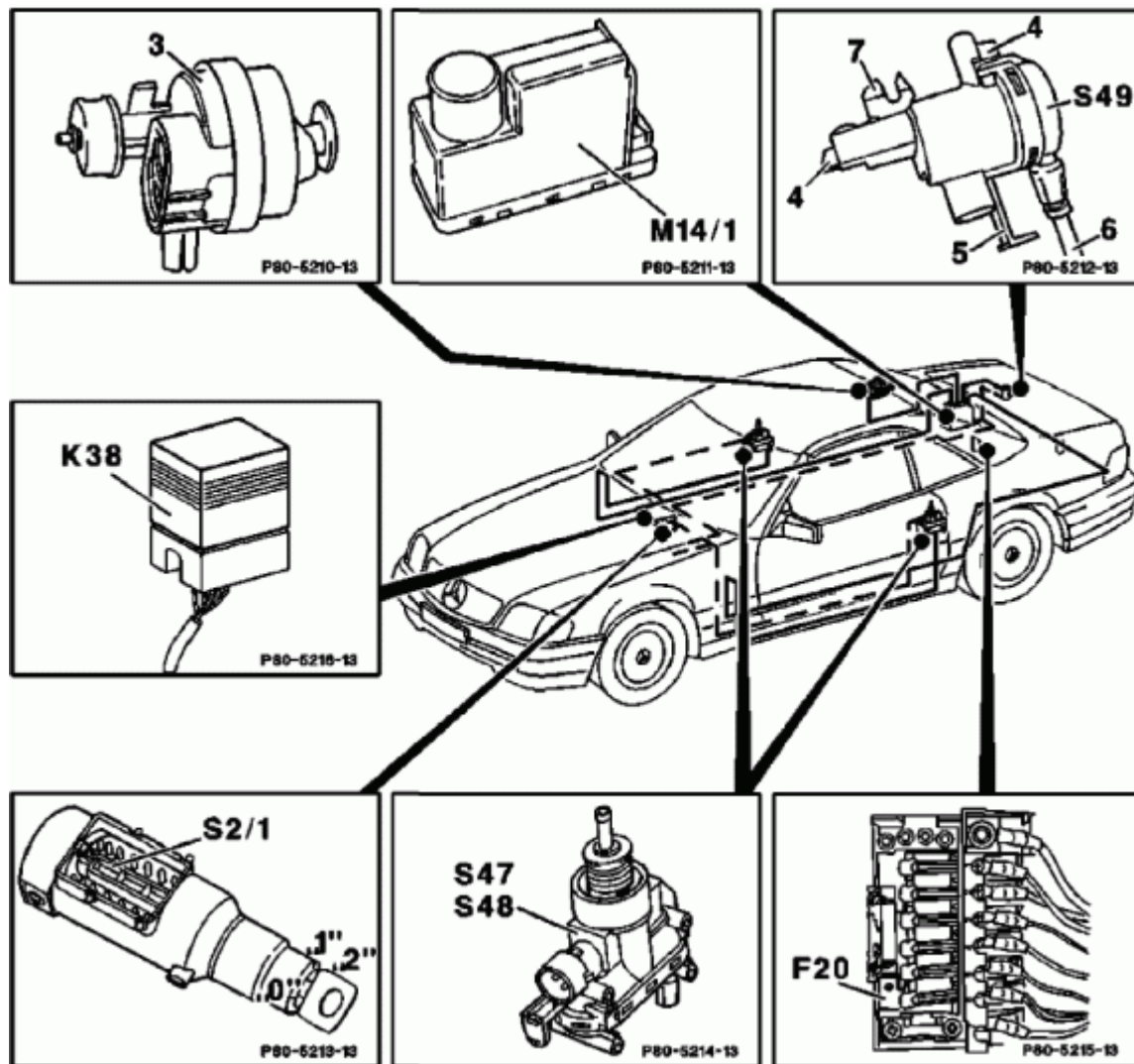


80-010	Function description of central locking
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**A. General**

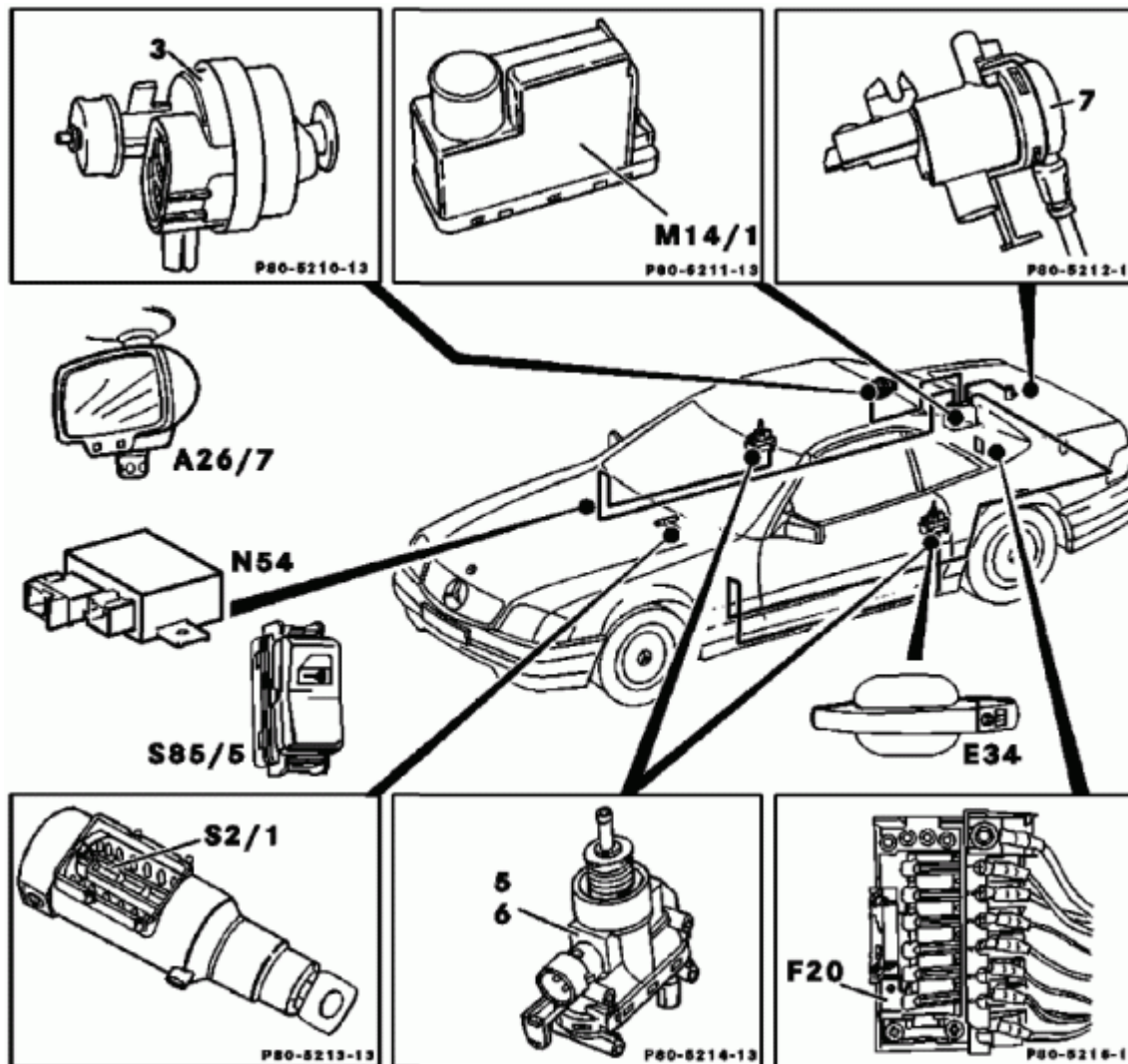
Version 1 up to 11/94, (USA) up to 8/95



P80-5209-59

3	Tank flap element	S47	Left door actuator
F20	Additional fuse box rear, with 7 fuses	S48	Right door actuator
M14/1	Supply pump for central locking	S49	Trunk lid lock actuator
S2/1	Ignition starter switch	K38	Starter lock-out (EDW) relay (vehicles as of 01/94)

Version 4 USA J as of 09/95



P80.20-0262-59

3	Tank flap element	S2/1	Ignition/starter switch
A26/7	Infrared remote central locking receiver unit, interior rearview mirror	S47	Left door actuator
F20	Auxiliary fuse box, rear, for 7 fuses	S49	Trunk lid lock actuator
M14/1	Supply pump, central locking (CL)	S85/5	CL interior control switch
N54	Infrared remote central locking control module		



The central locking with multipoint operation is a single line system, in which the pneumatic elements are operated through pressure or vacuum (dual pressure central locking).

It is possible to carry out central locking or unlocking from the outside from both drivers' doors and from the trunk lid by operating the key or the infrared remote control. The central locking can be operated inside via an interior control lever. All doors, the trunk lid and the tank flap are included in the central locking.

### Notes

On vehicles with infrared remote control as of 01/94 the central locking cannot be locked and unlocked centrally from the trunk lid lock with the mechanical key. Control of the interior central locking with the mechanical key is only possible from the lock cylinder in the glove box lock.

On vehicles as of 09/95 the central locking can be operated from inside with the CL interior control switch.



On  and  vehicles as of 09/95 the central locking can be operated from outside with the infrared remote control or with the mechanical key from the lock cylinder in the driver's door or the lock in the trunk lid. From the inside the central locking can be operated with the CL interior control switch.

## B. Operation

### Driver's door

The central locking can always be operated when the driver's door is closed. From outside with a key, (turning to the right to the stop for locking, turning to the left to the stop for unlocking).

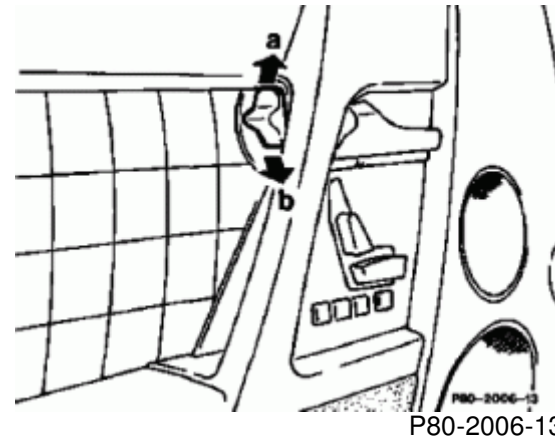
### Note

As of introduction of the stage 2 drive authorization system (12/94),  approx. 09/95 the central locking can be operated from outside only with the infrared control. Operation with the mechanical key remains possible for the  models.

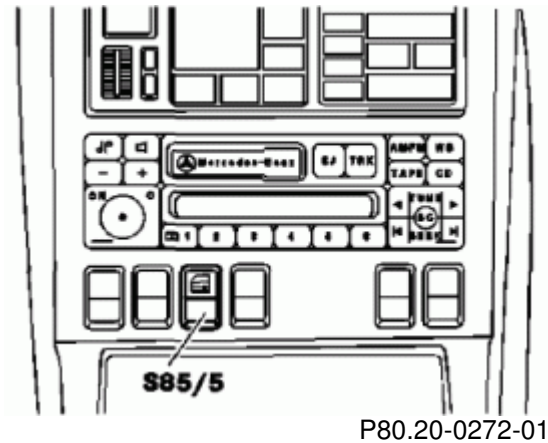
Vehicles up to 08/95

The central locking can be operated from inside with the interior control lever.

- a unlock
- b lock



Vehicles as of 09/95  
The central locking can be operated from the inside with the CL interior control switch (S85/5).



### Passenger door

The central locking can be operated from the closed or opened passenger door with the key (turning to the left to the stop for locking, and turning to the right to the stop for unlocking) or with the interior control lever up to 08/95. Central locking is only possible however, when the ignition key is removed or is inserted after removal, but has not been operated (key position 0 in the steering lock). In this way inadvertent locking out in key positions 1 and 2 via the passenger door is avoided.

### Note

On vehicles with infrared remote control the lock cylinder on the passenger door was eliminated as of 01/94. For this reason the central locking can no longer be controlled from the outside with the mechanical key from the passenger door.

### Trunk lid

The central locking can be operated with the key when the trunk lid is open or closed.

Central locking is however only possible when the ignition key is removed, or after having being removed, is inserted again, but has not been operated (key position 0 in the steering lock).

### Unlocking


Turn the key to the left to the stop and remove in the vertical position.

### Locking

Turn the key to the right to the 60° position and remove in the vertical position.

### Notes

On vehicles with infrared remote control the central locking element for the trunk lid is no longer connected electrically as of 01/94. For this reason the central locking can no longer be controlled with the mechanical key from the trunk lid.

Actuation with the mechanical key remains possible for models. 

### Additional security

Turn the key to the right as far as the stop and remove in the horizontal position.

The trunk lid now remains locked when the doors are unlocked by the central locking.



### Anti-theft protection

If the vehicle is locked from the outside, the trunk lid and the tank flap can only be opened after being unlocked from the outside. Only the respective door can be opened via the interior control lever or the handle on the door panel.

### Emergency unlocking of the tank flap

In the event of the central locking not functioning, the tank flap can be unlocked manually via a red emergency unlocking knob on the element for the tank flap.

### Extended central locking (vehicles without IRCL and models)

  When locking the vehicle via the driver's/ passenger door or the trunk lid, side windows which may have been left open can be closed.

For this purpose, hold the key in the locking direction (on the doors to the end stop, on the trunk lid to the 60° position) until the windows are closed.

The closing procedure can be interrupted at any time by turning back the key.

## C. Function

### Version 1 up to 11/94,

#### Example of basic function sequence for unlocking vehicle via the driver's door.

By turning the key to the left in the lock cylinder the electric switch in the actuator is switched over via a rod. This switch then supplies a positive voltage to the supply pump via its control line.

The supply pump starts up and produces pressure, which is led to all pneumatic elements via a system of lines. The diaphragms in the elements are pressed upwards, operating the locks via a rod and unlocks them.

The tank flap element unlocks the flap directly. At the same time the electrical switches of the actuators in the passenger door and the trunk lid are actuated likewise by the pneumatic part of the element and supply positive voltage to the supply pump in the same

way as the mechanically operated switch in the actuator of the driver's door.

If the system reaches a pressure significantly greater than 450 mbar, the supply pump is switched off by the pressure switch.

If the pneumatic line system and the elements are now vented again via the supply pump, the system is depressurized and the unlocking procedure is completed.

The locking procedure is carried out similar to the unlocking procedure. However if the supply pump is energized with a negative control voltage, the direction of rotation of the pump motor is reversed and thus the vacuum required for locking is produced.

### Version 2 as of 12/94, as of 09/95 <sup>(USA)</sup>

#### Example of basic function sequence for unlocking vehicle with infrared remote central locking (IRCL)

Point transmitter window on remote control at receiver and press remote control button. The infrared control module then supplies positive voltage to the supply pump via a control lead.

The supply pump starts up producing pressure which flows through a system of lines to all pneumatic elements. The diaphragms in the elements are pressed up actuating the locks via a linkage and unlocking the vehicle.

The tank flap element unlocks the flap directly.

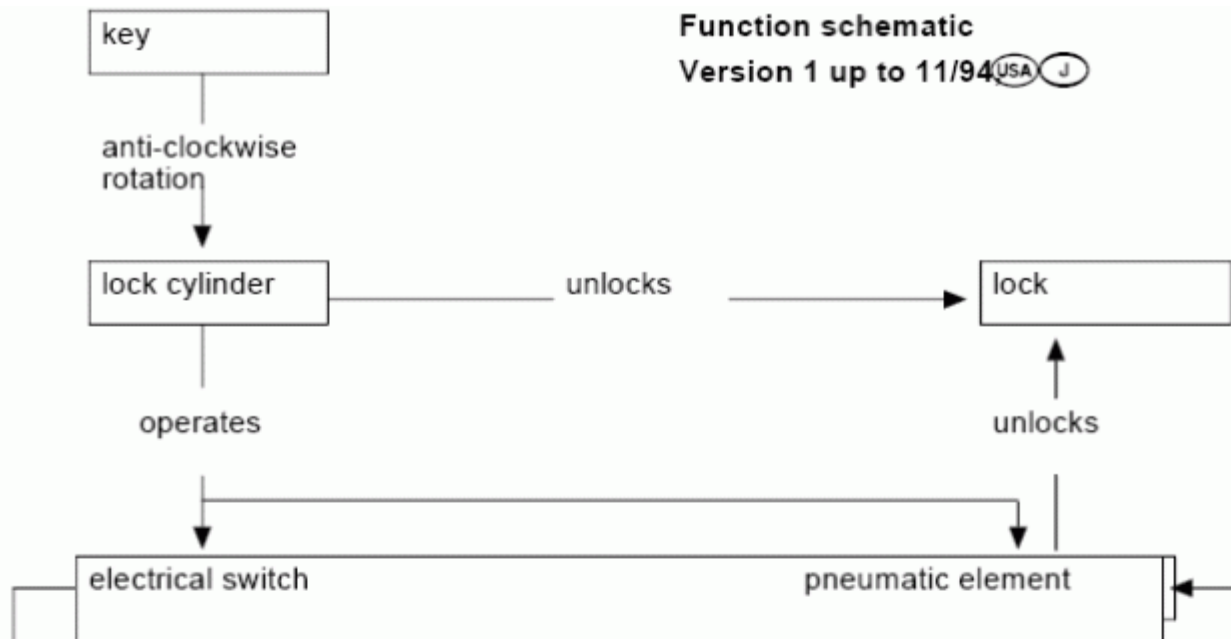
When a pressure of approx. 450 mbar is reached in the system, a pressure switch switches off the supply pump.

This relieves the pressure in the pneumatic system of lines and elements via the supply pump - the system is no longer under pressure and the unlocking operation is completed.

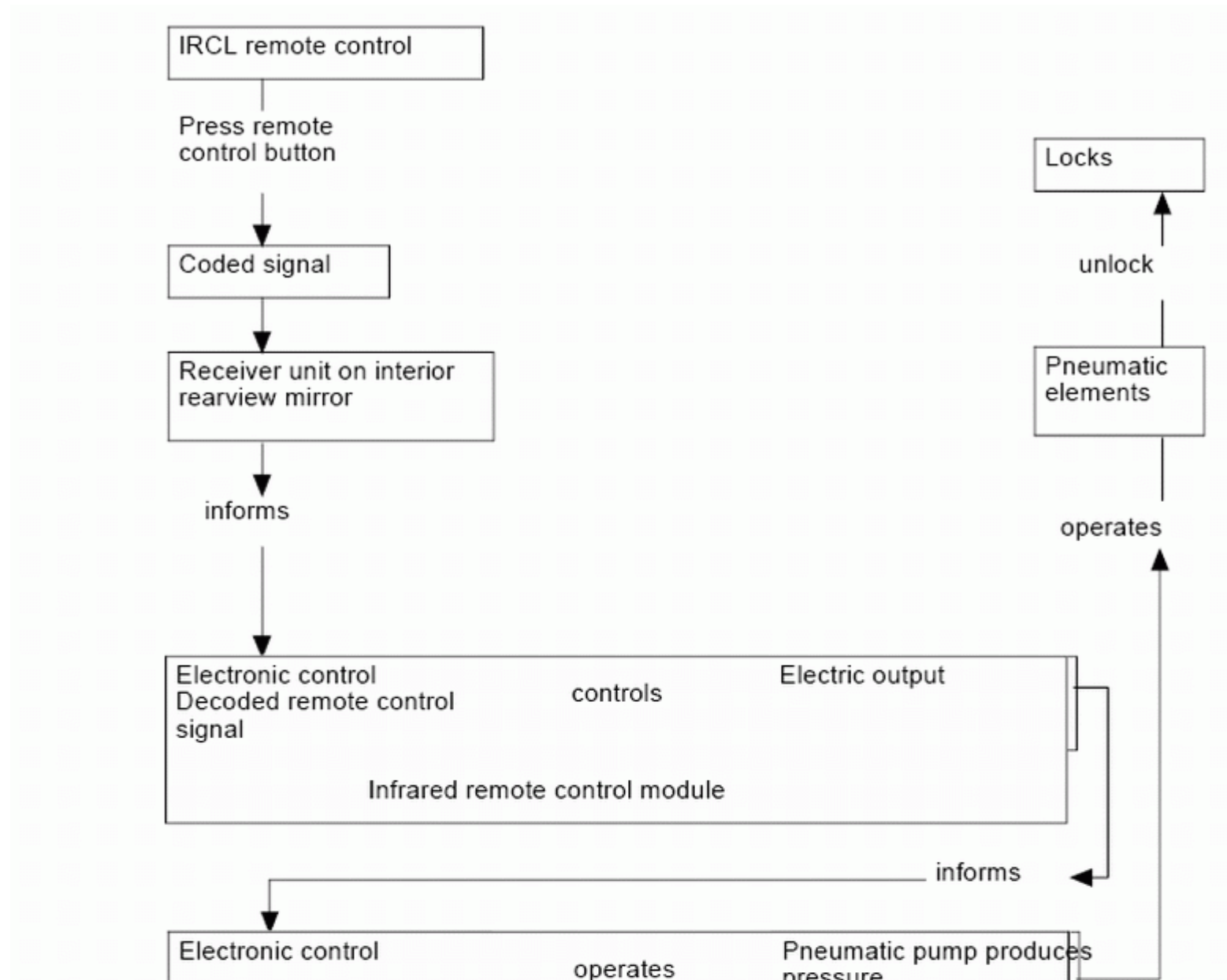
The locking operation is accomplished in a similar manner to the unlocking operation. However, negative control voltage is fed to the supply pump the next time the remote control button is pressed.

The direction of rotation of the pump motor is reversed so that the pump provides the vacuum required for locking.

### Function schematic Version 1 up to 11/94, <sup>(USA)</sup>



Function schematic Version 2 as of 12/94,  as of 09/95



**Pressurizing and depressurizing (vehicles up to approx. 12/93)**

In order to make possible locking immediately after unlocking or vice versa, without increased energy expenditure, the pneumatic lines to the doors are pressurized or depressurized with two electrical switchover valves.

The two valves hold the lines open in rest position. When the supply pump starts up, these valves are earthed and lock the lines. As soon as the supply pump switches off after locking or unlocking, the earth control to the valves is cancelled. The valves open and pressurize or depressurize the pneumatic lines.

**Pressurizing and depressurizing (vehicles as of approx. 01/94)**

The two pressurizing and depressurizing valves below the driver's and front passenger's seat are no longer used as of the introduction of the bi-pressure pumps with immobilization output.

For the pressurizing and depressurizing function of the central locking, the supply pump runs briefly in the opposite direction after reaching the shut-off pressure. The pressure in the system is thus reduced. As a result the vehicle can be locked immediately after unlocking or vice versa without increased use of energy.

**Emergency opening**

In order to facilitate the release of occupants of a vehicle which has been locked from the inside, in the event of a severe accident, the vehicle unlocks automatically.

Unlocking takes place when an acceleration of more than 4g or a vehicle inclination of more than 26° occurs and the ignition key is in position "1 or 2".

To do this, the control unit for the roll-over bar controls the supply pump for the central locking, which initiates unlocking of the vehicle after a 5 second delay.

**D. Components****1. Supply pump (M14/1, M14/2)**

There are 7 versions of supply pumps:

- a) Supply pump for the central locking and vacuum M14/1 (production up to 09/91).

Supply pump with 2 pneumatic connections.

Identification **ZV**: vacuum and pressure for central locking

Identification **PU**: vacuum for auxiliary consumers for supporting the intake manifold vacuum

- b) Supply pump for the central locking with orthopaedic seat backrest, vacuum and

interior central locking (special equipment up to 12/93).

Supply pump with 4 pneumatic connections.

Identification **ZV**: vacuum and pressure for central locking

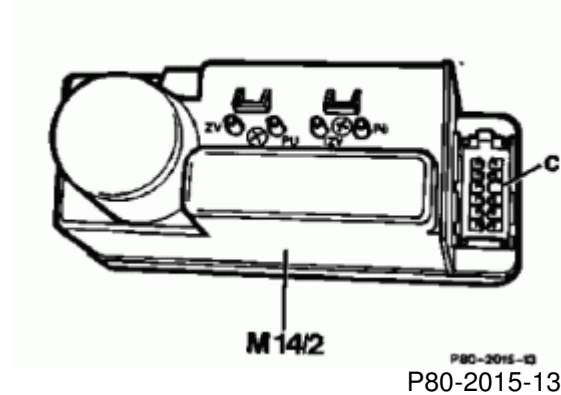
Identification **PU**: vacuum for auxiliary consumers for supporting the intake

manifold vacuum

Identification **IZV**: vacuum and pressure for interior central locking



Identification **PU**: pressure for the orthopaedic driver's seat backrest



- c) Supply pump for central locking with vacuum and interior central locking (production as of 10/91 up to 12/93).

Supply pump with 3 pneumatic connections.

Identification **ZV**: vacuum and pressure for central locking

Identification **IZV**: vacuum and pressure for interior central locking

Identification **PU**: pressure for the orthopaedic driver's seat backrest

- d) Supply pump for the central locking with vacuum and interior central locking and electrical actuation of starter lock-out relay (K38) (production as of 01/94 to 11/94).

Supply pump with 3 pneumatic connections.

Identification **ZV**: vacuum and pressure for central locking

Identification **IZV**: vacuum and pressure for interior central locking

Identification **PU**: pressure for the orthopaedic driver's seat backrest

- e) Supply pump for the central locking with orthopaedic seat backrest, vacuum and interior central locking and electrical actuation of starter lock-out relay (K38) (special equipment as of 01/94 to 11/94).

Supply pump with 4 pneumatic connections and electrical actuation of starter lock-out relay (K38).

Identification **ZV**: vacuum and pressure for central locking

Identification **PU**: vacuum for auxiliary consumers for supporting the intake manifold vacuum

Identification **IZV**: vacuum and pressure for interior central locking

Identification **PU**: pressure for the orthopaedic driver's seat backrest

- f) Supply pump for central locking with vacuum and interior central locking as well as electrical input for CL interior control switch (standard as of 09/95).

Supply pump with 3 pneumatic connections and electrical input for CL interior control switch.

Identification **ZV**: Vacuum and pressure for central locking

Identification **PU**: Vacuum for auxiliary loads for manifold vacuum assist.

Identification **IZV**: Vacuum and pressure for interior central locking.

- g) Supply pump for central locking with orthopedic backrest, vacuum and interior central locking as well as electrical input for CL interior control switch (special equipment as of 09/95).

Supply pump with 4 pneumatic connections and electrical input for CL interior control switch.

Identification **ZV**: Vacuum and pressure for central locking

Identification **PU**: Vacuum for auxiliary loads for manifold vacuum assist.

Identification **IZV**: Vacuum and pressure for interior central locking.

Identification **PU**: Pressure for orthopedic driver's backrest.

#### Note

Since the pin assignment in the electrical connector has been changed, supply pumps with/without output for control of the starter lockout relay (production breakpoint 01/94) and supply pumps with input for CL interior control switch (production breakpoint 09/95) are not interchangeable.

#### Technical data

Maximum current consumption	A	7.5
Closed-circuit consumption - terminal 30	mA	≤ 1
Closed-circuit consumption - terminal 15 (auxiliary consumers)	mA	≤ 100
Pressure switch off point for central locking and interior central locking	mbar	≥ 450
Switching time	about s	1
Safety switching time in the event of leaks in the central locking or interior central locking	about s	20 30
Safety switching time in the event of leaks in the auxiliary consumers	about s	70

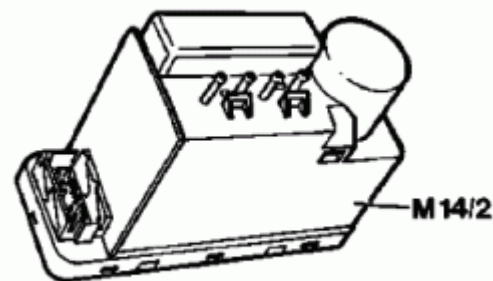
#### The control unit for the central locking

The supply pump is supplied with a negative control voltage for locking and a positive control voltage for unlocking from the actuators.

The supply pump produces pressure for unlocking and vacuum for locking (about 600 mbar).

The change of the pressure direction is controlled by the clockwise or anti-clockwise running of the motor and the pump. It is thus ensured, that the command which was last issued is carried out.

In the event of serious leaks, the supply pump switches off after 25 - 30 seconds (safety switching time). The electronic control has several logic functions, which avoid faulty switching and disturbances. In addition the control unit has a leakage current detection, whereby the leakage current cannot result in automatic functions, since the control inputs concerned are switched off.



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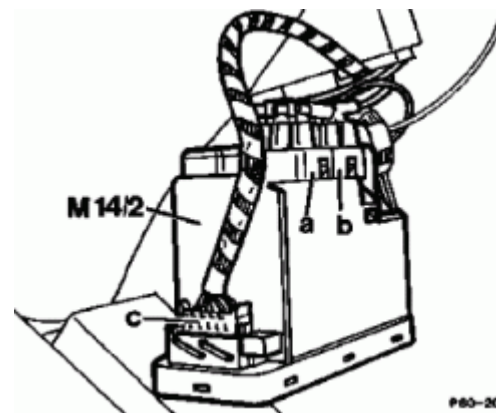
**Pneumatic connection**

Distributor plug (a, b) with identification of the individual connections.

**Note**

Distributor plugs (a, b) are eliminated as of installation of pneumatic line sets produced using the stamping method (04/95).

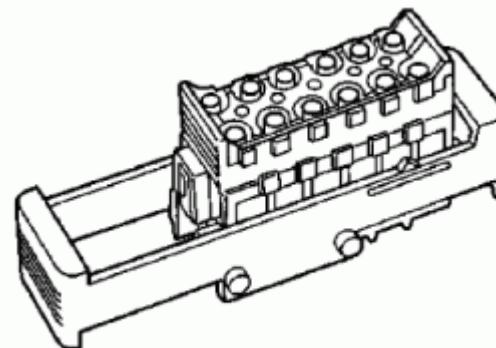
- a) Distributor plug for the interior central locking and orthopaedic backrest (special equipment)
- b) Distributor plug for the central locking and vacuum (production)
- c) Electrical cable harness



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**Electrical connection**

12-pin connector with insertion and removal aid. Connection and disconnection is effected with the help of a gripping device.



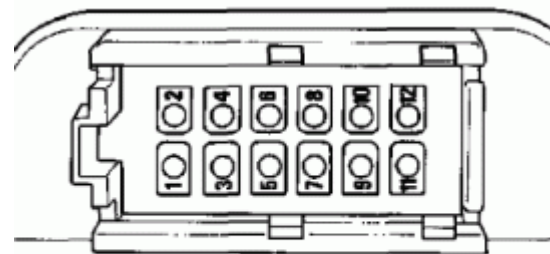
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Assignment of the electrical connections of the M14/1 or M14/2 supply pump

- 1 Terminal 15
- 2 Terminal 30
- 3 Emergency opening
- 4 Comfort/EDW
- 5 Steering lock interrogation
- 6 <sup>1)</sup> Vent valves
- 6 <sup>2)</sup> Input for CL interior control switch
- 7 Infrared remote control
- 8 Control line - driver's door
- 9 Control line - trunk lid
- 10 Control line - passenger door

- 11 Control line - interior central locking
- 12 Terminal 31

- 1) Vehicles up to 12/93
- 2) Vehicles without infrared remote central locking (IRCL) as of 01/94
- 3) Vehicles as of 09/95



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P80-2055-13

### List of the supply priorities

1. Emergency opening
2. Infrared remote operation
3. Central locking
4. Interior central locking
5. Vacuum for auxiliary consumers After switching on the ignition, the vacuum supply can only begin after a delay period of 5 - 8 seconds.
6. Pressure for orthopedic driver's seat backrest. After switching on the ignition the pressure supply can only begin after a delay period of about 2 seconds.

### Control unit for auxiliary consumers, vacuum

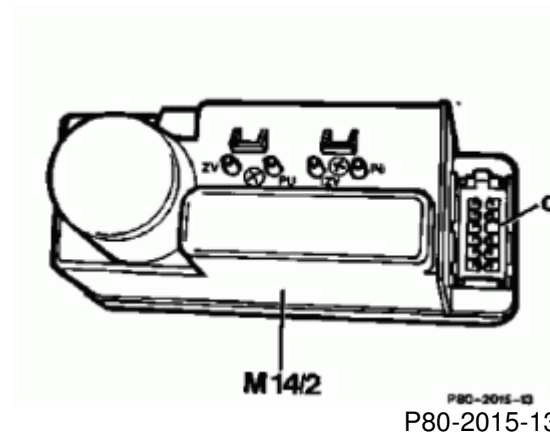
The M14/1 or M14/2 supply pump supports the units depending on intake manifold vacuum, e.g. automatic heating or air conditioning.

If the vacuum in the storage reservoir reaches a value of about 410 - 390 mbar, the supply pump starts up for 2 seconds when the ignition is switched on. In the event of severe leaks in the vacuum system the pump switches off after a continuous running period of 60 - 70 seconds.

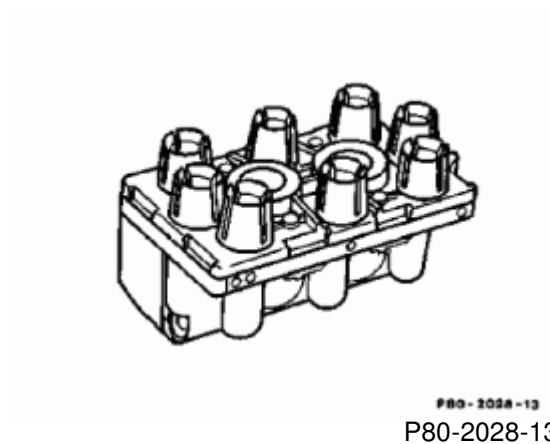
If the supply pump constantly switches on and off in time intervals shorter than  $17 \pm 2$  seconds due to slight leaks, these switching operations are summated by a leakage detection system and the pump switches off after 31 switching operations. This process is interrupted by switching off the ignition and starts all over again. The summated switching operations are erased, as soon as the supply pump has not been switched on for longer than  $17 \pm 2$  seconds.

### PU identification

Connection for auxiliary consumers, vacuum.



From the distributor plug on the supply pump, connection PU a vacuum line leads straight to the vacuum distributor block in the engine compartment.



### Control of emergency opening

Emergency opening may only be carried out if the steering lock interrogation switch is open (key in place) and continuous earth (-) is applied to the emergency opening control input for at least 0.1 seconds.

Thereafter the supply pump starts running in the direction "unlocking" after a delay of about 5 seconds.

### Interior central locking control unit

The interior central locking is unlocked, when:

- the control unit of the interior central locking is earthed and remains in this condition independent of the central locking.
- the control input for the driver's door or passenger door is earthed and simultaneously the control unit for comfort/ATA is earthed for a short time.
- the control input of the trunk lid is earthed.
- the control input of the infrared remote control is earthed.

The interior central locking is unlocked, when:

- positive voltage is supplied to the control input of the interior central locking.
- a positive voltage is applied to the control input of the driver's door or passenger door and when simultaneously the control unit of the comfort/ATA is earthed briefly.
- positive voltage is applied to the control input of the trunk lid.
- positive voltage is applied to the control input of the infrared remote control.

The interior central locking is connected to the central locking by a 3/2 directional control valve on the supply pump. Actuation of the control input of the interior central locking will only ever operate the interior central locking. If the interior central locking is operated indirectly by the central locking, then the central locking is always operated first. In the event of severe leakage in the system the pump switches off after a continuous running time of 20 - 30 seconds.

#### **Control unit for infrared remote control**

If the supply pump receives a positive signal via the control input of the infrared remote operation, it carries out an unlocking process. Likewise, the interior central locking unlocks, if necessary, provided that the control input of the interior central locking is earthed.

When there is a negative signal to the control input of the infrared remote control the central locking locks, and if need be, the interior central locking.

#### **Control unit for the orthopedic driver's seat backrest**

The M14/2 supply pump produces the necessary pressure for the orthopedic driver's seat backrest.

It applies pressure to the storage reservoir up to a maximum of 590 mbar.

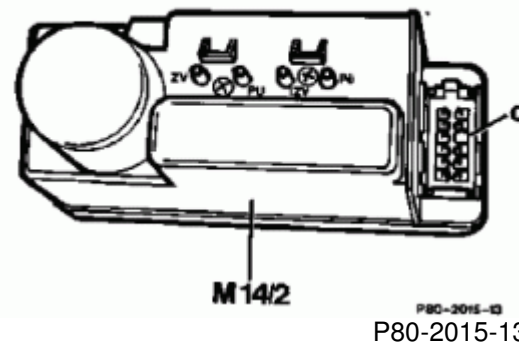
If this pressure reduces to about 200 - 230 mbar the supply pump starts up again until the maximum pressure of 590 mbar has been reached again.

In the event of severe leakage in the pressure system (orthopedic driver's seat backrest) the pump switches off after a continuous running period of 60 - 70 seconds.

If the supply pump constantly switches on and off in time intervals shorter than  $17 \pm 2$  seconds due to slight leaks, these switching operations are added up by a leakage detection system and the pump switches off after 31 switching operations. This process is interrupted by switching off the ignition, and starts all over again. The added-up switching operations are erased, as soon as the supply pump has not been switched on for longer than  $17 \pm 2$  seconds.

#### **PU identification (special equipment)**

Connection for orthopaedic driver's seat backrest.



## 2. Actuators (S47, S48, S49)

A combined actuator is installed in the driver's and passenger door and in the trunk lid. This actuator has an electrical and a pneumatic connection for a quick-fit connection.

The electrical and pneumatic function of all actuators is the same. The electrical switch in the upper part of the actuator is permanently connected to the positive terminal and to ground.

The two-way switch provides the supply pump with a positive control voltage for unlocking and a negative control voltage for locking.

The lower chamber of the actuator is applied with pressure for unlocking and with vacuum for locking.

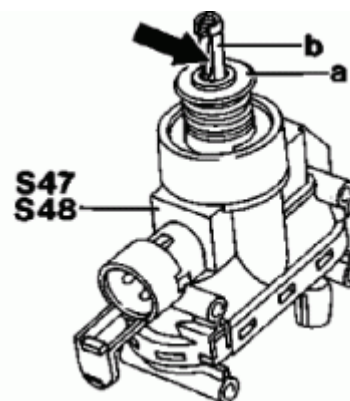
The electrical and pneumatic part of the actuator can be separated by a sliding sleeve with a catch, so that the lock can also be operated, when the actuator is still applied with pressure or vacuum.

Adjustment of the sliding sleeve (a) is prevented by an integrated support (arrow) on the actuator S47 and S48. When the connecting rod is loaded against the lock the adjusting lock is made inoperative.

In this way the actuator is in the installation position. Adjustment errors on the door actuators are excluded.

S47 Left door actuator

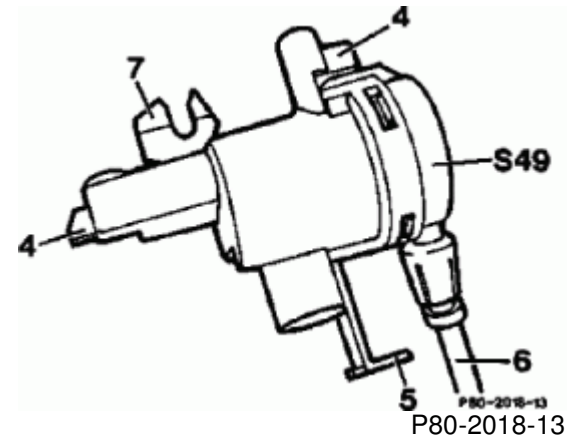
S48 Right door actuator



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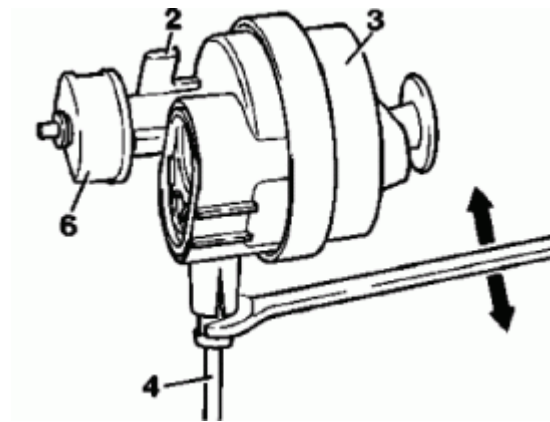
The trunk lid lock actuator S49 is attached with clip attachments (4) directly to the lock. No adjustment is necessary.

## S49 Trunk lid lock actuator

**3. Tank flap element**

A clippable pneumatic element with direct locking rod, anti-theft device and emergency unlocking knob.

A valve in the element makes it impossible for the locking rod to be pushed back mechanically by the tank flap. The guide bush (6) covers the locking rod and prevents water reaching the rod, which can result in the element freezing up in winter.

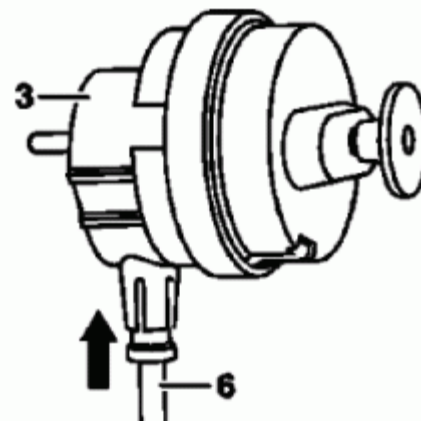
**4. Pneumatic line system and connections**

Pneumatic lines with quick-fit connection

All pneumatic lines have a plug on their ends which lock into the pneumatic connecting bush of the elements.

- 3 Tank flap element
- 6 Pneumatic line

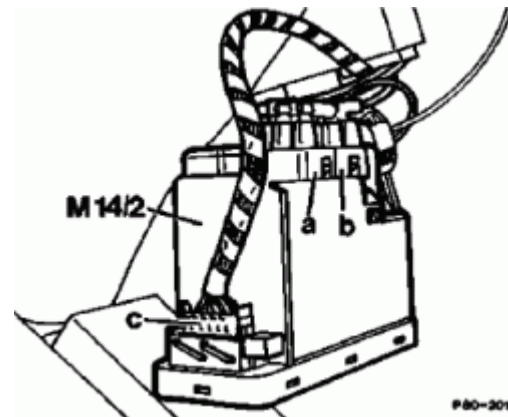




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The pneumatic lines lead straight to the elements from distributor plugs on the supply pump

- a Distributor plug - interior central locking and orthopaedic backrest (special equipment)
- b Distributor plug - central locking and vacuum (standard)

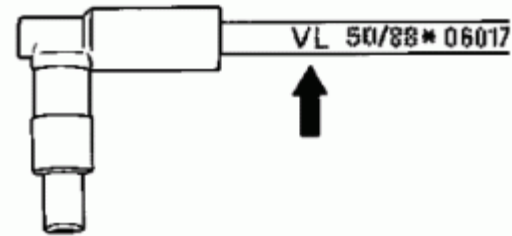


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The ends of the pneumatic lines are identified. The identification indicates to which pneumatic element the line belongs.

Identification	Element
VL	Left door actuator
VR	Right door actuator
HD	Trunk lid lock actuator
KE	Tank flap element



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**Note**

As of 09/95 pneumatic line sets are used, which are produced using a new production method, the so-called stamping method. The pneumatic distributors used previously on the pneumatic control module have been eliminated. A pneumatic line plugged onto the pneumatic control module leads to a 6-way distributor for distribution of the dual pressure for central locking.

From this 6-way distributor a separate pneumatic line leads to each of the central locking elements. Letters on the 6-way distributor indicate the central locking element to which the pneumatic line leads. Connections C and D are plugged.

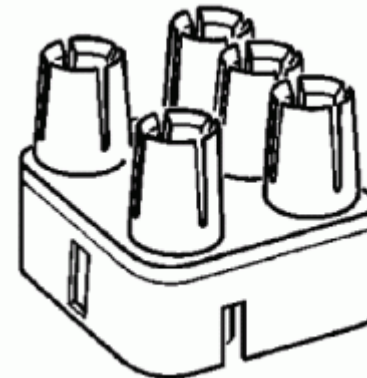
- A. Left door
- B. Trunk lid
- C. Plugged
- D. Plugged
- E. Right door
- F. Tank flap

**5. Pneumatic distributor plug**

The connecting bushes on the distributor plug are identified. The identification indicates to which pneumatic system the connected lines lead.

**Note**

The pneumatic distributor plugs have been eliminated as of the production breakpoint for the stamping production method (09/95).

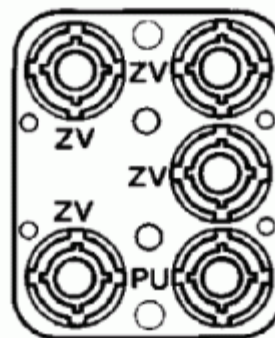


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Identification	Pneumatic system
ZV	Central locking

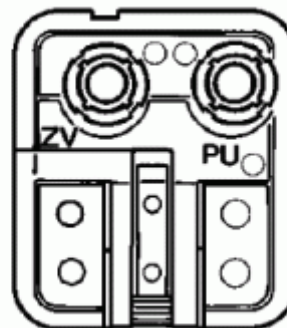
PU	Vacuum - auxiliary consumers
IZV	Interior central locking
PU	Orthopedic driver's seat backrest

Distributor plug - upper side



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Distributor plug - under side

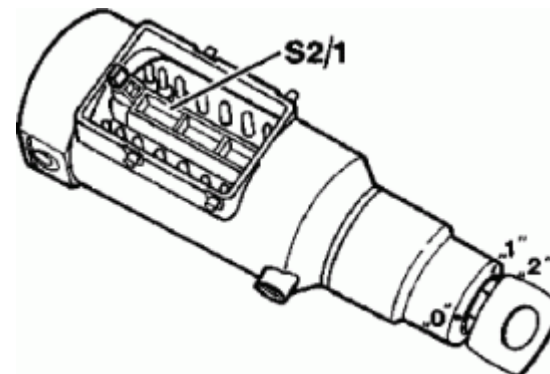


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### 6. Ignition starter switch

#### Switch-steering lock interrogation S2/1s2

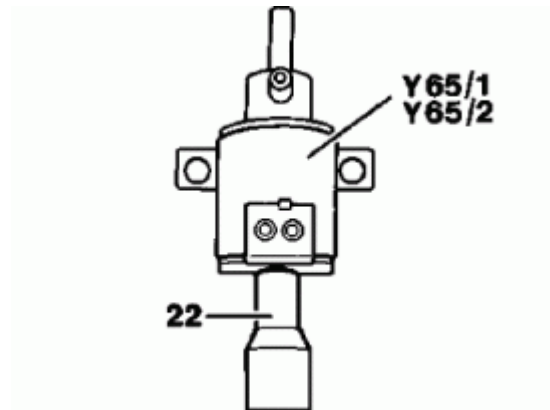
This switch earths and thus activates the supply pump when the key is removed or is inserted again after removal, but has not been operated (key position "0" on the steering lock).



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- 7. Switchover valve for venting central locking of the driver's door Y65/1 (passenger door Y65/2) (vehicles up to 12/93)

These valves are accommodated beneath the left and right driver's/passenger's seat. They vent the pneumatic line to the driver's and passenger door after locking or unlocking



P80-2058-13

**E. Stage 1 immobilizer as of 01/94 to 11/94**

The central locking pump is equipped with an electrical output (pin 6) for control of the starter lockout relay (K38) as of 01/94 for the immobilizer function.

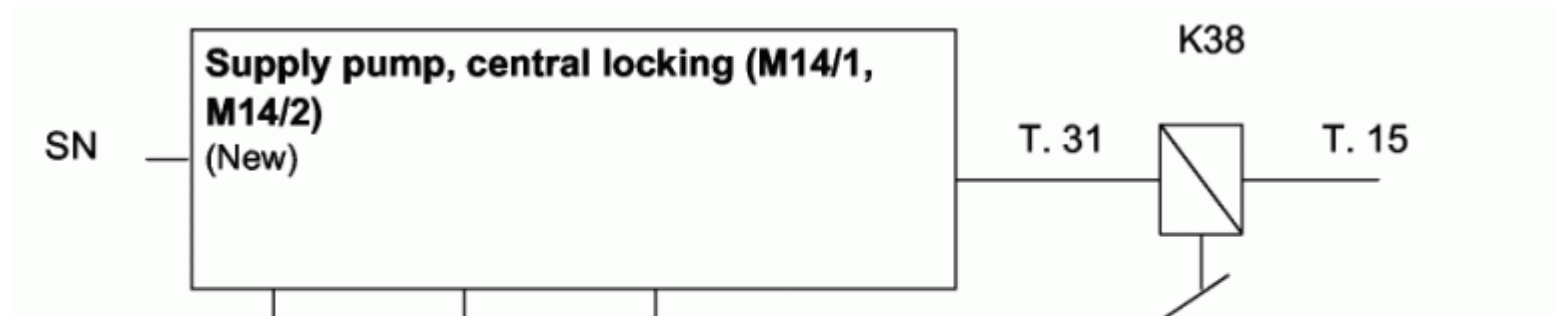
If the vehicle is unlocked from outside at one of the three control points (CL element and lock switch switched in the unlocking direction), the immobilization output is connected to ground. When the ignition is switched on the starter lockout relay (K38) pulls in allowing the vehicle to be started.

If the vehicle is locked from the outside at one of the three control points (CL element and lock switch switched in locking direction), the immobilization output interrupts the ground connection for the starter lockout relay (K38) preventing the vehicle from being started.

**Note**

On vehicles as of 01/94 with infrared remote central locking (IRCL) the starter lockout relay (K38) is controlled by the infrared remote central locking control module (N54) and not by the central locking pump.


**Stage 1 immobilizer**



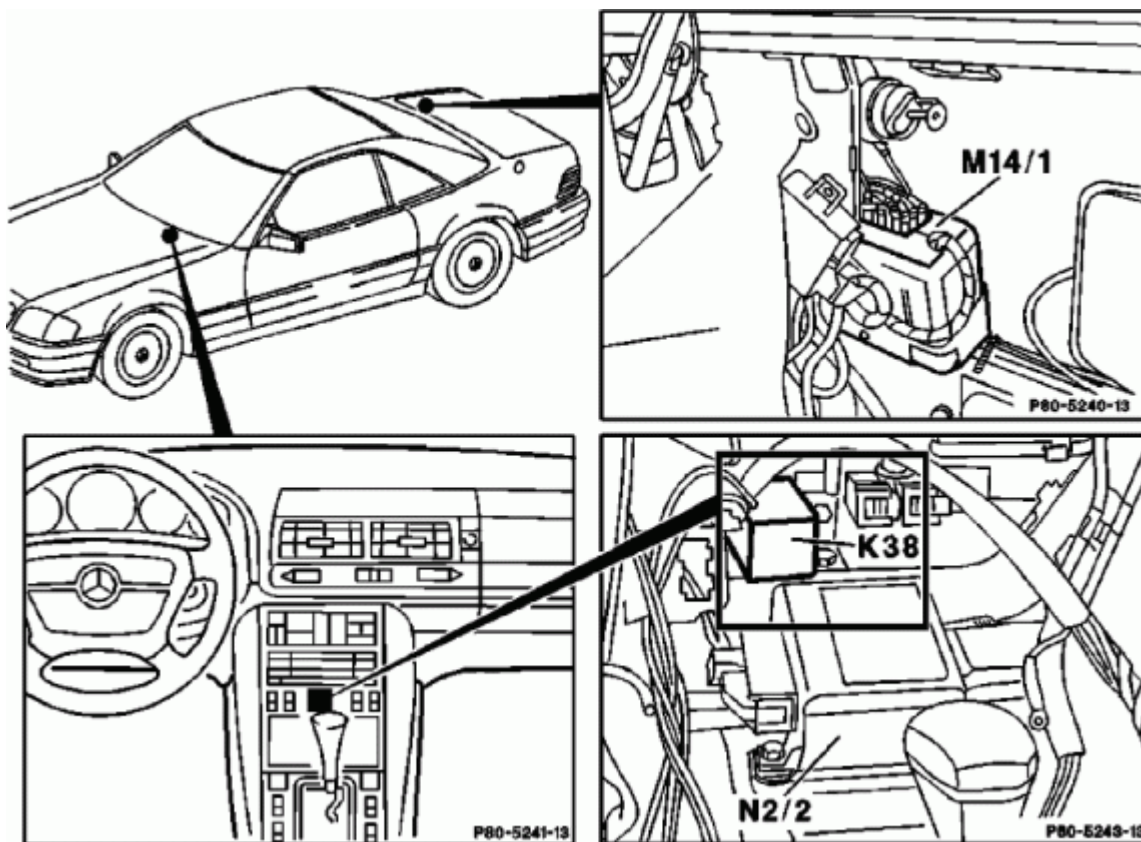
SN = Lock switch

S47 = Left door actuator

S48 = Right door actuator

S49 = Trunk lid lock actuator (only connected electrically on  models)

**Location of components for stage 1 immobilizer**



K38	Starter lockout relay
N54	Infrared remote central locking control module