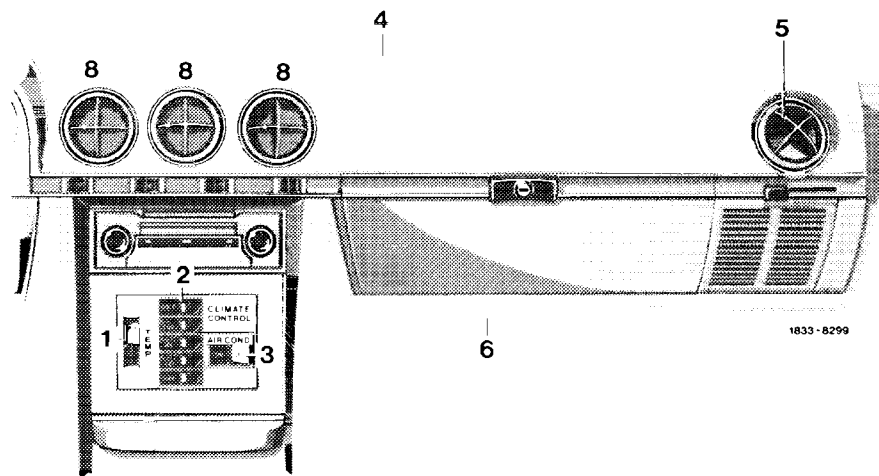


A. General



- | | | |
|--|------------------------------------|-----------------------------|
| 1 Temperature dial | 4 Air outlet from defroster nozzle | 6 Air outlet in legroom |
| 2 Pushbutton switch | 5 Lateral ventilation | 8 Cooling air outlet center |
| 3 "ON/OFF" switch refrigerant compressor | | |

The automatic climate control system is provided with an automatic temperature control, by means of which a given temperature between 18 °C to approx. 30 °C (64 °F to 86 °F) can be set, which will then be maintained automatically and independent of changes in outside (ambient) temperature.

Apart from the automatic control which is covered in detail below, the basic components of the heating and air conditioning system are similar to those described in repair instructions air conditioning system I.

The automatic climate control system comprises the following main components:

Control unit (with temperature dial, pushbutton switch and "ON/OFF" switch for refrigerant compressor).

In-car and ambient temperature sensor

Amplifier

Regulating valve

Electrical and vacuum system for controlling entire installation

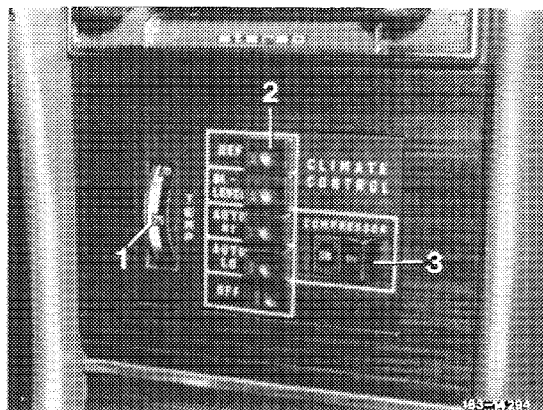
Temperature control

B. Control unit

The control unit is located in dome and comprises a temperature dial (1), a pushbutton switch (2) and the refrigerant compressor "ON/OFF" switch (3). The temperature dial (1) serves to adjust vehicle inside temperatures from 18 °C to approx. 30 °C (approx. 64 °F to 86 °F).

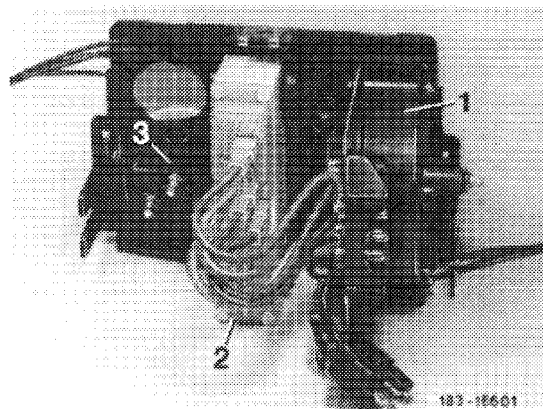
Layout of control unit

- 1 Temperature dial
- 2 Pushbutton switch
- 3 "ON/OFF" switch refrigerant compressor



The temperature dial carries 5 numerals (65 — 70 — 75 — 80 — 85) to set the desired temperature. Turning of temperature dial will adjust a resistance potentiometer. Together with the inside and outside temperature sensor (in-car and ambient temperature sensor) the potentiometer provides the desired value for temperature control.

- 1 Temperature dial with potentiometer
- 2 Pushbutton switch
- 3 "ON/OFF" switch of refrigerant compressor



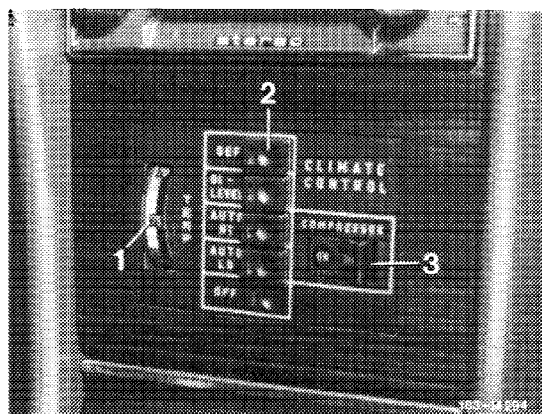
The pushbutton switch (2) is a component of the control unit (controller) and comprises 5 pushbuttons:

OFF — blower switched off, no fresh air input.

The electronic system continues to operate while driving and the regulating valve remains in operating position. The fresh air flap in blower housing is closed and the refrigerant compressor is inoperative.

AUTO-LO — for normal driving

In cooling range the system operates with 5 blower stages, in heating range with 4 stages. The max. blower speed in cooling range is higher than the max. blower speed in heating range. The temperature is held to preselected level. In heating range, the heating begins to operate only when the coolant has attained 40 °C (approx. 104 °F). The main air flap will open only then and the blower will be switched on. In cooling range, the blower will usually start immediately.



In heating range, tempered air will flow out of leg-room jets, with a leak air share from defroster jets. In cooling range, cool air will come out of center jets and lateral jets, with a leak air share from defroster jets (up to July 1978, starting August 1978 no leak air during cooling operation). The changeover is automatic. In addition, tempered air will always come out of the lateral venting jets. Closing and opening of the jets is always manually.

AUTO-HI — with higher blower output

Function similar to "AUTO-LO", but with higher blower stages. In cooling range, the system operates with 3 stages, in heating range with 2 stages.

This kind of adjustment permits:

1. Maintaining a pleasant temperature also in city traffic, when the air supply decreases due to a lower driving speed.
2. Providing enough fresh air for passengers on rear seats also under extreme temperature conditions.
3. Fast evacuation of cigarette smoke.

BI-LEVEL — under fog conditions

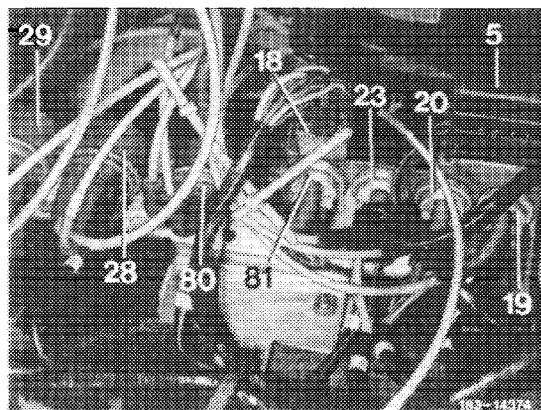
The blower operates in the higher stages 1 and 2 and will start already at a coolant temperature below 40 °C (104 °F). When "heating", all the air will enter through defroster jets into legroom and through jets of lateral ventilation; when "cooling" through defroster jets into legroom, at center jets and jets of lateral ventilation, if they are open. The air is tempered in accordance with the setting of temperature dial and in-car temperature. This function serves the purpose of removing the fog from the windows. In addition, this mode is particularly recommended at low outside temperatures.

DEF — defrosting windows

The blower starts immediately and operates in higher 4th stage. Max. heated air flows out of defroster jets, independent of ambient or in-car temperature or adjustment of temperature dial (83–605).

Note: In position "DEF" the blower is immediately switched on independent of the vacuum directly via double contact relay (18), and in position "BI-LEVEL" by means of a vacuum circuit. But if at a coolant temperature below 40 °C (104 °F) the mode "AUTO-LO" or "AUTO-HI" is subsequently pushed, the blower remains engaged, since the main switch (19) is already activated by a vacuum. In such a case, the blower can only be switched off by way of the position "OFF" when the coolant temperature is above 40 °C (104 °F).

- 5 10-point plug connection for tester
- 18 Double contact relay
- 19 Vacuum switch (main switch, green)
- 20 Vacuum switch (refrigerant compressor, yellow)
- 23 Vacuum switch for refrigerant compressor (only at "BI-LEVEL")
- 28 Switchover valve legroom flap
- 29 Switchover valve fresh air flap
- 80 Switchover valve "BI-LEVEL" (at "DEF")
- 81 Vacuum switch (at "BI-LEVEL" only)

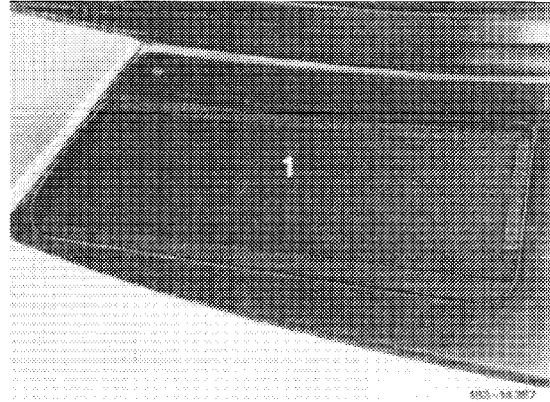


Main air flaps

As before, model 107 has two main air flaps for air guide at left and right in front of windshield.

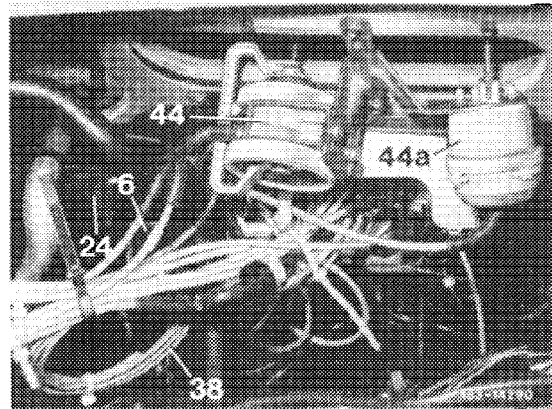
One double-acting and one single-acting vacuum element for actuating these flaps are located at bottom surface. The double-acting vacuum element (43 and 44) supports by means of the single-acting vacuum element (43a and 44a) the operation of the flaps in two switching functions.

1 Main air flap

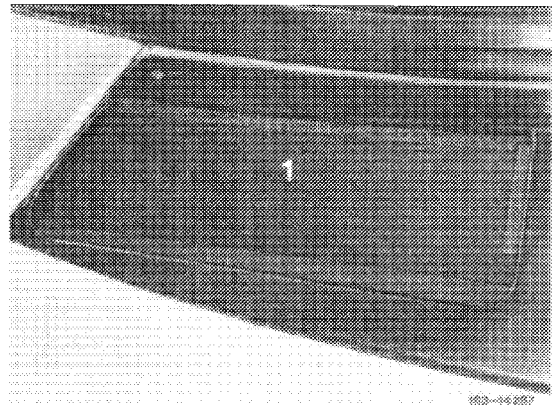


Layout of vacuum elements at right, mirror image at the left

- 6 Amplifier
- 24 ETR-switch
- 38 Specified leak point
- 44 Double-acting vacuum element
- 44a Single-acting vacuum element



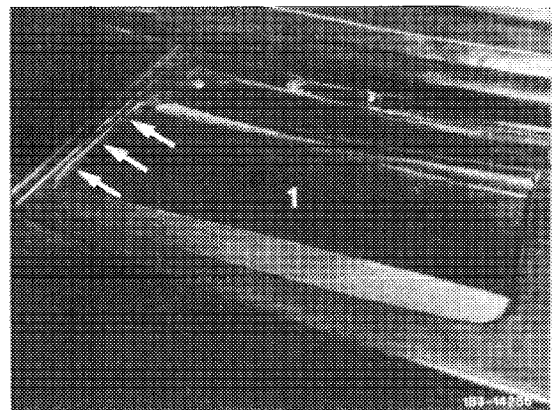
With the flaps in opened condition (fresh air) all vacuum elements for the main air flaps are energized by a vacuum, while in position "OFF" only the vacuum elements (43 and 44) are likewise energized, while the single-acting vacuum elements (43a and 44a) are held closed by the spring force of the flaps.



The vacuum elements (43a and 44a) also serve the purpose of keeping flaps (1) in closed condition with the engine stopped and a slowly decreasing vacuum by way of the specified leak point (38) or when driving under ambient air conditions.

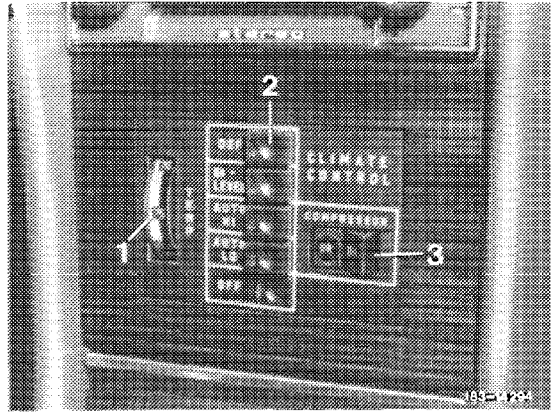
The flap position "closed" also corresponds to the "ambient air" position. In this position, fresh air is fed to vehicle interior at the point identified by the arrows.

1 Main air flap in position "closed" or "ambient air"



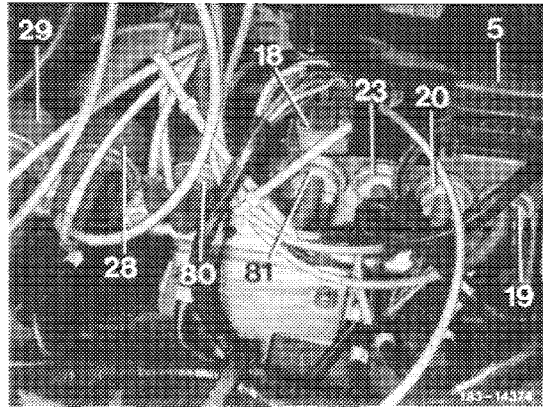
ON/OFF switch refrigerant compressor

Since the refrigerant compressor is always operating at an ambient temperature above 2 °C (36 °F), the compressor can be completely switched off in positions "AUTO-LO" and "AUTO-HI"; e.g. to save fuel or if no cooling is desired. However, the refrigerant compressor will nevertheless run along in modes "BI-LEVEL" and "DEF" to support the effect of this mode by drying the air.



In position "OFF" of refrigerant compressor switch (3) and in range of max. cooling, the switchover valves (28 and 29) will open main air flaps in evaporator housing into position of 100 % fresh air, as well as flaps in center air duct for legroom under air conditioner unit.

- 5 10-point plug connection for tester
- 18 Double contact relay
- 19 Vacuum switch (main switch, green)
- 20 Vacuum switch (refrigerant compressor, yellow)
- 23 Vacuum switch for refrigerant compressor (at "BI-LEVEL" only)
- 28 Switchover valve legroom flap
- 29 Switchover valve fresh air flap
- 80 Switchover valve "BI-LEVEL" (at "DEF")
- 81 Vacuum switch (at "BI-LEVEL" only)

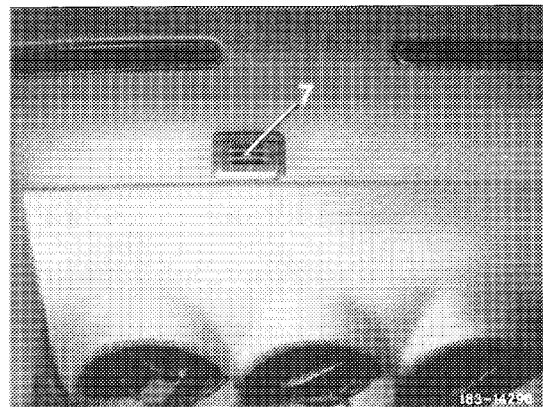


C. In-car and ambient temperature sensor

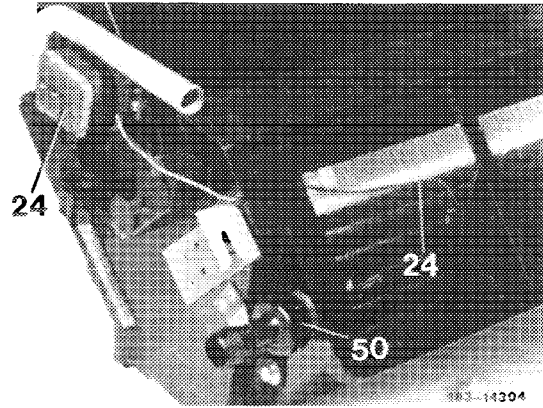
The in-car temperature sensor (7) is located under a grille at top inside instrument panel. The sensor feels the in-car temperature and transmits that temperature to the amplifier (6) to balance the temperature as set.

Layout of in-car temperature sensor

7 In-car temperature sensor

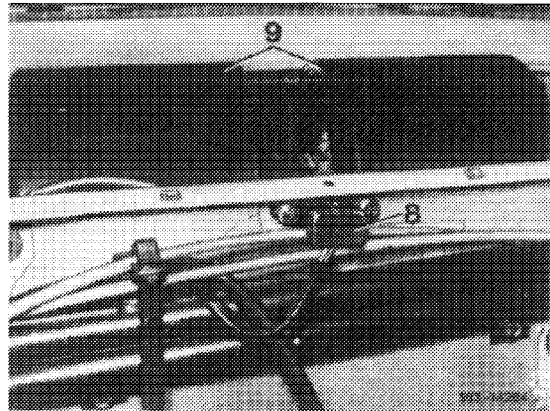


An air jet nozzle (50) attached to air conditioner unit will draw air from interior of vehicle by way of the in-car temperature sensor while the blower is running. As a result, the response period of this sensor is shortened and the control accuracy is increased.



24 ETR-switch with capillary
50 Air jet nozzle

The ambient air temperature sensor (8) for the drawn-in fresh air is located in air duct (water tank) in front of blower. With the blower running, the fresh air is constantly circulating around sensor, which in turn results in a short response period. Both sensors are temperature-sensitive resistors (thermistors) and are connected in series with potentiometer on temperature dial.



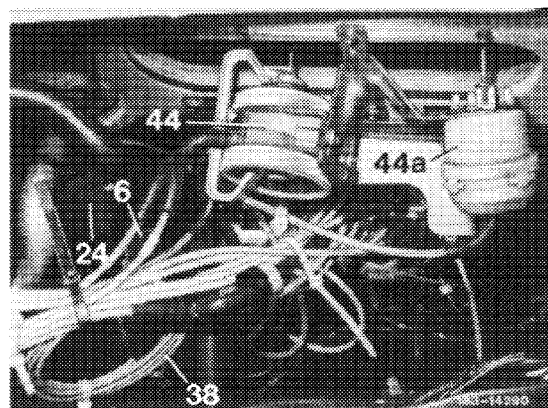
Layout of ambient air temperature sensor

8 Ambient air temperature sensor
9 Blower

D. Amplifier

The amplifier (6) is attached to a holder at the right of air conditioner unit and compares the entire resistance of the chain: in-car temperature sensor, ambient temperature sensor, adjusting potentiometer and feedback potentiometer with a fixed resistor in amplifier. If the above are not in balance, a difference in potential will result which, in amplified condition, will drive the servomotor in regulating valve until both resistors are again in balance.

With the ignition switched off, the amplifier will signal the regulating valve to move into "parking position" (2nd cooling stage) independent of the sensor temperatures and temperature adjustment. When the "DEF" button is pushed, the amplifier will signal the regulating valve to move into position for max. heating (higher 4th stage "DEF"), again independent of the temperature setting or the sensor temperatures.

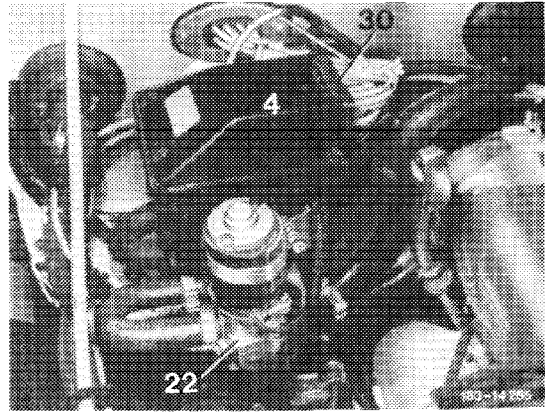


E. Regulating valve

The regulating valve (4) is driven by a gear motor and runs through the positions from max. heating to max. cooling, while adjusting a feedback potentiometer by means of which the amplifier (6) regulates the respective position. The following adjustments are made while running from heating to cooling:

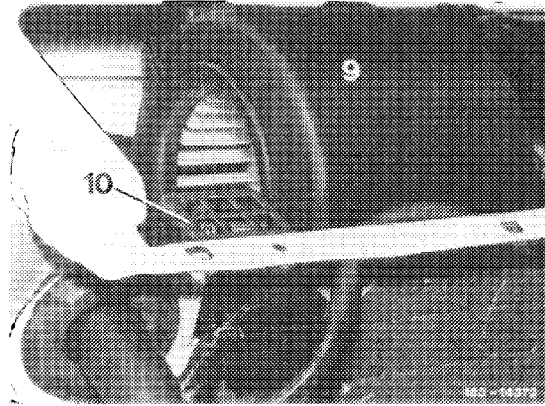
Layout of regulating valve with heating water pump

- 4 Regulating valve
- 22 Heating water pump
- 30 Vacuum lines



- a) The water valve which controls the heating water flow from max. flow to 0.
- b) Sliding contacts for connection of pre-resistance group (10), for all blower stages.
- c) The vacuum valve, which controls the various flap positions of the air outlet jets and the main air flaps.

- 9 Blower
- 10 Pre-resistance for blower



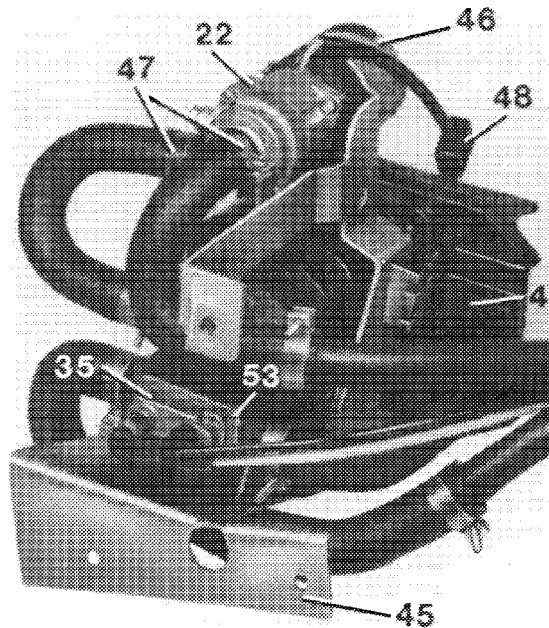
F. Electrical and vacuum system for controlling entire installation

a) Temperature switch for blower (cold engine lock)

This switch (35) is at bottom of regulating valve (4) and consists of a bimetallic vacuum switch. The switch releases vacuum starting at a coolant temperature of 40 °C (104 °F) or at an ambient temperature of above 20 °C (68 °F). In position "AUTO-LO" or "AUTO-HI" the blower will start only if one of the specified temperatures is attained. The temperature switch (35) can be individually replaced.

Layout of temperature switch in regulating valve

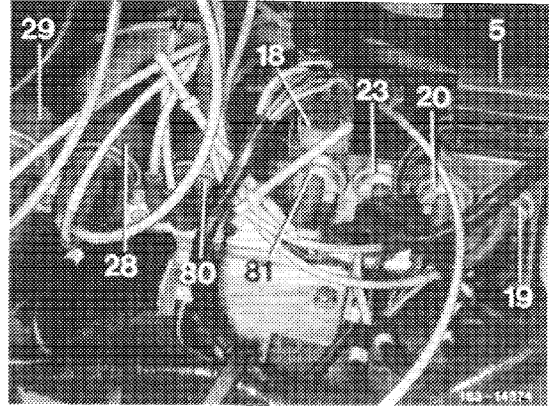
- 4 Regulating valve
- 22 Heating water pump
- 35 Temperature switch (water valve)
- 45 Holder
- 46 Clamp
- 47 Hose clamp
- 48 Electric plug
- 53 Screw



183-18593

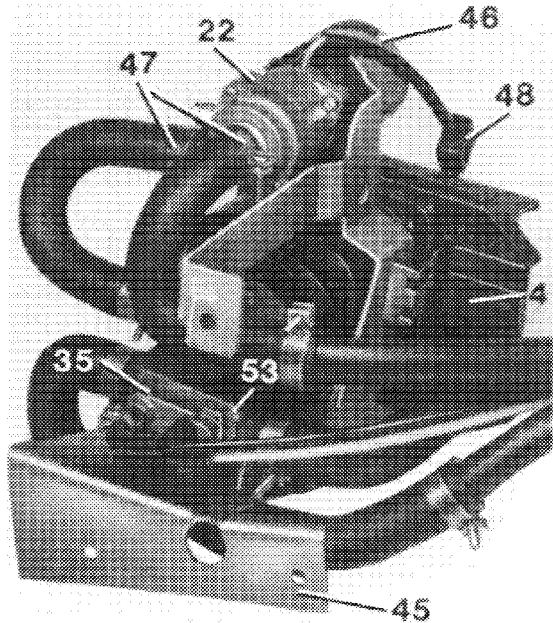
b) Vacuum solenoid switch (main switch)

This switch (19), color code green, is actuated by a vacuum. The vacuum arrives by way of temperature switch (35) and engages the blower, if set to "AUTO-LO" or "AUTO-HI" and a vacuum of more than 175 mbar (0.18 atu) is applied. In position "DEF" the blower is switched in directly via double contact relay (18) independent of blower.



c) Vacuum solenoid switch for refrigerant compressor

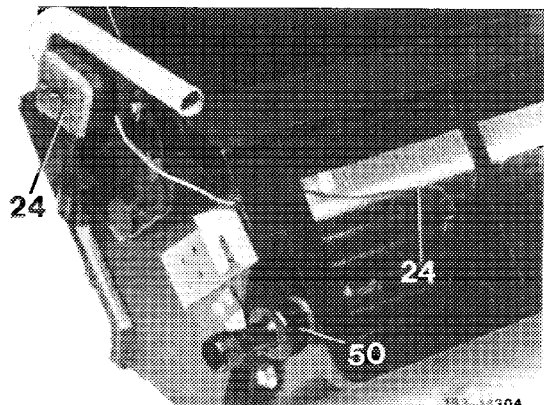
This switch (20), color code yellow, is also actuated by a vacuum. The vacuum is also supplied via temperature switch (35) and engages the refrigerant compressor if a vacuum of more than 78.5 mbar (0.08 atu) is available and if the pressure switch (25) and the ETR-switch (24) have an unobstructed passage (refer to 83-612).



Layout of temperature switch in regulating valve

- | | | | |
|----|----------------------------------|----|---------------|
| 4 | Regulating valve | 46 | Clamp |
| 22 | Heating water pump | 47 | Hose clamp |
| 35 | Temperature switch (water valve) | 48 | Electric plug |
| 45 | Holder | 53 | Screw |

103-10503



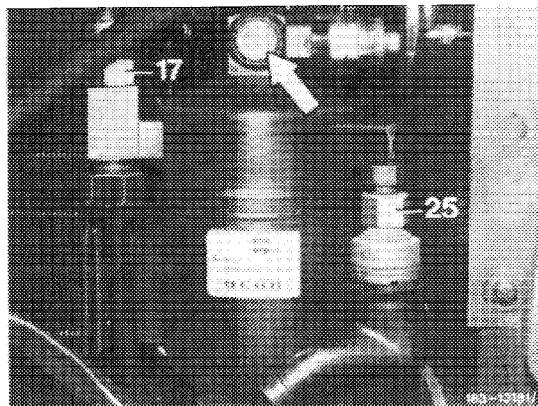
Layout of ETR-switch

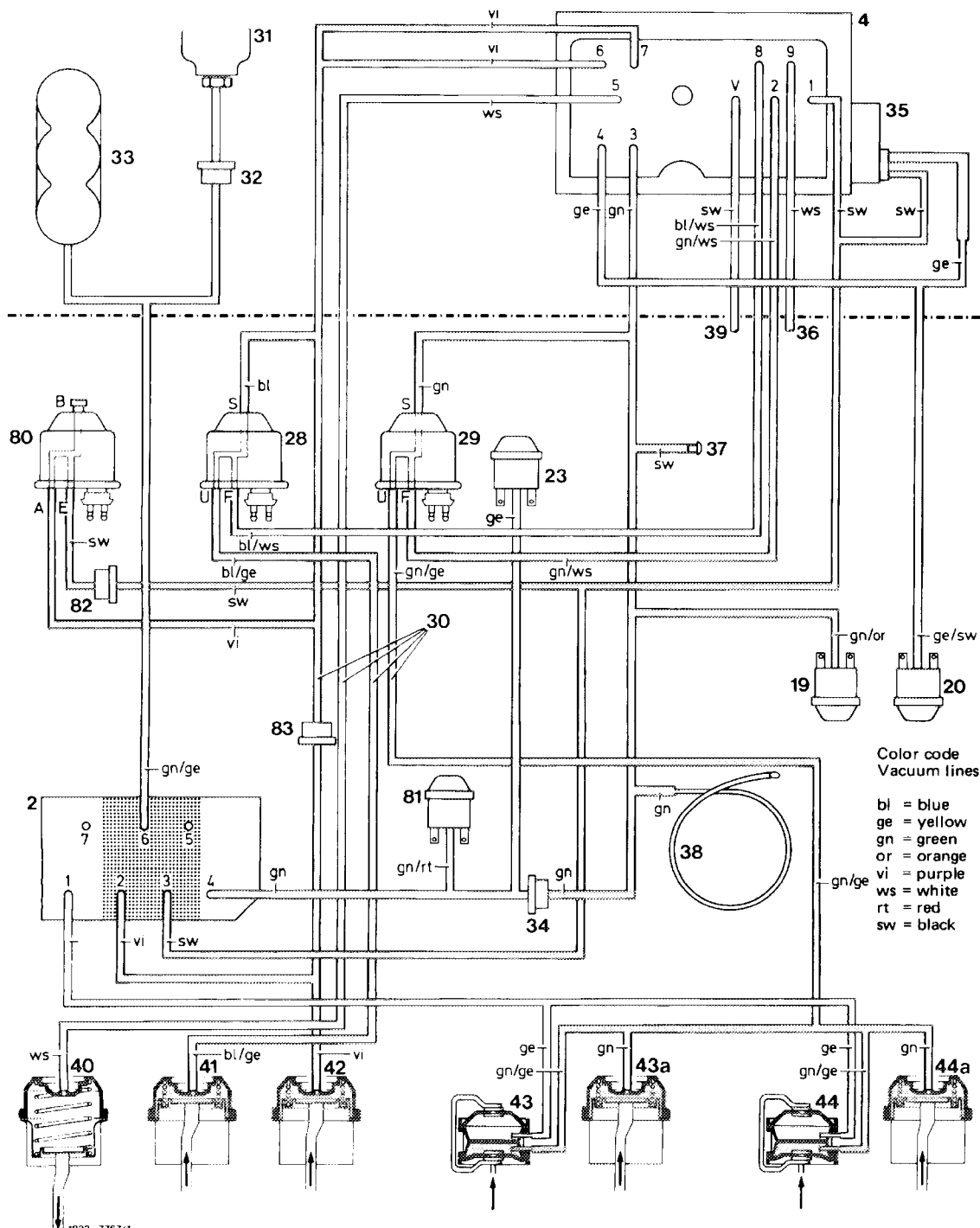
- | | |
|----|---------------------------|
| 24 | ETR-switch with capillary |
| 50 | Air jet nozzle |

103-14304

Layout of pressure switch in receiver
dehydrator

25 Pressure switch





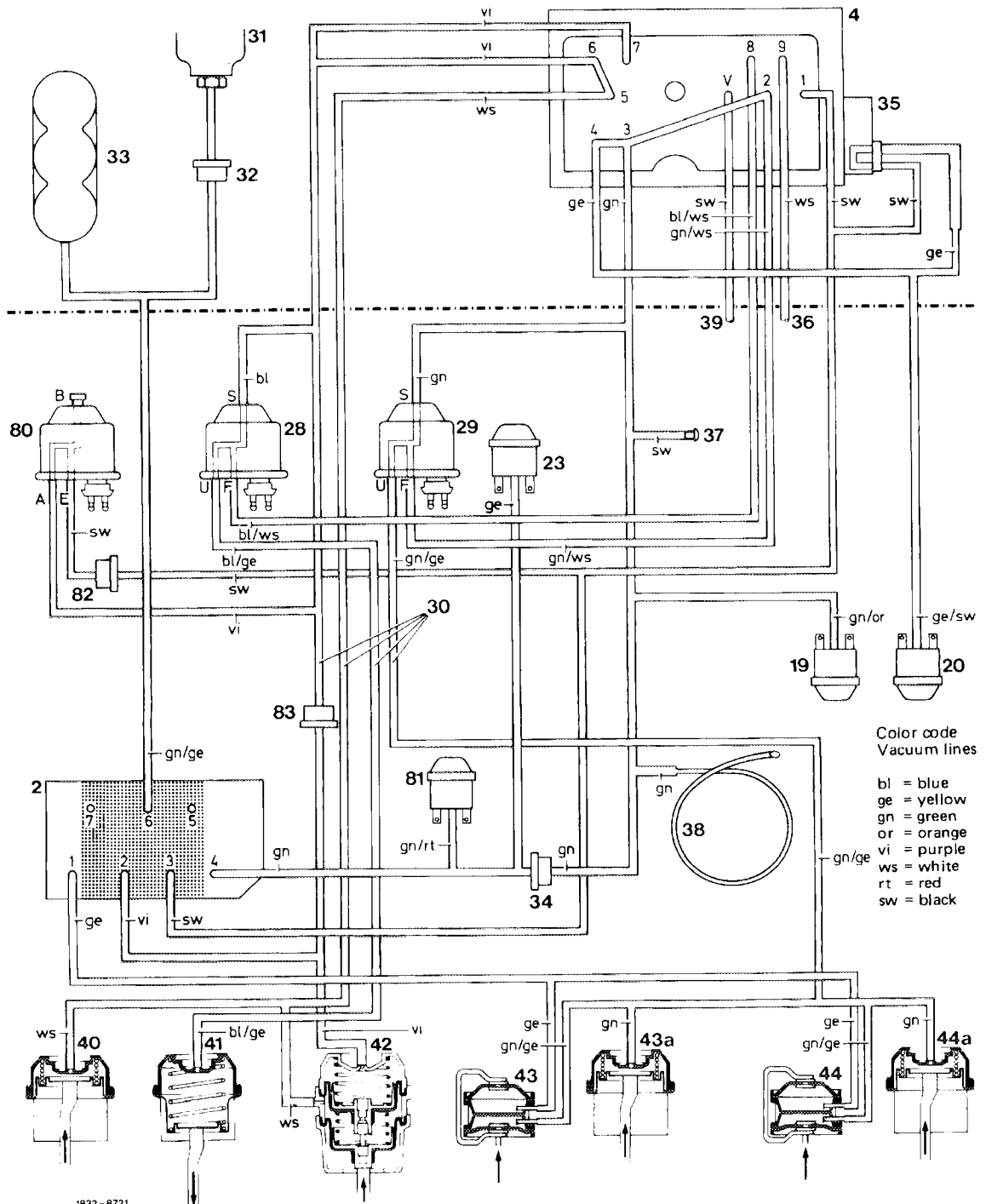
Color code
Vacuum lines

bl = blue
ge = yellow
gn = green
or = orange
vi = purple
ws = white
rt = red
sw = black

Vacuum function diagram (version 1)

Pushbutton switch at "AUTO-LO" or "AUTO-HI", "ON/OFF" switch refrigerant compressor at "ON"
Regulating valve in position "heating", coolant temperature > 40 °C (> 104 °F),
(temperature switch (35) without influence)

- | | | |
|---|---|--|
| 2 Pushbutton switch | 33 Vacuum reservoir | 43 Vacuum element for main air flap left (flap "open") |
| 4 Regulating valve | 34 Check valve | 43a Single-acting vacuum element for main air flap left |
| 19 Vacuum switch (main switch, green) | 35 Temperature switch | 44 Vacuum element for main air flap right (flap "open") |
| 20 Vacuum switch (refrigerant compressor, yellow) | 36 Vent line for legroom flaps | 44a Single-acting vacuum element for main air flap right |
| 23 Vacuum switch (for refrigerant compressor, at "BI-LEVEL" only) | 37 Vacuum connection for tester | 80 Switchover valve "BI-LEVEL" (at "DEF") |
| 28 Switchover valve (legroom flaps) | 38 Specified leak point | 81 Vacuum switch (at "BI-LEVEL" only) |
| 29 Switchover valve (fresh air-recirculating air changeover switch) | 39 Vent line for regulating valve | 82 Check valve |
| 30 Vacuum lines | 40 Vacuum element for center jets (flap "closed") | 83 Check valve |
| 31 Vacuum connection at intake pipe | 41 Vacuum element for legroom flaps (flaps "open") | |
| 32 Check valve | 42 Vacuum element for defroster jets (flaps "closed" with leak air portion) | |



1832-8721
Vacuum function diagram (version 2)

Pushbutton switch at "AUTO-LO" or "AUTO-HI", "ON/OFF" switch refrigerant compressor at "ON"

Regulating valve in position "cooling" (fresh air), coolant temperature $> 40^{\circ}\text{C}$ ($> 104^{\circ}\text{F}$)

- | | | |
|---|---|--|
| 2 Pushbutton switch | 33 Vacuum reservoir | 43 Vacuum element for main air flap left (flap "open") |
| 4 Regulating valve | 34 Check valve | 43a Single-acting vacuum element for main air flap left |
| 19 Vacuum switch (main switch, green) | 35 Temperature switch | 44 Vacuum element for main air flap right (flap "open") |
| 20 Vacuum switch (refrigerant compressor, yellow) | 36 Vent line for legroom flaps | 44a Single-acting vacuum element for main air flap right |
| 23 Vacuum switch (for refrigerant compressor, at "BI-LEVEL" only) | 37 Vacuum connection for tester | 80 Switchover valve "BI-LEVEL" (at "DEF") |
| 28 Switchover valve (legroom flaps) | 38 Specified leak point | 81 Vacuum switch (at "BI-LEVEL" only) |
| 29 Switchover valve (fresh air-recirculating air changeover switch) | 39 Vent line for regulating valve | 82 Check valve |
| 30 Vacuum lines | 40 Vacuum element for center jets (flap "open") | 83 Check valve |
| 31 Vacuum connection at intake pipe | 41 Vacuum element for legroom flaps (flaps "closed") | |
| 32 Check valve | 42 Vacuum element for defroster jets (flaps "closed") | |