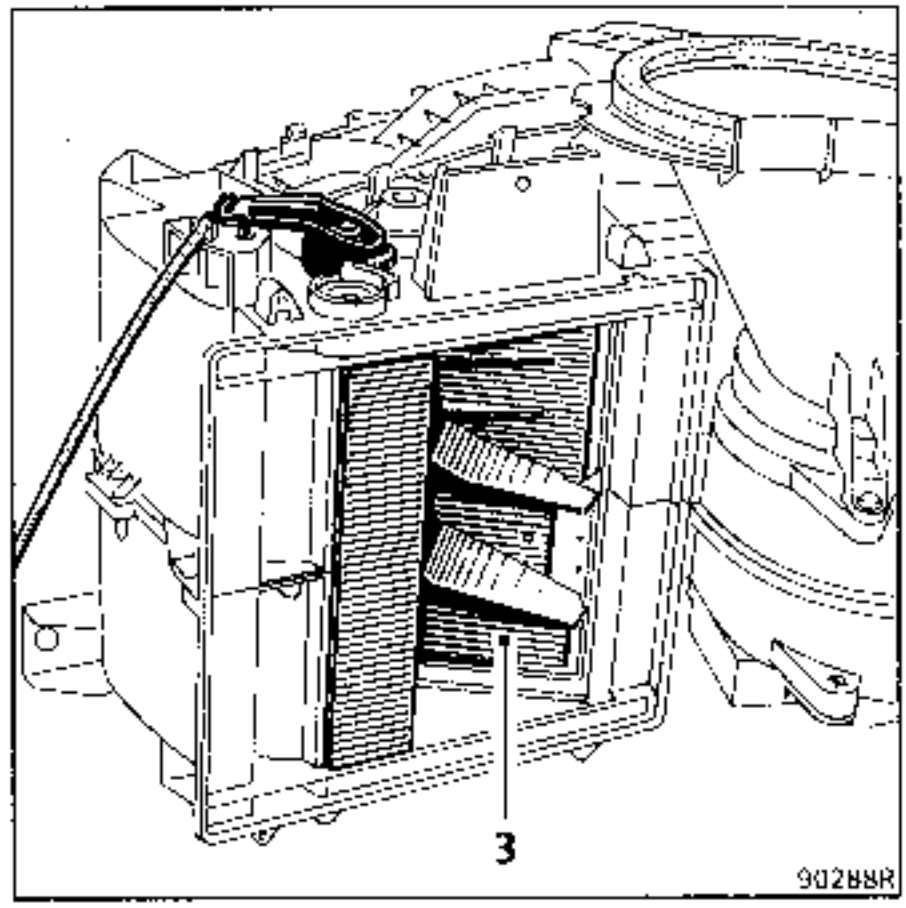
COLD AIR



HOT AIR







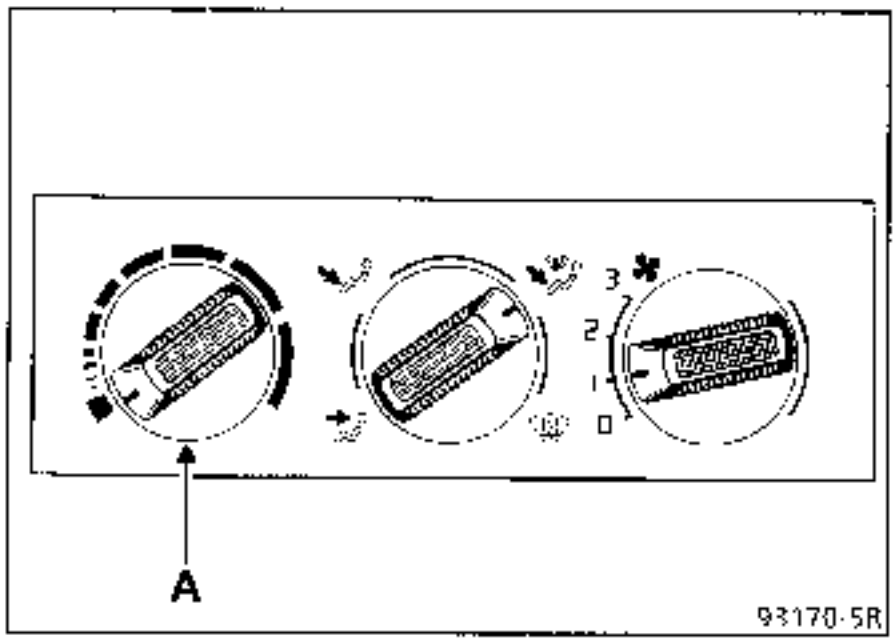
The blower does not have a heater valve and has a permanent current supply. Flap (3) controls the operation of the fresh air reheating system.

FROM MODEL YEAR 1990 ONWARDS

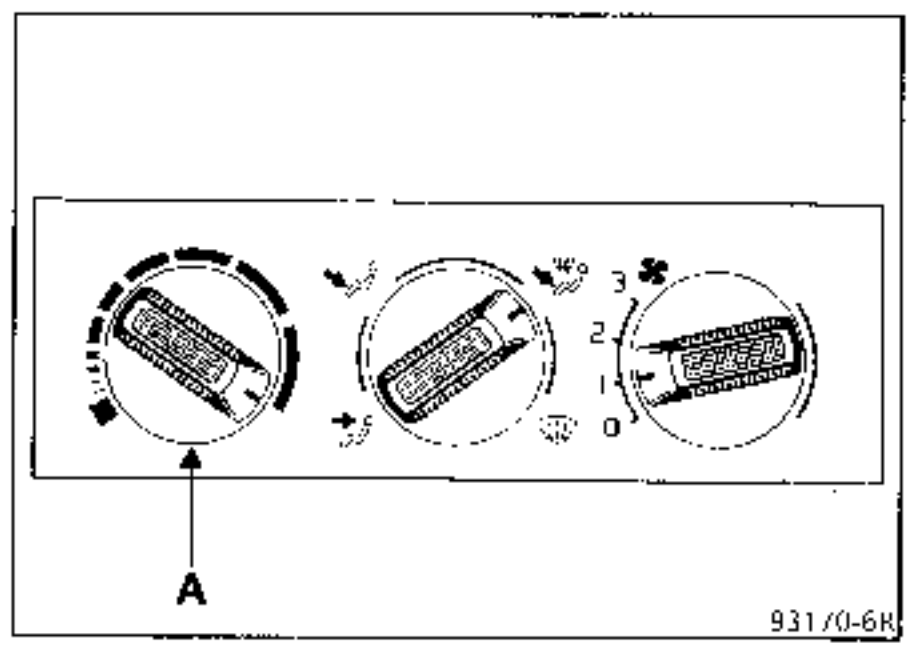
Temperature control dial (A)

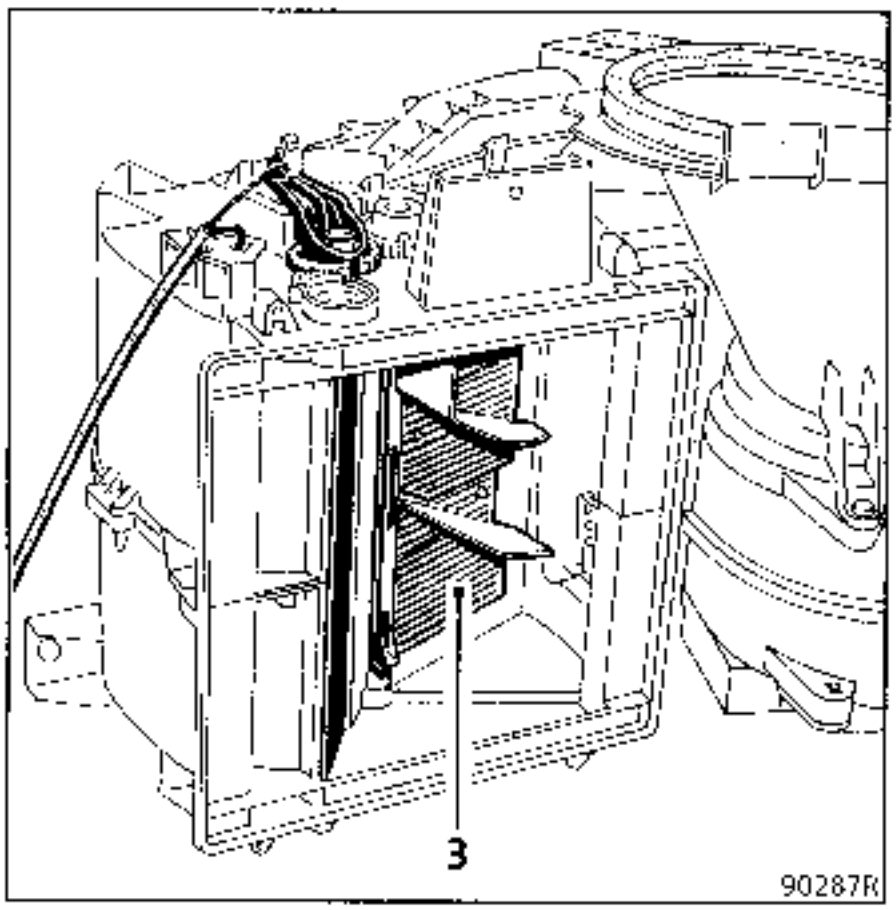
Controls hot air / cold air flap (3).

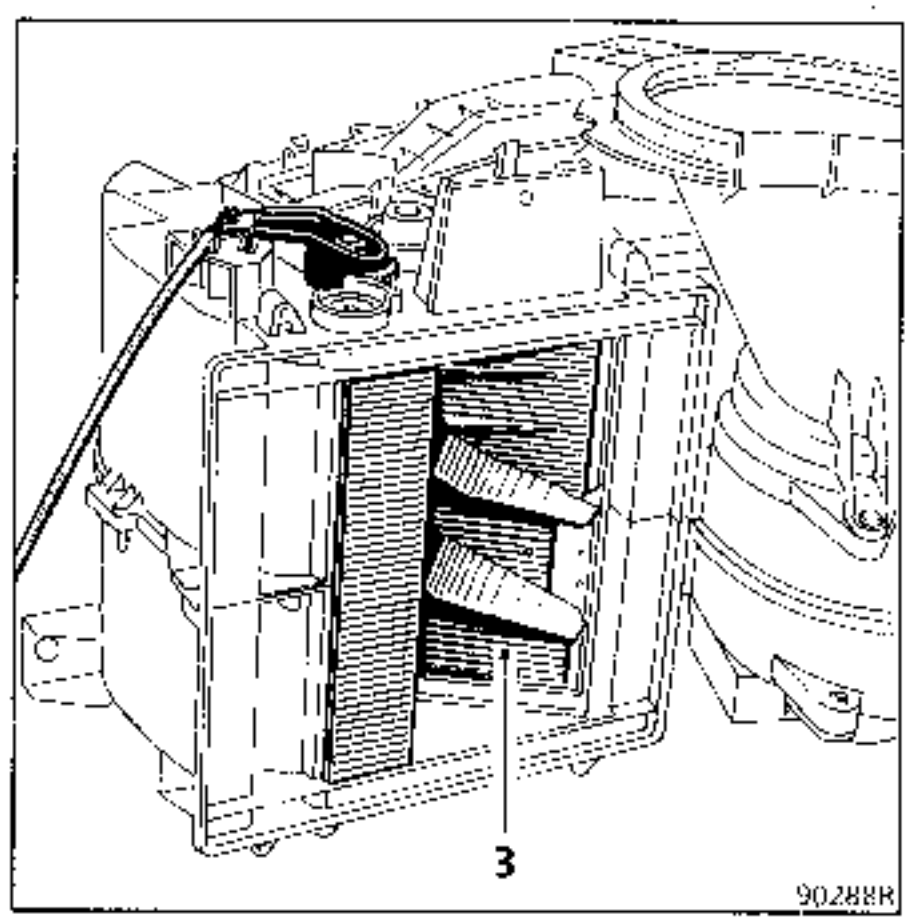
COLD AIR



HOT AIR







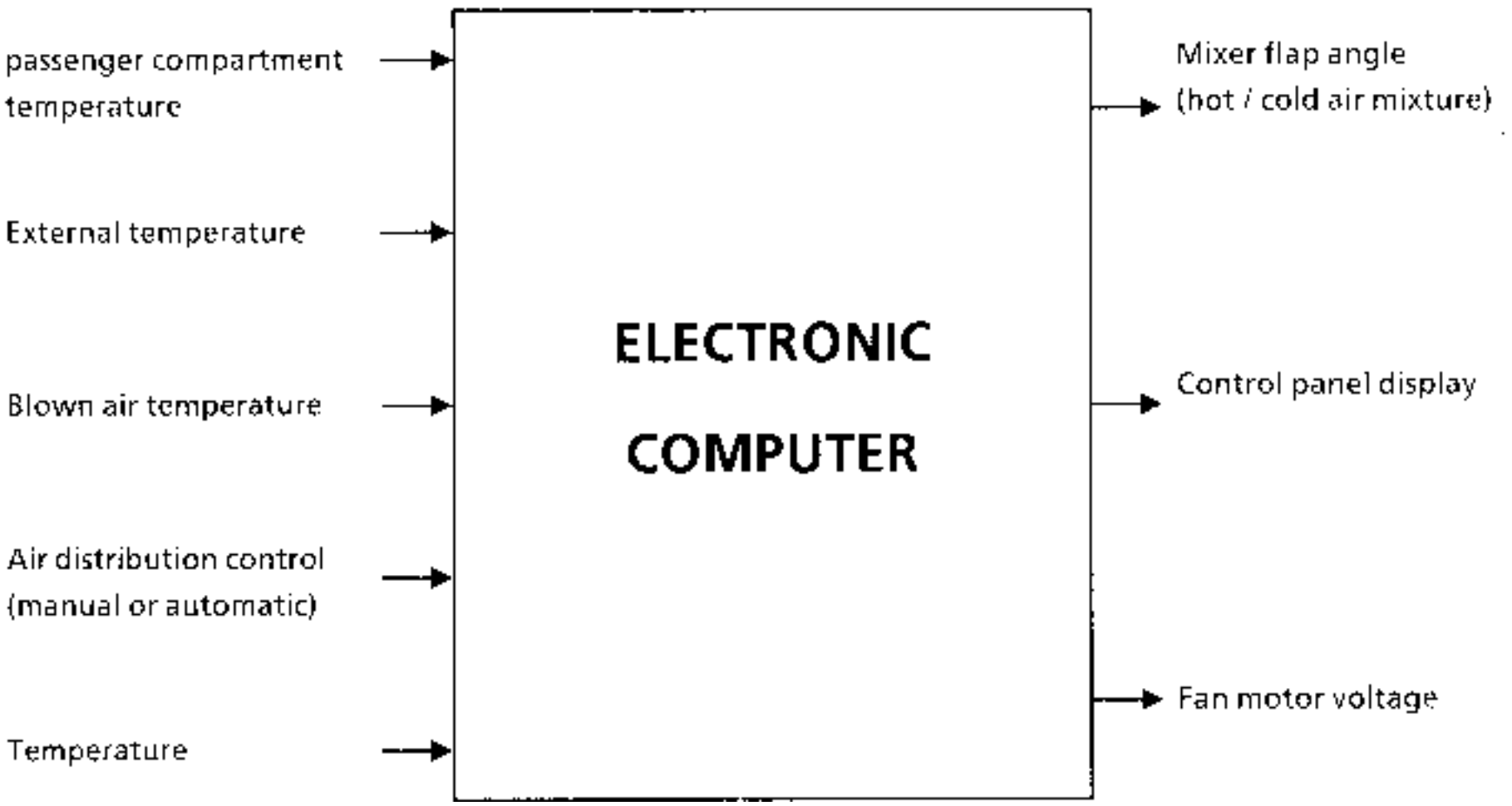
The blower does not have a heater valve and has a permanent current supply. Flap (3) controls the operation of the fresh air reheating system.

FROM MODEL YEAR 1990 ONWARDS - VERSION WITH REGULATED HEATING/VENTILATION

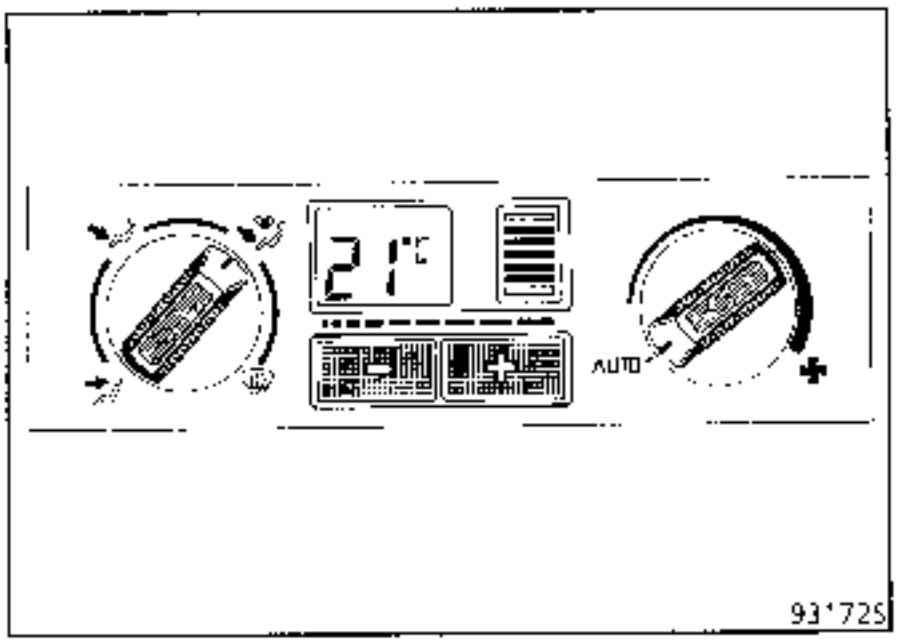
As from model year 1990, **Renault 21 "Phase 2"** vehicles may be equipped with a heating system with temperature regulation.

The aim of the temperature regulation is to make the temperature inside the vehicle as comfortable as possible for the occupants, taking account of the different conditions which can occur inside the passenger compartment.

The temperature regulation system is electronically controlled by means of a computer integrated in the control unit.



ADJUSTING THE TEMPERATURE

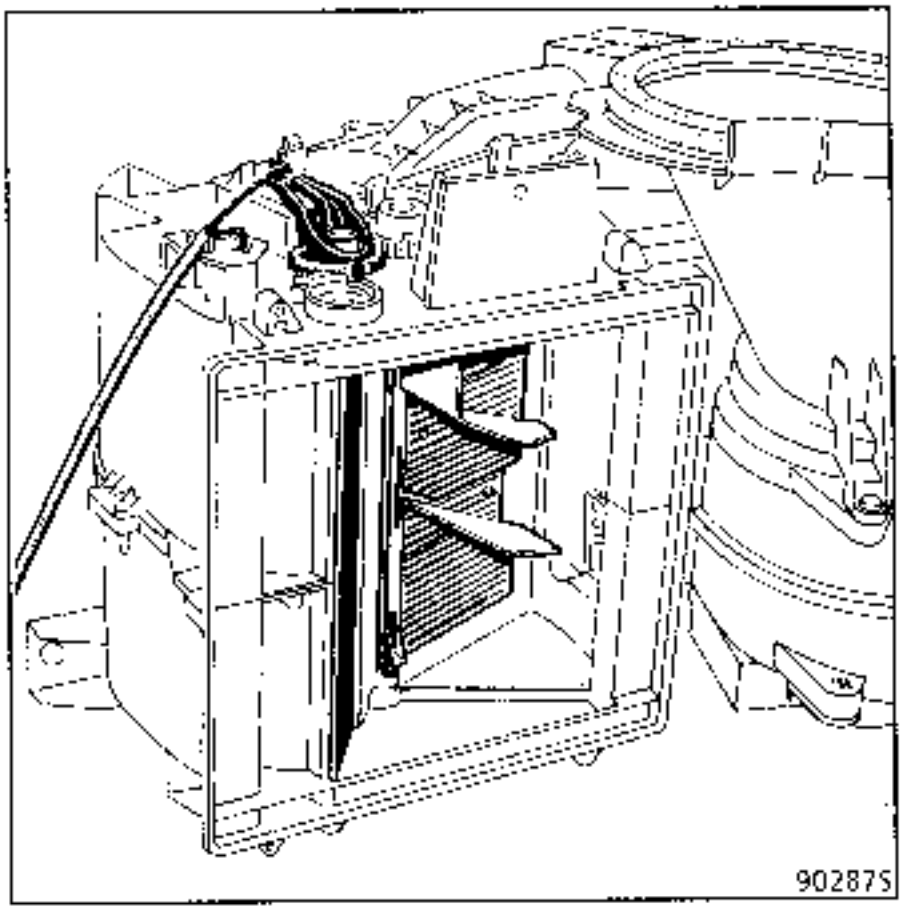


The two "-/+" keys enable the temperature to be adjusted (average temperature measured at head height of the front seat passengers) between **18 °C** and **28 °C**.

Depressing one or other of these keys enables the temperature to be increased or decreased by **2 °C** per second; brief pressure on the same keys will alter the level displayed by **1 °C**.

When the temperature has been adjusted, the regulating device ensures that the temperature in the passenger compartment remains stable, irrespective of the weather conditions and the speed of the vehicle.

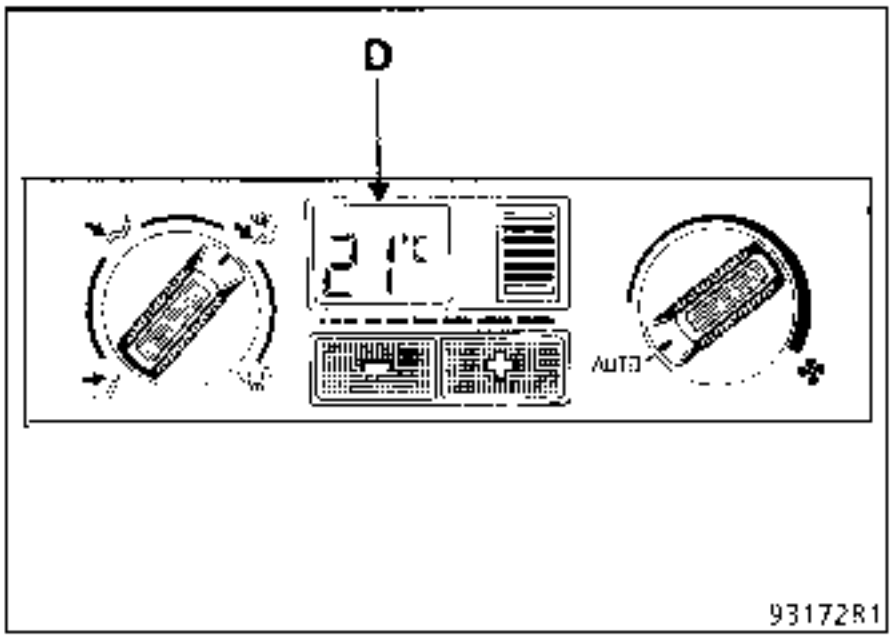
The temperature regulation device controls the adjustment of the mixer flap (hot/cold air mixture).



When the temperature level selected is **28 °C**, the temperature cannot be regulated : the temperature is the one obtained as a result of the system giving maximum performance.

NOTE : When starting the vehicle in cold weather, increasing the temperature displayed (in particular above **21 °C**) will not increase the temperature more quickly. The system increases the temperature in an optimum manner irrespective of the information displayed.

DISPLAY (D)

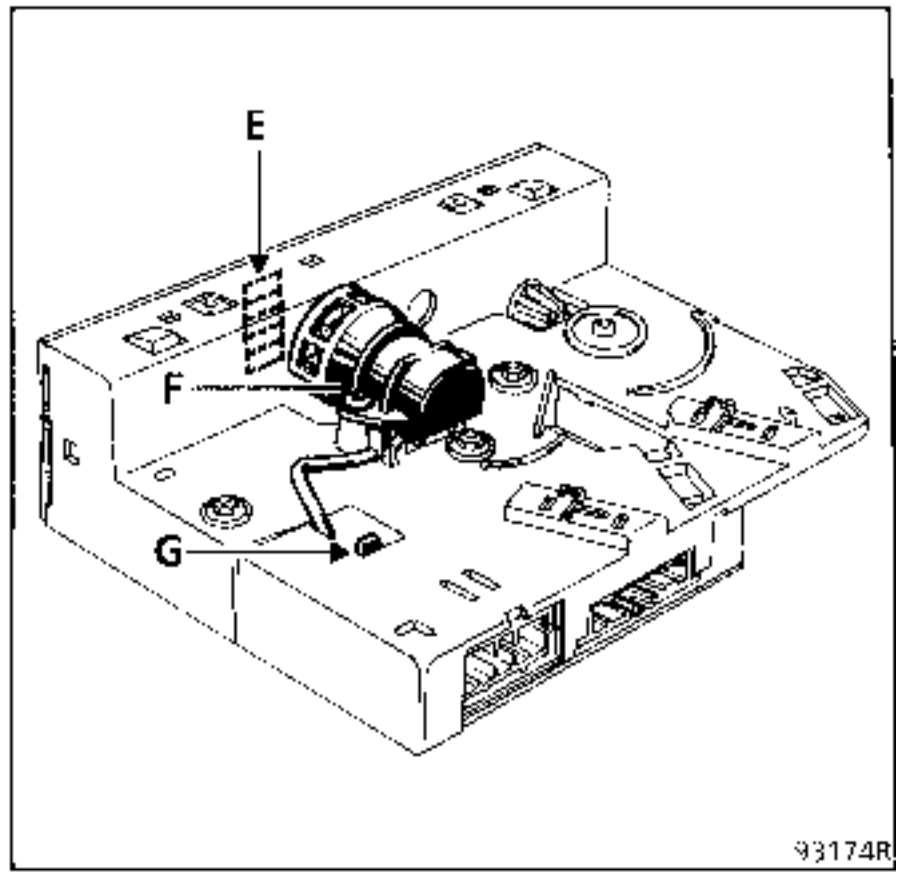


The temperature selected is displayed together with its unit of measurement (°C or °F).

The last temperature selected before the ignition was switched off is stored in the system's memory and is displayed after a two second delay when the vehicle is restarted.

When an incident is detected on the system, the message "**SERVICE**" appears on the display. **The system must then be examined to determine the fault.**

Internal temperature sensor (E)

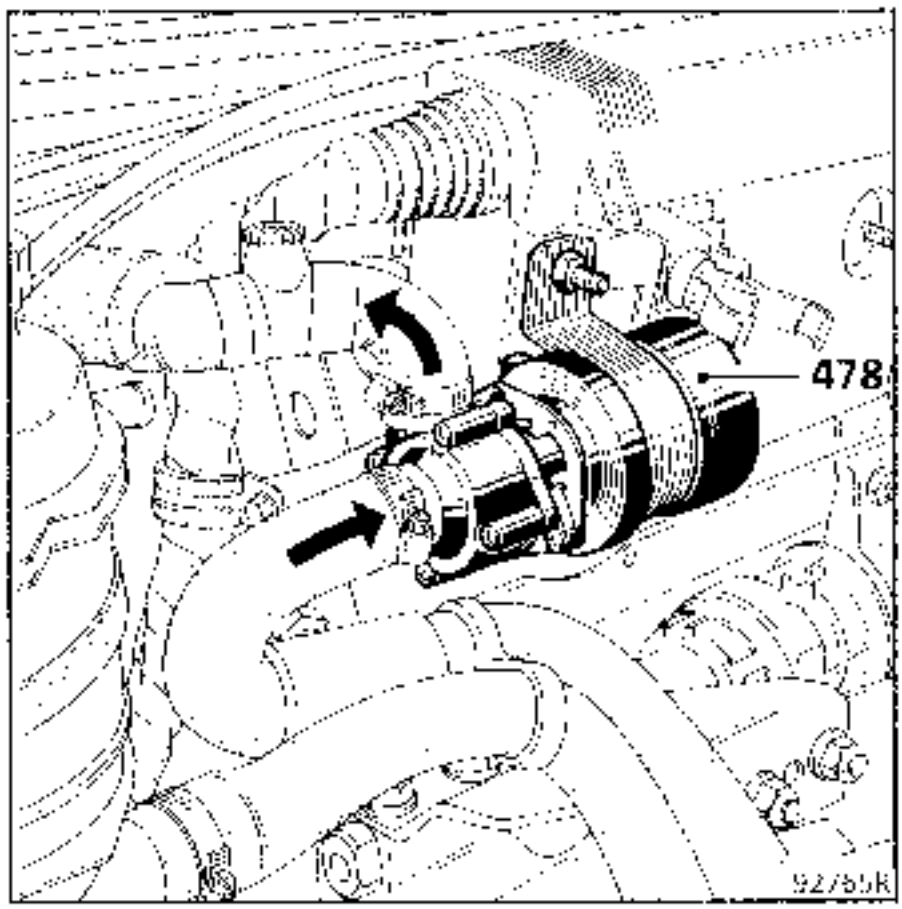


A thermistor with a negative temperature coefficient is integrated in the control panel with the sensor ventilation system (**F**). If there is a sensor failure, the control panel will have to be replaced.

As from model year 1989, **Renault 21 Diesel X486, X488 and X48V** are equipped with an electric pump (**478**) circulating the coolant in the heating system.

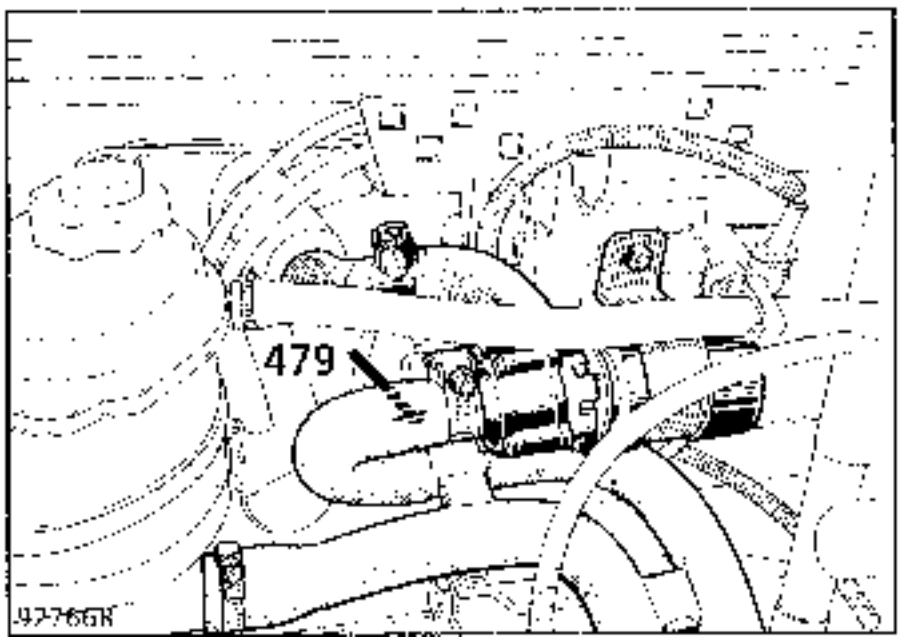
This pump is controlled up to a temperature of **77 °C** at the heater radiator inlet. Above this temperature, the circuit is established in the normal way.

The pump is only activated again when the temperature drops to below **67 °C**.

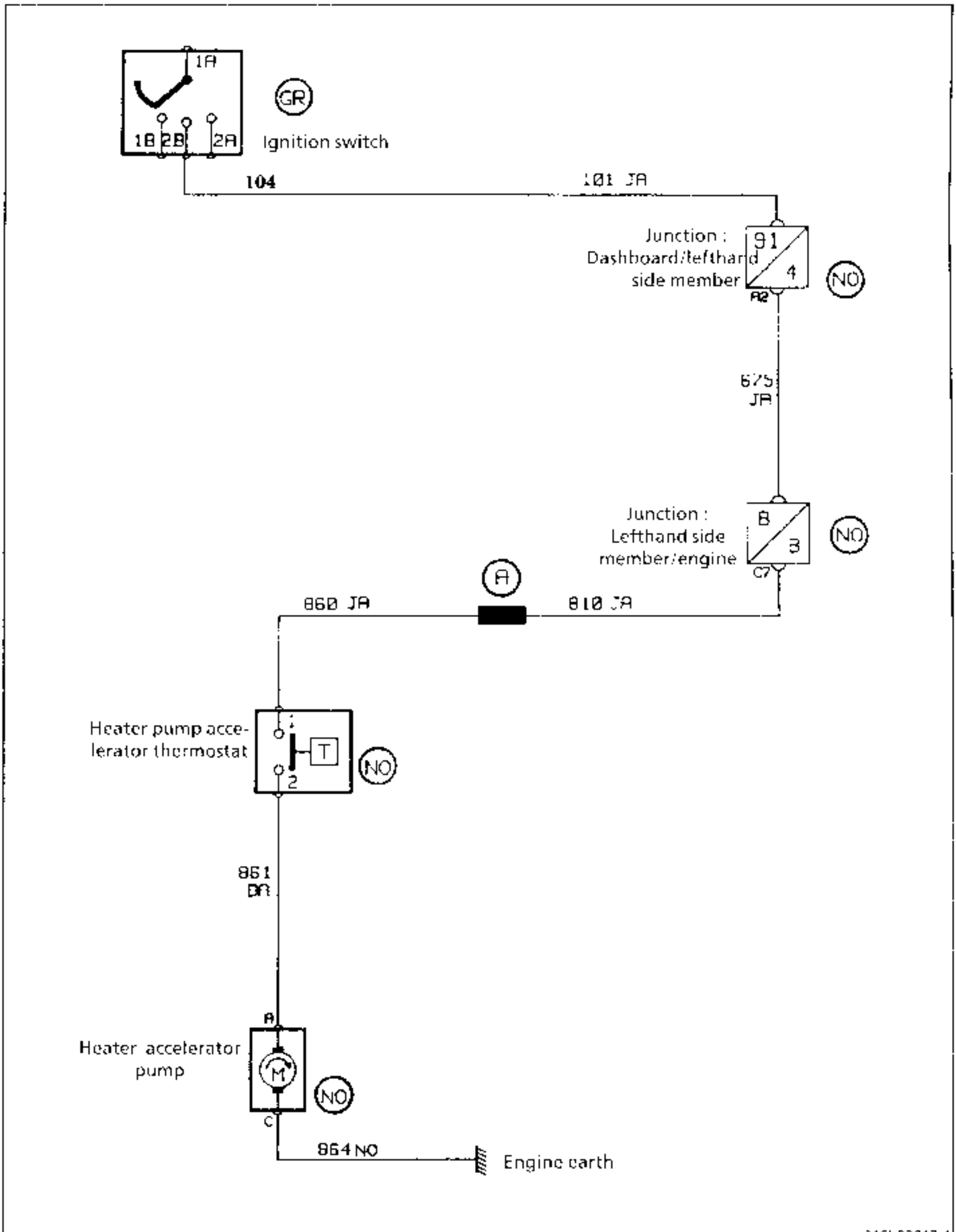


This pump is located on the engine compartment bulkhead and is connected in production in the coolant system.

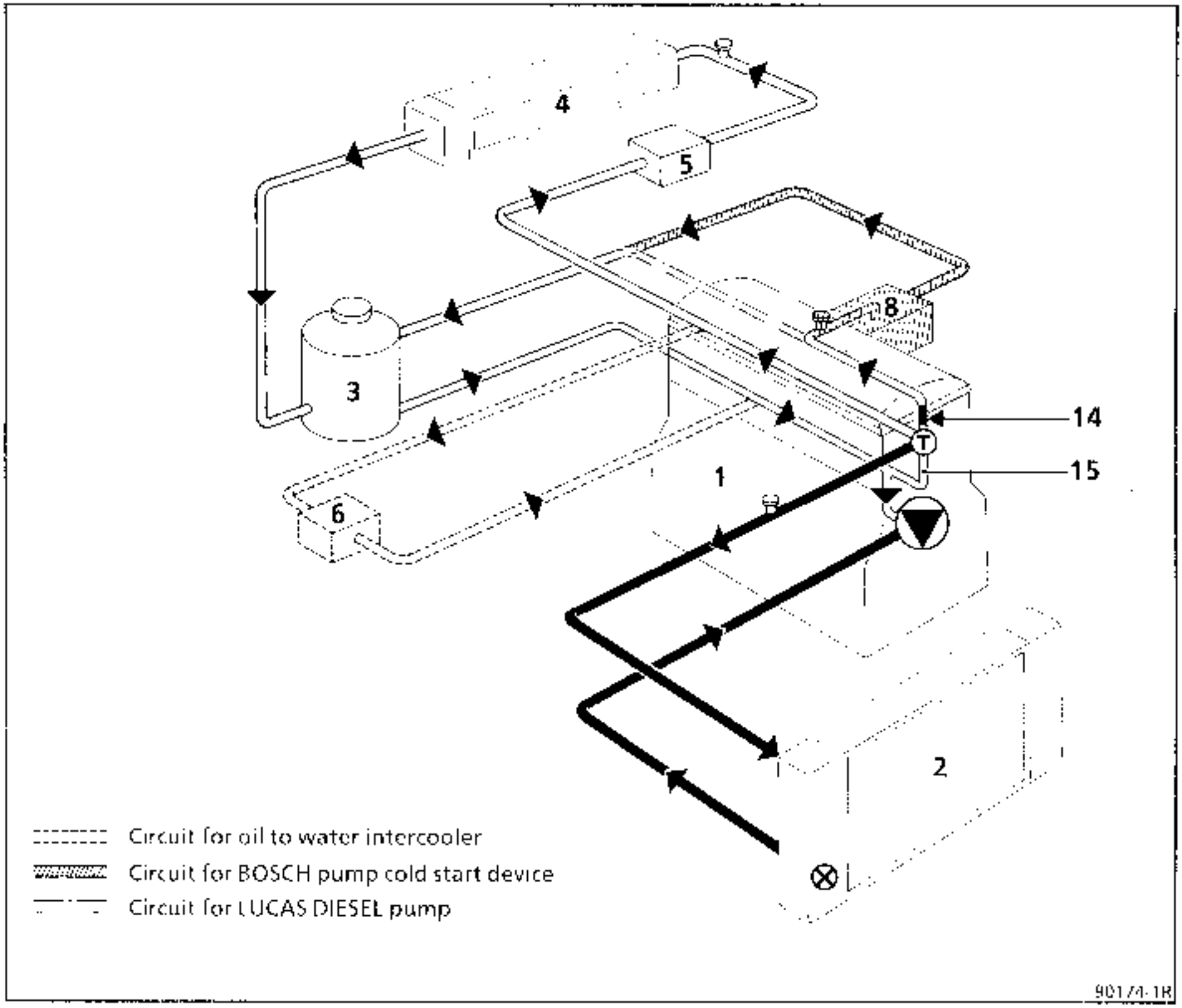
Thermostatic sensor (**479**) is screwed onto the electric pump inlet tube.



Wiring diagram for the X48 heating system coolant pump



Special feature of the X48 with auxiliary heating system coolant pump.



1 Engine
2 Radiator
3 "Hot type" expansion chamber with permanent defuming
4 Heater matrix
5 Electric coolant pump
6 "Modine" oil to water intercooler for Turbo diesel engine
8 BOSCH pump cold start device
14 ⌀ 3.5 mm restrictor
15 P circuit (see thermostat operation)

Coolant pump

Dual action thermostat

Bleed screws :
- 2 for : LUCAS DIESEL pump
- 3 for : BOSCH pump

Thermal switch

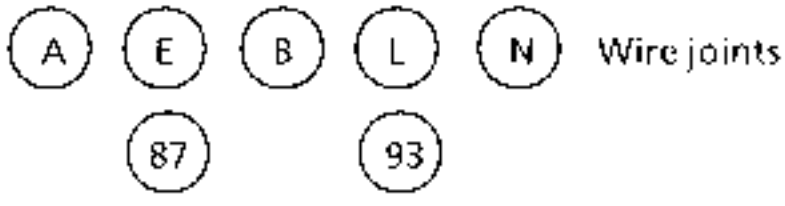
6	Electronic module for fan motor assembly
18	Blown air temperature sensor
104	Ignition switch
124	Heater control
209	Combined lighting/direction indicators switch stalk
234	Fan motor assembly relay
245	External temperature sensor
260	Fuse box
298	Blower device
320	Fan motor assembly
418	Passenger compartment temperature sensor ventilator
420	Mixer flap

LIST OF JUNCTIONS

R5	Dashboard/heater bulkhead harness
R11	Dashboard/lefthand side member harness
R99	Dashboard/heater harness

LIST OF EARTHS

M9	Front righthand pillar earth
M10	Front lefthand pillar earth

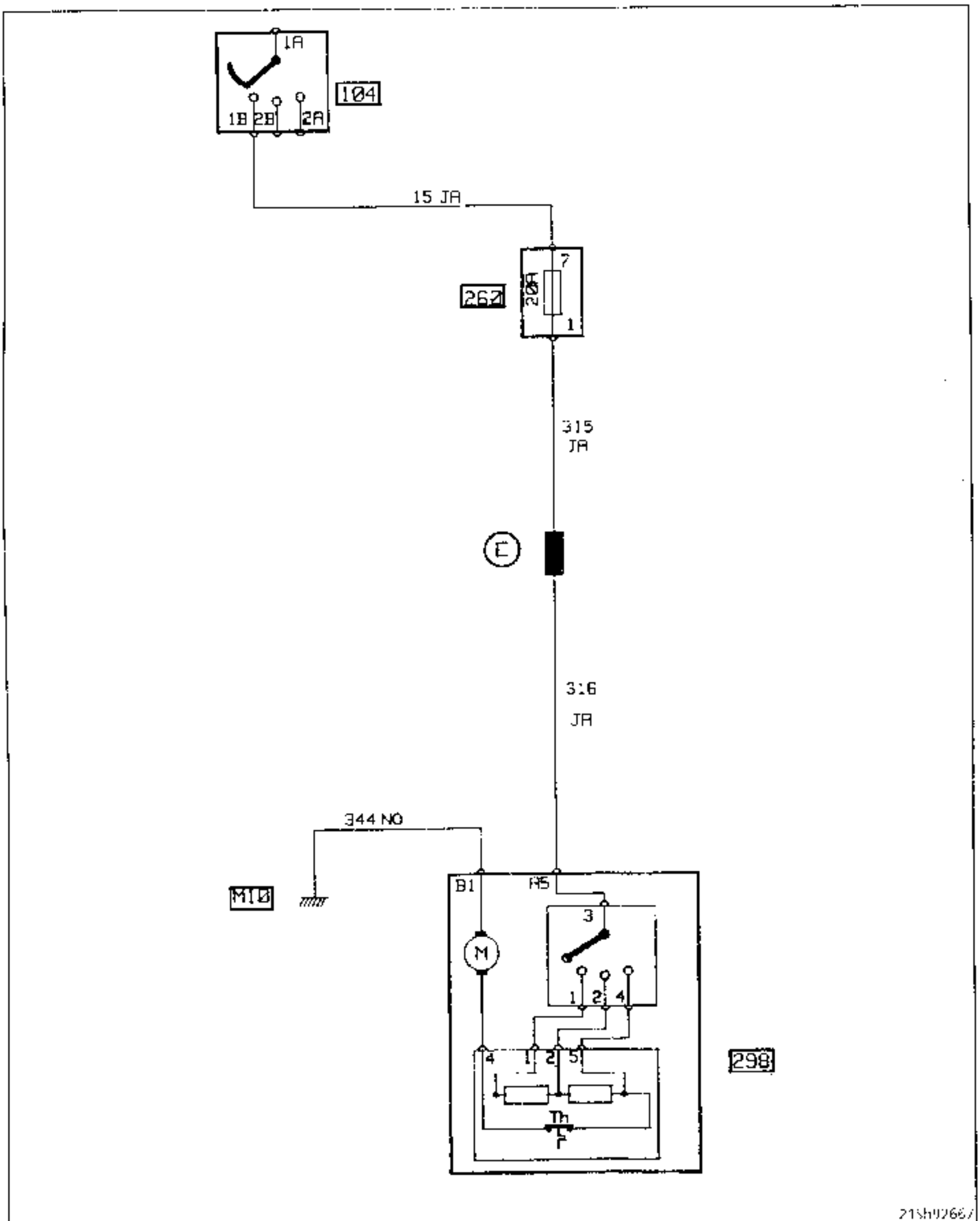


Wire joints

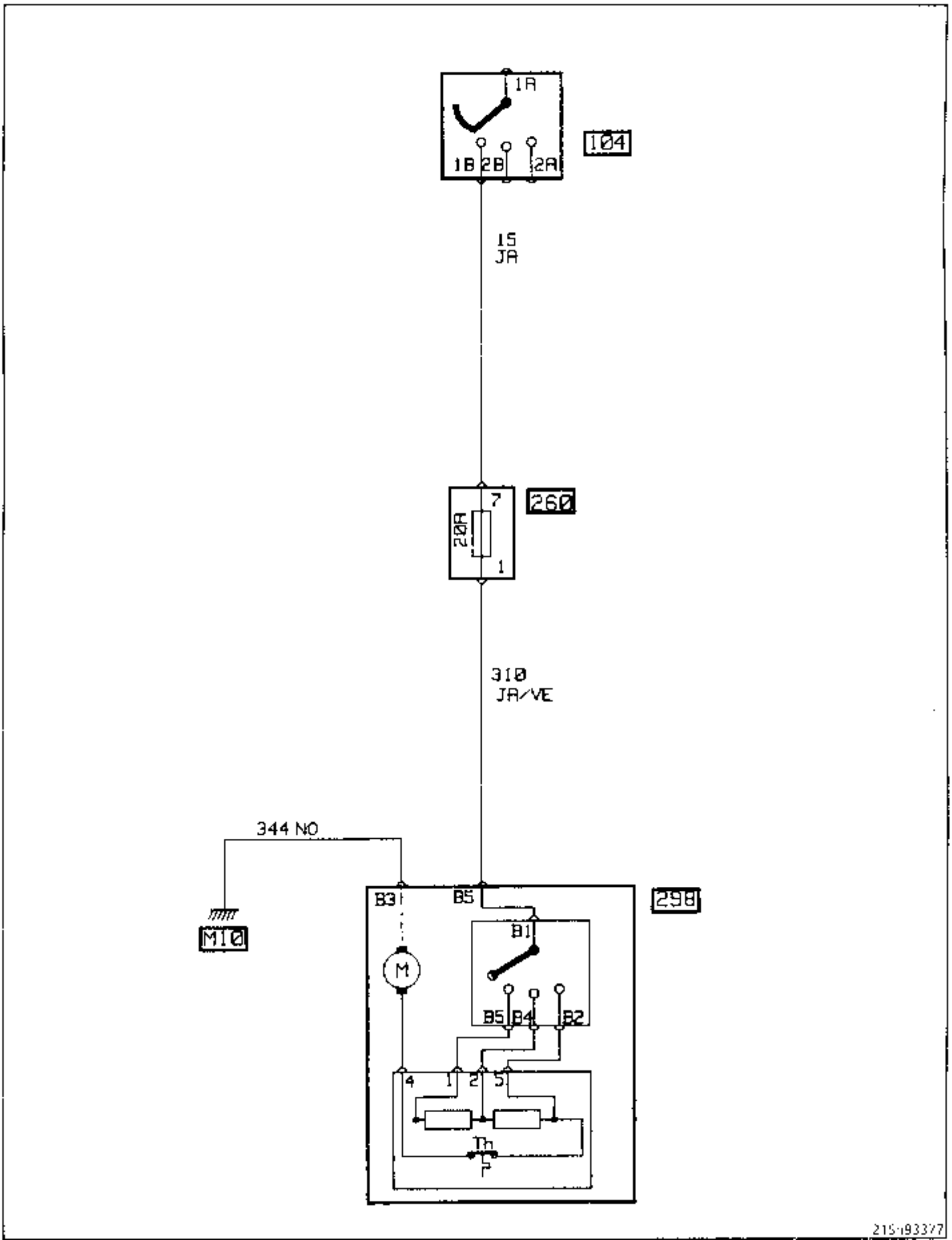
Connection bars

ALL TYPES UP TO MODEL YEAR 1989

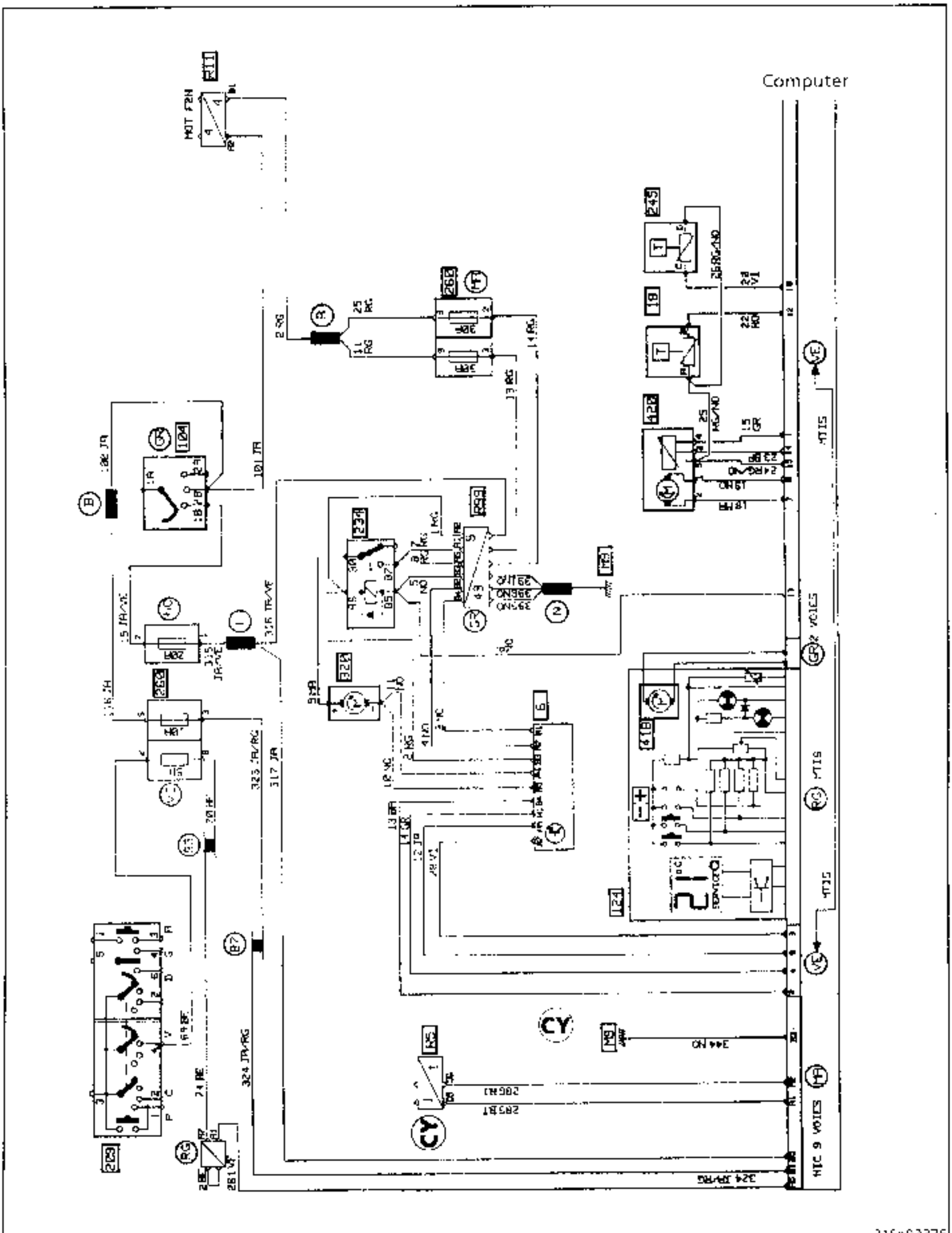
WIRING DIAGRAM



AS FROM MODEL YEAR 1990



AS FROM MODEL YEAR 1990 - VERSION WITH REGULATED TEMPERATURE



GENERAL

The computer integrated in the control unit has a self-diagnostic system for the peripheral units of the heating/ventilation system with regulated temperature.

If one of the units fails, a warning light is triggered and the **"SERVICE" warning light** on the instrument panel illuminates.

At the same time, operation of the system in **"defect mode"** is triggered and this enables the driver to reach the nearest workshop without major damage being caused to the system.

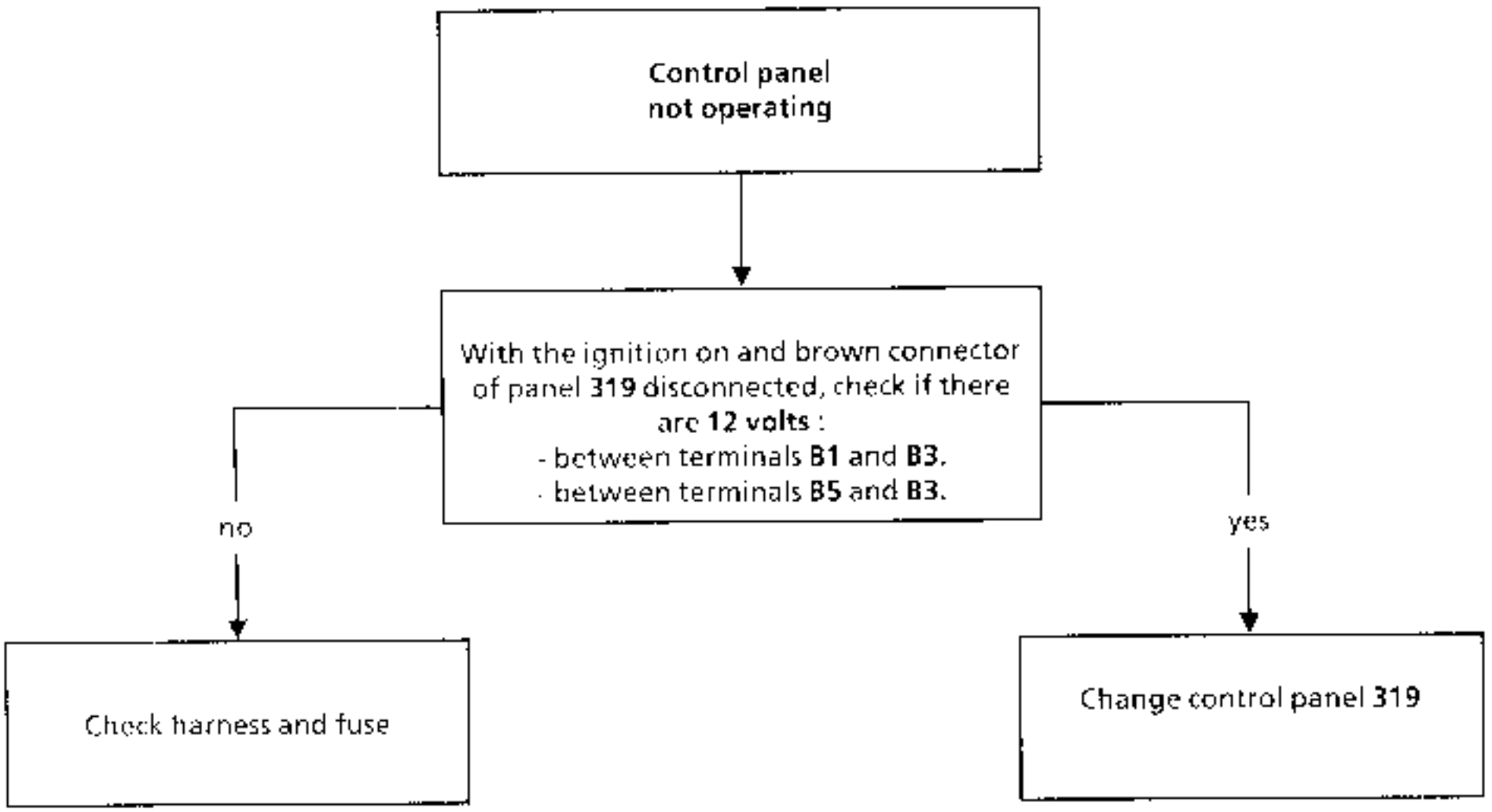
The incident causing the warning light to illuminate can be displayed by using the diagnostic plug, **XR 25** test box and the appropriate cassette.

When an incident has occurred it is stored in the computer's **"non-volatile memory"** when the ignition has been switched off. This memory can be consulted at any time using the **XR 25** test box and the appropriate cassette.

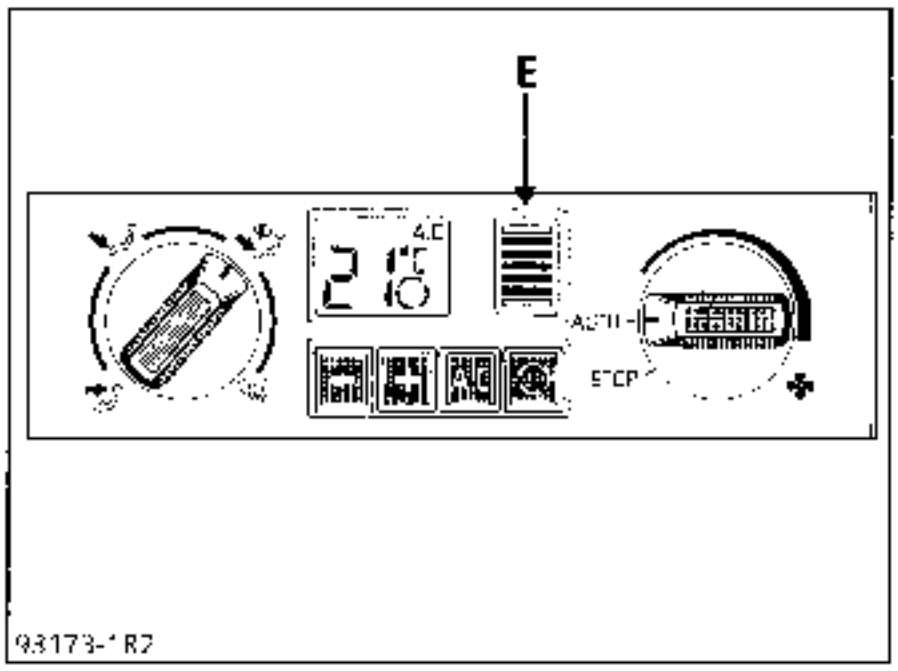
If one of the peripheral units of the temperature regulating system fails, the computer will instruct the **"SERVICE"** warning light to illuminate and the system to operate in defect mode, which may differ according to the components at fault.

DEFECT MODES FOR DIFFERENT INCIDENTS

Incident detected	Warning light illuminated	Corresponding defect mode
Internal temperature sensor	"SERVICE"	- Value imposed : 21 °C - imposed fan voltage : minimum
External temperature sensor	"SERVICE"	Value imposed : external temperature stored at the time the incident occurred.
Blown air temperature sensor	"SERVICE"	Value imposed : blown air temperature stored at the time the incident occurred.
Fan control potentiometer	"SERVICE"	- AUTO instruction for the air flow operating mode.
Mixer flap copying potentiometer	"SERVICE"	- Extreme hot or extreme cold depending on external temperature
Mixer motor	"SERVICE"	- Motor stops: fan voltage : minimum
Fan motor	"SERVICE"	- Motor stops

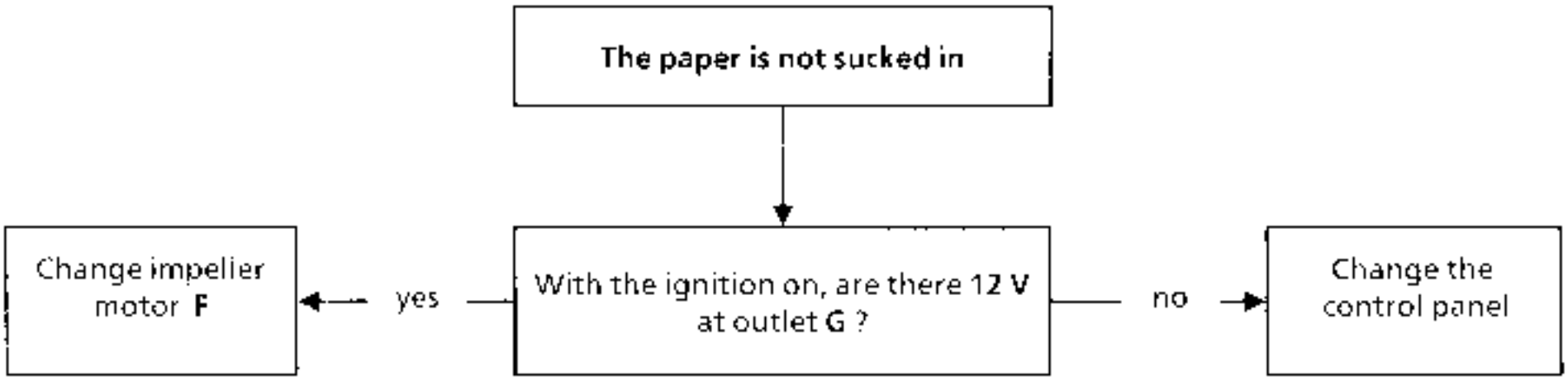

Control panel not operating
With the ignition on and brown connector of panel 319 disconnected, check if there are 12 volts :
- between terminals B1 and B3.
- between terminals B5 and B3.
no
yes
Check harness and fuse
Change control panel 319

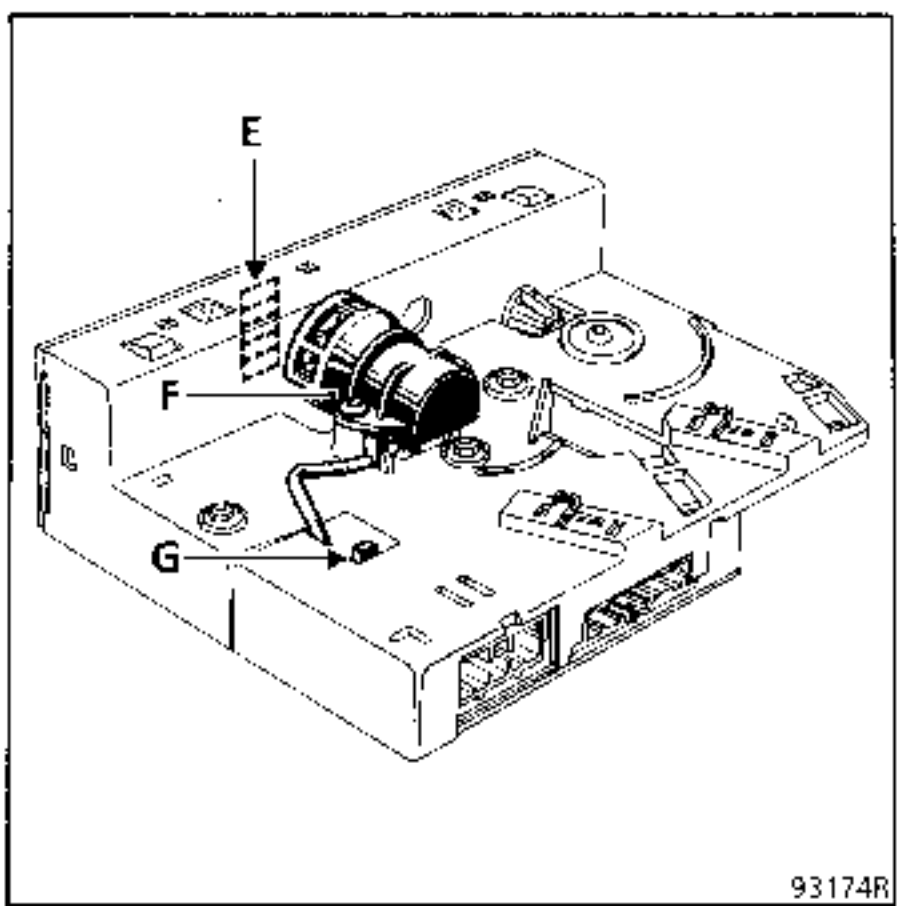
Incident : **BARGRAPH 13 LEFT OR RIGHT ILLUMINATED** : (Impeller motor)



Checking ventilation of the passenger compartment temperature sensor

With the ignition on and using a small piece of paper (such as a paper handkerchief) placed in front of the internal temperature sensor (E) check that the paper is sucked in.





ESSENTIAL SPECIAL TOOLING		
Mot.	453-01	Hose clamps
M.S.	583	Hose clamps

REMOVAL

Disconnect the battery.

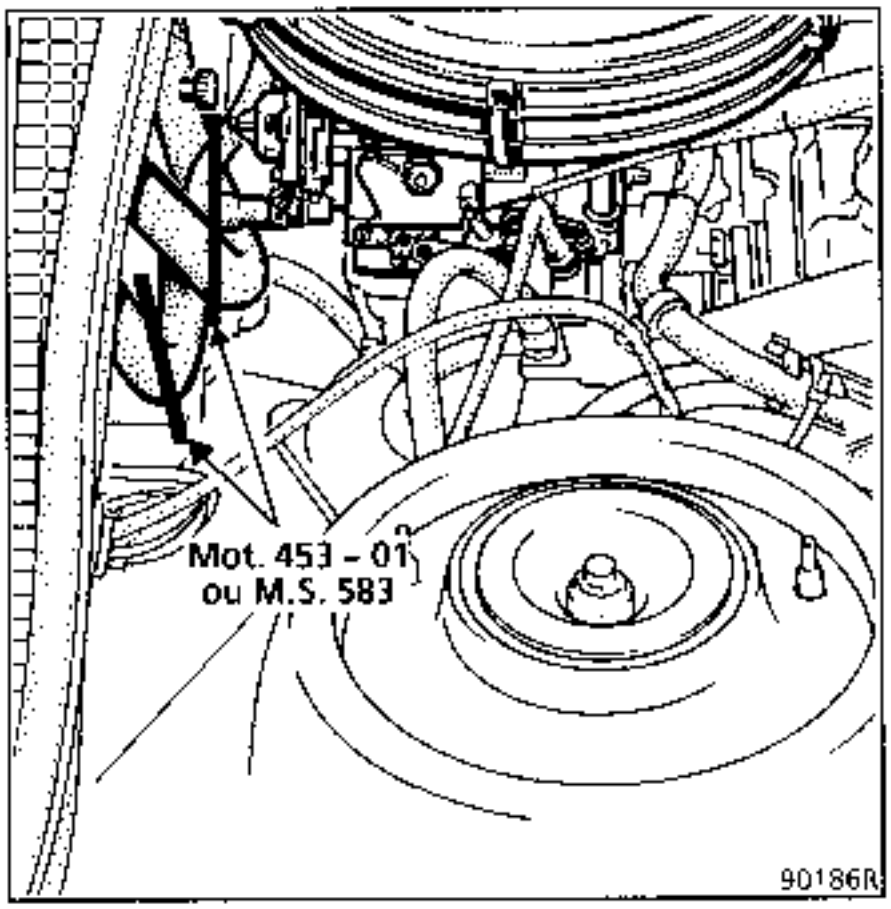
Remove the dashboard (see "**Electrical**" section).

Leave the cable-controlled assembly coupled to the blower device.

Disconnect the block connectors.

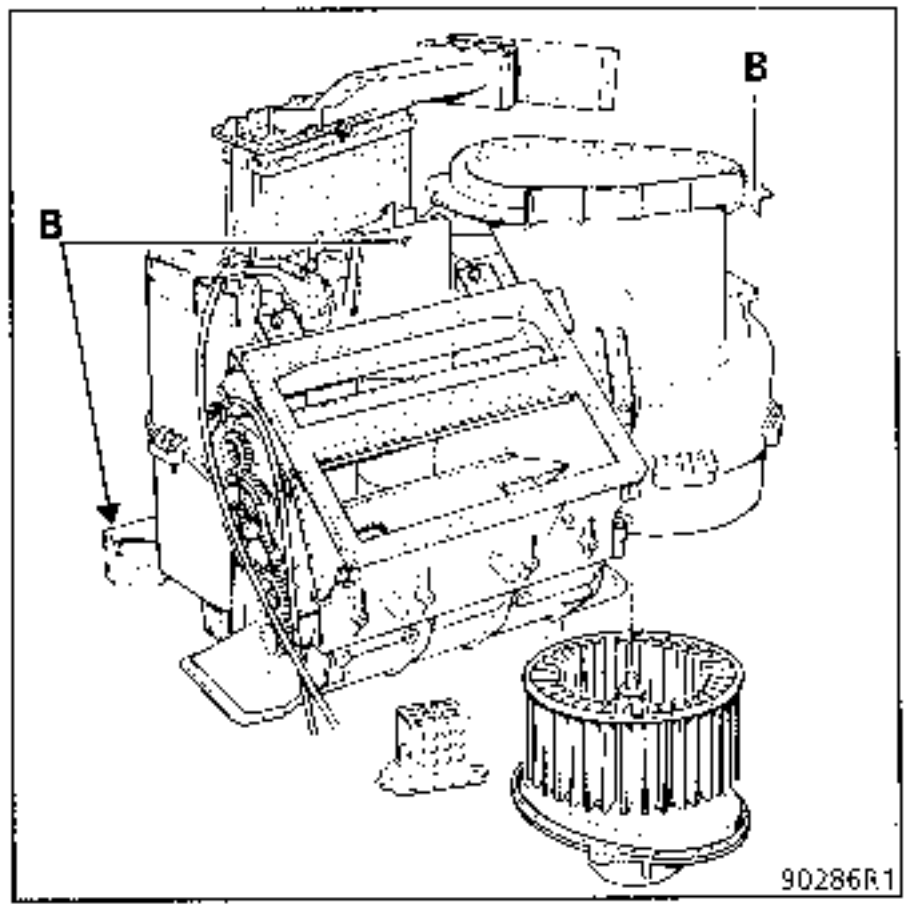
Clamp the heater coolant hoses using tools **Mot. 543-01** or **M.S. 583.**

Disconnect the hoses.



Remove the three mounting screws (B) from the bulkhead blower.

Disengage the blower assembly at the rear to remove it.



REFITTING

Offer up the air blower to the bulkhead, tilting it so that the sealing lips can be put back in the correct place.

Secure the blower device by means of screws (B).

Ensure that the sealing lips are in place.

Refit the dashboard.

Adjust the flap control cables.

Secure the cable-controlled device under the dashboard.

Connect the coolant hoses.

Fill and bleed the engine cooling system (see "**Engine**" section).

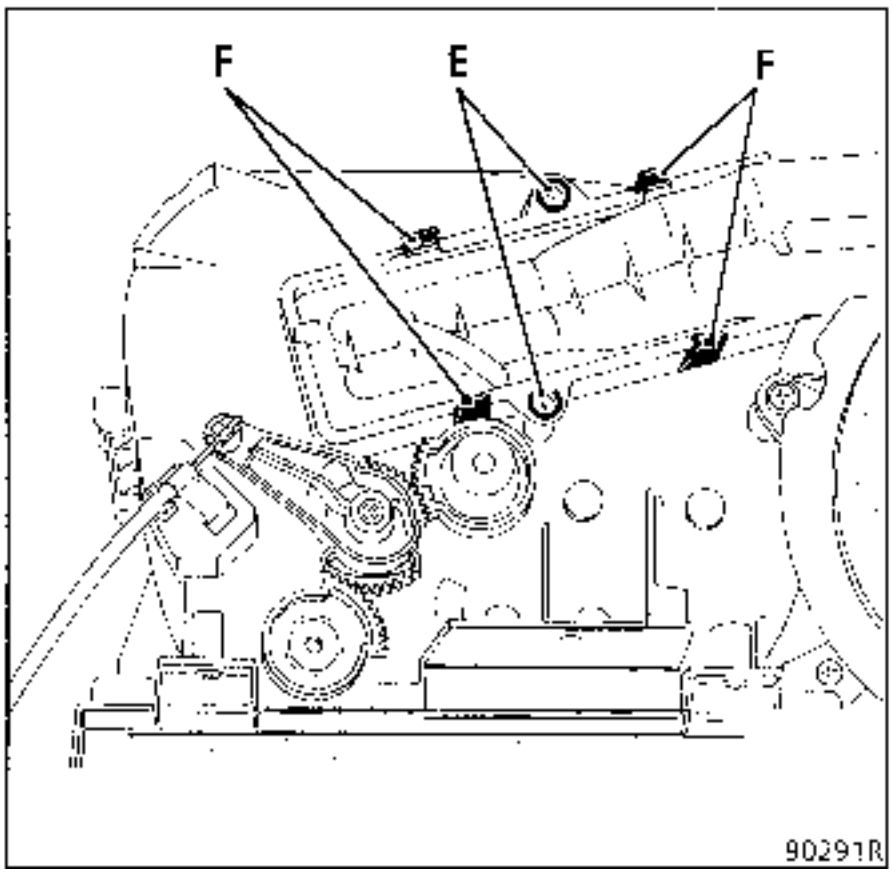
REMOVAL

Remove :
- the blower assembly,
- the screws securing the radiator on to the blo wer device (E).

Pull the four support clips apart (F).

Take out the radiator by disengaging it in an upwards direction.

NOTE : Be very careful not to damage the radiator fins.

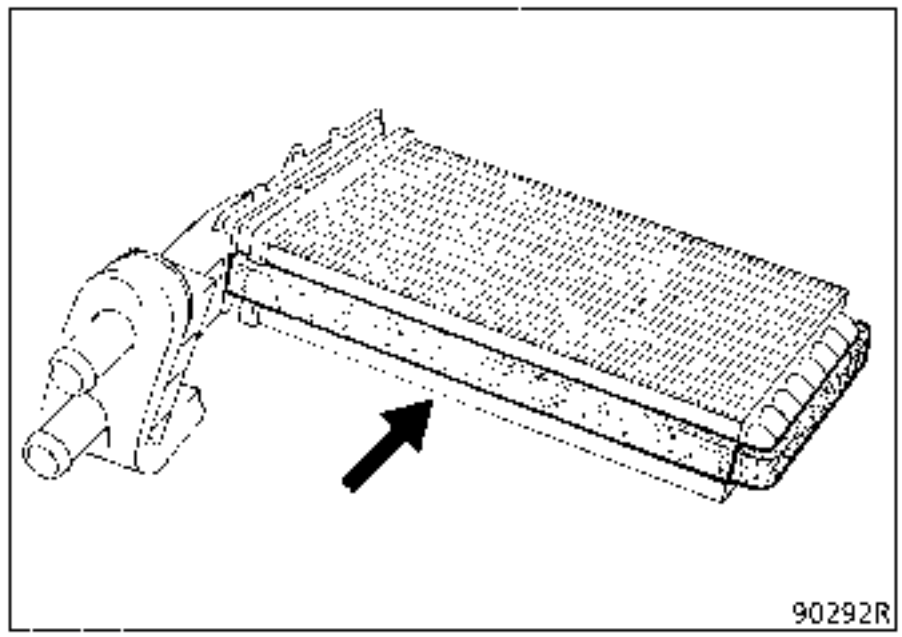


REFITTING

Fit the radiator complete with its foam spacer bands into the body of the blower device.

Make sure that the 4 tabs are clipped.

Fit the mounting screws onto the body of the blower device.

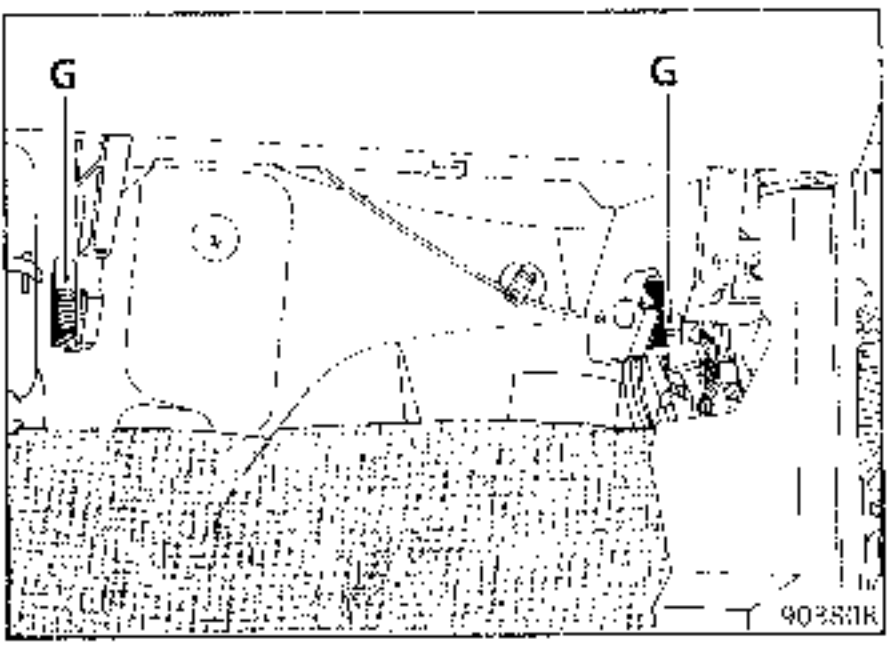


REMOVAL - REFITTING

The fan motor is reached through the passenger compartment.

Disconnect the battery.

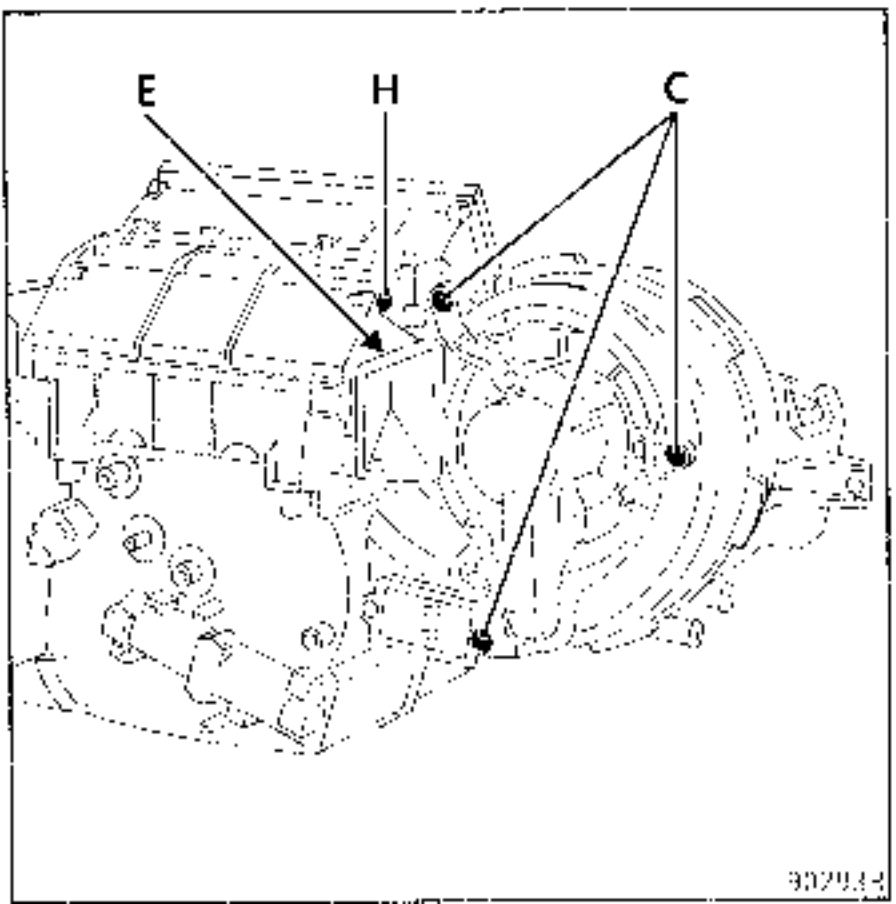
Remove the righthand glovebox (move the righthand and lefthand locking clips away from the hinge pins (**G**)).



Unclip fan outlet (**E**) on the righthand side of the blower device.

Remove the three mounting screws (**C**) from the fan motor.

Take out the impeller/fan assembly from the blower device.



NOTE : Pull the fan motor to free it from its mounting.

When reassembling the motor on its mounting, follow the identification marks to ensure that the connector is positioned correctly.

If the ventilator clips break, fit a mounting screw at (**H**).

REMOVAL - REFITTING

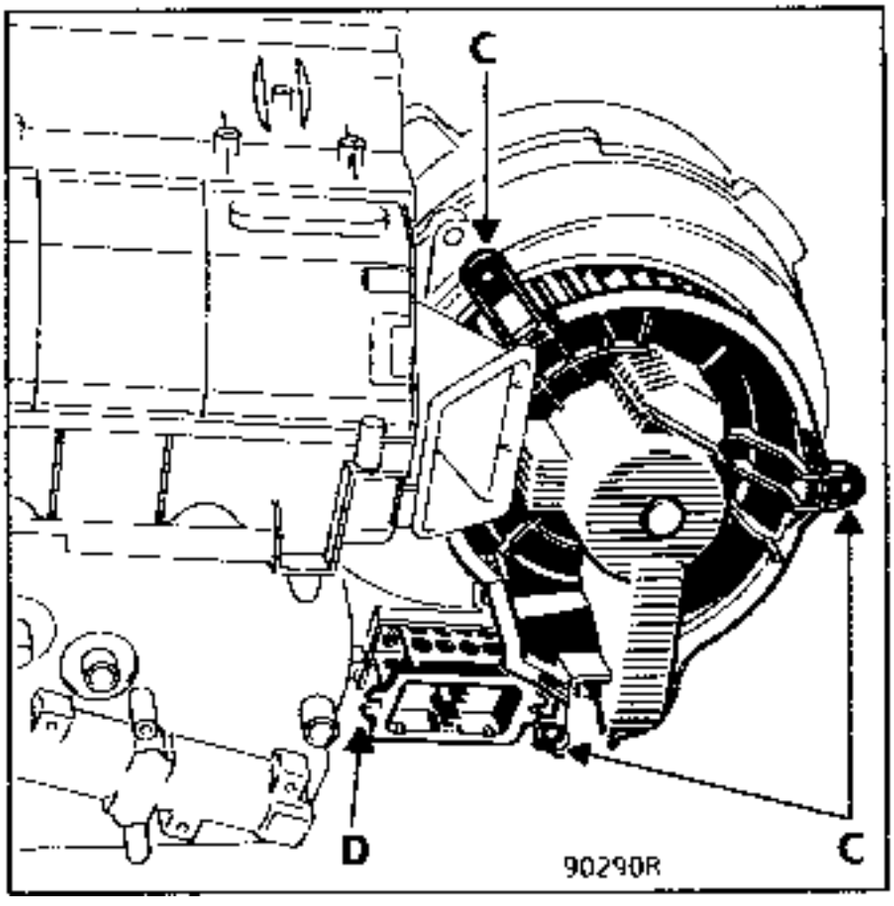
The electrical resistors for the fan motor can be reached through the passenger compartment.

Remove :
- the righthand glovebox,
- the fan mounting screws (C).

Leave the fan motor hanging.

Remove the screw (D) securing the resistor mounting.

Take out the resistors from the bottom.



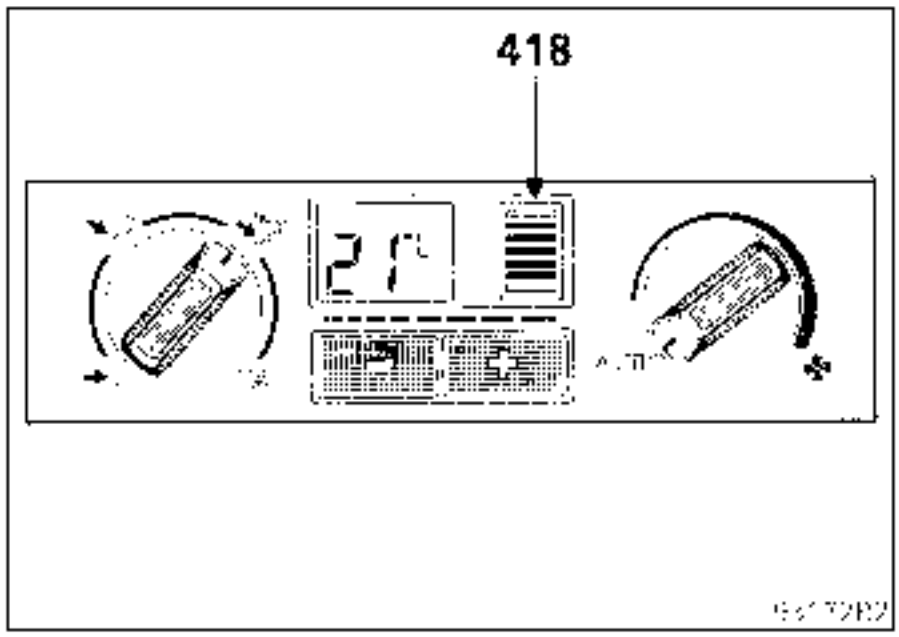
Checking the blown air, external and internal temperature sensors

DEGREES CELSIUS	THERMAL RESISTANCE (Ω)
-10	49000 to 60000
5	37300 to 45700
0	29000 to 35500
5	22500 to 27500
10	18000 to 21600
15	14000 to 17000
20	11300 to 13800
25	9000 to 11000
30	7300 to 8500
35	5800 to 7000
40	4700 to 5600
45	4000 to 4500

These values are given as guide, but have no significance for fault finding as they present too great a thermal spread.

Internal temperature sensor (418)

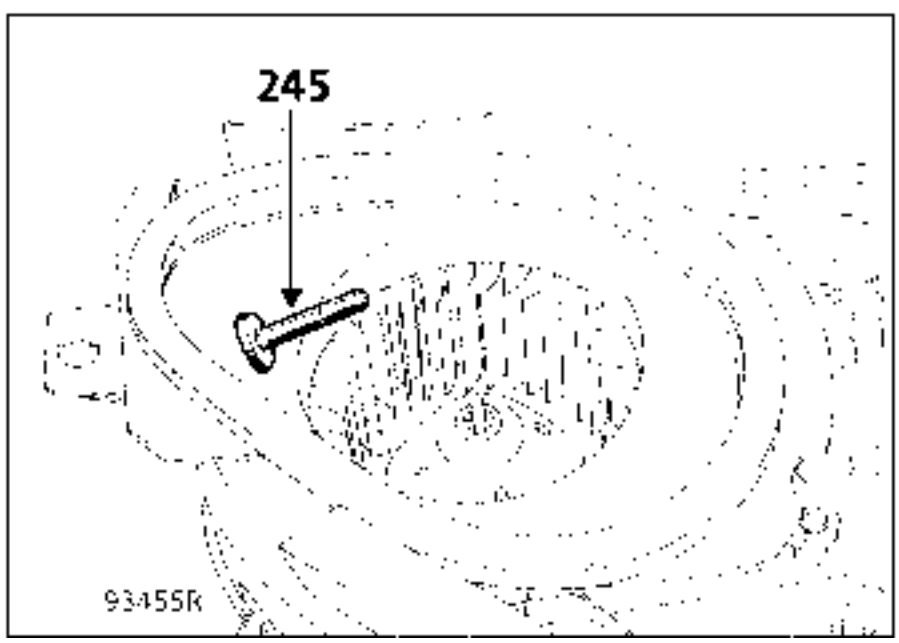
This is a thermistor with a negative temperature coefficient, integrated in the control panel printed circuit. If the sensor is faulty, the control panel will have to be replaced.



External temperature sensor (245)

This is a thermistor with a negative coefficient located in the air conditioner air intake.

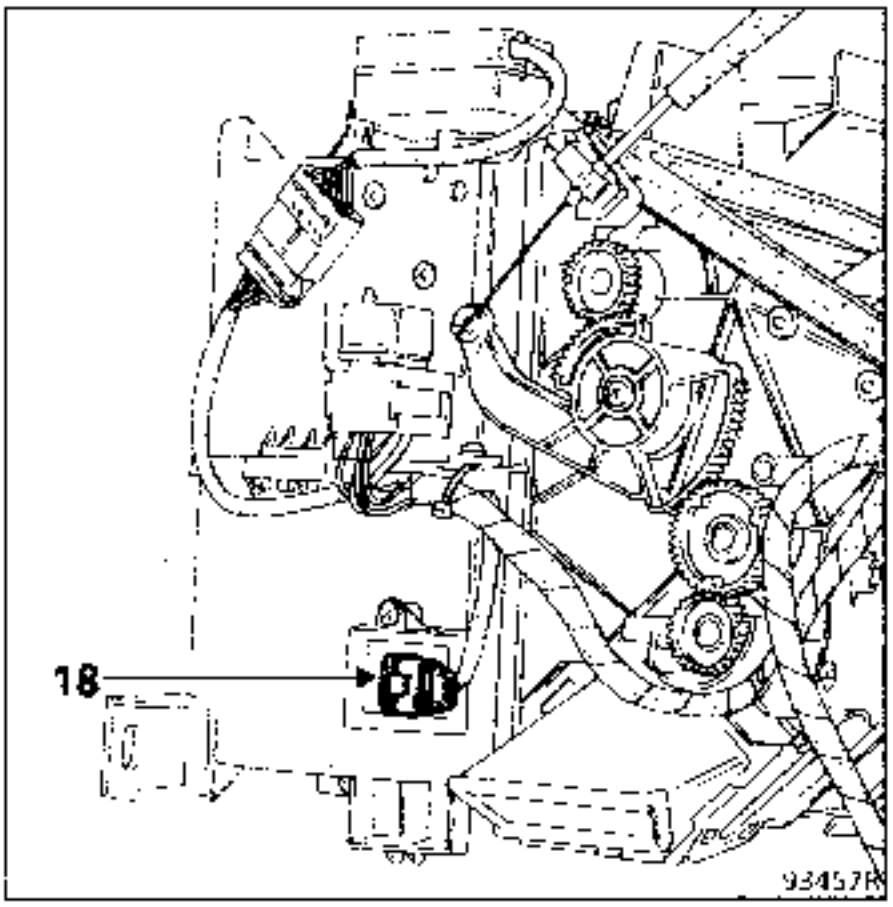
It is interchangeable and can be reached through the air intake duct at the water box end



Blown air temperature sensor (18)

This is a thermistor with a negative temperature coefficient located downstream of the radiator.

It can be reached directly from inside the vehicle, at the pedal assembly end and is located on the heater device.



MIXER MOTOR (420)

The mixer flap is assisted by an electric motor with a potentiometre for checking the position of the flap.

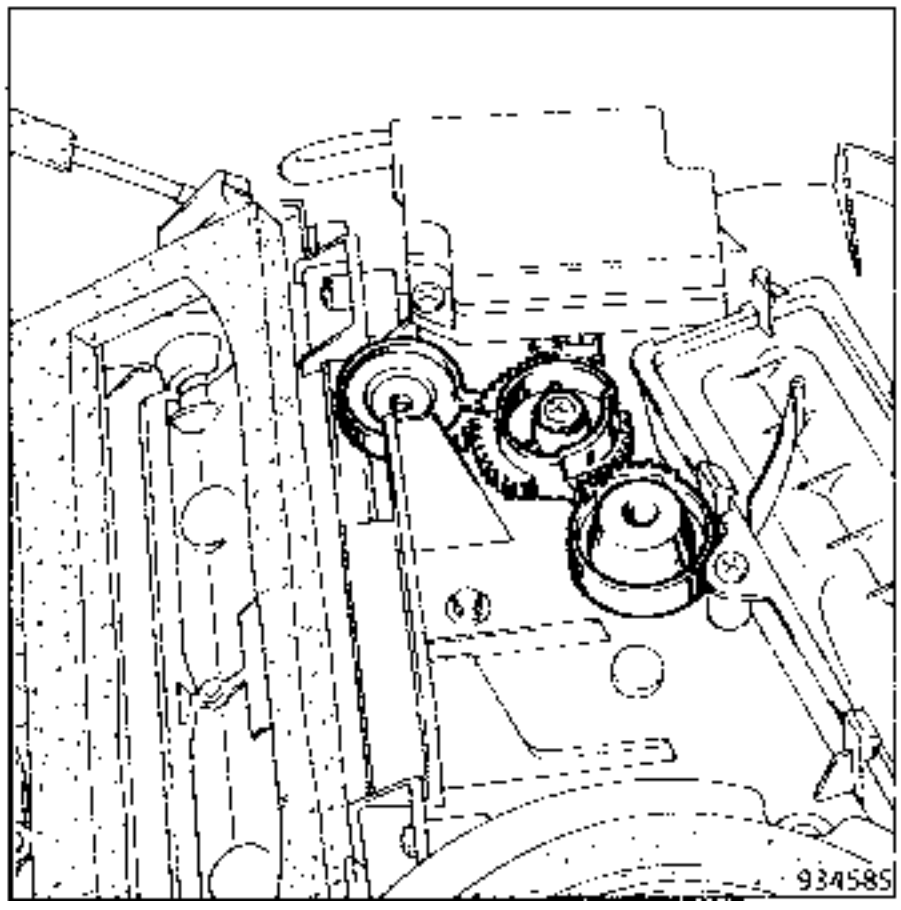
The motor is permanently supplied with approximately **7 volts** power in the extreme **HOT** or **COLD** settings.

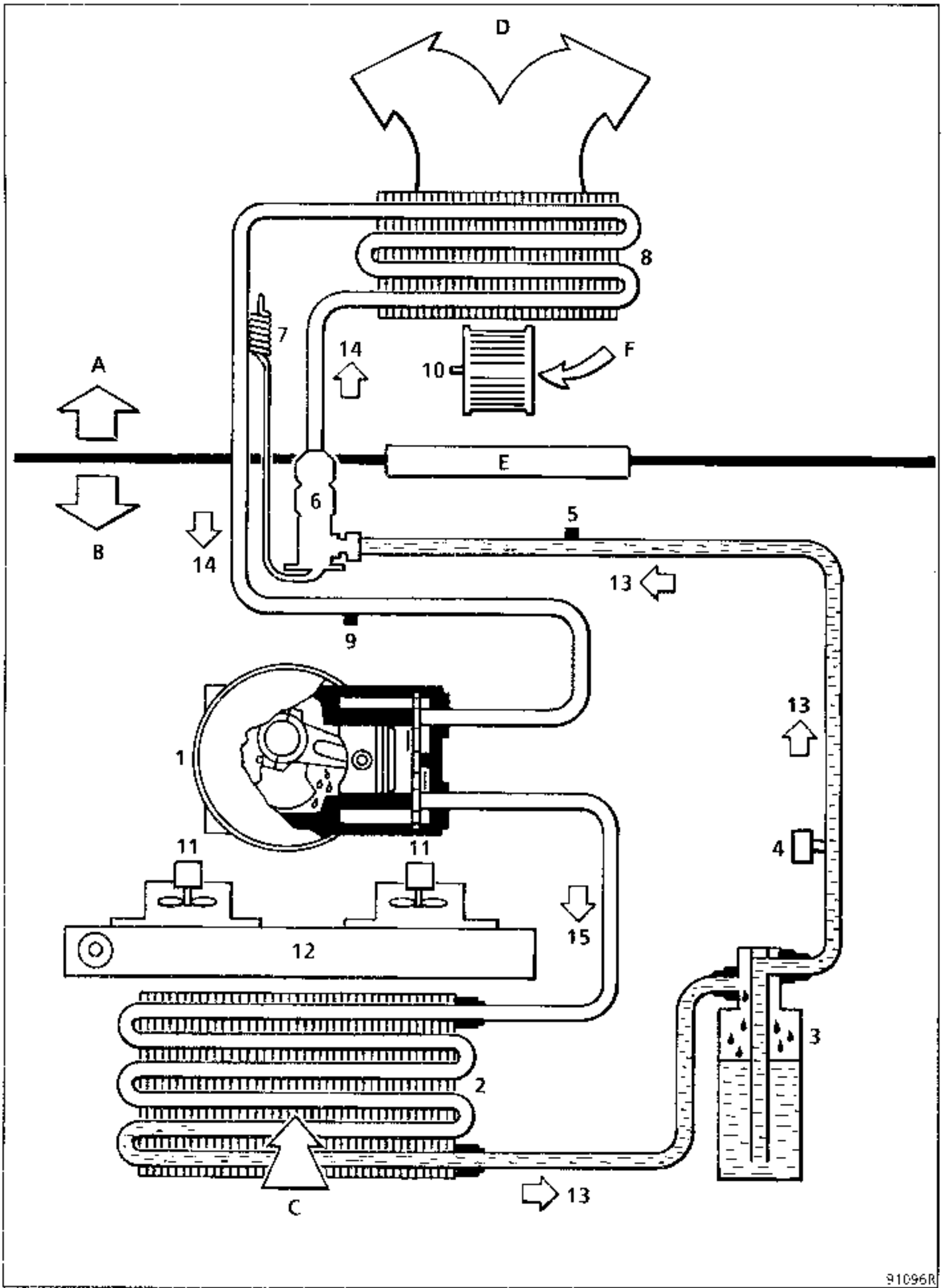
In the intermediate setting, the voltage is **0 volts**.

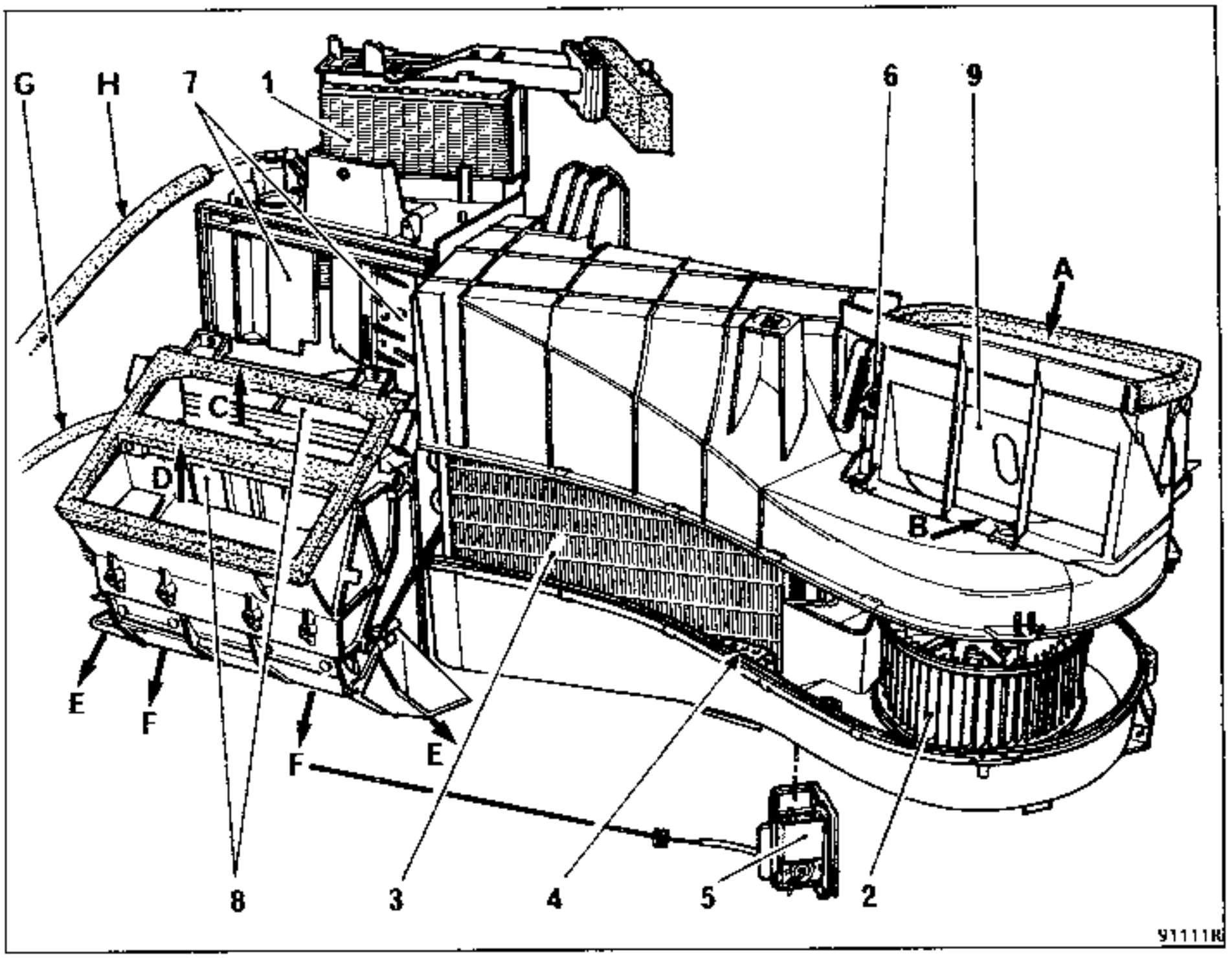
The motor can be reached after the dashboard and air conditioner have been dismantled (see section 83).

If the motor has to be replaced, the new one is supplied with its connector and output drive gear. It is pre-set for fitting to the air conditioner.

On refitting, the marks on the drive gears for the flap and motor **must be aligned**.




D
8
7
14
A
10
F
E
6
5
B
14
13
9
13
1
11
11
4
15
12
3
2
C
13
91096R



1 Heater radiator
2 Blower fan
3 Evaporator
4 Fan resistors
5 Fixed thermostat
6 Motor or recirculation flap diaphragm
7 Hot air/cold air flaps
8 Top/bottom air flaps
9 Recirculation flap
A External air inlet
B Recirculated air inlet
C Windscreen demisting outlet
D Dashboard ventilator outlet
E Lower ventilator outlets
F Ventilator outlets to rear seats
G Air distribution cable
H Air mixer cable

A Passenger compartment
B Engine compartment
C External air
D To air mixer unit
E Scuttle panel
F External or recirculated air

CONSUMABLES

Compressor oil :

- **ELF RIMA 100** . **135 cm³ ± 15.**

Refrigerant fluid :

- Freon **R12** : **950 g ± 50.**
  R134a : **750 g + 35.**

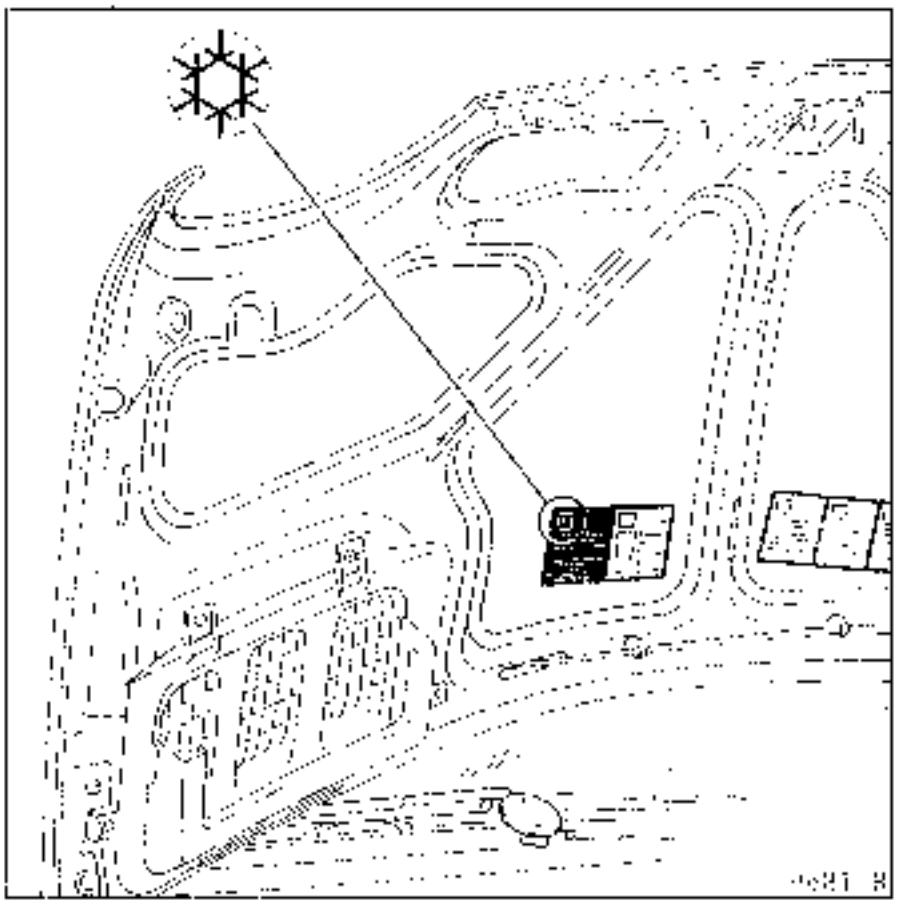
1 Compressor
2 Condenser
3 Refrigerant fluid reservoir
4 Three-purpose pressostat
5 High pressure bleed screw
6 Relief valve
7 Relief valve thermostatic regulation
8 Evaporator
9 Low pressure bleed screw
10 Air conditioning fan
11 Cooling fan
12 Engine radiator
13 High pressure fluid
14 Low pressure vapour
15 High pressure vapour

To contribute towards protecting the environment, **Renault** vehicles now use refrigerant fluid type **R134a** in their air conditioning systems. Refrigerant type R134a for use with **SANDEN SP20 (PAG)** is not compatible with refrigerant type R12 for use with **ELF RIMA 100** type oil. It is therefore forbidden to use one type in place of the other. For servicing and maintenance you must use the refrigerant type and oil recommended for the system it was designed for (**R12** for **R12** and **R134a** for **R134a**).

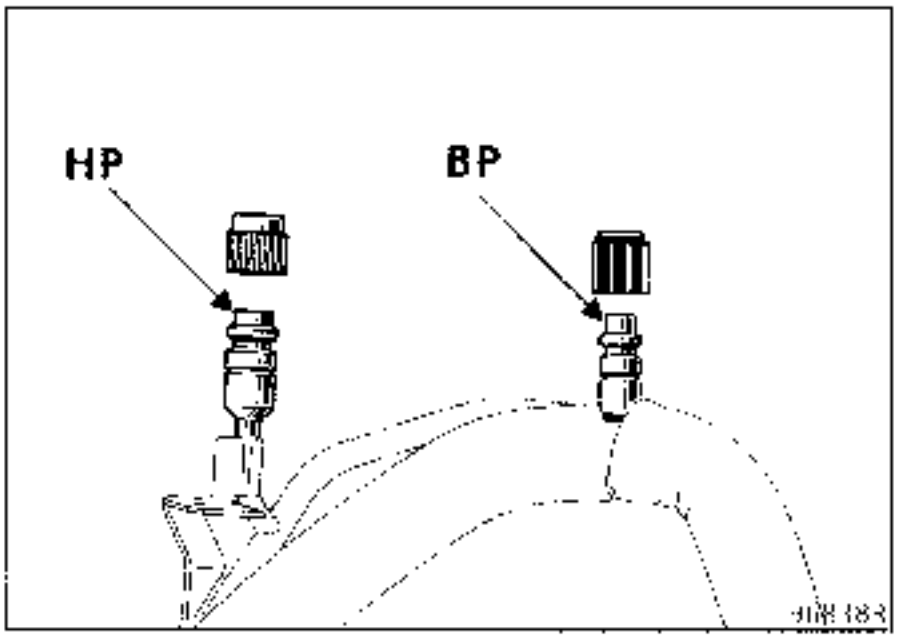
There are two ways of recognising those vehicles equipped with refrigerant type **R134a** :

- a label carrying the symbol and the inscription **R134a** marked either on the bonnet, on the grille panel or on the front cross member.

Example



- The refill valves are of the "**snap**" type with a difference in diameter between the **high pressure** and the **low pressure** valves



For details on refilling and oil levels, refer to the manual entitled **"Air Conditioning - New Refrigerant type R134a"**.

CONTENTS

Type	Engine	Quantity (g) R134a
X 48	All types	750 ± 35

OIL LEVEL

The quantity of oil for **air conditioning** circuits **R12** and **R134a** is identical. It is only the type of oil that changes.

When carrying out repair work concerning leakages or if a component has been replaced, oil (special R134a) should added.

OPERATION ON AC CIRCUIT	QUANTITY OF OIL TO BE ADDED
Draining AC circuit	Measure the amount of oil drained out and add a similar quantity of new oil
Hose split or other rapid leakage	100 ml
Replacing a condenser	30 ml
Replacing an evaporator	30 ml
Replacing the dehydrating bottle	15 ml
Replacing a hose	10 ml

When removing-refitting the compressor without replacing it (for example, when repairing a clutch) after draining the oil from the compressor, refill it with **120 ml**.

AS FROM MODEL YEAR 1990 - VERSION WITH TEMPERATURE REGULATION AND AIR CONDITIONING

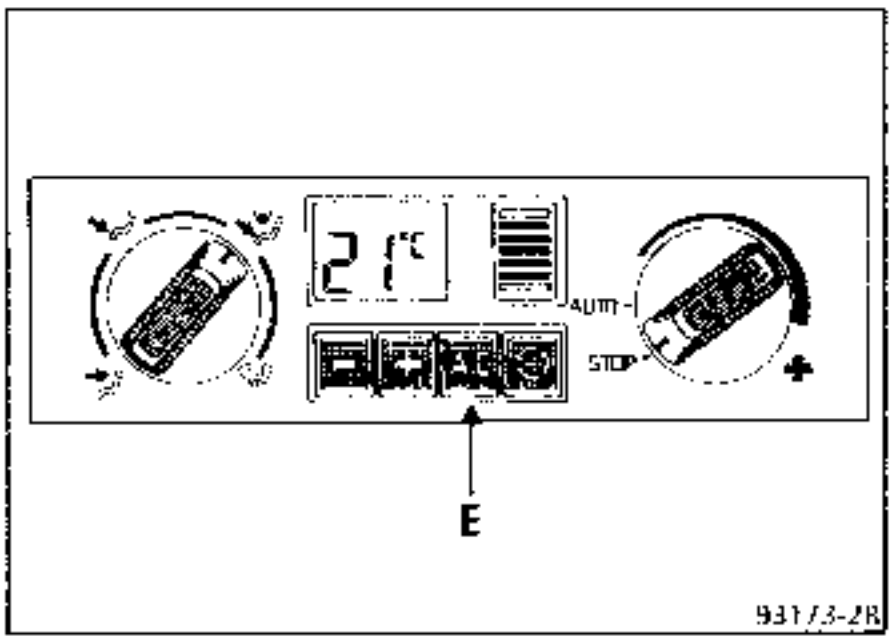
As from model year **1990, Renault 21 "Phase 2"** vehicles may be equipped with a heating system with temperature regulation.

The aim of temperature regulation is to make the temperature inside the vehicle as comfortable as possible for the occupants, taking account of the different conditions which can prevail inside the passenger compartment.

The temperature regulation system is electronically controlled by means of a computer integrated in the control unit

COMPOSITION OF THE SYSTEM

ADJUSTING THE TEMPERATURE



The two "-/+" keys have the same function as the one described in the **"regulated heating"** section. Only the temperature level is different :
14 °C to **28 °C**.

The temperature is not regulated when the level selected is **14 °C**.

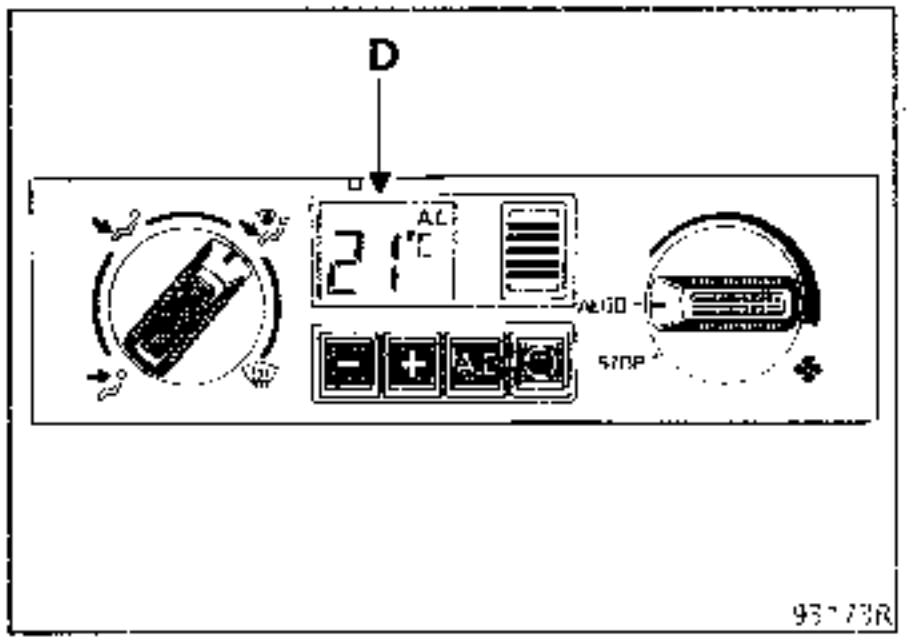
The temperature will be that obtained when the system is on its maximum performance setting.

If the external temperature is higher than the one selected, the air conditioning system will have to be activated in order to regulate the temperature.

If the air conditioning system is not in operation, the message "**A-C**" flashes on the display. Just press "**A-C**" (E) to activate the system.

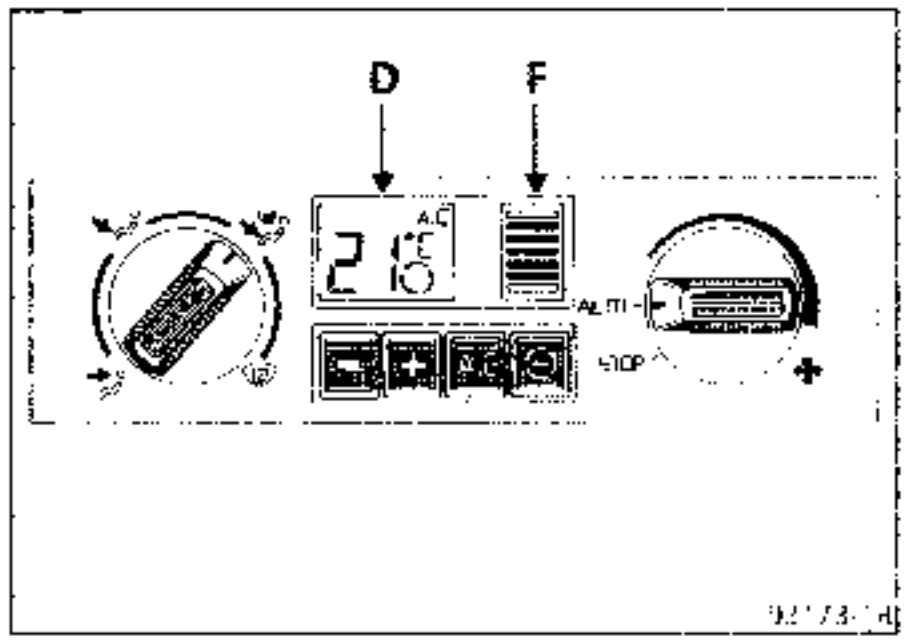
When there is a great difference **between the external temperature and the temperature level displayed**, in particular when the external temperature is very high, the air **RECIRCULATION** system will have to be activated in order to accelerate the reduction in temperature inside the passenger compartment. The system will return to the **"external air"** mode if conditions allow when the desired temperature has been reached.

AIR CONDITIONING ON/OFF KNOB



Press the "**A-C**" (E) key to activate the air conditioning system. The message "**A-C**" will appear on display (**D**). Cold air taken from outside the car is constantly renewed.

INTERNAL TEMPERATURE SENSOR (F) AND DISPLAY (D)



The internal temperature display and sensor have the same functions as those described in the **"Heating - Ventilation"** section.

SPECIAL OPERATION OF THE L485

Compressor controlled by the engine injection computer.

The computer receives two types of data relating to the heating and ventilation system :

- request to start the air conditioning system,

- authorisation to start the compressor, depending on the temperature conditions and pressure in the air conditioning system.

These two data, and the engine speed, coolant temperature and inlet manifold pressure, are processed by the computer so that it can control the compressor's magnetic clutch (via a relay) and the idling speed.

- When there is a request for the air conditioning to be activated, the computer increases the idling speed from **800** to **1000 rpm**.

- When the computer receives the signal authorising the activation of the compressor, the computer checks that :

  a) the engine speed is less than **5000 rpm**, the coolant temperature is less than **105 °** and **the inlet manifold pressure is less than 1.5 bars**.

  b) the coolant temperature is less than **115 °C**.

  If one or other of the conditions **a)** and **b)** is not complied with, the computer cuts off the compressor or will not allow it to start.

THERMOSTAT (all types)

The fixed thermostat prevents the compressor operating if the temperature of the air from the evaporator is less than + **4 °C**.

6 : Air conditioning fan assembly electronic module
7 : Resistor unit controlling module
18 : Blown air temperature sensor
19 : Electronic thermostat
103 : Alternator
104 : Ignition switch
120 : Injection computer
124 : Heater control
171 : Air conditioning clutch
188 : Cooling fan assembly
206 : Air conditioning three purpose pressure switch
208 : Integral electronic ignition module
209 : Combined lighting/direction indicators switch stalk and horn push
224 : Power-assisted steering pressostat
225 : Diagnostic plug
234 : Fan assembly relay
241 : Lighting shunt or rheostat
245 : External temperature sensor
248 : Fan assembly thermal switch
251 : Coolant dual-purpose thermal switch
257 : Preheater unit
259 : Thermal switch
260 : Fuse box
262 : Air conditioning cooling fan assembly
274 : Air conditioning solenoid valve
292 : Lighting rheostat relay
298 : Blower device
316 : Ignition 4" relay
319 : Air conditioning control panel
320 : Air conditioning/basic fan motor assembly
321 : Air conditioning fan motor assembly resistor
322 : Power-assisted steering air conditioning diode
323 : Power-assisted steering air conditioning solenoid valve diode
334 : Thermal cut-out

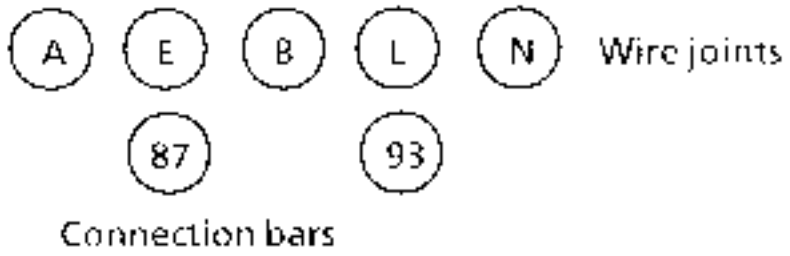
335 Fan assembly 1st speed relay
336 Fan assembly 2nd speed relay
337 Fan assembly 3rd speed relay
362 Battery - terminal plate
408 Evaporator sensor
412 Fast idling solenoid valve
417 Air conditioning recirculating relay
418 Passenger compartment temperature sensor fan
420 Mixer flap
474 Air conditioning compressor control relay
475 Recirculating motor

LIST OF JUNCTIONS

R5 Dashboard/heater bulkhead
R10 Dashboard/righthand side member
R11 Dashboard/lefthand side member
R17 Heater bulkhead/engine
R21 Engine/fan assembly
R28 Engine/lefthand side member
R58 Fan assembly/righthand side member
R59 Fan assembly/injection harness
R63 Lefthand side member/injection harness
R75 Fan assembly earth/fan assembly
R99 Dashboard/heating system
R138 Heater bulkhead/ABS
R139 Engine/ABS

LIST OF EARTHS

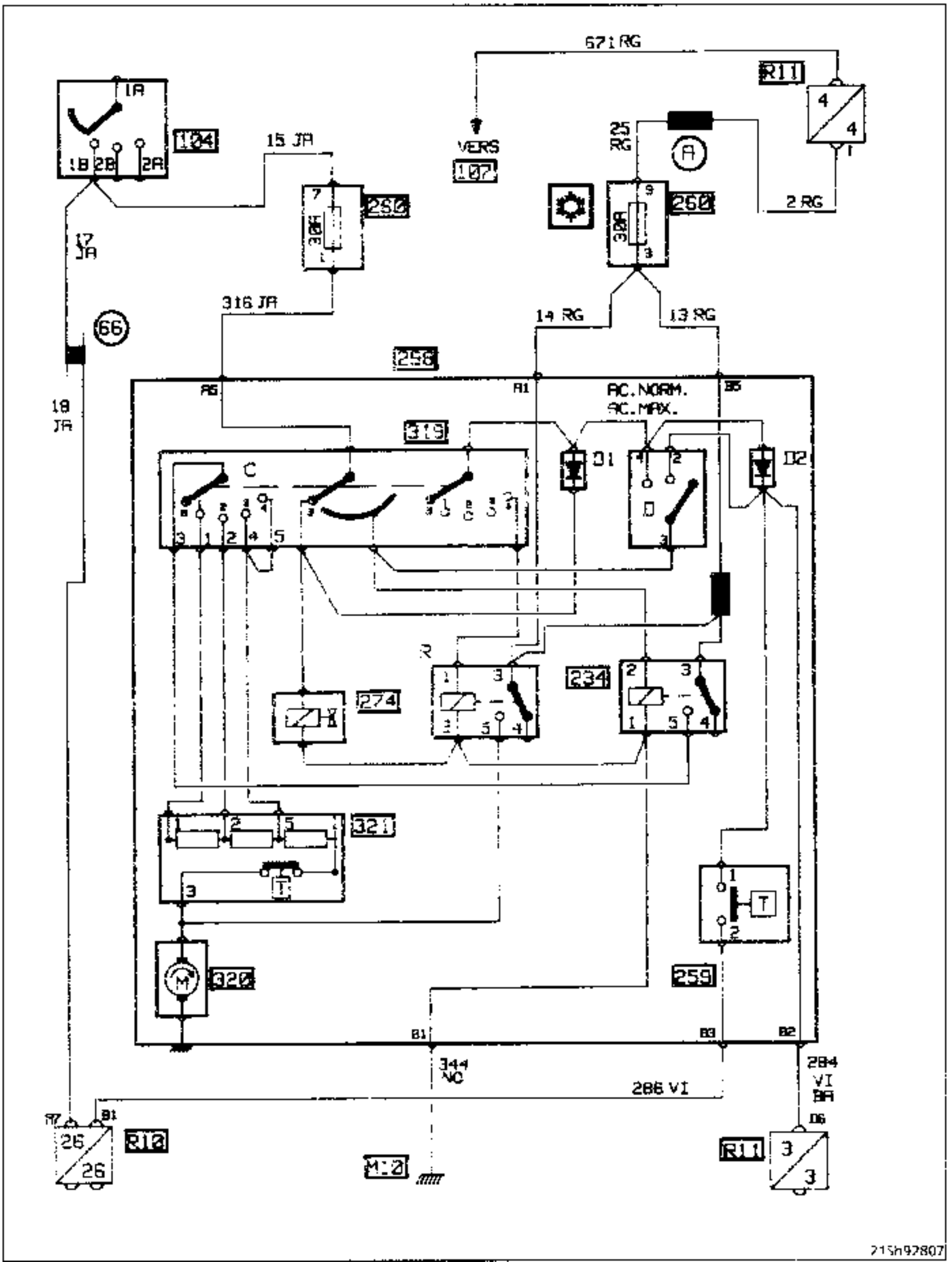
M4 Bodywork earth
M9 Front righthand pillar earth
M10 Front lefthand pillar earth
M16 Engine/bodywork earth



Wire joints

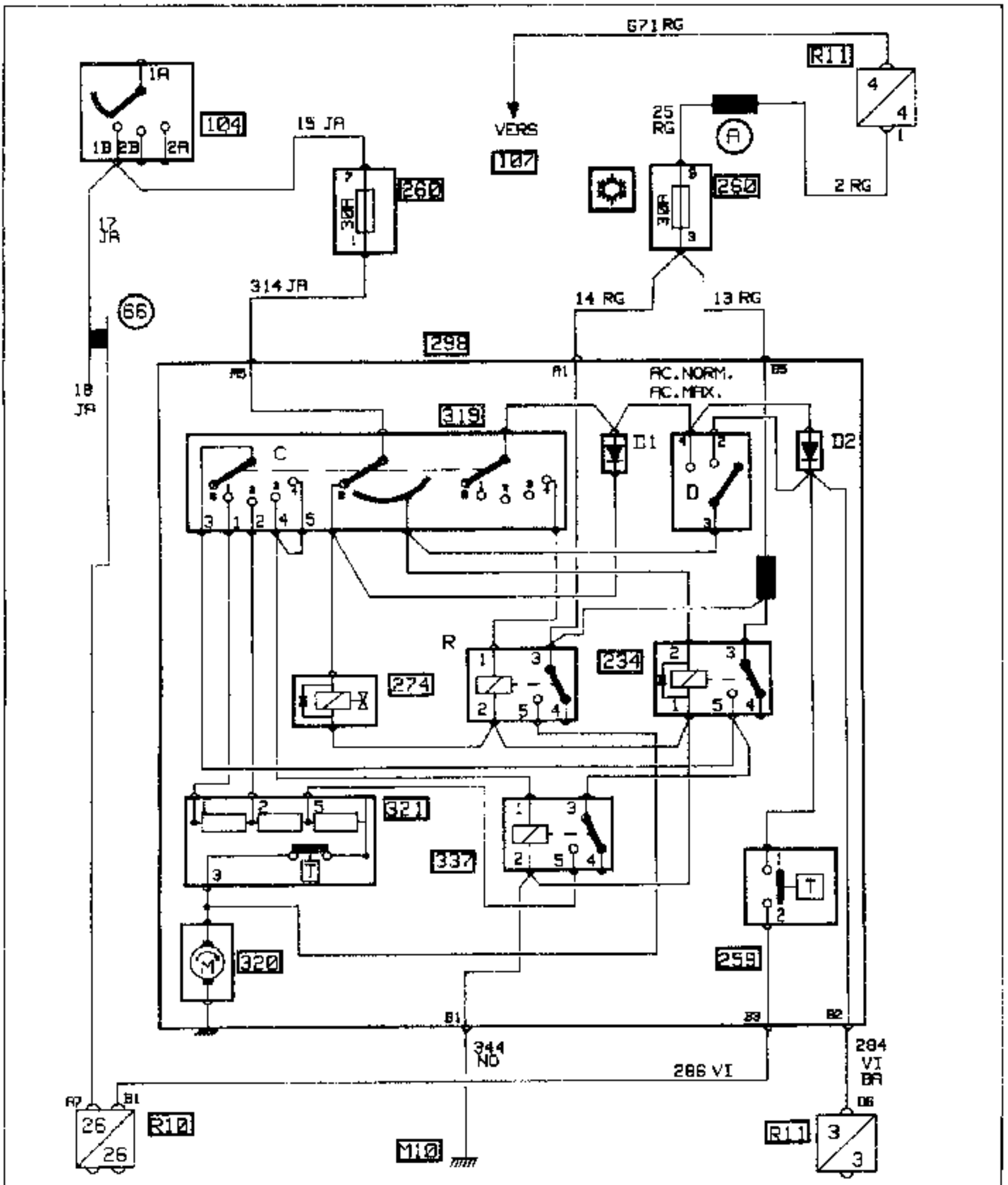
Connection bars

WIRING DIAGRAM - Passenger compartment end - ALL TYPES - 1987



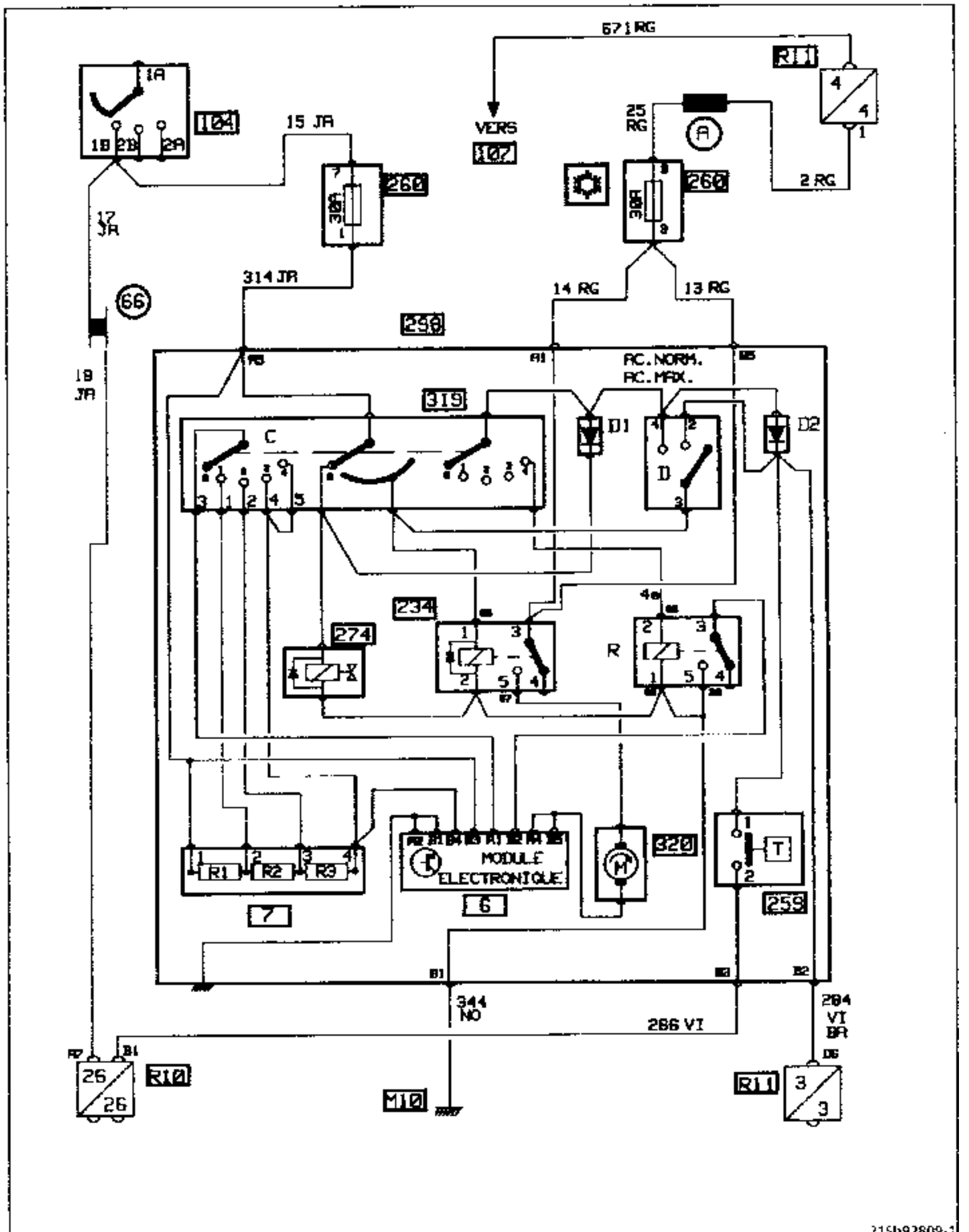
21Sh92807

WIRING DIAGRAM - Passenger compartment end - ALL TYPES - 1988

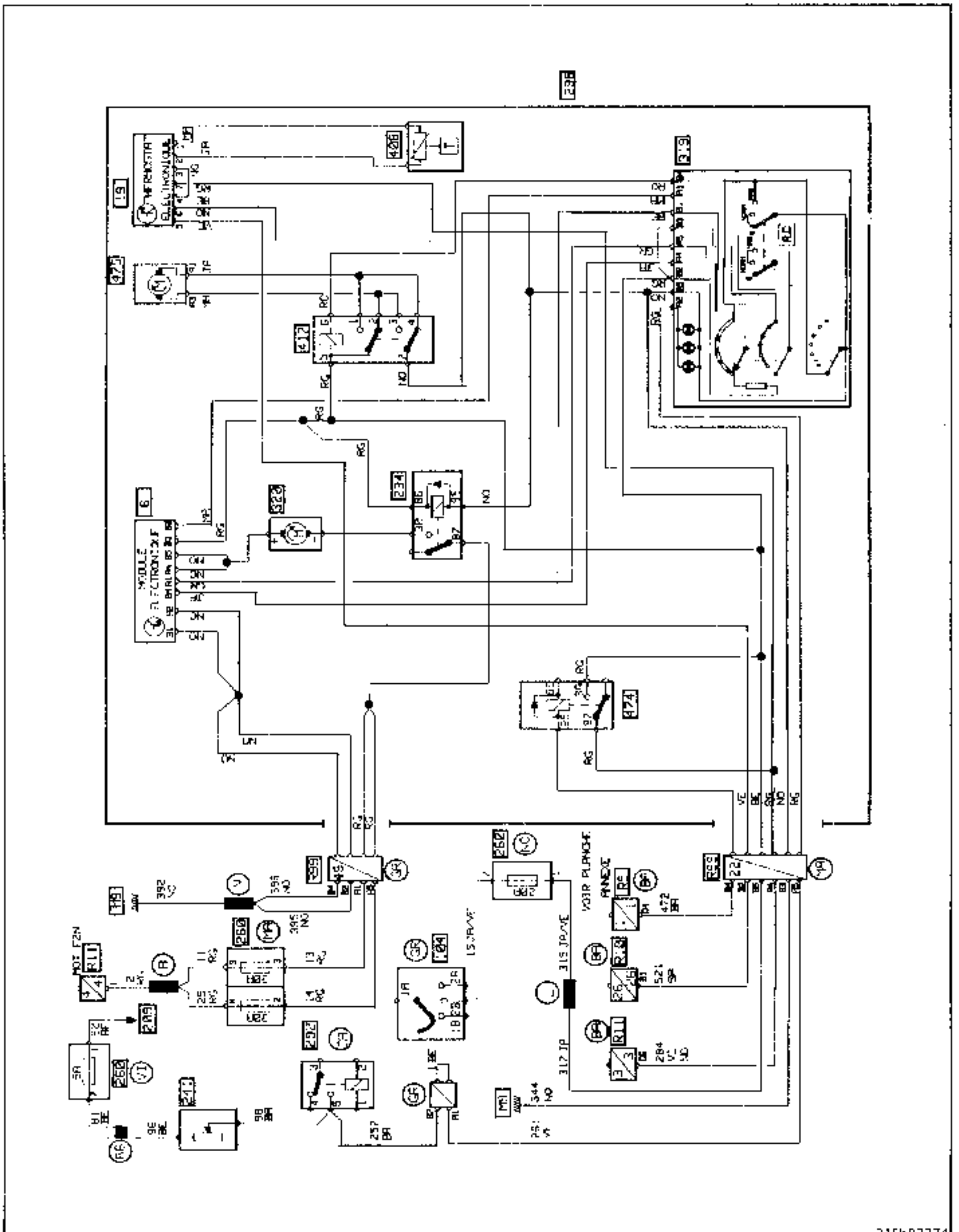


21Sh02808-1

WIRING DIAGRAM - Passenger compartment end - ALL TYPES - 1989

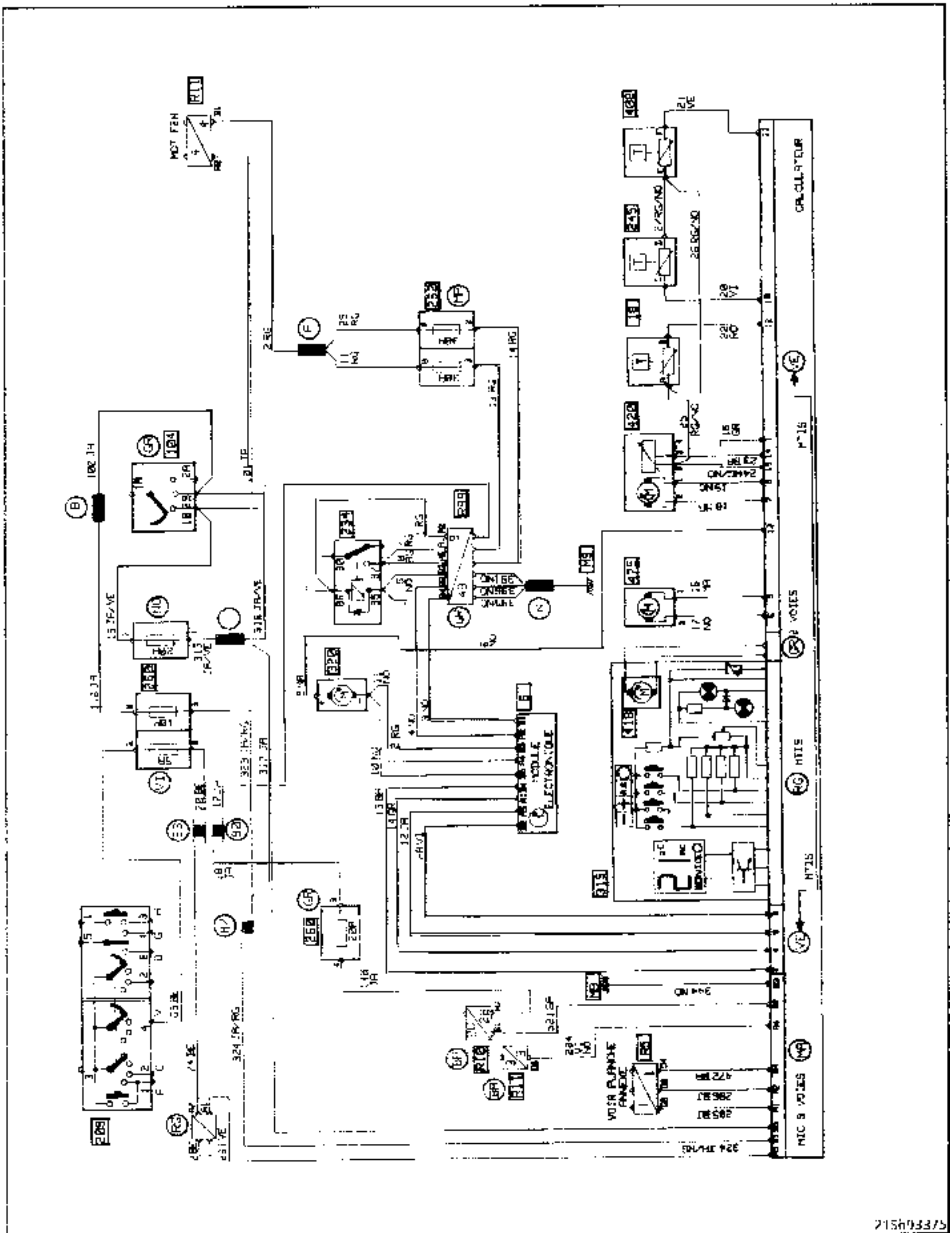


WIRING DIAGRAM - Passenger compartment end - ALL TYPES - 1990 - DAI

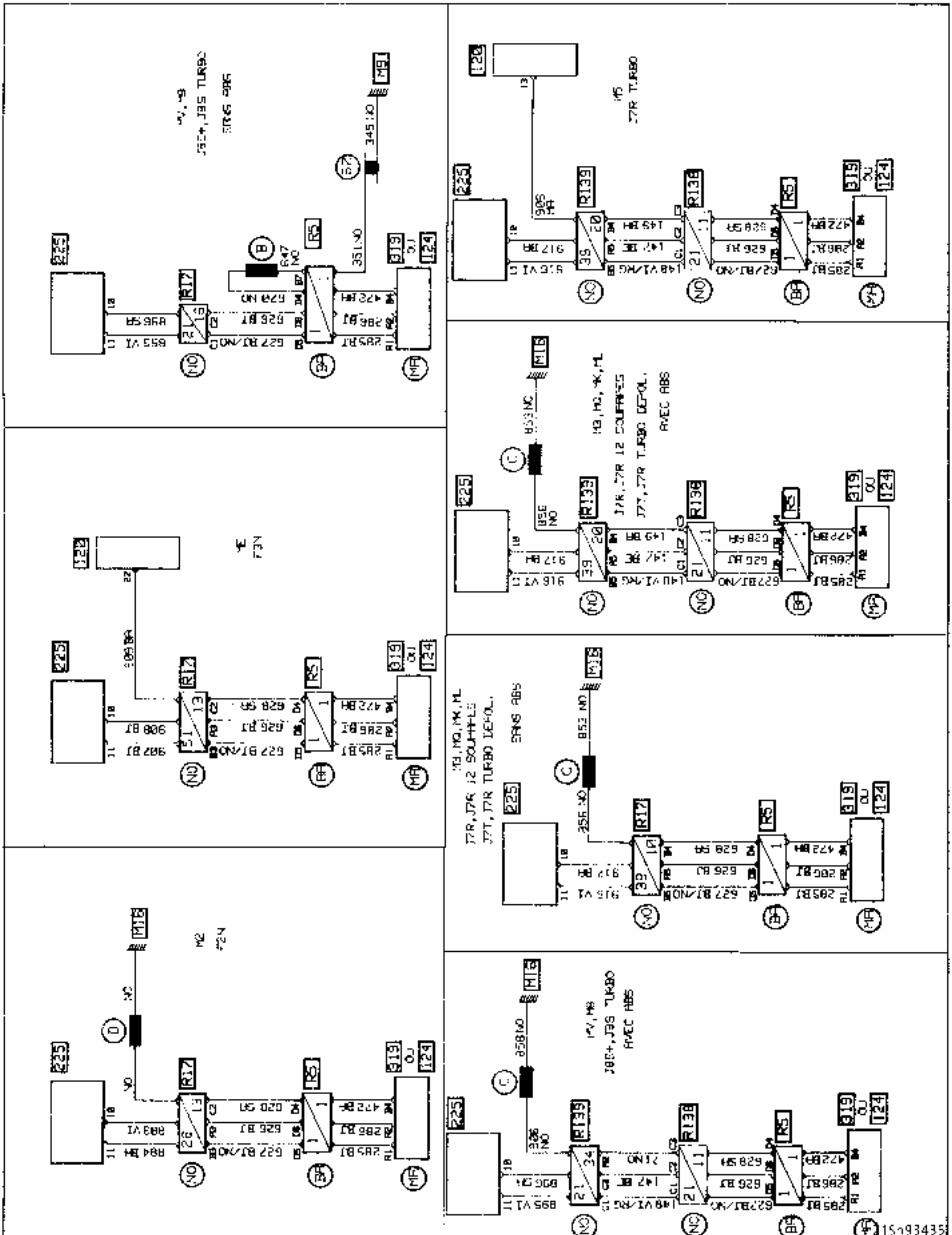


215h93374

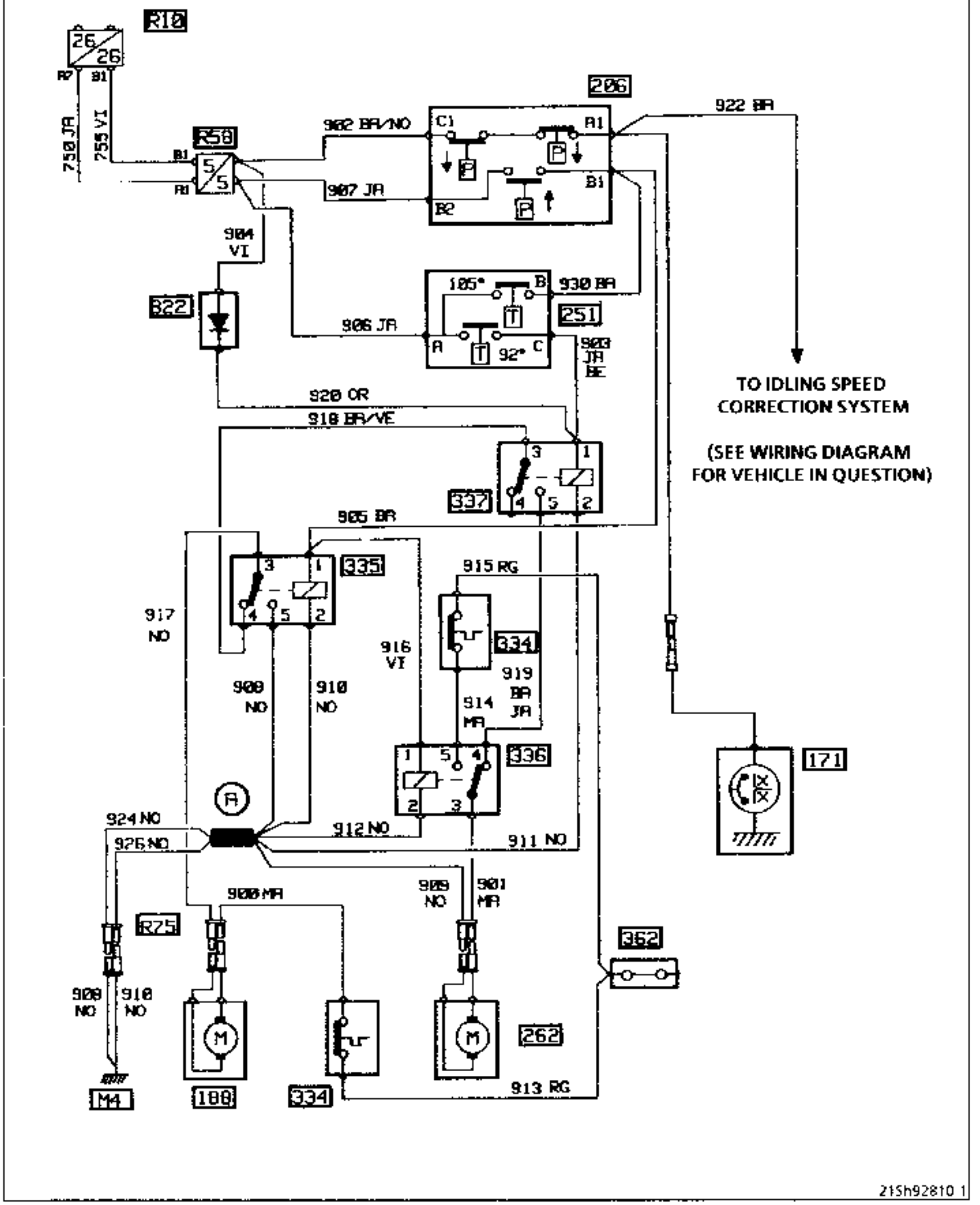
WIRING DIAGRAM - Passenger compartment end - VERSION WITH REGULATED TEMPERATURE - 1990 model



WIRING DIAGRAM - Diagnostic plug appendix - 1990 model

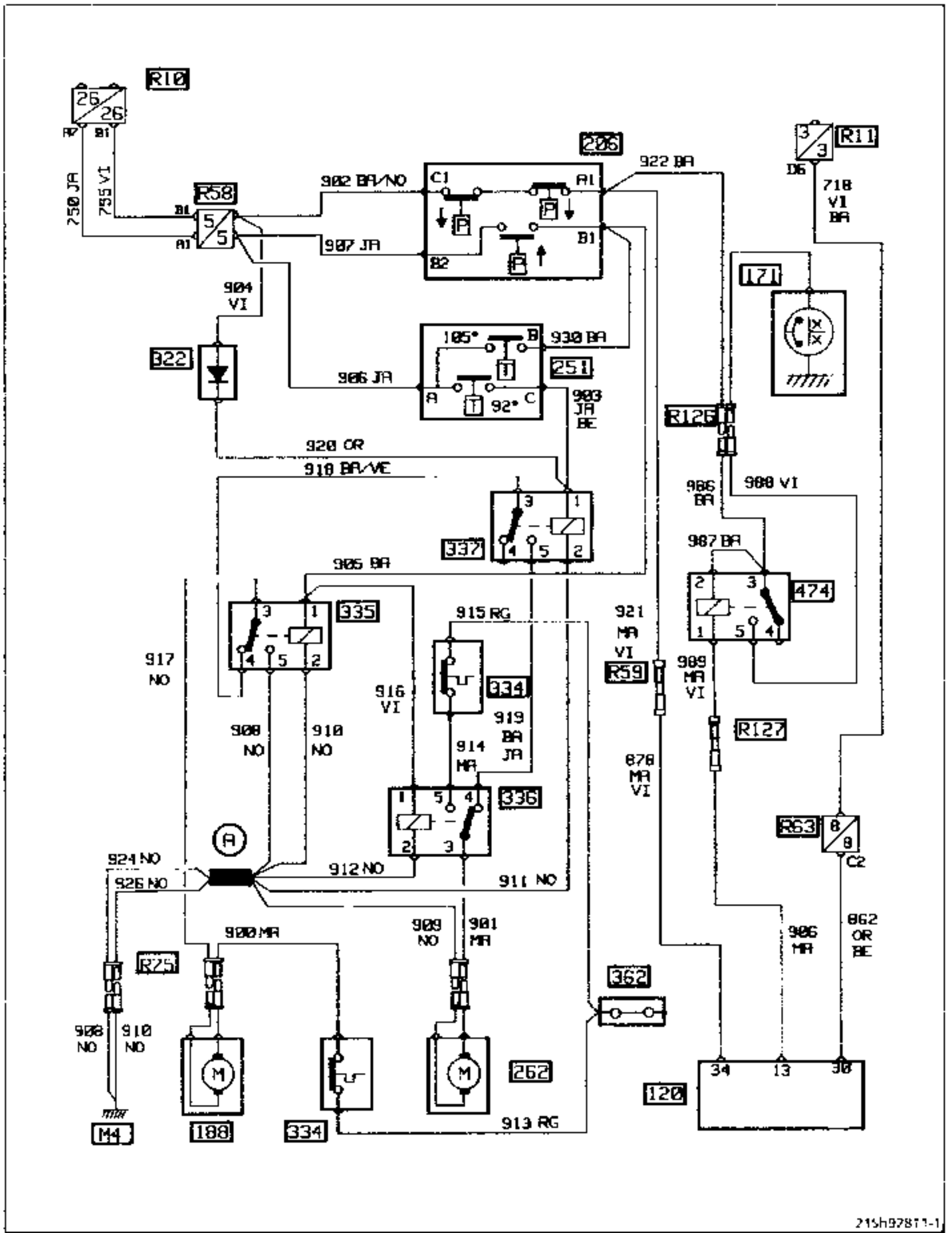


WIRING DIAGRAM - Engine end - X482 - X483 - X488 - X489 - 1987 - 1988 - 1989 models

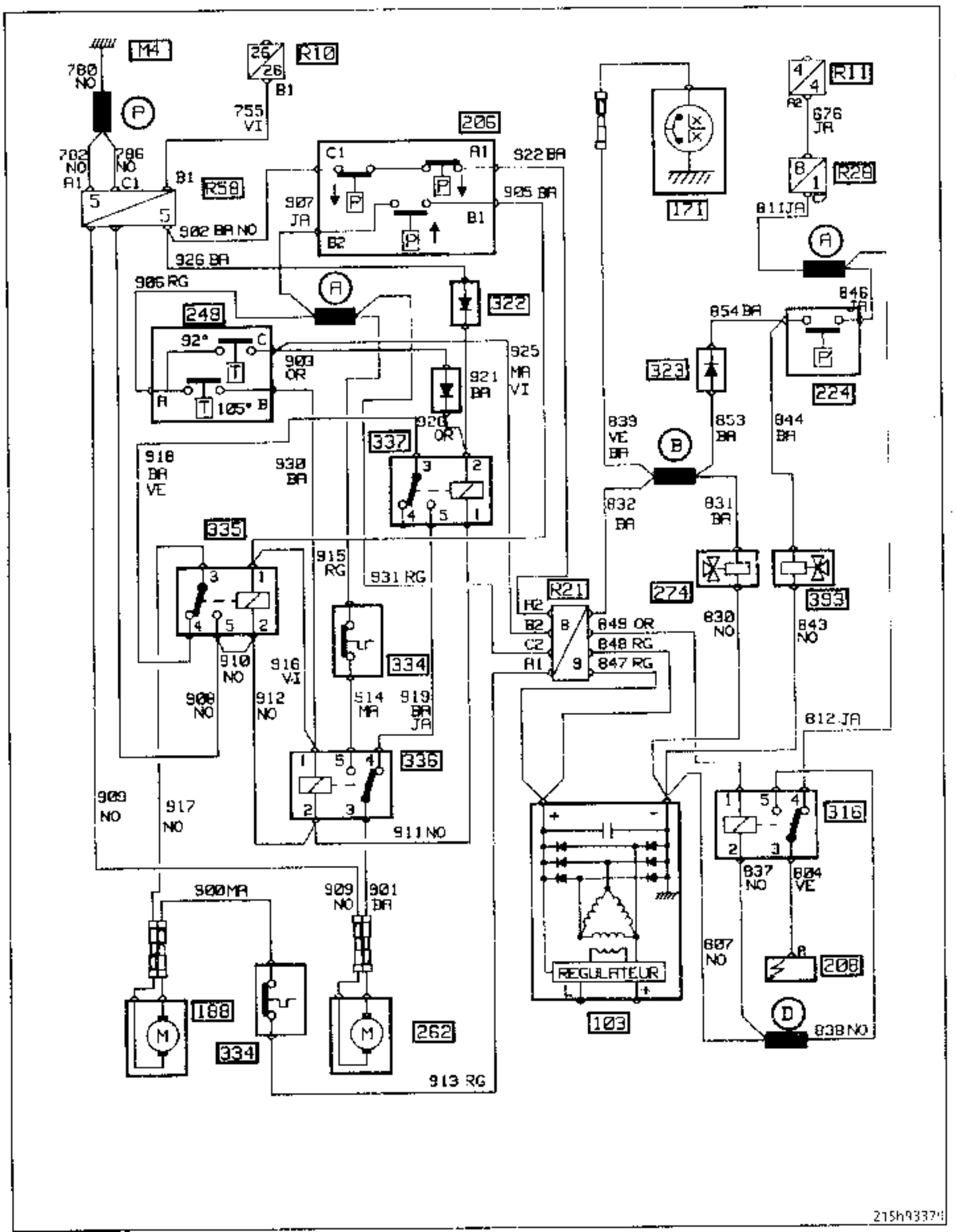


21Sh92810 1

WIRING DIAGRAM - Engine end - L485 - 1988 - 1989 models

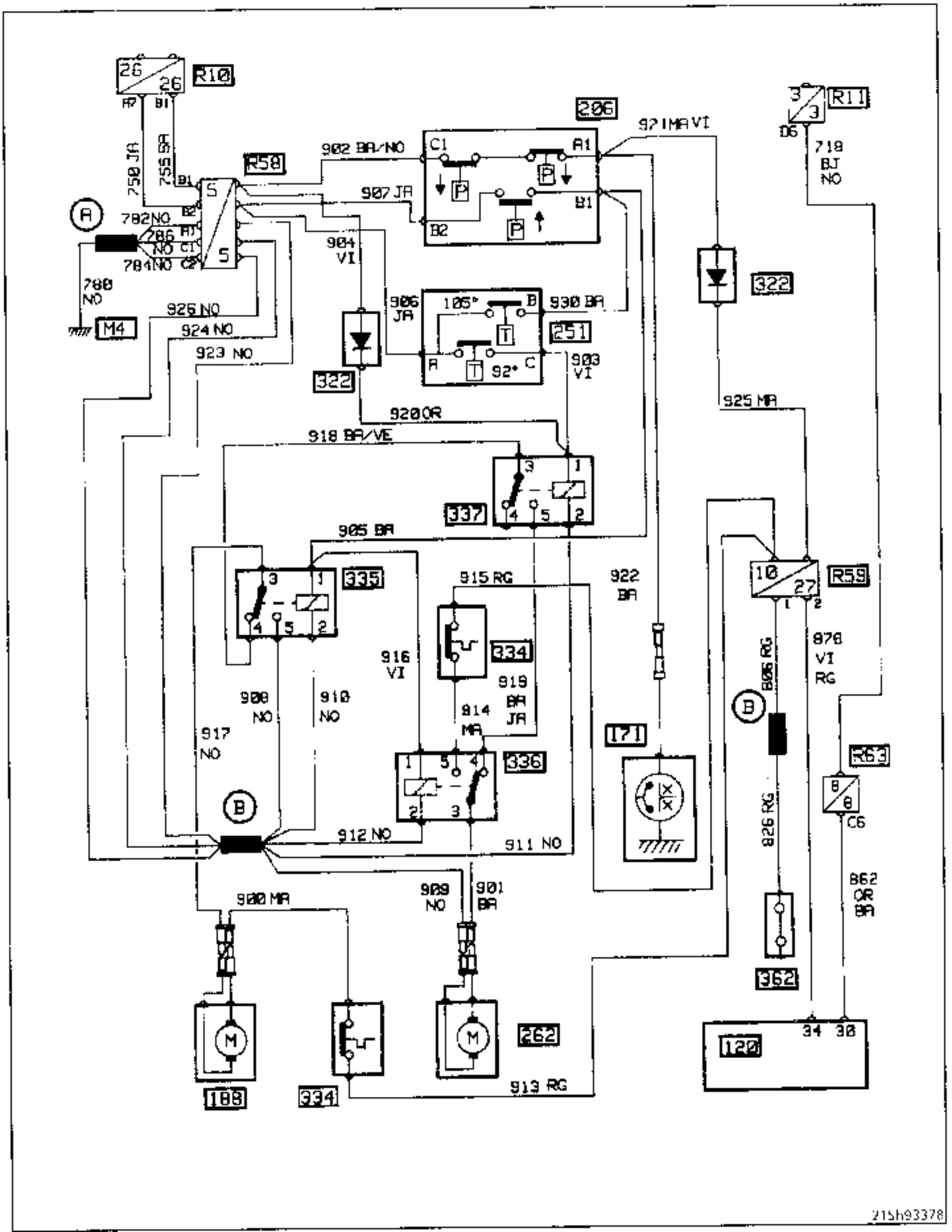


WIRING DIAGRAM - Engine end - F2N - 1990 model



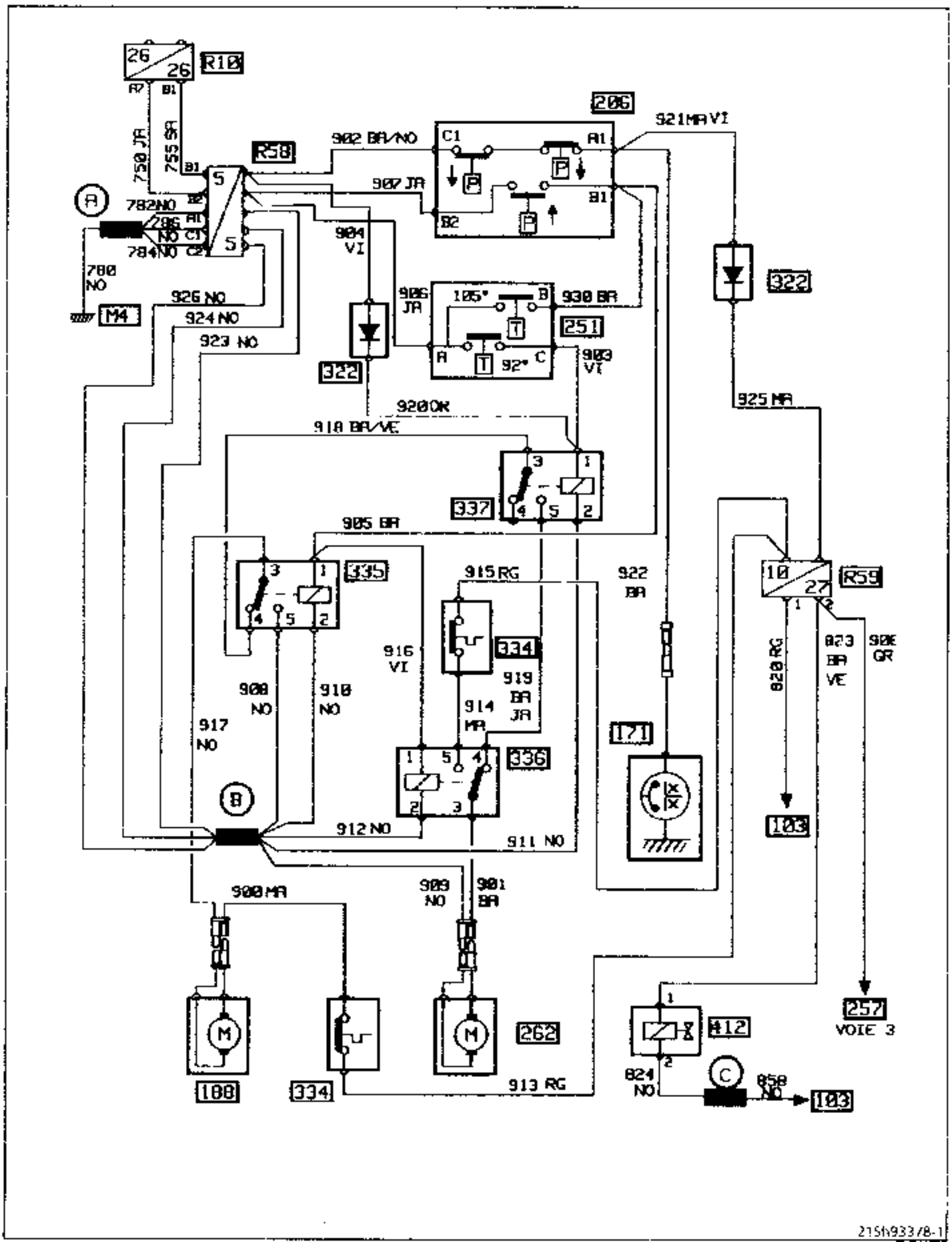
WIRING DIAGRAM - Engine end - F3N - 1990 model

WIRING DIAGRAM - In-line (longitudinal) engine end (petrol) - 1990 model



215h93378

WIRING DIAGRAM - In-line (longitudinal) engine (diesel) - 1990 model



21SN933/8-1

If one of the peripheral units of the temperature regulating system breaks down, the computer illuminates the "**SERVICE**" warning light and activates the various defect modes for the system, which can differ according to which components are defective.

DEFECT MODES IN THE EVENT OF AN INCIDENT

Incident detected	Warning light illuminated	Corresponding defect mode
Internal temperature sensor	"SERVICE"	- Value imposed : 21 °C Fan voltage imposed : minimum
External temperature sensor	"SERVICE"	- Value imposed : external temperature stored when incident occurred - Air inlet flap on external air position
Evaporator temperature sensor	"SERVICE"	- AC control on stop
Blown air temperature sensor	"SERVICE"	- Value imposed : external temperature stored when incident occurred
Fan assembly control potentiometer	"SERVICE"	- AUTO instruction for the air flow operating mode
Mixer flap copying potentiometer	"SERVICE"	- Extreme hot or extreme cold depending on external temperature - Air inlet in recirculation mode or external air mode depending on external temperature
Mixer motor	"SERVICE"	Value imposed : external temperature stored when incident occurred - Air inlet flap on external air position
Recirculation motor	"SERVICE"	Stop motor
Fan motor	"SERVICE"	- Stop motor, stop AC control
AC clutch current supply line	"SERVICE"	- Stop AC control

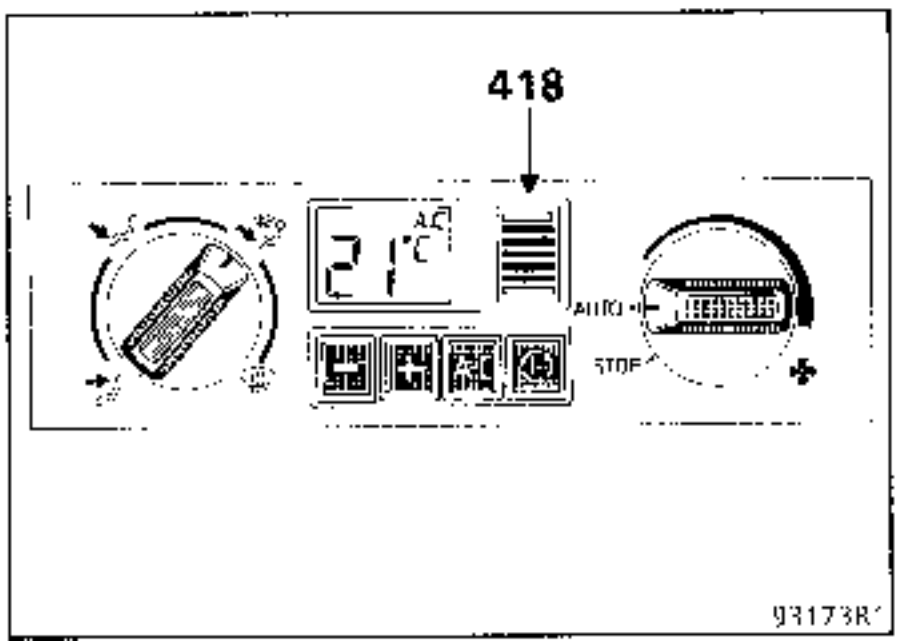
Checking blown air, external and internal temperature sensors

DEGREES CELSIUS	THERMAL RESISTANCE(Ω)
10	49000 to 60000
- 5	37300 to 45700
0	29000 to 35500
5	22500 to 27500
10	18000 to 21600
15	14000 to 17000
20	11300 to 13800
25	9000 to 11000
30	7300 to 8500
35	5800 to 7000
40	4700 to 5600
45	4000 to 4500

These values are given as an example and have no relevance to fault-finding as their thermal range is too great.

Internal temperature sensor (418)

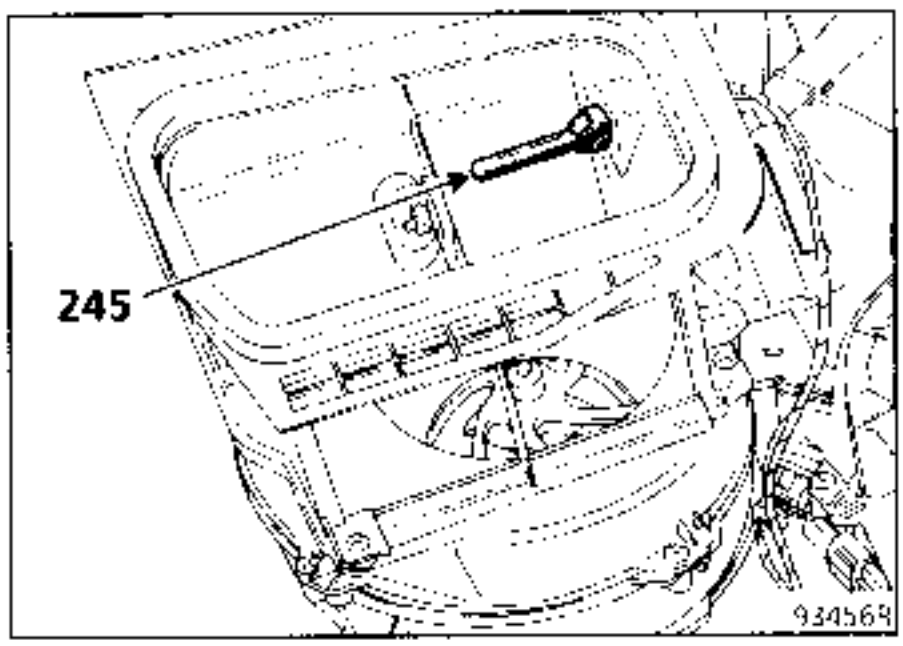
This is a thermistor with a negative temperature coefficient, integrated in the control panel printed circuit. If the sensor is faulty, the control panel will have to be replaced.



External temperature sensor (245)

This is a thermistor with a negative temperature coefficient located in the air conditioner air intake.

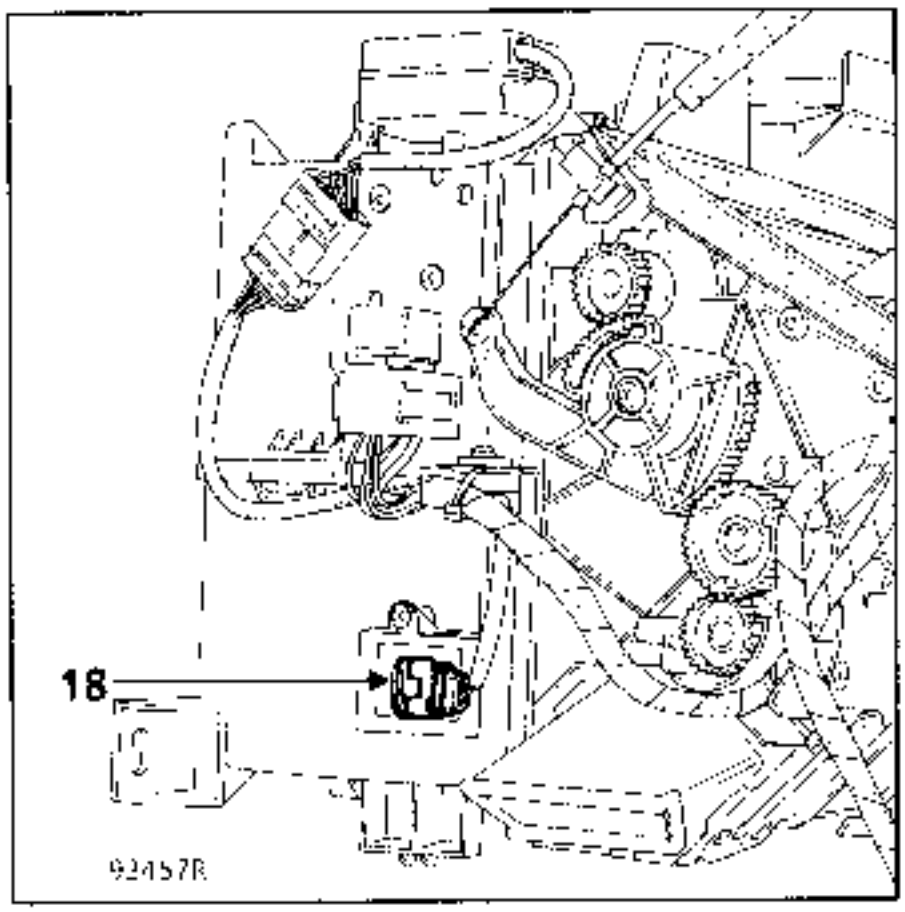
It is interchangeable and can be reached through the air intake duct at the water box end.



Blown air temperature sensor (18)

This is a thermistor with a negative temperature coefficient located downstream of the radiator.

It can be reached directly from inside the vehicle at the pedal assembly end and is located on the air conditioning heater device.



Checking the evaporator temperature sensor (408)

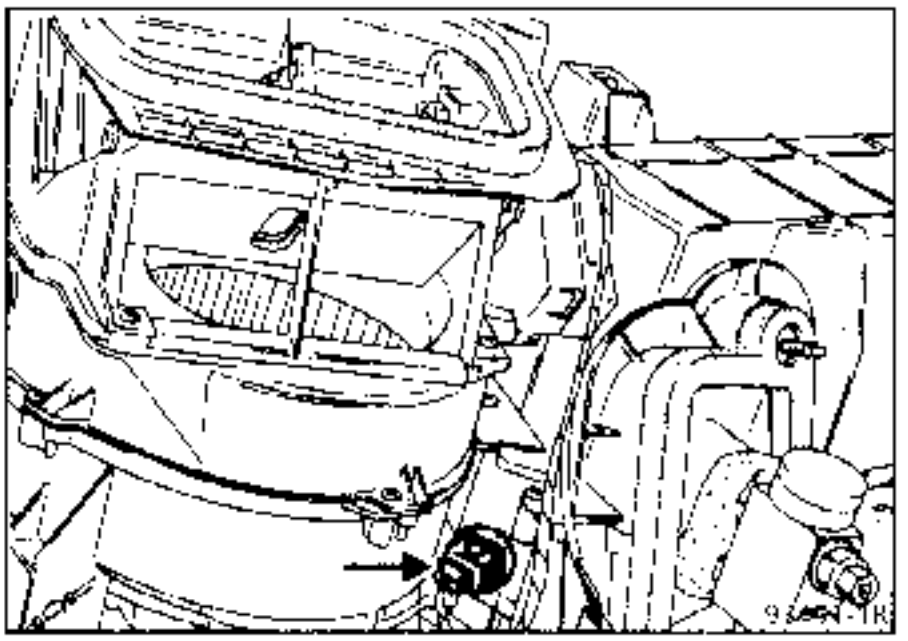
DEGREES CELSIUS	THERMAL RESISTANCE (Ω)
- 10	24300 to 30500
- 5	19000 to 23300
0	14700 to 18000
5	11400 to 14000
10	9000 to 11000
15	7100 to 8700
20	5600 to 6900
25	4500 to 5500
30	3600 to 4400
35	3000 to 3500
40	2400 to 2900
45	2000 to 2300

These values are given as an example.

Evaporator temperature sensor

This is a thermistor with a negative temperature coefficient, located in the evaporator.

It can be reached directly on the air conditioning heater device when the glove box and air conditioner soundproofing have been dismantled.



MIXER MOTOR (420)

the mixer flap is assisted by an electric motor with a potentiometer for checking the position of the flap.

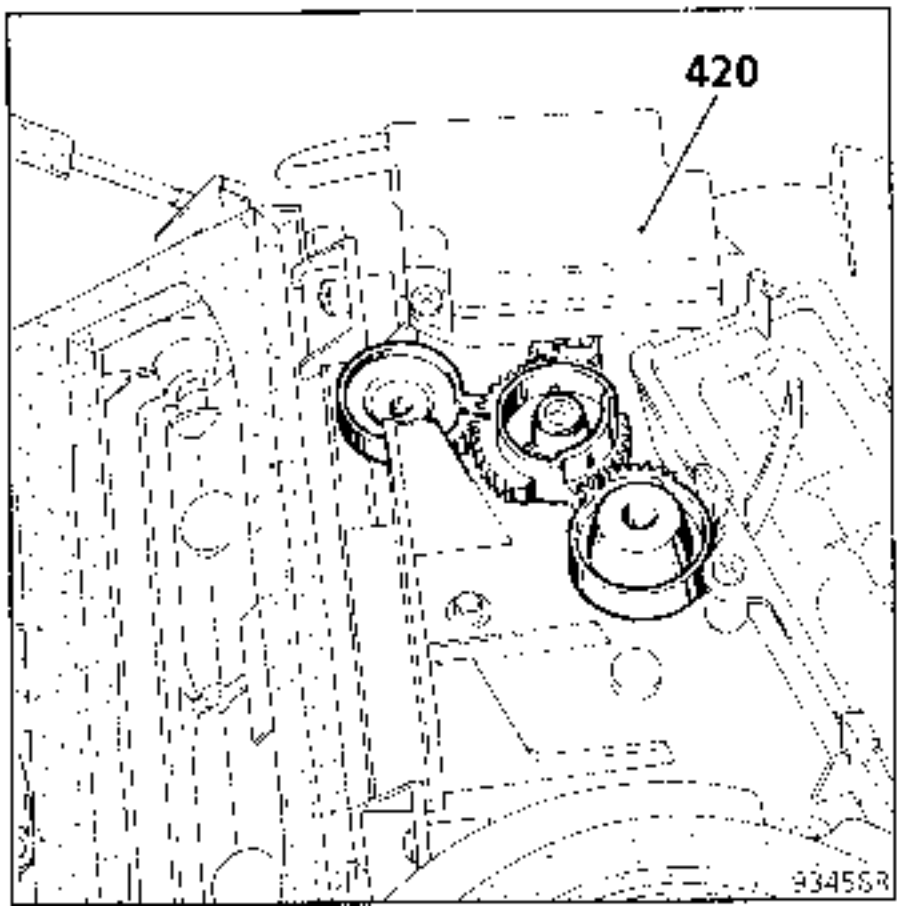
The motor is permanently supplied with approximately **7 volts** power in the extreme **HOT** or **COLD** settings.

In the intermediate setting, the voltage is **0 volts**.

The motor can be reached after the dashboard and the air conditioner have been dismantled.

If the motor has to be replaced, it is supplied with its connector and output drive gear. It is pre-set for fitting to the air conditioner

On refitting, the marks on the drive gears for the flap and motor **must be aligned**.

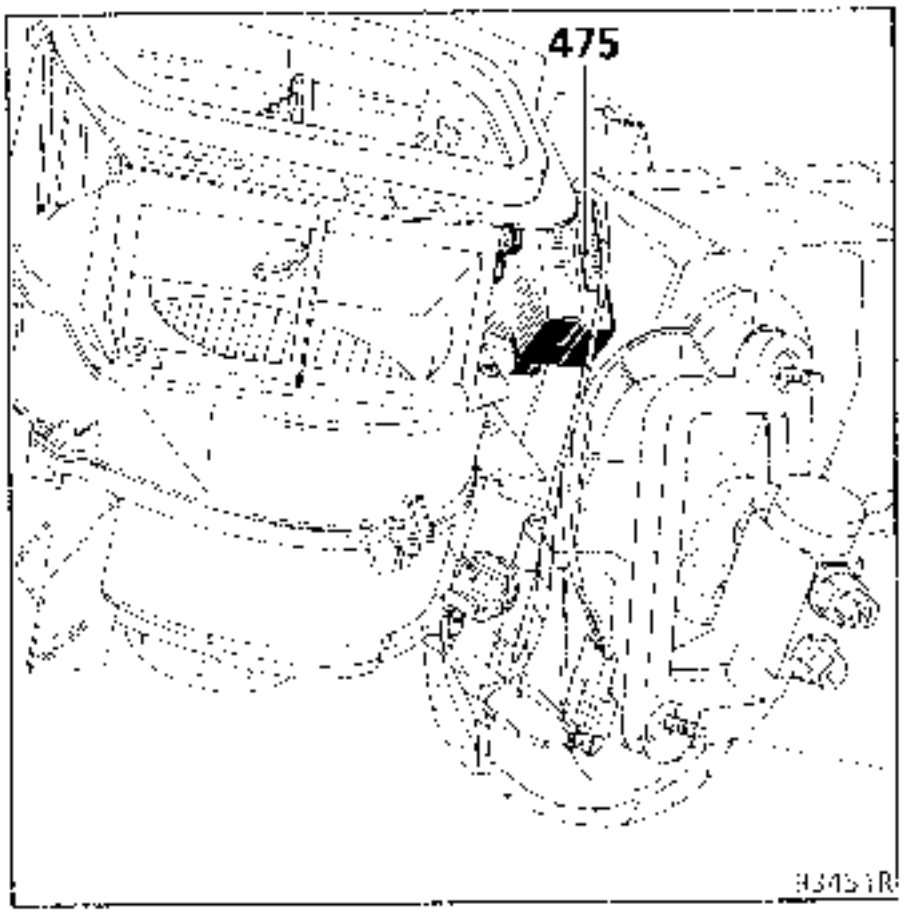


RECIRCULATING MOTOR (475)

The flap is moved by an electric motor which is always supplied with power and only stops in the extreme end setting.

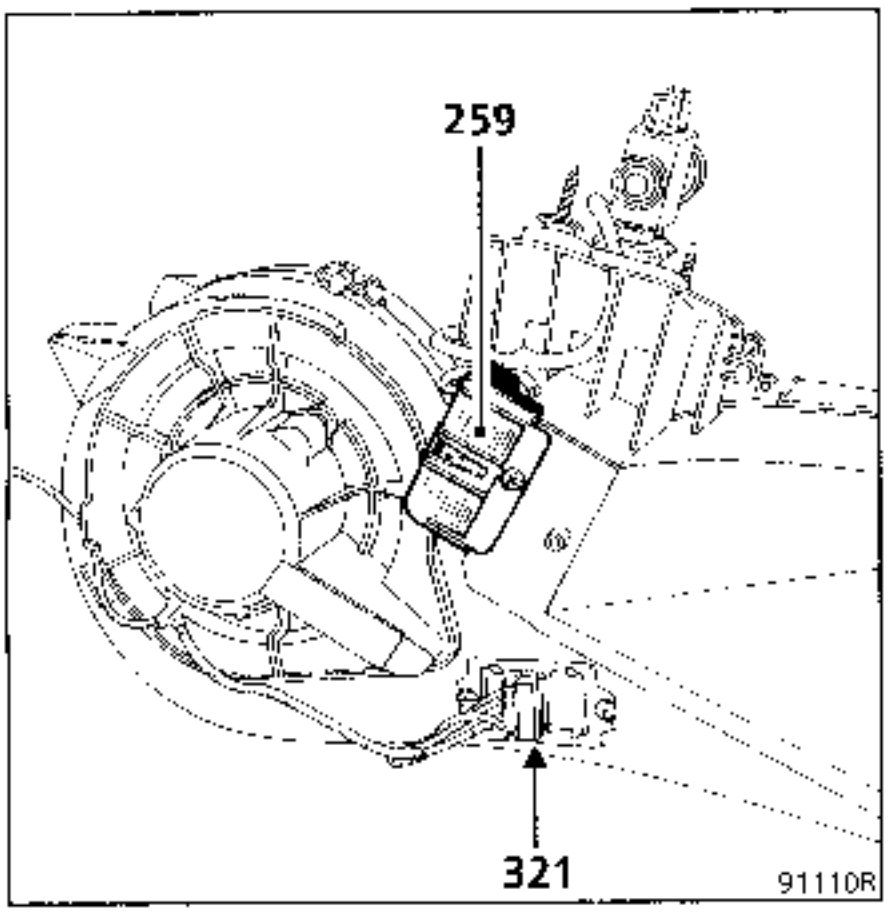
The recirculating motor can only be reached when the dashboard and air conditioner have been removed.

If the motor is replaced, the new one is equipped with a connector and lever.



FIXED THERMOSTAT

Fixed thermostat (**259**) is located under the air conditioning assembly, near the fan.



Remove the engine anti-noise shield under the dashboard.

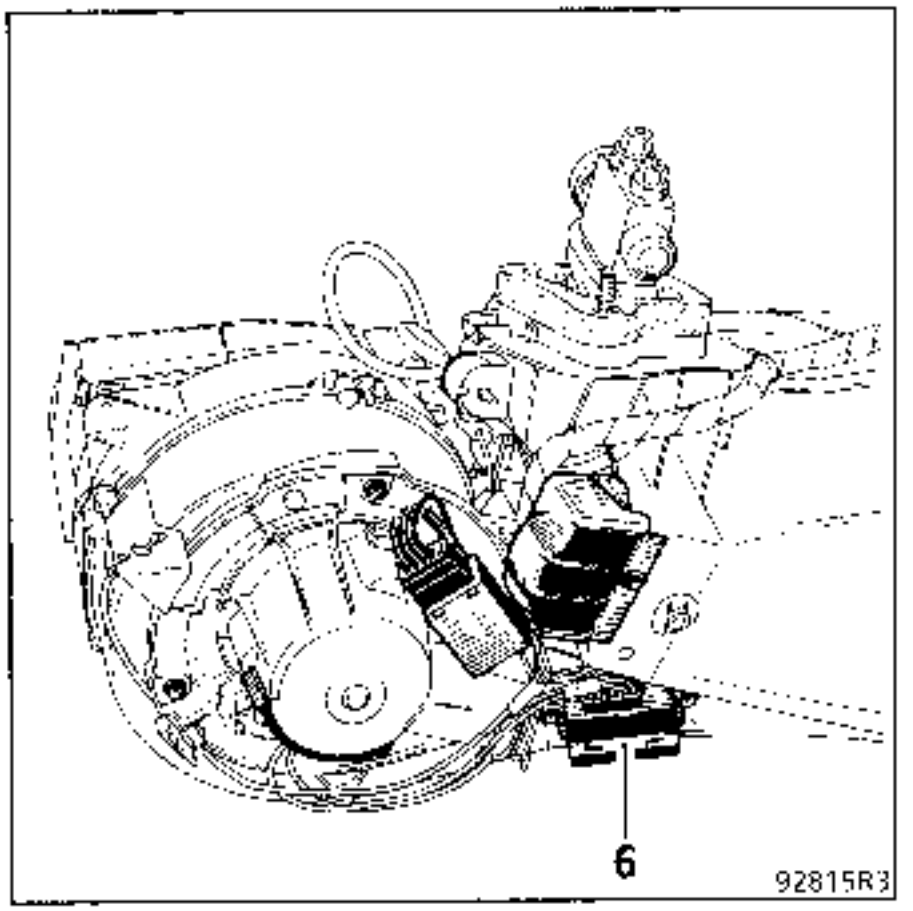
Remove the thermostat mounting screw.

Take out the thermostat, disengaging the thermostatic tube.

SPEED VARIATION DEVICE (6) OR FAN MOTOR RESISTORS (321)

These components are located under the air conditioning assembly, near the fan motor.

They are remove and refitted according to the method described on **page 61-39**.

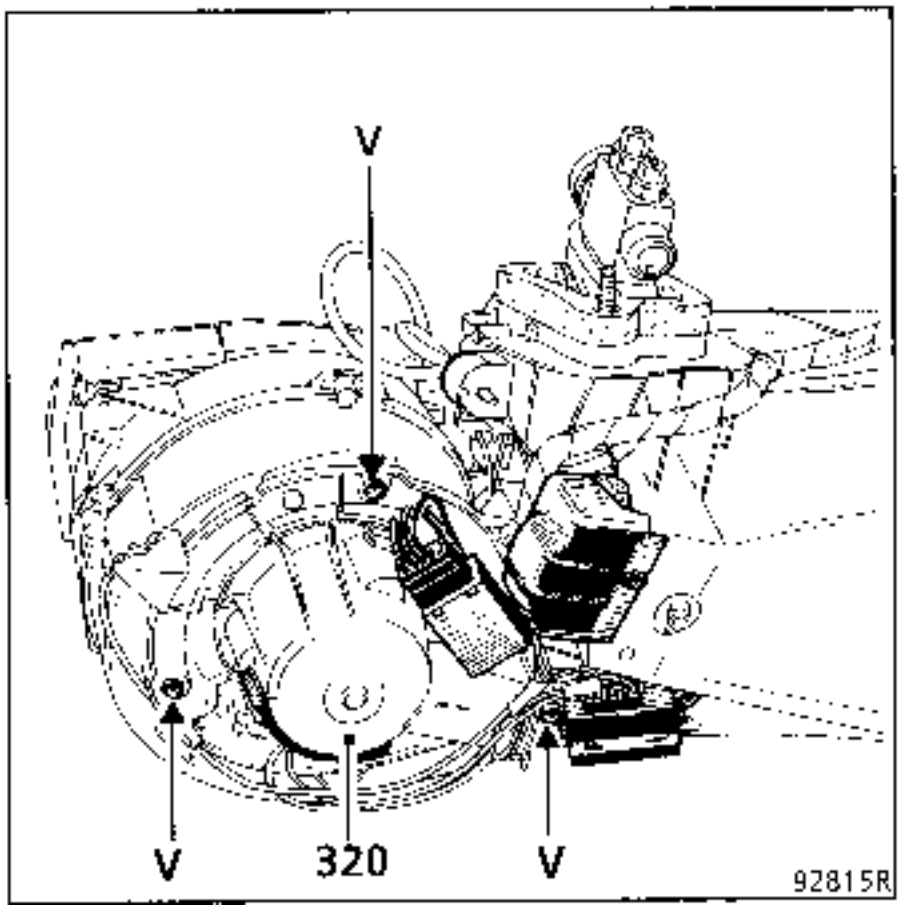


FAN MOTOR (320)

Fan motor (**320**) is reached through the passenger compartment.

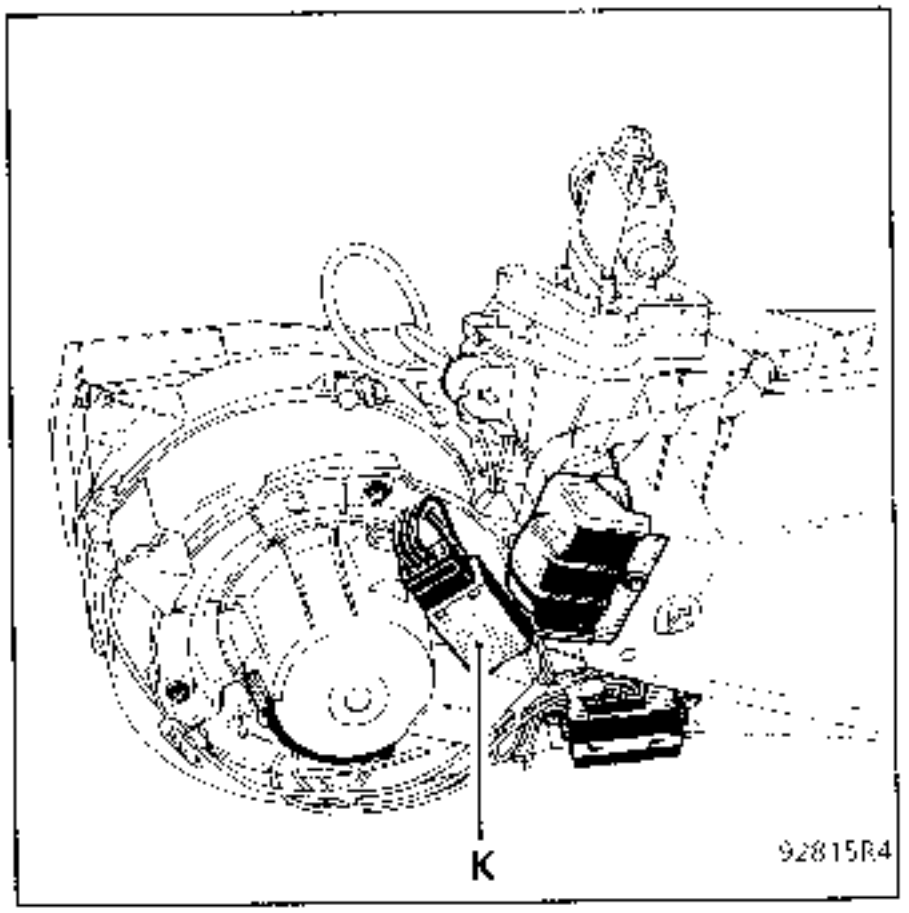
It is mounted on the air conditioner by means of three bolts (**V**).

It is removed when the righthand glove box and anti-noise shield have been removed.

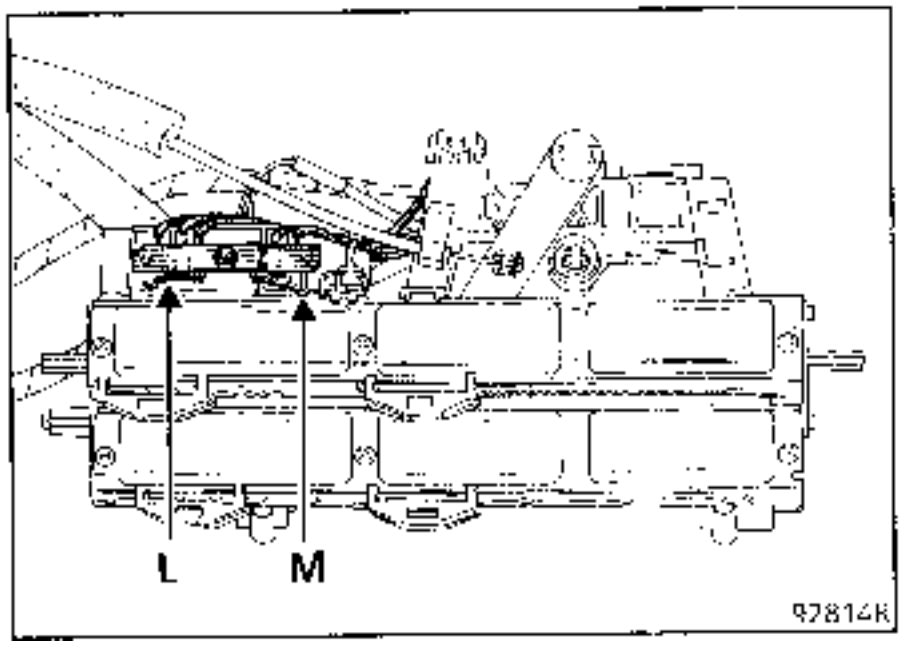


LOCATION OF THE CONTROL UNITS

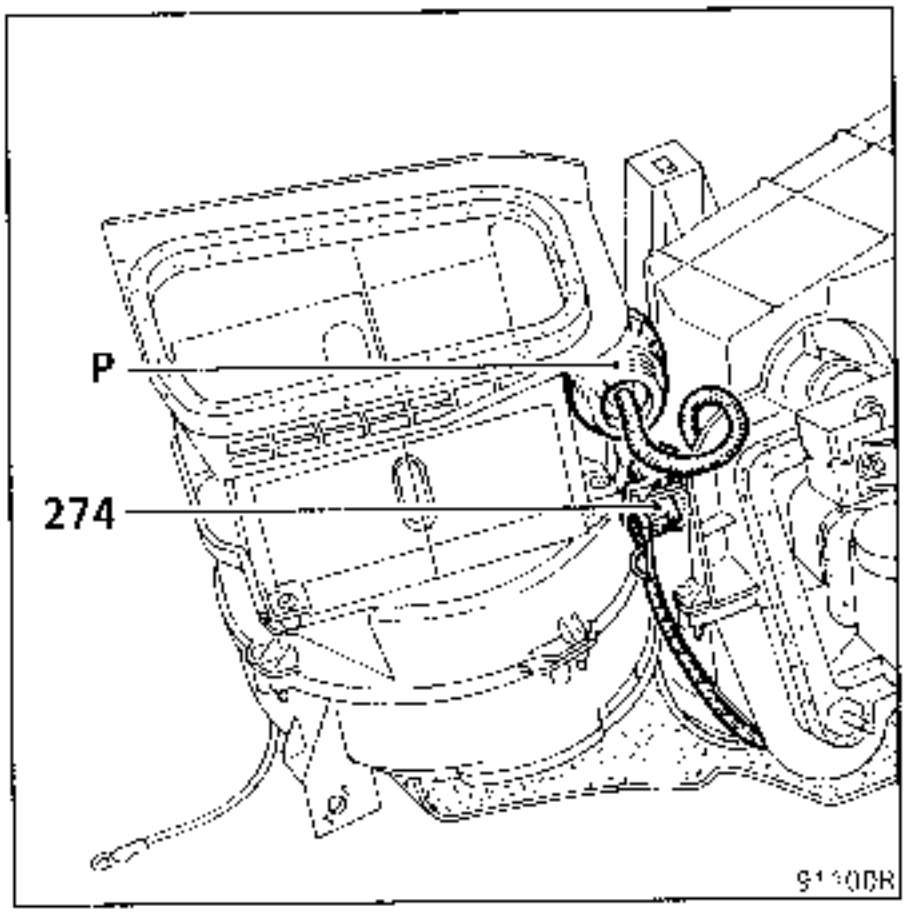
The third speed relay (**K**) is located under the air conditioning fan, near the fixed thermostat.



The micro-switches for controlling fan assembly relay (**L**) and fan assembly 4th speed relay (**M**) are under the control panel.



Solenoid valve (**274**) controlling the recirculating flap diaphragm is on the righthand side of the evaporator, near diaphragm (**P**).



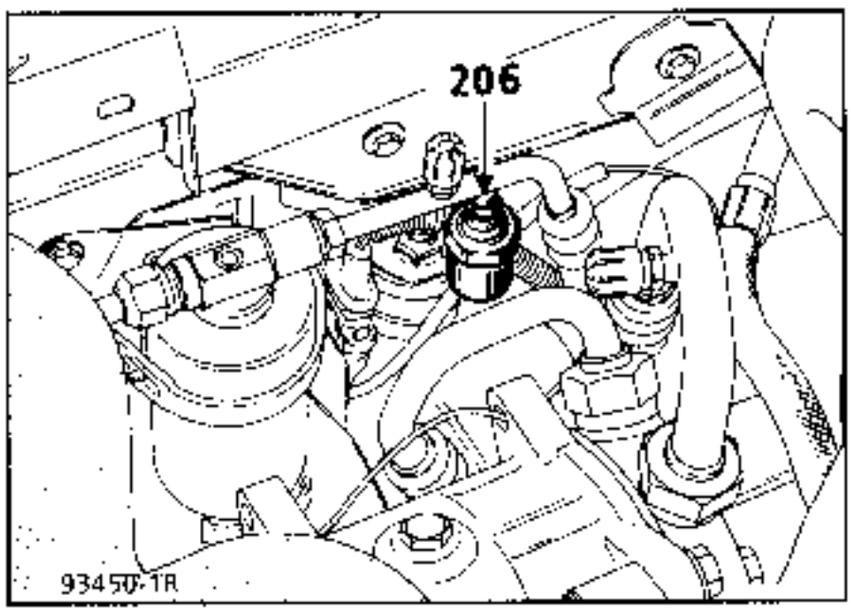
THREE-PURPOSE PRESSOSTATS (206)

The three-purpose pressostat for protecting the refrigerating system has the three following functions :

- low pressure (**2 bars**),
- high pressure (**27 bars**),
- cooling fan motor (**19 bars**).

The low and high pressure pressostats are mounted in series between **A1** and **C1** on the connector (see "**Engine harness**" wiring diagram).

The pressure for triggering the cooling fan motor is fed between **B1** and **B2** (see "**Engine harness**" wiring diagram).



All operations on the pressostat can be performed without the refrigerant circuit having to be drained as they are mounted on a **SKRADER** valve.

The compressors fitted to the **Renault 21** are of the **SANKYO** alternating axial type,
- type **SD 709-709** for the **J engine**,
- type **SD 510** for the **F engine**.

During model years **88** and **89** the **SD 709** compressors have been fitted as standard to all versions.

It is possible to check the compressor oil level.

For compressors with **5 pistons** :
- use a locally manufactured dipstick,

For compressors with **7 pistons** :
- level measured using a charging station when adding oil,
- when removing the compressor, drain the oil completely and refill with the recommended quantity.

NOTE : To contribute towards the environment the latest series of X48 vehicles are equipped with air conditioning system which use refrigerant fluid type R134a. See "**General**" section and the "**New Refrigerant R134a Air Conditioning**" workshop manual for its use.

For all other information concerning the maintenance of the compressors, consult the "**Air Conditioning**" workshop manual.

REMOVAL - REFITTING

Bleed the refrigerant circuit.

Disconnect the hoses and blank off the apertures at the compressor and hose ends.

Disconnect the electrical feed from the compressor.

If necessary, remove the compressor mounting strengtheners.

Slacken the drive belt.

Remove the compressor mounting bolts and the compressor itself.

NOTE : When refitting circuits operating with **R12** type refrigerant, the threaded unions are to be greased with ELF **RIMA 100** compressor oil.

On reassembly, check the compressor drive belt tension (see **section 11**).

REMOVAL - REFITTING

Disconnect the battery.

Drain refrigerant fluid circuits and the engine cooling circuit.

Disconnect engine coolant hoses from the radiator (C).

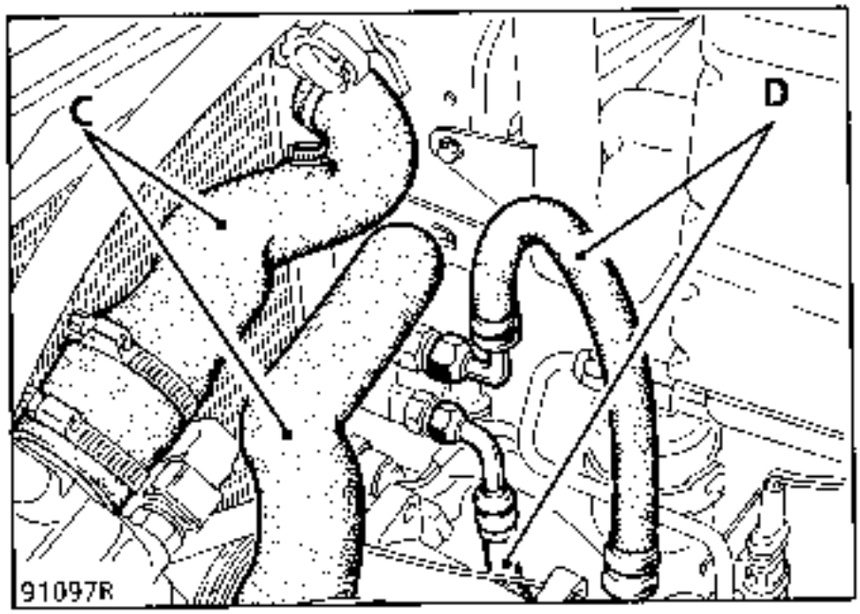
Disconnect the refrigerant fluid hoses from the condenser (D) (take care, the ends are very fragile).

Blank off the disconnected hoses and the ends of the condenser.

Disconnect the electrical connections for the fan motors.

Remove the upper cross member.

Take out the radiator condenser assembly.



On refitting, proceed in the reverse order to removal.

Top up the engine coolant (see "**Engine**" section) and top up the refrigerant fluid (see "**Air Conditioning**" workshop manual).

REMOVAL - REFITTING

The evaporator is located in the passenger compartment under the dashboard.

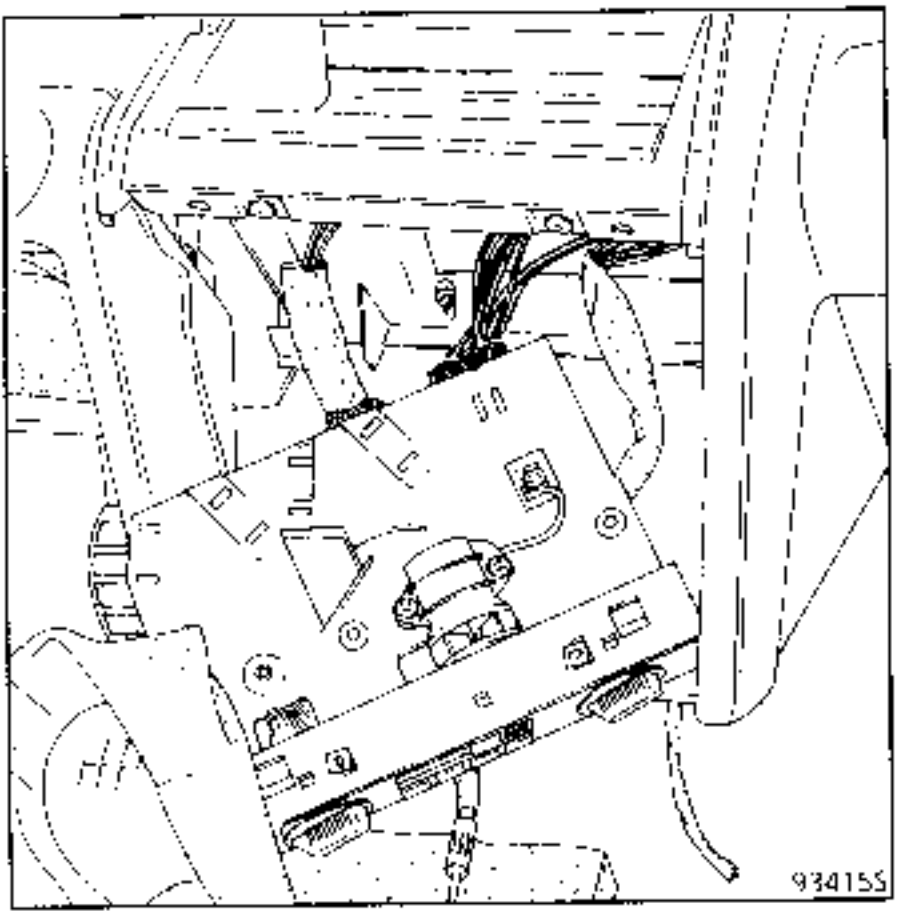
The evaporator can only be removed when the air conditioning assembly has been removed.

Disconnect the battery.

Remove the console and dashboard (see **MR 291** - "**Electrical**" section).

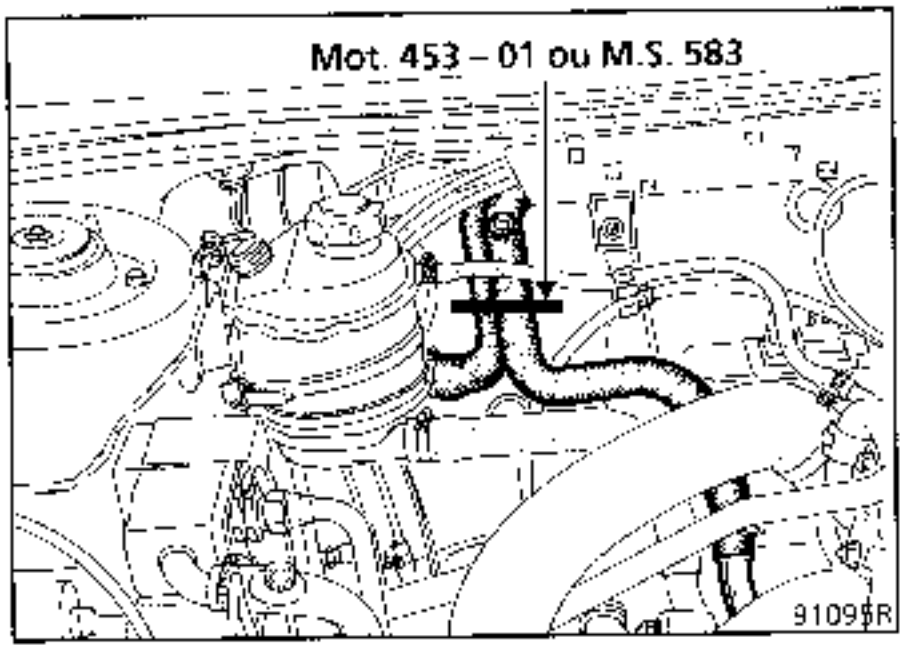
Leave the cable-controlled assembly coupled to the blower device.

Disconnect the block connectors.

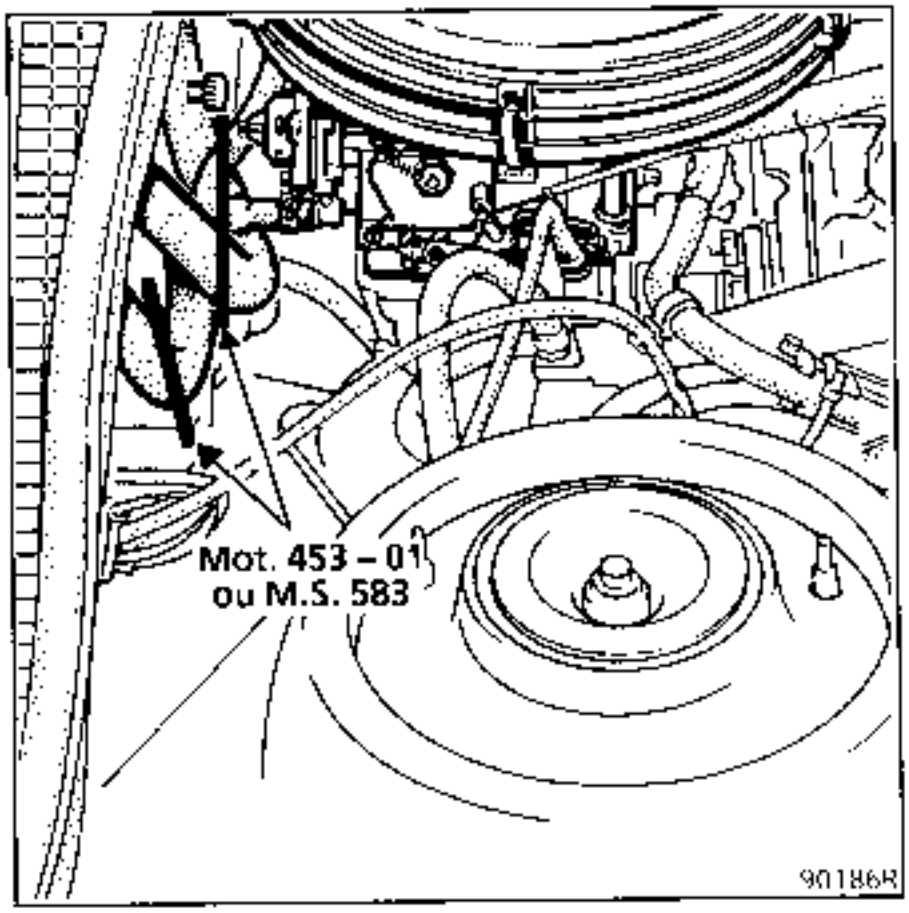


Fit clamps to the heater system coolant hoses (using tool **Mot. 453-01** or **M.S. 583**).

IN-LINE ENGINE



TRANSVERSE ENGINE



REMOVAL - REFITTING (continued)

Disconnect the following hoses :

- radiator coolant hose,
- relief valve refrigerant hose,
- vacuum chamber low pressure hose (thin hose).

Blank off the apertures in the refrigerant and relief valve hoses.

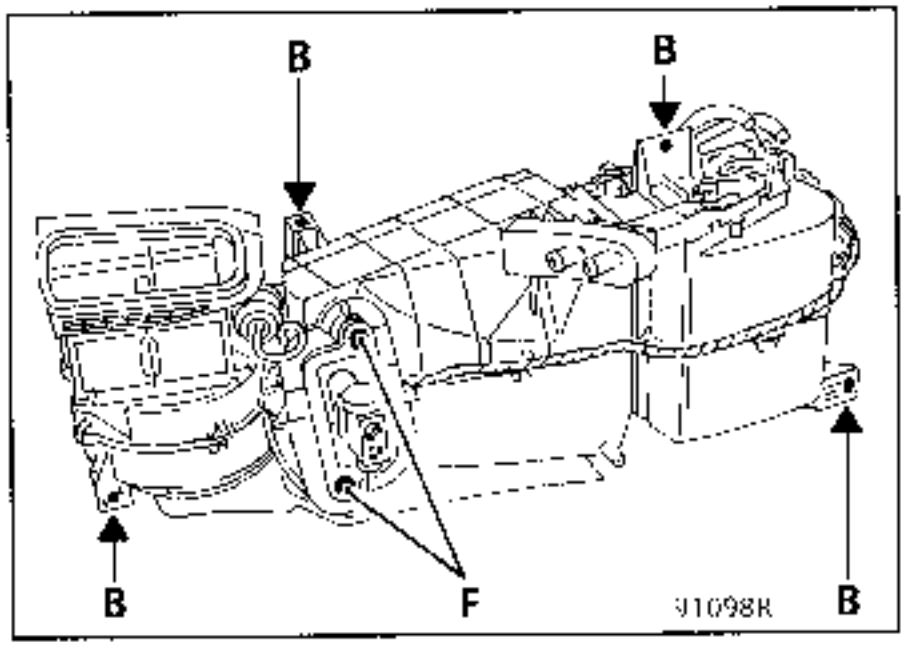
Remove the expansion bottle and low pressure chamber.

Remove the two nuts (**F**) securing the relief valve on the bulkhead.

Remove the four bolts (**B**) securing the air conditioner to the bulkhead.

Remove the air conditioning assembly, by freeing it at the rear.

REFITTING



Proceed in the reverse order to removal.

Ensure that the air conditioner is perfectly leaktight when mounted on the bulkhead.

Top up the engine coolant (see "**Engine**" section).

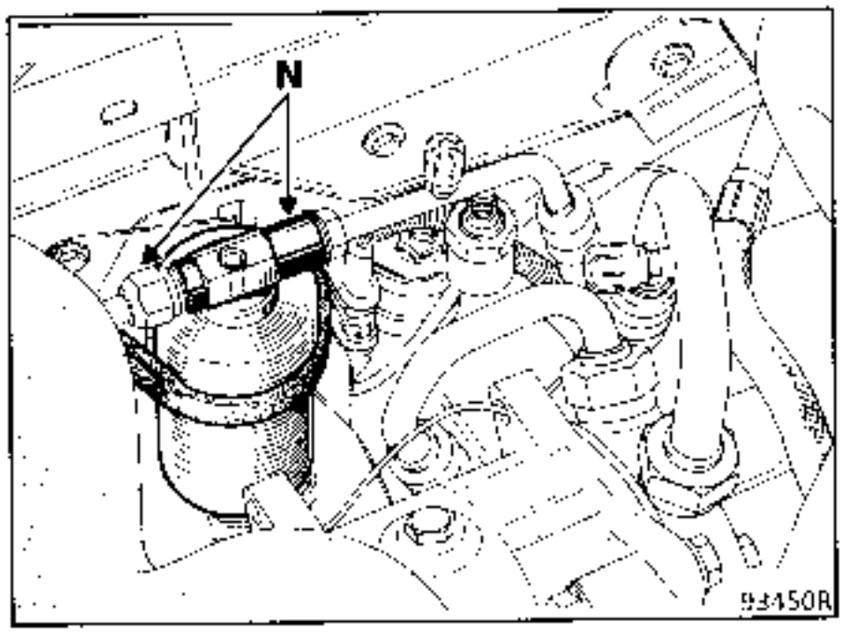
Fill the refrigerant fluid system (see "**Air Conditioning**" manual).

REPLACING

Drain the refrigerant circuit using the charging unit (see method described in the "Air Conditioning" manual).

Disconnect connection hoses (N).

Fit plugs to the apertures.



On reassembly, oil the threads using compressor oil and ensure that the seals are in good condition.

LOCATION OF COMPONENTS

171 Air conditioning clutch
188 Cooling fan motor assembly
248 Fan motor thermal switch
262 Air conditioning cooling fan assembly
322 Air conditioning diode
334 Thermal cut-out
335 Fan motor 1st speed relay
336 Fan motor 2nd speed relay
337 Fan motor 3rd speed relay
362 Battery + terminal plate

M4 Bodywork earth
R21 Engine/fan motor assembly
R58 Fan motor assembly/righthand side member
R75 Fan motor assembly earth/fan motor assembly