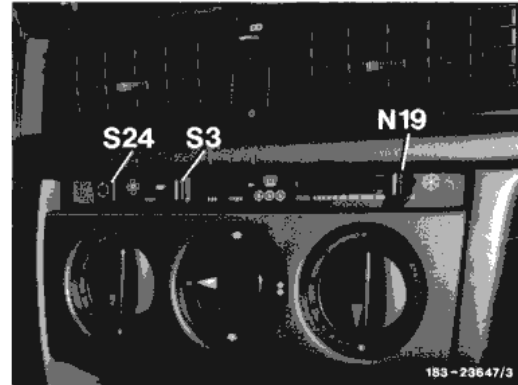


### A. General

Model 201 can be optionally equipped with a manually operated air conditioning system. Adjustment and distribution of the air quantity are similar to the heating system installed as standard equipment. The filling capacity amounts to 1.0 kg refrigerant R 12, or 0.95 kg for model 201.03.

The layout and operation of the air conditioning system are similar to that of model 123. Instead of the temperature selector for the air conditioning system, model 201 is provided with a temperature slide control (N19). The temperature control range is between 0° and + 25 °C.

In order for the air conditioning system or the recirculated air mode to operate, one of the four blower stages must be switched on.



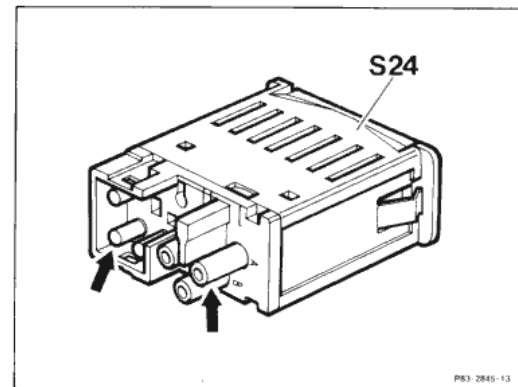
## B. Fresh/recirculated air switch

In addition to the temperature slide control there is also a switch (S24) for fresh air/recirculated air operation. This can be used at any time to switch between fresh air and recirculated air, i.e. approx. 80% recirculated air and approx. 20% fresh air. If the switch (S24) or the ignition is switched off, the fresh air/recirculated air flap moves to the position for 100% fresh air (see vacuum function diagram).

N19 Air conditioning temperature slide control  
S24 Fresh/recirculated air switch



As of 10/84, the fresh/recirculated air switch (S24) has one electrical and one pneumatic connection (arrow) (see vacuum function diagram).

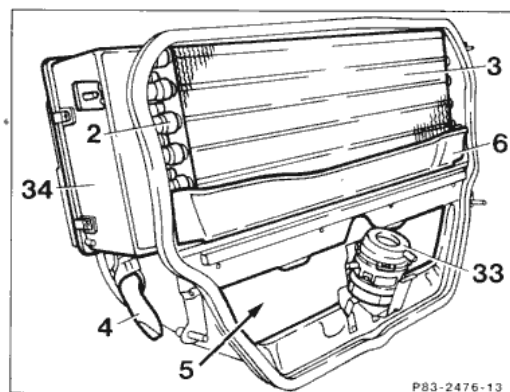


## C. Evaporator and expansion valve

A 6-row evaporator with 6-point injection and housing is not located in the passenger compartment as before, but in the component compartment between the firewall and the bulkhead. The evaporator housing carries the fresh air/recirculated air flap (5), as well as the 2-stage vacuum element (33) for the fresh air/recirculated air flap.

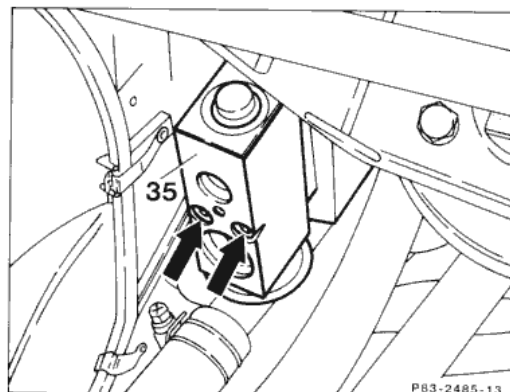
Aluminum tubes are now used in the evaporator instead of copper tubes (2). As before, the fins are made from aluminum.

- 2 Evaporator pipe
- 3 Grille
- 4 Condensate drain hose, left
- 5 Fresh air/recirculated air flap
- 6 Pan
- 33 2-stage vacuum element
- 34 Evaporator housing



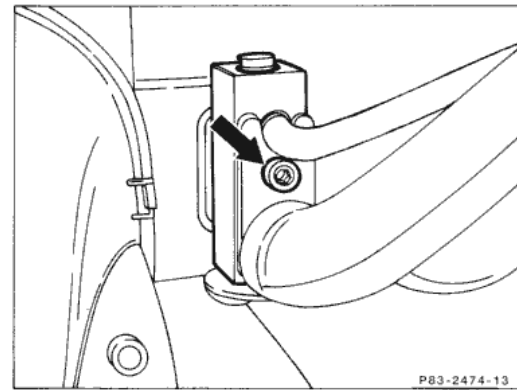
The expansion valve is a block valve familiar from models 123 and 126.

Arrangement of expansion valve (35) on evaporator housing



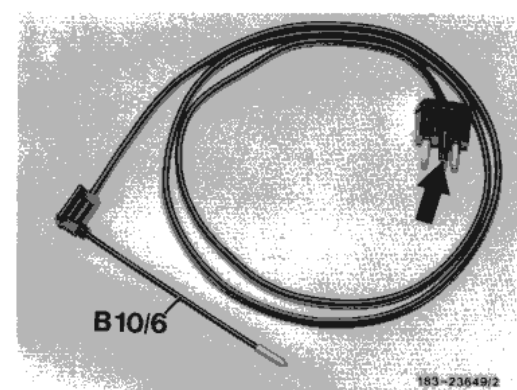
All hose and pipe lines are provided with O-ring fittings. Instead of steel, the pipe lines are now made of an aluminum-manganese alloy. The suction and pressure lines are inserted in the corresponding connections of the expansion valve and are fastened to the expansion valve by means of a plate located on the suction line and by a screw or hexagon nut (arrow).

Arrangement of lines on expansion valve



#### D. Temperature sensor

A temperature-dependent resistor is used as a temperature sensor (B10/6), which is characterized by the fact that its resistance drops as the temperature increases (NTC). The sensor senses the evaporator fin temperature and transmits its resistance value to the temperature slide control.

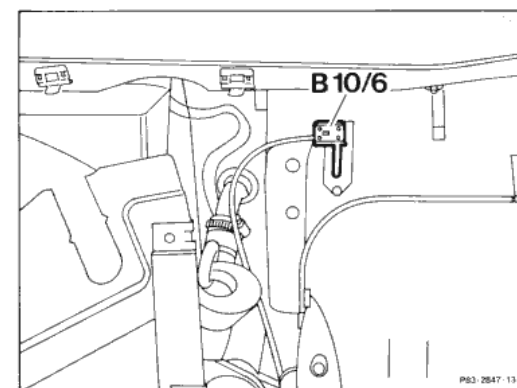


#### Data

Resistance value at ambient temperature

+ 20 °C	24 to 28 kΩ
+ 25 °C	20 to 24 kΩ
+ 30 °C	14 to 16 kΩ
+ 35 °C	13 to 15 kΩ

Arrangement of temperature sensor (B10/6) in evaporator housing



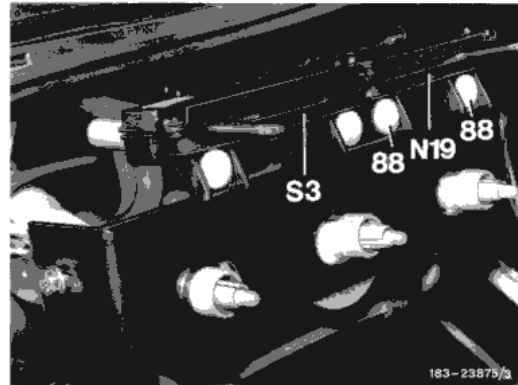
83.10 - 500/4

83.10 500/4

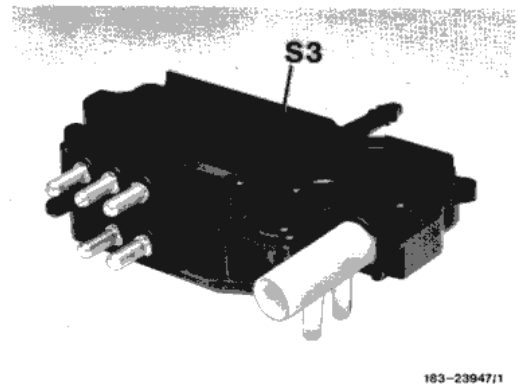
## E. Temperature slide control and air volume slide switch

The temperature slide control (N19) comprises a slide potentiometer, electronic components and a relay which switches the clutch of the refrigerant compressor on and off.

As a result, the temperature set on the temperature slide control is maintained.



A vacuum switch is located on the air volume slide switch (S3) in connection with the air conditioning system. If the lever on the air volume slide switch is at the left-hand stop ("min"), the fresh air/recirculated air flap is closed (fresh air closed). If the lever is moved in the direction of the 1st blower stage, the vacuum switch will disable the vacuum before the blower cuts in and the fresh air/recirculated air flap is opened (refer to vacuum diagrams 83-500, section K).



83.10 - 500/5

**83.10-500/5**

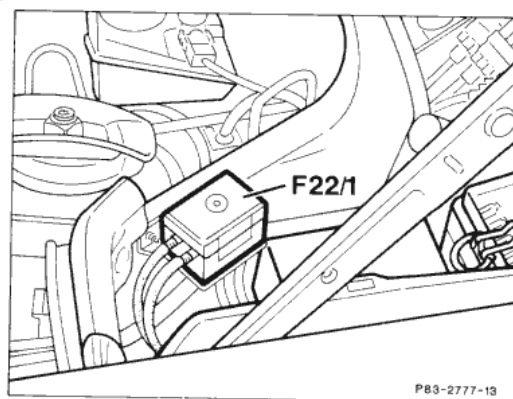
## F. Blower motor

A radial blower with two fan rotors (four stages) and 123 mm fan dia. is installed in vehicles with air conditioning system. The current consumption at the 4th blower stage and a battery voltage of 13 volts is approx. 21 amps.

Arrangement of blower motor (M2)



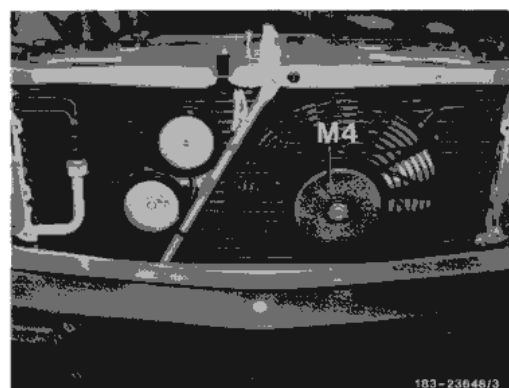
As of 09/88, an auxiliary fuse holder (F22/1) with a 25 amp fuse is installed for the blower motor instead of the 16 amp fuse no. 1 in the fuse/relay box.



## G. Auxiliary fan and control of auxiliary fan

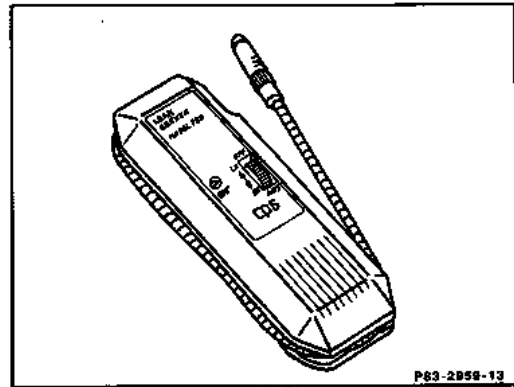
Models 201.022/023/024 up to 01/89 and model 201.122 are equipped with a small electric auxiliary fan. The current consumption at 13 V is approx. 13.5 amps.

M4 Auxiliary fan



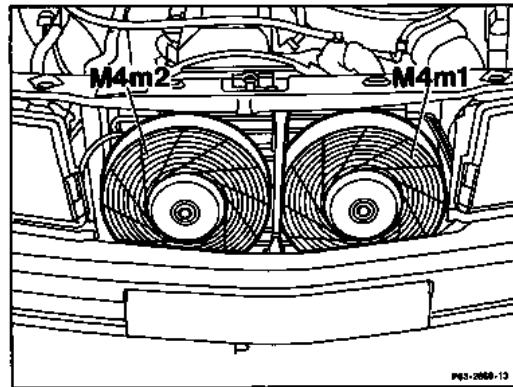
Model 201.024 as of 02/89 and models 201.028/034/126 are equipped with a large electric auxiliary fan. The current consumption at top speed and 13 volts is approx. 17.5 amps.

M4 Auxiliary fan



Models 201.029/128 are equipped with 2 electric auxiliary fans. They are both actuated simultaneously. The current consumption of both fans at top speed and a battery voltage of 13 volts is approx. 26 amps. The auxiliary fans are mounted directly on the condenser.

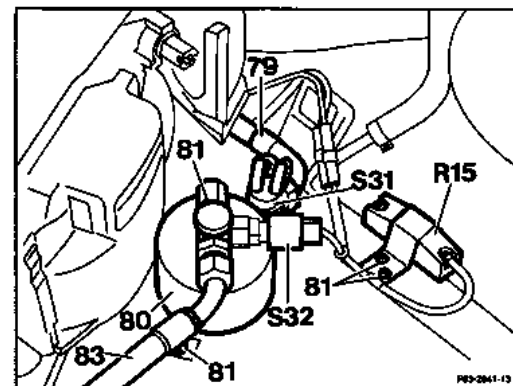
M4m1 Auxiliary fan, left  
M4m2 Auxiliary fan, right



#### Actuation of the auxiliary fan

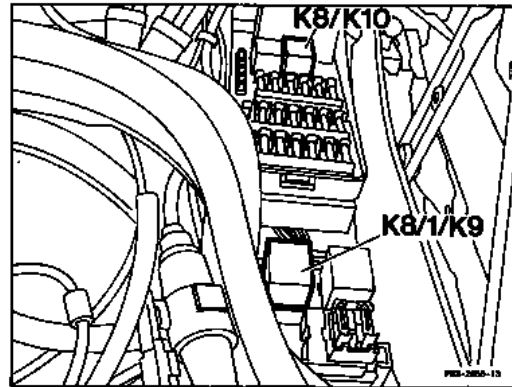
- a) In vehicles with small auxiliary fan. At a refrigerant pressure of 20 bar (as of 09/88 at 16 bar), the pressure switch (S32) switches on the auxiliary fan and the engine fan via the double contact relay (K8); the fans are switched off at approx. 15 bar (as of 09/88 at 12 bar).

- b) In vehicles with large auxiliary fan or with 2 small auxiliary fans, actuation occurs in 2 stages:  
1st stage by the pressure switch (S32), at a refrigerant pressure of 20 bar (as of 09/88 at 16 bar) via the relay (K8 or K10) and via the pre-resistor (R15).  
2nd stage by the temperature switch (S25/4), at a coolant temperature of 100 °C or (S25/5) 105 °C via the relay (K8/1 or K9) directly.

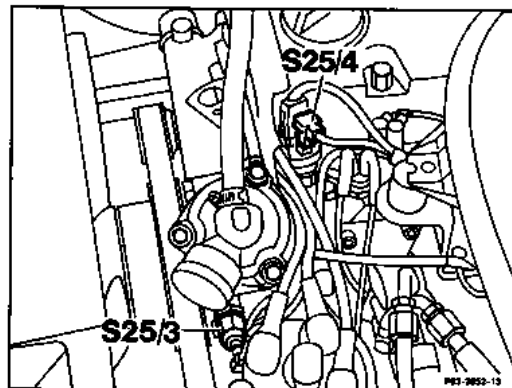


The arrangement of auxiliary fan relays depends on the vehicle model and version (see wiring diagrams 83-506).

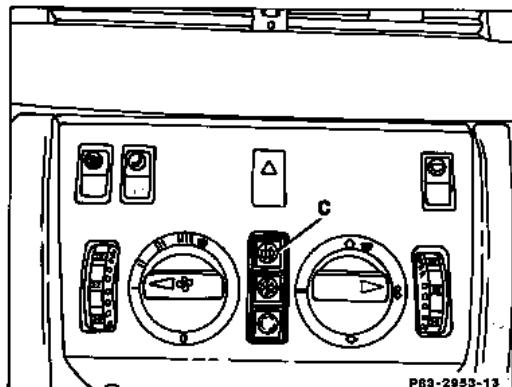
K8	Double contact relay:	Black cover
K8/1	NO relay:	Black housing
K9	NO relay:	Blue cover
K10	Preresistor relay:	Silver



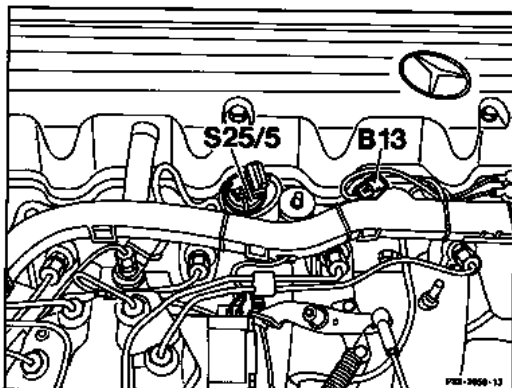
S25/4 100/110 °C temperature switch  
in models 201.024 J, AUS and  
201.028



S25/5 105/115 °C temperature switch  
in models 201.034/035

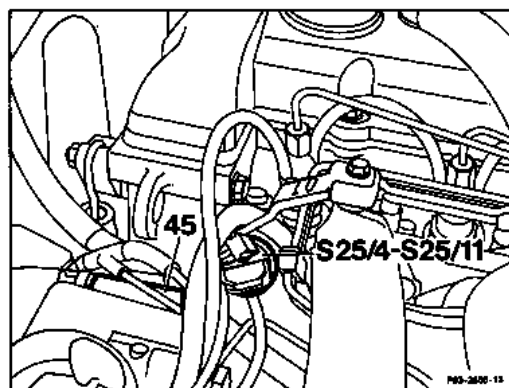


S25/5 105/115 °C temperature switch  
in model 201.029





S25/5 105/115 °C temperature switch  
in models 201.126 and 201.128



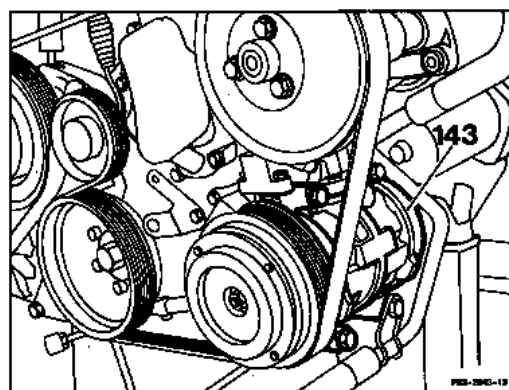
## H. Refrigerant compressor

The diesel vehicle is equipped with a Nippondenso swash plate refrigerant compressor.

Vehicles with gasoline engine up to 08/84 are fitted with the Delco R4 refrigerant compressor, and as of 09/84 the Nippondenso refrigerant compressor. The filling capacity of the air conditioning system amounts to 1.1 kg refrigerant R12 (0.95 kg for models 201.034/035).

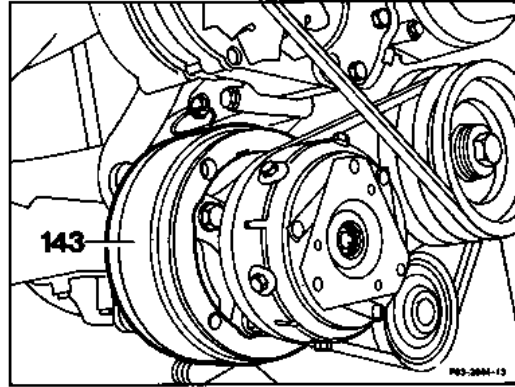
If the Nippondenso refrigerant compressor operates sluggishly, it is switched off to protect the single belt drive (see "Function of compressor cutout").

Arrangement of Nippondenso refrigerant  
compressor (143) in vehicles with engine 601

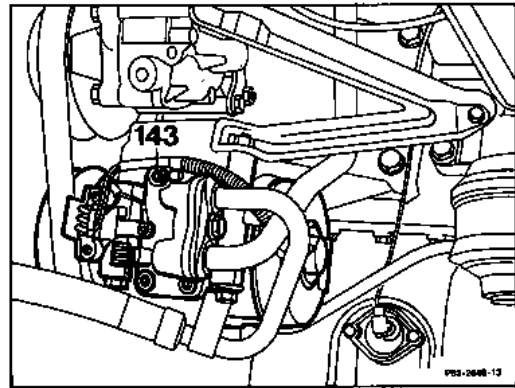


83.10 - 500/9

Arrangement of Delco R 4 refrigerant compressor (143) in vehicles with engine 102 up to 08/84



Arrangement of Nippondenso refrigerant compressor (143) in vehicles with engine 102 as of 09/84



## I. Function of compressor cutout in vehicles with single belt drive

### General

Should the refrigerant compressor block, the electromagnetic clutch is switched off via a control unit to protect the single belt drive.

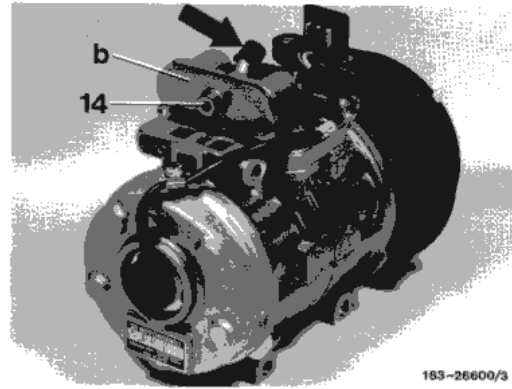
Design of compressor cutout:

1. Speed sensors
2. Control unit
3. Microswitch (only in vehicles with diesel engine and automatic transmission)

### 1. Speed sensors

The speed sensors measure the speeds of the engine and refrigerant compressor. They consist of a magnetic core and a coil. If the ring gear or the shaft of the refrigerant compressor is rotating, an alternating voltage is induced in the coils of the speed sensors, and this is passed on to the control unit (N6).

L1 Speed sensor, refrigerant compressor

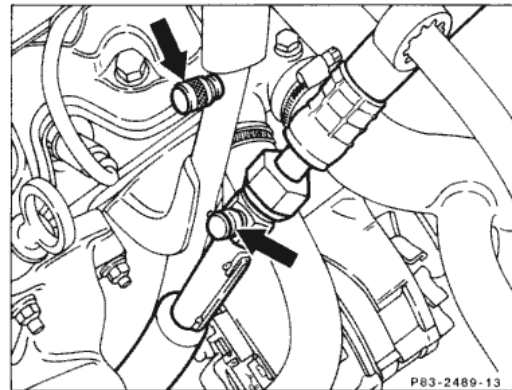


The alternating voltage and frequency rise and fall according to the rotational speeds.

#### Note

In vehicles with gasoline engine, the engine speed is registered by terminal TD at the terminal block of the diagnosis plug.

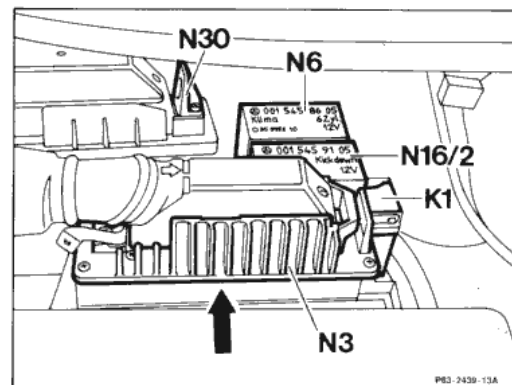
L3 Speed sensor, starter ring gear (at ring gear of flywheel in diesel engine)



### 2. Compressor cutout control unit (N6)

The control unit compares the two speeds from the engine and refrigerant compressor sensors and switches off the refrigerant compressor if the speeds differ by approx. 30%.

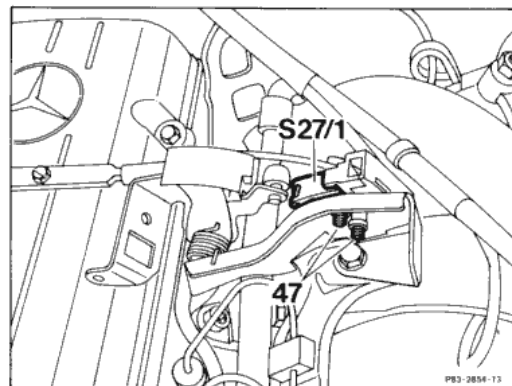
N6 Compressor cutout control unit



### 3. Microswitch (S27/1), only in model 201.1 with automatic transmission

The microswitch switches off the refrigerant compressor via the control unit (N6) at full throttle at engine speeds under approx. 1050 rpm up to approx. 2150 rpm (to improve moving off).

S27/1 Microswitch



83.10 - 500/11

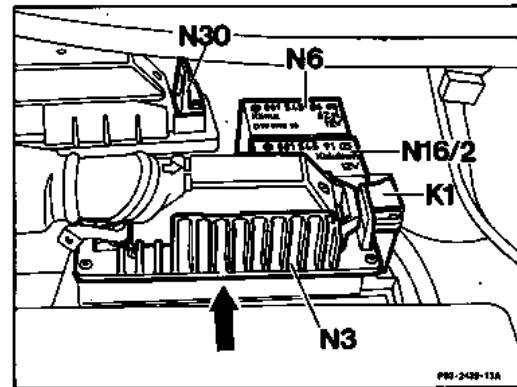
**83.10 - 500/11**

### Function description of compressor cutout

In vehicles up to 01/88, the refrigerant compressor is only switched on approx. 10 seconds after an engine speed of approx. 600 rpm is reached (to stabilize the engine speed). In vehicles as of 02/88, the refrigerant compressor is switched on after 4 seconds in model 201.0 or immediately in model 201.1.

The control unit (N6) only compares the two speeds of the ring gear and the refrigerant compressor 2 seconds after the refrigerant compressor cuts in (due to slip in the clutch when switching on). If there is a difference in speed of more than 30% when the refrigerant compressor cuts in, this condition is monitored for 200 milliseconds. If the speed difference no longer exists after 200 milliseconds, the refrigerant compressor remains switched on. If the speed difference remains due to sluggishness in the refrigerant compressor, the control unit (N6) switches off the refrigerant compressor immediately.

This procedure is only repeated after the ignition has been switched off and the engine started again.

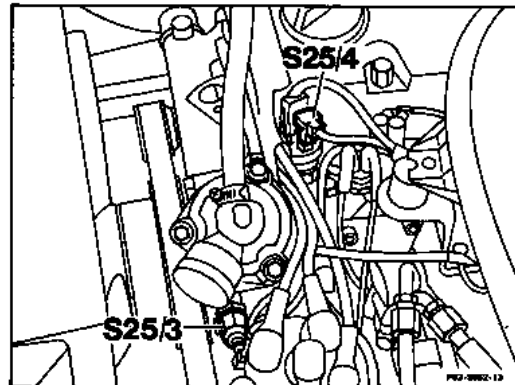


**Emergency cutout of refrigerant compressor**  
In order to prevent thermal overload of the engines, the refrigerant compressor is switched off as follows:

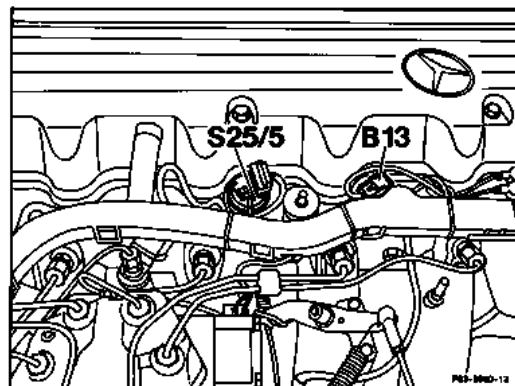
- a) In vehicles with engine 102 RÜF/CAT and engine 602, it is switched off by a temperature switch (S25/3 or S25/5) via the compressor cutout control unit. At a coolant temperature of 110 or 115 °C, the temperature switch switches to ground causing the compressor cutout control unit to switch off the refrigerant compressor.

When the engine temperature drops to 103 or 108 °C, the temperature switch opens and the refrigerant compressor is switched back on again immediately by the compressor cutout control unit.

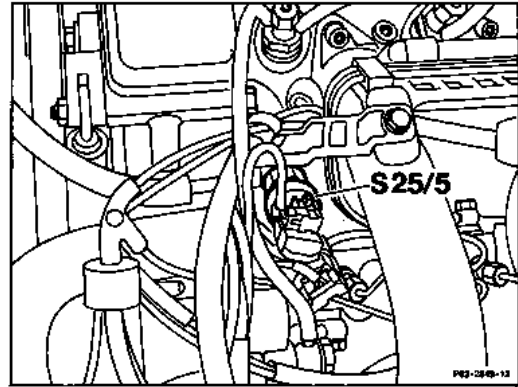
S25/3 110 °C temperature switch  
Engine 102 RÜF/CAT except  
models 201.034/035 RÜF/CAT



S25/5 105/115 °C temperature switch  
in models 201.034/035  
RÜF/CAT

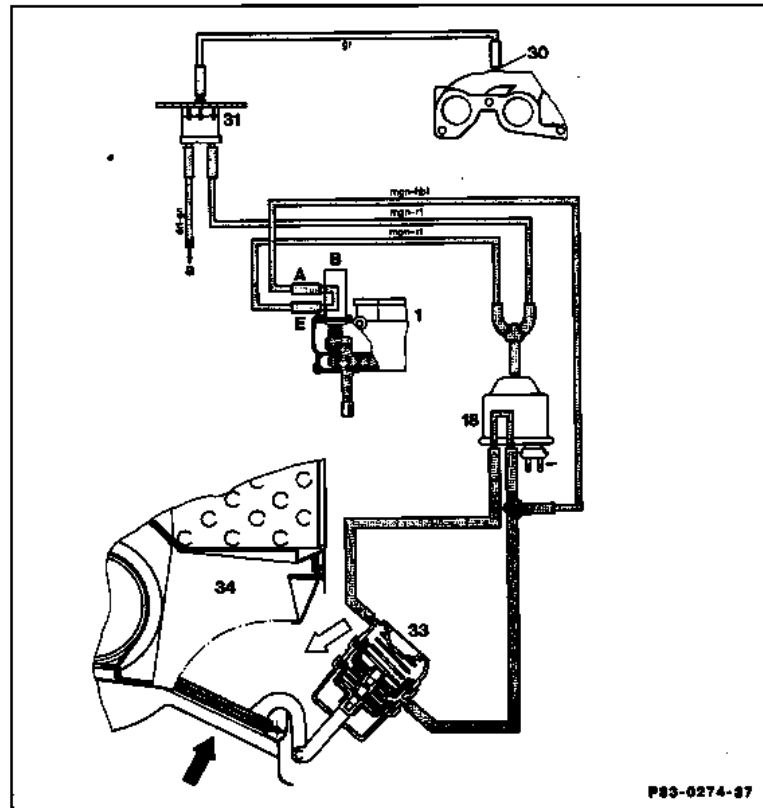


**S25/5** 105/115 °C temperature  
switch, engine 602



## K. Vacuum function diagram for fresh air/recirculated air flap

a) Up to 08/83



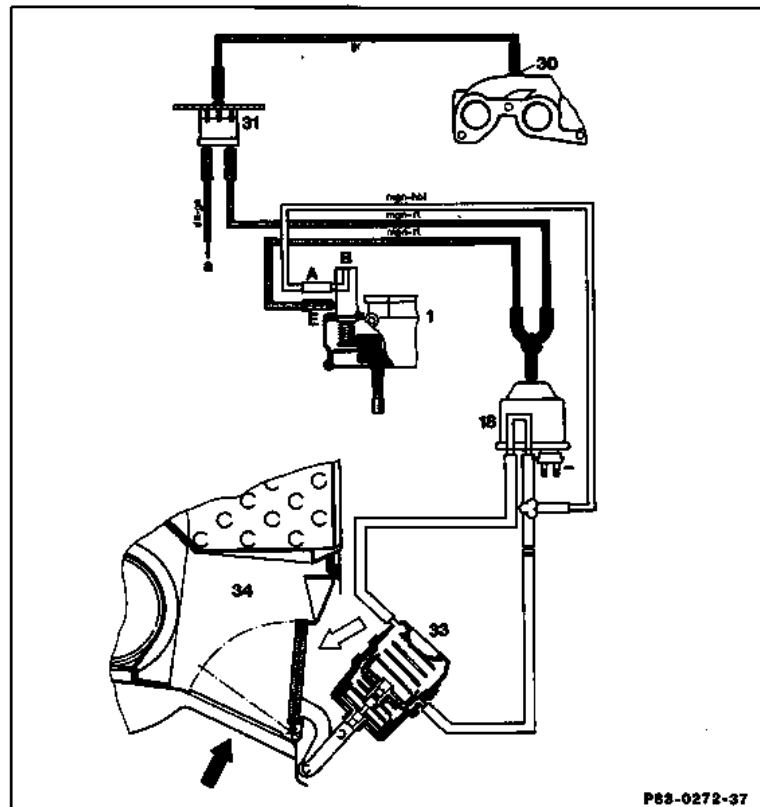
Air volume slide switch in position "min", fresh air/recirculated air flap closed - no fresh air supply  
1st version

- |    |  |
|----|--|
| A  | Vacuum output  |
| B  | Positive ventilation   |
| E  | Vacuum input   |
| 1  | Air volume slide switch with vacuum switch                   |
| 18 | Switch-over valve for fresh air/recirculated air flap        |
| 30 | Vacuum connection on intake manifold                         |
| 31 | Check valve  |
| 33 | 2-stage vacuum element for fresh air/recirculated air flap   |
| 34 | Evaporator housing   |
| a  | Connection to left-hand heater switch for vacuum water valve |

Arrow, white	Fresh air
Arrow, black	Recirculated air

## Vacuum function diagram for fresh air/recirculated air flap

a) Up to 08/83



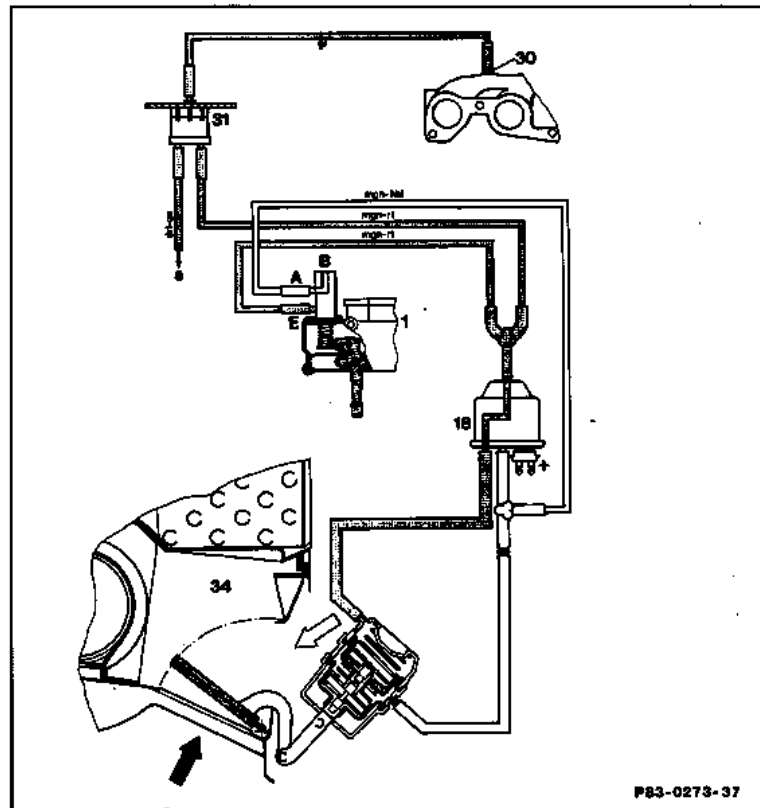
Air volume slide switch at 1st blower stage, fresh air/recirculated air flap open, 100% fresh air  
1st version

A	Vacuum output	Arrow, white	Fresh air
B	Positive ventilation	Arrow, black	Recirculated air
E	Vacuum input		
1	Air volume slide switch with vacuum switch		
18	Switch-over valve for fresh air/recirculated air flap		
30	Vacuum connection on intake manifold		
31	Check valve		
33	2-stage vacuum element for fresh air/recirculated air flap		
34	Evaporator housing		
a	Connection to left-hand heater switch for vacuum water valve		



## Vacuum function diagram for fresh air/recirculated air flap

a) Up to 08/83



Air volume slide switch at 1st blower stage and fresh/recirculated air switch switched on, fresh air/recirculated air flap in position "recirculated air" corresponds to approx. 20% fresh air and 80% recirculated air

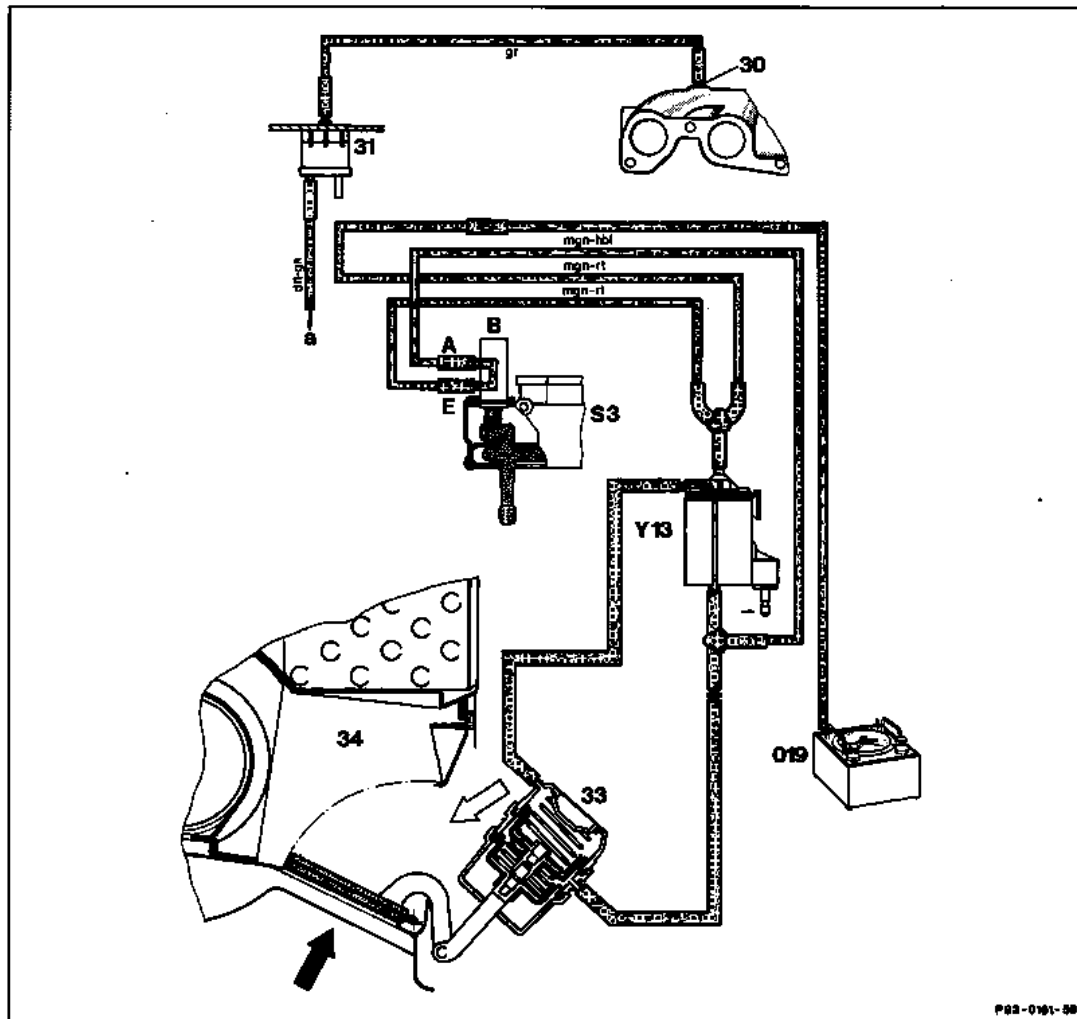
1st version

A	Vacuum output
B	Positive ventilation
E	Vacuum input
1	Air volume slide switch with vacuum switch
18	Switch-over valve for fresh air/recirculated air flap
30	Vacuum connection on intake manifold
31	Check valve
33	2-stage vacuum element for fresh air/recirculated air flap
34	Evaporator housing
a	Connection to left-hand heater switch for vacuum water valve

Arrow, white Fresh air  
Arrow, black Recirculated air

## Vacuum function diagram for fresh air/recirculated air flap

b) From 09/83 to 08/84



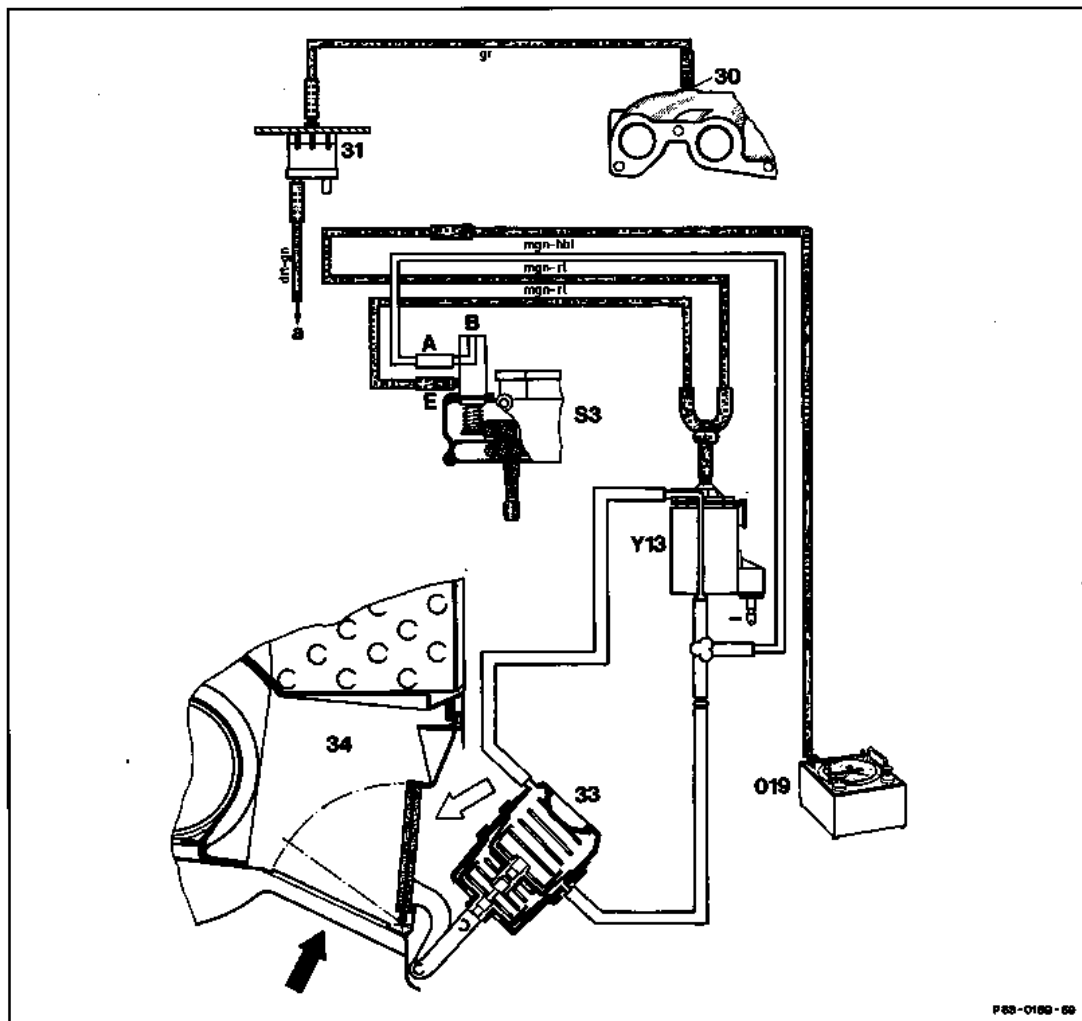
Air volume slide switch in position "min", fresh air/recirculated air flap closed - no fresh air supply  
2nd version

A	Vacuum output	Arrow, white	Fresh air
B	Positive ventilation	Arrow, black	Recirculated air
E	Vacuum input		
1	Air volume slide switch with vacuum switch		
18	Switch-over valve for fresh air/recirculated air flap		
30	Vacuum connection on intake manifold		
31	Check valve		
33	2-stage vacuum element for fresh air/recirculated air flap		
34	Evaporator housing		
a	Connection to left-hand heater switch for vacuum water valve		

83.10 - 500/18

## Vacuum function diagram for fresh air/recirculated air flap

b) From 09/83 to 08/84



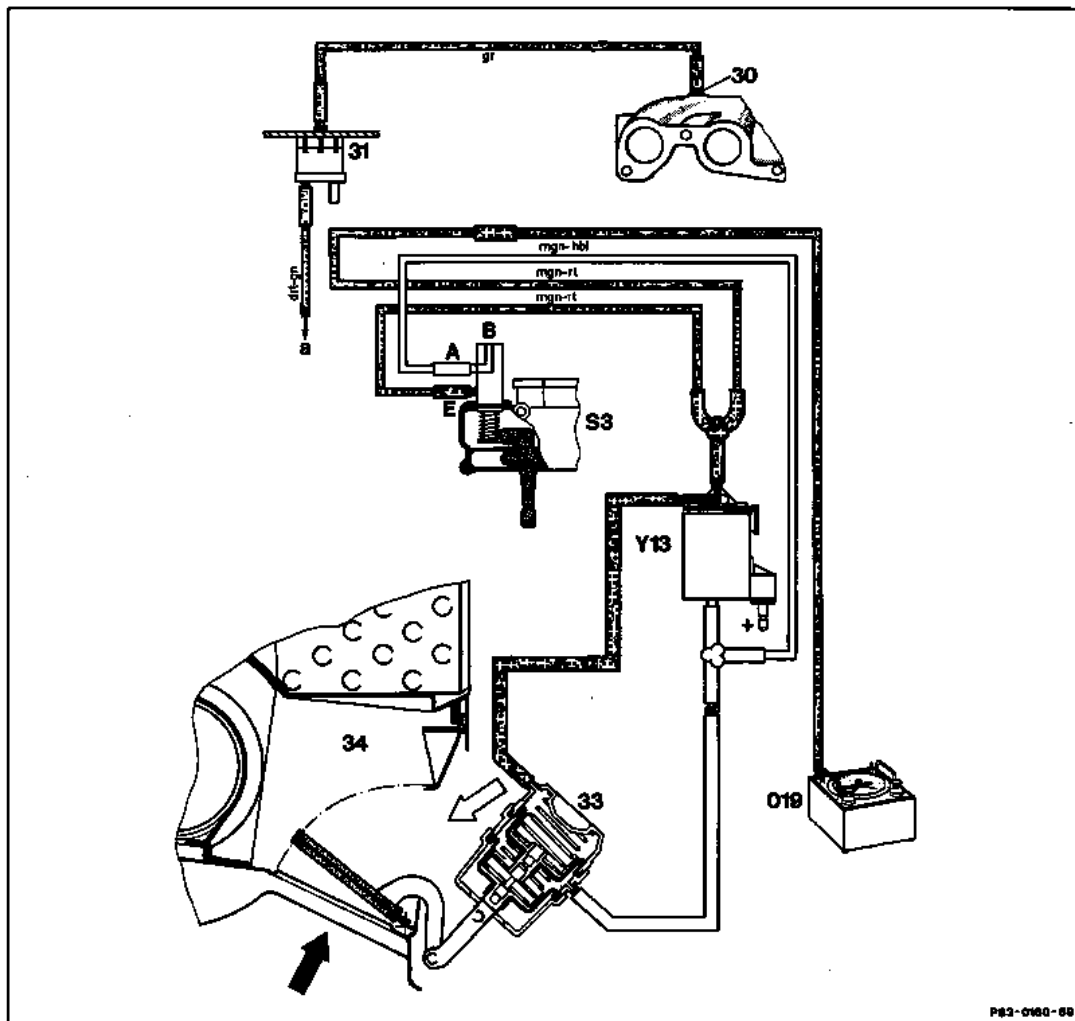
Air volume slide switch at 1st blower stage, fresh air/recirculated air flap open, 100% fresh air  
2nd version

- A Vacuum output
- B Positive ventilation
- E Vacuum input
- 1 Air volume slide switch with vacuum switch
- 18 Switch-over valve for fresh air/recirculated air flap
- 30 Vacuum connection on intake manifold
- 31 Check valve
- 33 2-stage vacuum element for fresh air/recirculated air flap
- 34 Evaporator housing
- a Connection to left-hand heater switch for vacuum water valve

- Arrow, white Fresh air
- Arrow, black Recirculated air

83.10 - 500/19

**b) From 09/83 to 08/84**



Air volume slide switch at 1st blower stage and fresh/recirculated air switch switched on, fresh air/recirculated air flap in position "recirculated air" corresponds to approx. 20% fresh air and 80% recirculated air

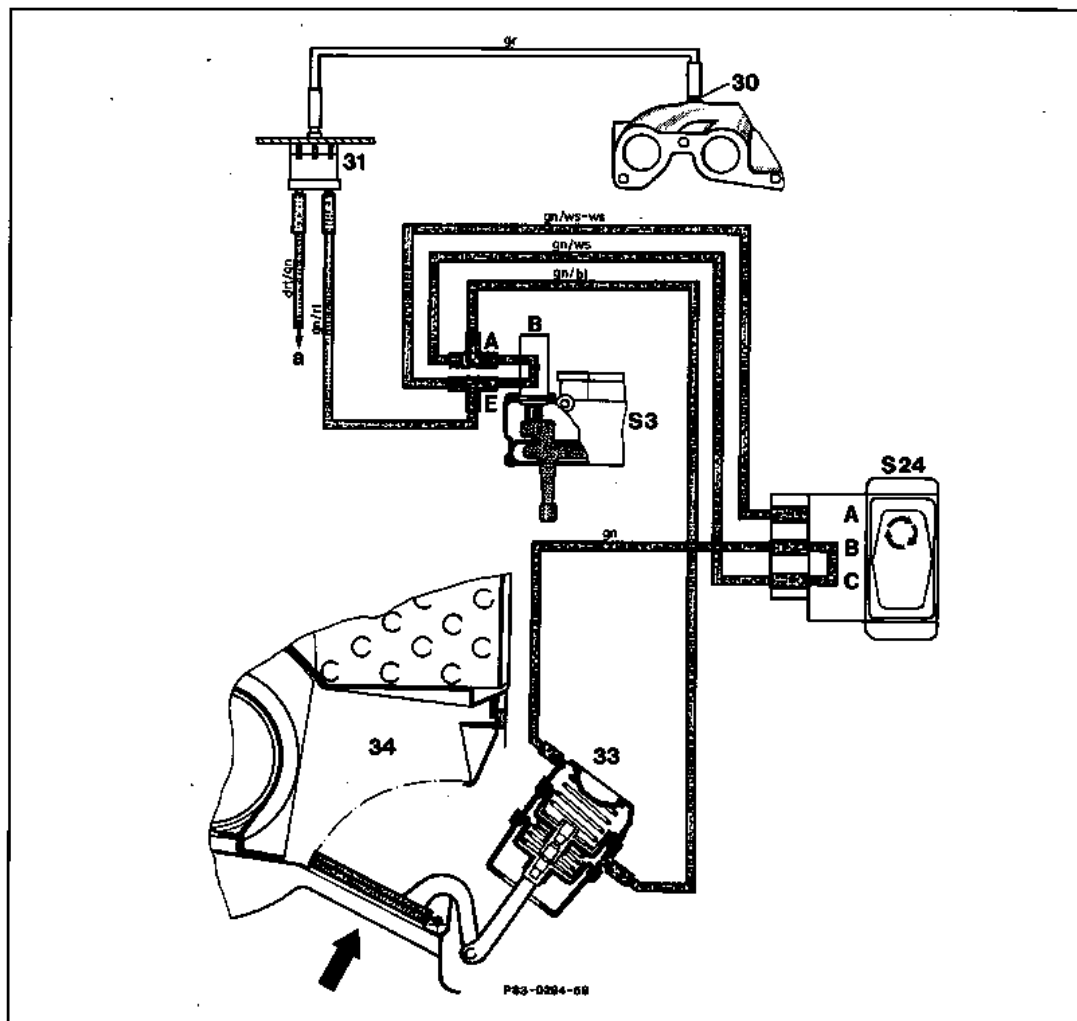
## 2nd version

- |    |  |
|----|--|
| A  | Vacuum output  |
| B  | Positive ventilation   |
| E  | Vacuum input   |
| 1  | Air volume slide switch with vacuum switch                   |
| 18 | Switch-over valve for fresh air/recirculated air flap        |
| 30 | Vacuum connection on intake manifold                         |
| 31 | Check valve  |
| 33 | 2-stage vacuum element for fresh air/recirculated air flap   |
| 34 | Evaporator housing   |
| a  | Connection to left-hand heater switch for vacuum water valve |

- |              |                  |
|--------------|------------------|
| Arrow, white | Fresh air        |
| Arrow, black | Recirculated air |

# **Vacuum function diagram for fresh air/recirculated air flap**

c) From 09/84 to 08/85



**Air volume slide switch in position "min", fresh air/recirculated air flap closed - no fresh air supply**  
**3rd version with electropneumatic fresh/recirculated air switch (S24)**

A	Vacuum output	33	2-stage vacuum element for fresh air/recirculated air flap
B	Positive ventilation	34	Evaporator housing
E	Vacuum input	a	Connection to left-hand heater switch for vacuum water valve
S3	Air volume slide switch with vacuum switch		
S24	Fresh/recirculated air switch		
30	Vacuum connection on intake manifold		
31	Check valve		

Arrow, white Fresh air  
 Arrow, black Recirculated air

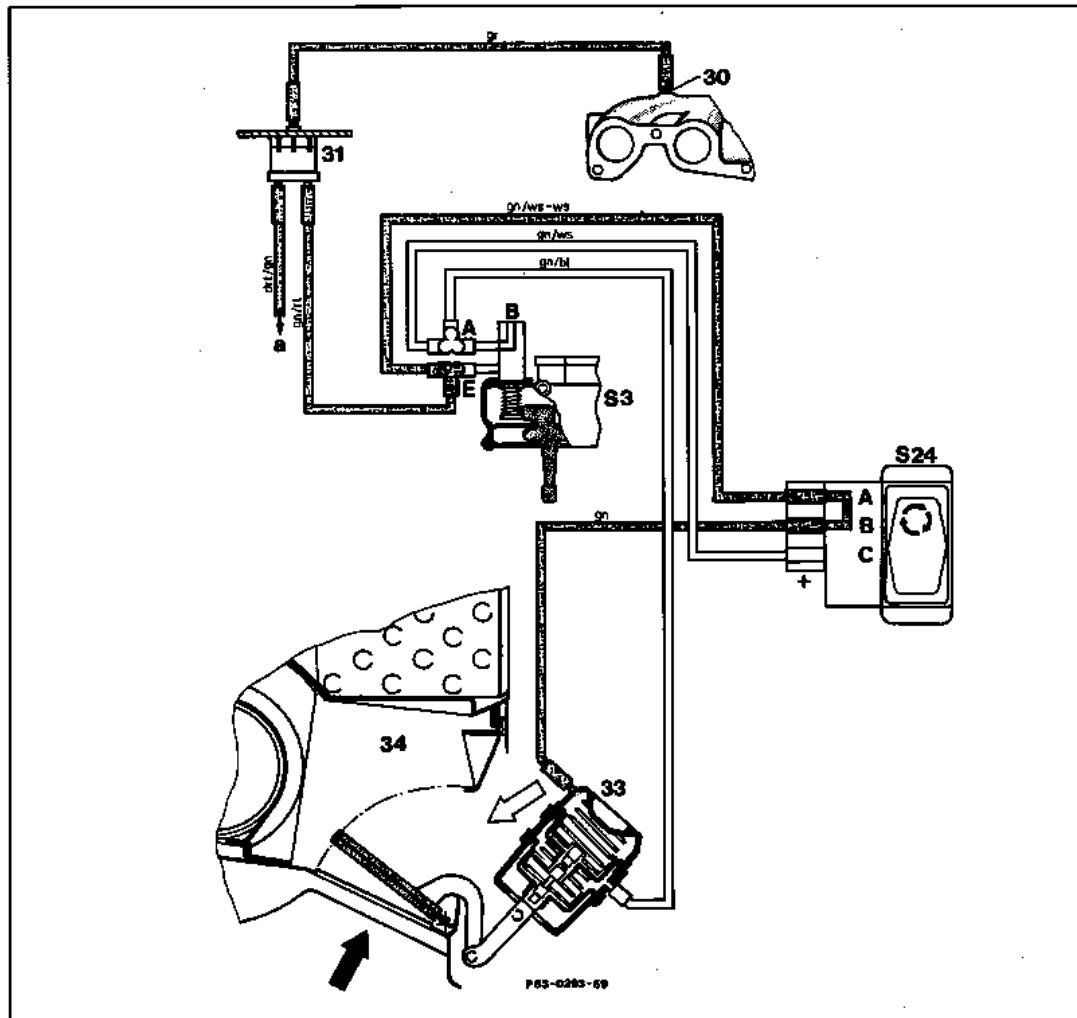
**c) From 09/83 to 08/85**



A	Vacuum output	33	2-stage vacuum element for fresh air/recirculated air flap
B	Positive ventilation		
E	Vacuum input	34	Evaporator housing
S3	Air volume slide switch with vacuum switch	a	Connection to left-hand heater switch for vacuum water valve
S24	Fresh/recirculated air switch		
30	Vacuum connection on intake manifold		Arrow, white Fresh air
31	Check valve		Arrow, black Recirculated air

## Vacuum function diagram for fresh air/recirculated air flap

c) From 09/84 to 08/85



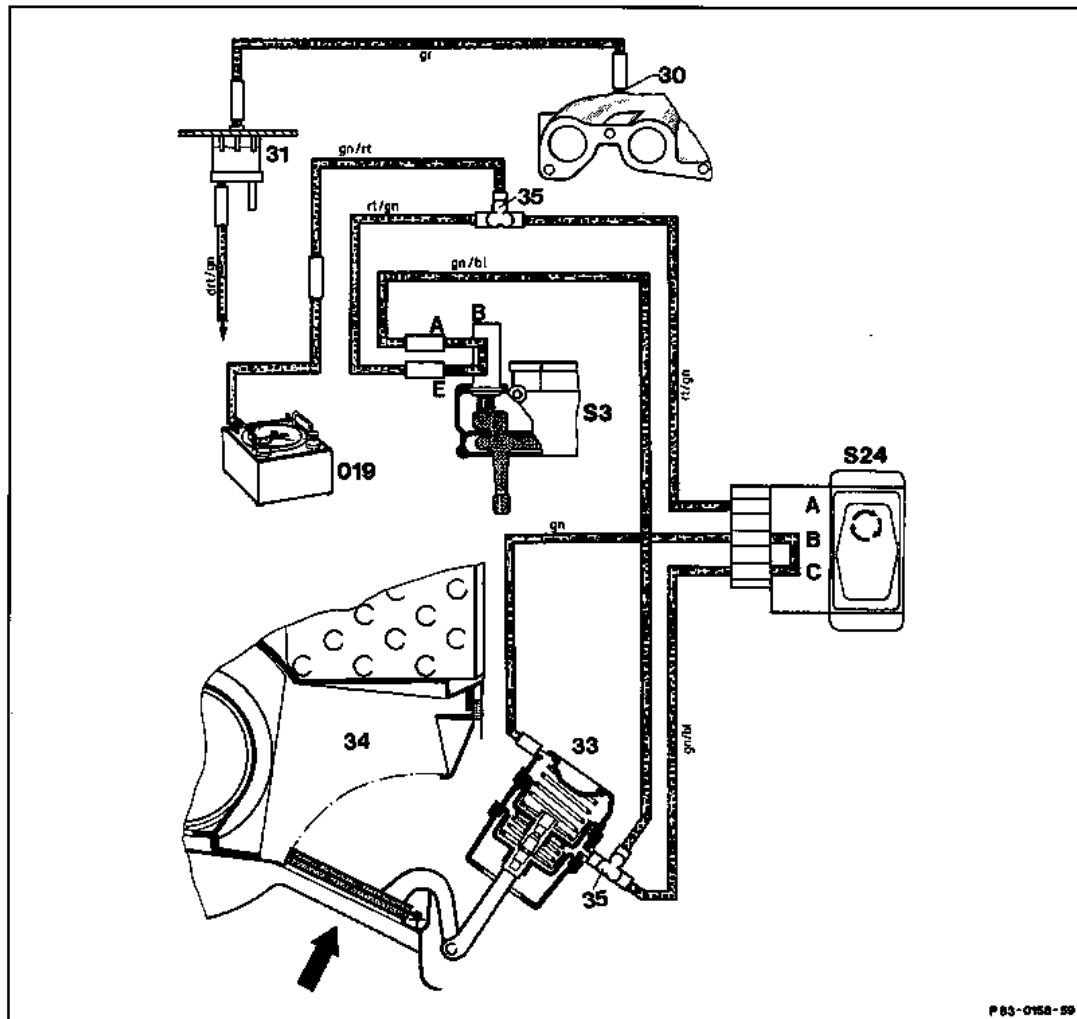
Air volume slide switch at 1st blower stage and fresh/recirculated air switch switched on, **fresh air/recirculated air flap in position "recirculated air"** corresponds to approx. 20% fresh air and 80% recirculated air

3rd version with electropneumatic fresh/recirculated air switch (S24)

A	Vacuum output	33	2-stage vacuum element for fresh air/recirculated air flap
B	Positive ventilation	34	Evaporator housing
E	Vacuum input	a	Connection to left-hand heater switch for vacuum water valve
S3	Air volume slide switch with vacuum switch		Arrow, white Fresh air
S24	Fresh/recirculated air switch		Arrow, black Recirculated air
30	Vacuum connection on intake manifold		
31	Check valve		

# **Vacuum function diagram for fresh air/recirculated air flap**

d) As of 09/85



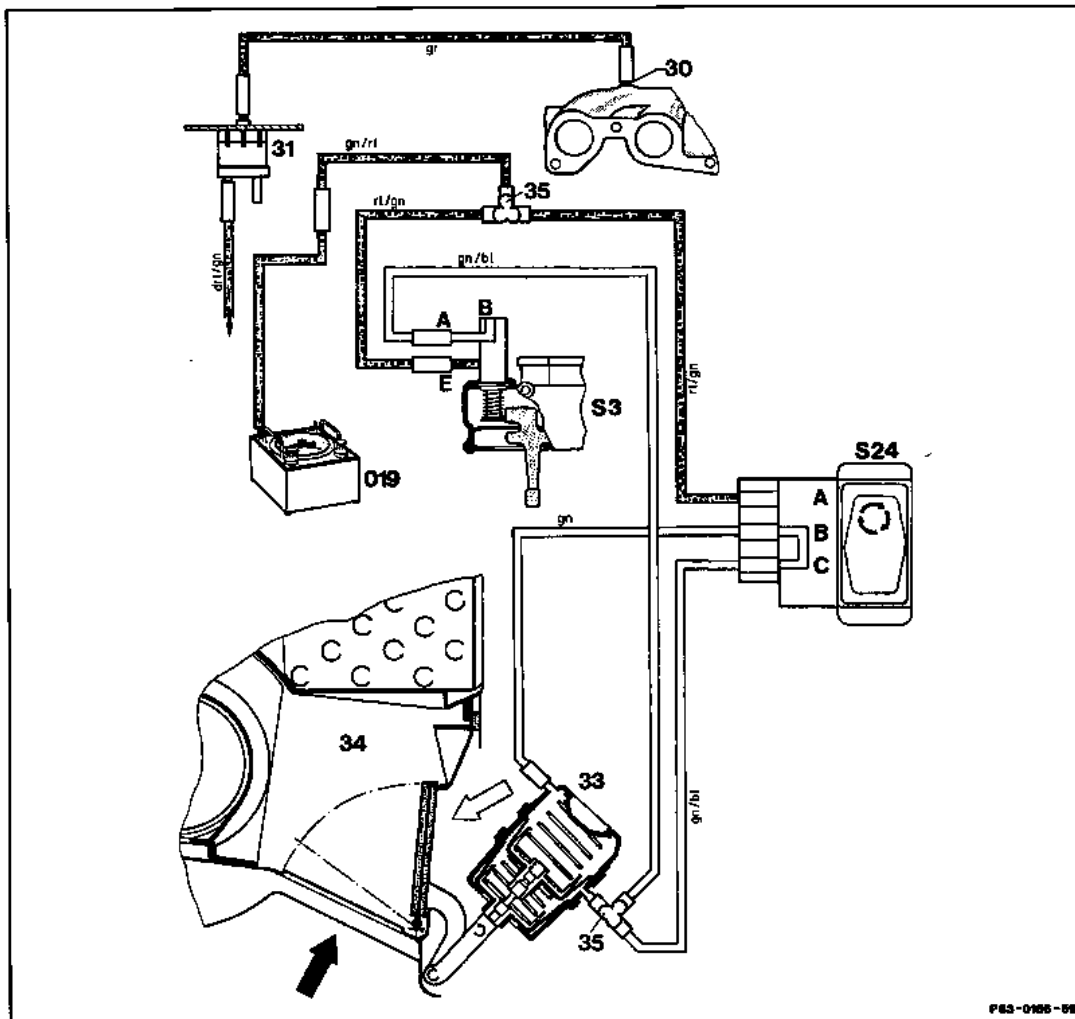
Air volume slide switch in position "min", fresh air/recirculated air flap closed - no fresh air supply  
4th version with electropneumatic fresh/recirculated air switch (S24)

A	Vacuum output	33	2-stage vacuum element for fresh air/recirculated air flap
B	Positive ventilation	34	Evaporator housing
E	Vacuum input	35	3-point vacuum distributor
S3	Air volume slide switch with vacuum switch	a	Connection to left-hand heater switch for vacuum water valve
S24	Fresh/recirculated air switch		Arrow, white Fresh air
30	Vacuum connection on intake manifold		Arrow, black Recirculated air
31	Check valve		



## Vacuum function diagram for fresh air/recirculated air flap

d) As of 09/85

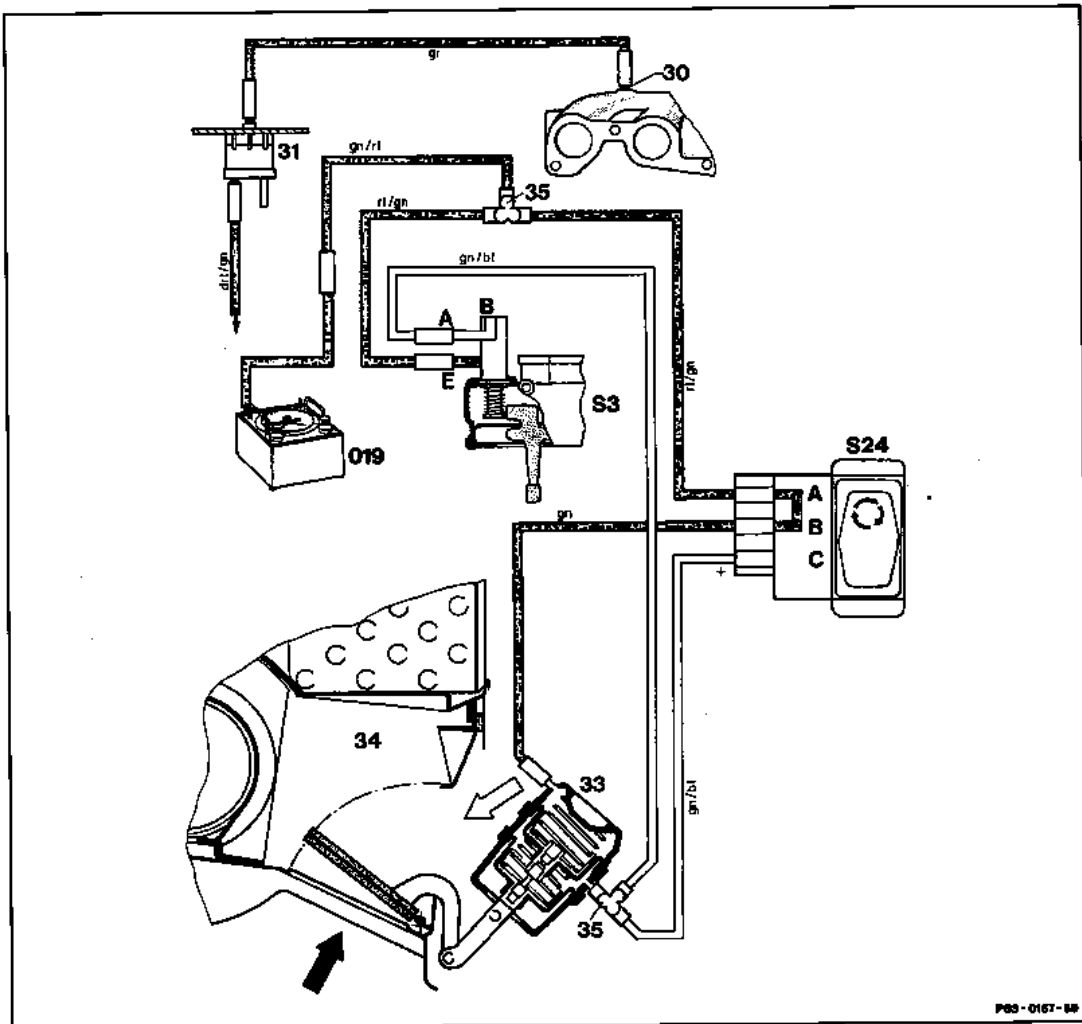


Air volume slide switch at 1st blower stage, fresh air/recirculated air flap open, 100% fresh air  
4th version with electropneumatic fresh/recirculated air switch (S24)

A	Vacuum output	33	2-stage vacuum element for fresh air/recirculated air flap
B	Positive ventilation	34	Evaporator housing
E	Vacuum input	35	3-point vacuum distributor
S3	Air volume slide switch with vacuum switch	a	Connection to left-hand heater switch for vacuum water valve
S24	Fresh/recirculated air switch		
30	Vacuum connection on intake manifold		
31	Check valve		
			Arrow, white Fresh air
			Arrow, black Recirculated air

## Vacuum function diagram for fresh air/recirculated air flap

d) As of 09/85



Air volume slide switch at 1st blower stage and fresh/recirculated air switch switched on, fresh air/recirculated air flap in position "recirculated air" corresponds to approx. 20% fresh air and 80% recirculated air

4th version with electropneumatic fresh/recirculated air switch (S24)

A	Vacuum output	30	Vacuum connection on intake manifold
B	Positive ventilation	31	Check valve
E	Vacuum input	33	2-stage vacuum element for fresh air/recirculated air flap
S3	Air volume slide switch with vacuum switch	34	Evaporator housing
S24	Fresh/recirculated air switch	35	3-point vacuum distributor
		a	Connection to left-hand heater switch for vacuum water valve

83.10 - 500/26