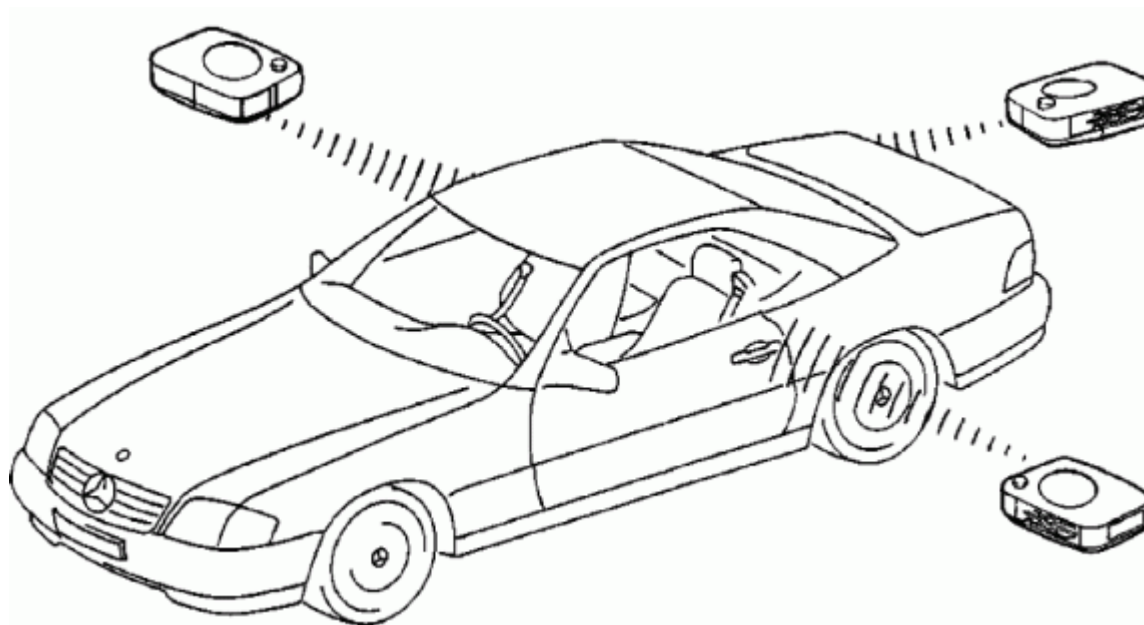


| | |
|--------|---|
| 80-400 | Function description of infrared remote control |
|--------|---|

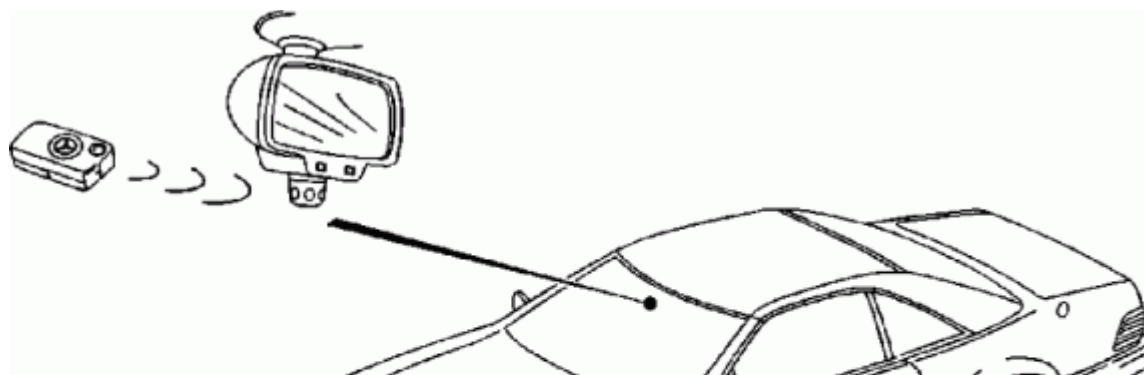
A. General

Version 1 up to 11/94, (USA) up to 08/95



P80-0028-55

Version 2 as of 12/94, (USA) as of 09/95



P80.30-0260-05

To improve the operating convenience it is possible to control the central locking, where applicable, interior central locking and ATA with one infrared remote control in the key head. Moreover, any side windows open can be closed.

All operations are indicated by signal lamps. At maximum battery capacity the central locking remote control is effective up to a distance of approx. 6 m, remote control of the convenience feature is possible up to a distance of approx. 3 m.

Receiver units with signal lamps were installed in the lock cylinders for the doors and trunk lid up to 11/94, (USA) up to 08/95.

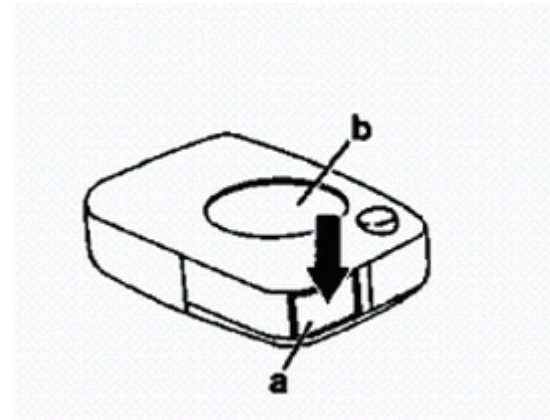
As of 12/94, (USA) as of 09/95, the receiver unit with indicator lamps is located on the interior rear view mirror. The driver's door handle does not contain a receiver unit. Only signal lamps are located here (not (USA)).

B. Operation

Unlocking the central locking and interior central locking

Deactivation of ATA

Aim transmitter window (a) on remote control at receiver on vehicle at distance of up to approx. 6 m. Momentarily press the button (b), the green signal lamp flashes. The green signal lamp goes out after approx. 3 seconds.



P80-2011-13

Locking the central locking and the interior central locking

As with unlocking, point the transmitter window (a) at the receiver. Momentarily press button (b), red signal lamp flashes. As soon as all commands have been carried out, the red signal lamp goes out after about 3 seconds. If a command was not able to be carried out, e.g. because a door or the trunk lid is not completely closed, the lamp flashes again for up to about 10 seconds (for about 3 seconds on vehicles as of 12/93). After closing the door or the trunk lid correctly the central locking must first be unlocked and then locked again.

Closing side windows with infrared remote control

When locking, hold down the button (b) on the remote control, after about 1 second the windows which may have been left open begin to close. The closing process is interrupted, if the button on the remote control is released or the infrared beam between the remote control and the receiver is interrupted.

C. Function

The infrared remote control can only be used in combination with the vehicle to which it belongs, because the remote control and control module installed in the vehicle are matched to one another.

The remote control transmits the signal to the receiver in the form of an infrared light beam. The receiver picks up this light beam, filters out extraneous light, amplifies the signal and transfers it to the control module via a control line.

The transmitted signal consists of a fixed code, which is encrypted additionally by a computer. This additional encryption changes each time it is used. This makes it impossible to decode the signal.

The control module decodes the signal and actuates the central locking, interior central locking and ATA when the fixed code is correct. Simultaneously the control module is reset to the next signal to be transmitted inhibiting the previous signal.

If the remote control is actuated outside of the reception range, the current signal changes in the remote control, however, not in the control module in the vehicle. When the remote control is used

again within the reception range, the signal from the remote control does not coincide with that expected by the control module in the vehicle. However, since the control module can extrapolate 250 switching operations, it adjusts itself to the current signal from the remote control.

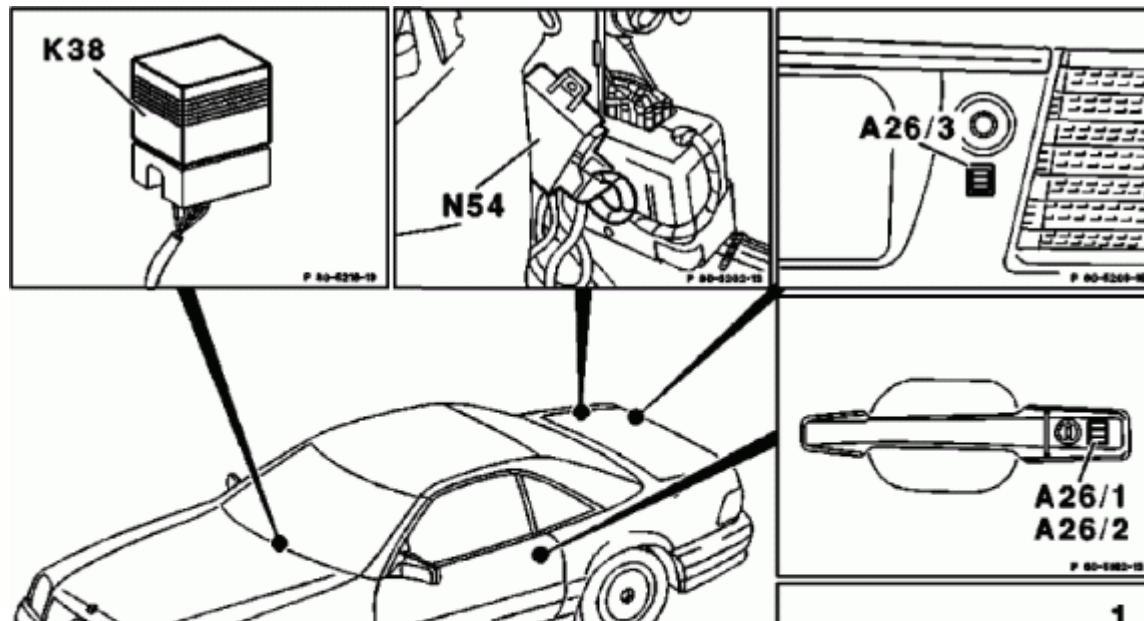
If the remote control is actuated more than 250 times outside of the reception range, it is necessary to resynchronize the remote control (see 80-420).

Desynchronization

If a remote control key is lost the alternating code component of the signal can be desynchronized on vehicles as of 12/93 using the hand-held tester. This means that it is only necessary to replace the mechanical locks when a remote control key is lost. All remote control keys for this locking system must then be resynchronized (see 80-420).

D. Components

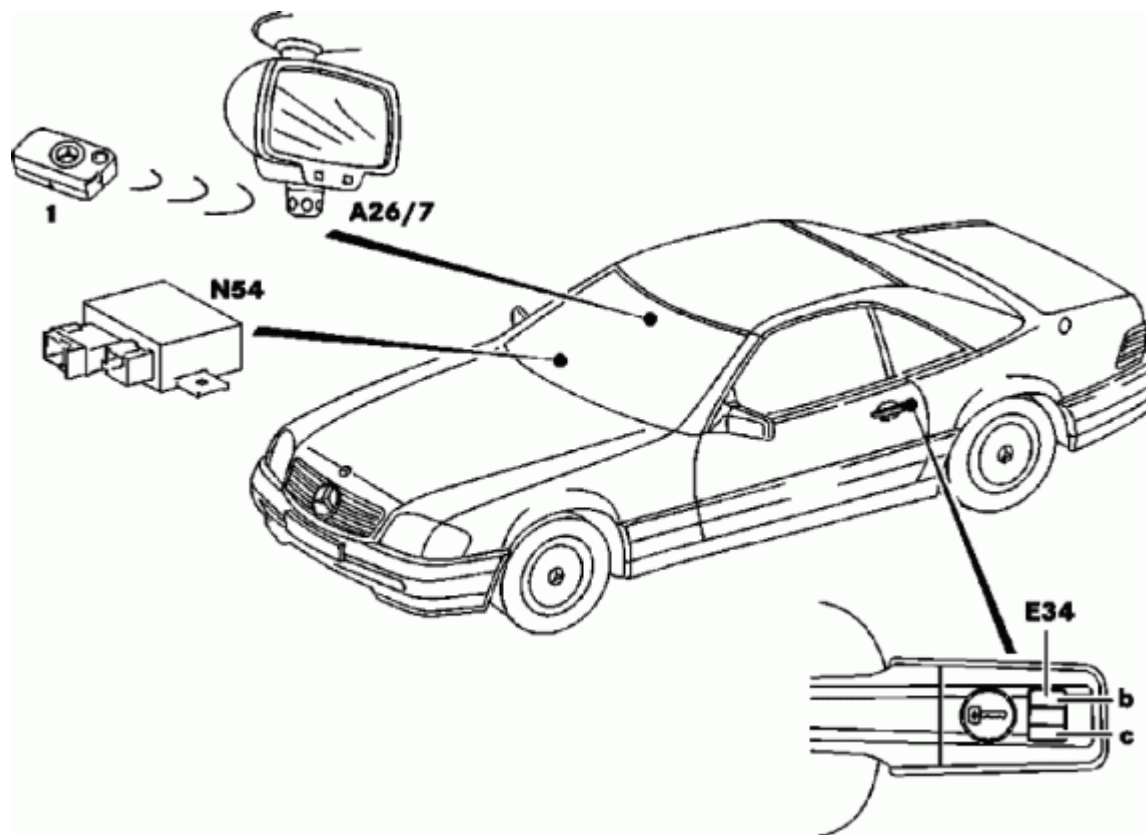
Version 1 up to 11/94, (USA) up to 08/95



P80-5207-57

| | | | |
|-------|--|-------|---|
| 1 | Remote control key | A26/3 | Receiver unit for infrared remote control for the trunk lid |
| A26/1 | Receiver unit for infrared remote control for the driver's door | K38 | Starter lock-out relay (vehicles as of 01/94) |
| A26/2 | Receiver unit for infrared remote control for the passenger door | N54 | Infrared remote central locking control module |

Version 2 as of 12/94, ^{USA} as of 09/95



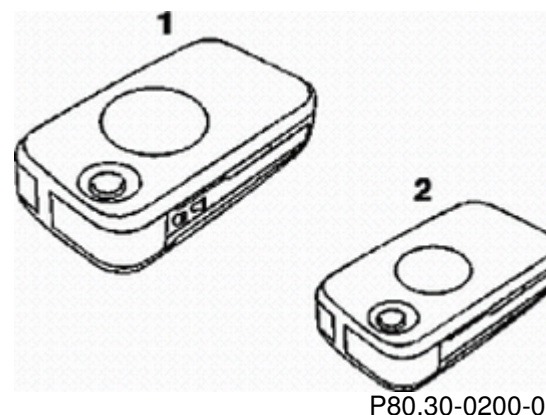
P80.30-0267-06

| | | | |
|-------|--|-----|--|
| 1 | Remote control key | E34 | Function indicator (IRCL), (except USA; Japan) |
| A26/7 | Infrared remote central locking receiver unit, interior mirror | N54 | Infrared remote central locking control module |

Remote control key

In the key head there is an infrared remote control with transmitter window (a), a button for operating (b), a battery compartment (c) with 4 batteries (remote control key up to 09/93) or 2 batteries (remote control key as of 10/93) and a folding 4-track key (d). The key is folded out by a pushbutton (e).

If a remote control key is lost, a new one can be ordered in the usual way by specifying the locking mechanism number.



Up to 8 remote controls can be adjusted to a locking mechanism number by the manufacturer.

If the locking mechanism on a vehicle up to 11/93 is replaced the remote control and the control module for infrared remote control also have to be replaced.

If the locking mechanism on a vehicle as of 01/94 is replaced the remote control and the control module for infrared remote control do not have to be replaced.

Only the remote control signal has to be desynchronized and then resynchronized (80-420).

The folding key in the remote control can be exchanged.


When the remote control button (b) is operated continuously, the remote control switches off after about 30 seconds, in order to avoid discharging the batteries.

As of 10/93 the size of the remote control key has been reduced by approximately 40%. The mechanical key shank of a remote control key up to 09/93 cannot be replaced by a remote control key as of 10/93.

1 Remote control key up to 09/93

2 Remote control key as of 10/93

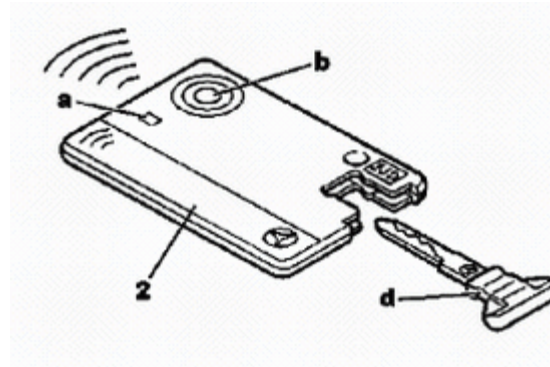
Spare infrared remote control key and auxiliary key function

As of approx. 05/95 customers have been given a spare infrared remote control key in addition to the two standard infrared remote control keys (except ). Upon introduction of this spare infrared remote control key the spare batteries have been eliminated for the standard infrared remote control key, which were included in the car document envelope as of introduction of the stage 2 drive authorization system. The spare infrared remote control key can also be obtained for older vehicles with infrared remote central locking from ZVL Germersheim.

The spare key (2) is the size of a credit card. The spare key can be used for the central locking as well as the ATA. Moreover, the drive authorization system can be activated and deactivated with the infrared remote control signal.

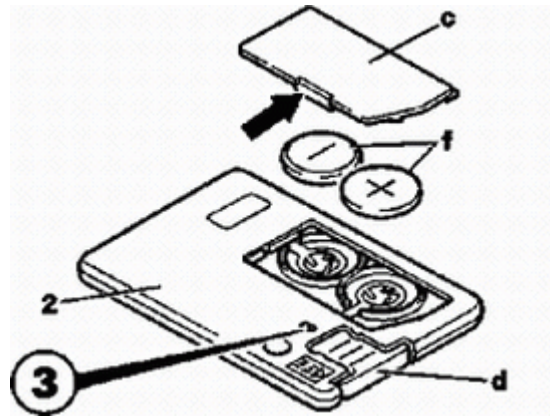
Actuation of the convenience feature is not possible. The spare key (2) contains an infrared remote control, a pushbutton (b) for actuation, a LED (a) for checking the battery, a battery compartment with two batteries and a mechanical main key (d). The infrared beam exits from the middle of the front

side of the spare key when the button (b) is pressed.



P80.30-0252-01

The spare keys are marked with an embossed number on the back (here 3). To replace the two batteries (f), remove the battery compartment cover (c) on the spare key (2). For this purpose press in the catch (arrow). The same batteries are used as in the standard infrared remote control.



P80.30-0253-01



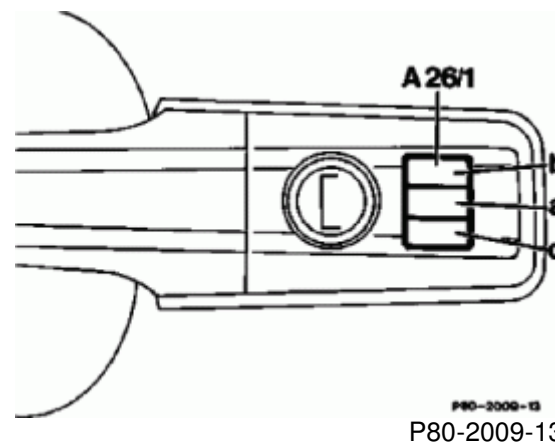
If necessary the mechanical main key (d) can be replaced with a mechanical auxiliary key. This can be obtained from ZVL Germersheim. The lock cylinders in the trunk and glove box cannot be operated with the mechanical auxiliary key. Customers then still have the familiar advantages when the key is given to a hotel attendant or the vehicle is left in the workshop.

Infrared remote control receiver units (A26/1, A26/2, A26/3) up to 11/93, up to 08/95 ^{USA}

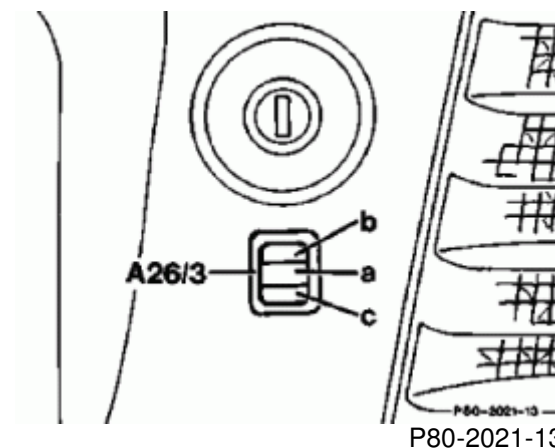
From outside only the infrared window (a) and the red (b) and green (c) signal lamps are visible on the receiver units.

The driver door infrared remote control receiver unit (A26/1) and front passenger door infrared remote control receiver unit (A26/2) are located on the lock cylinders.

The receiver unit on the trunk lid (A26/3) is fixed to the push button lock of the trunk lid. In order to remove it the actuator and the push button lock of the trunk lid must be loosened.



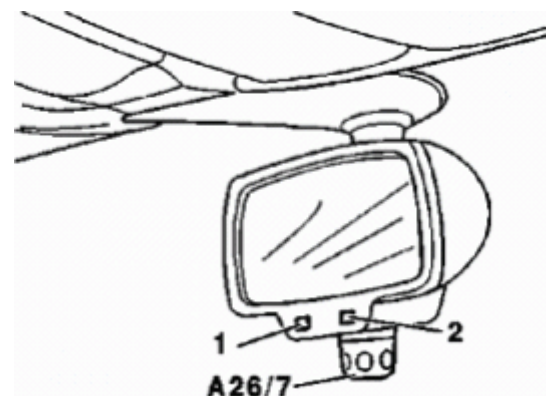
P80-2009-13
P80-2009-13



P80-2021-13
P80-2021-13

Infrared remote control receiver unit, interior mirror (A26/7) as of 12/94, as of 09/95 ^{USA}

The red (b) and green (c) signal lamps are located on the receiver unit (A26/7) in the interior rear view mirror.




P80.30-0254-01

The receiver units can be exchanged individually without specifying the code number.

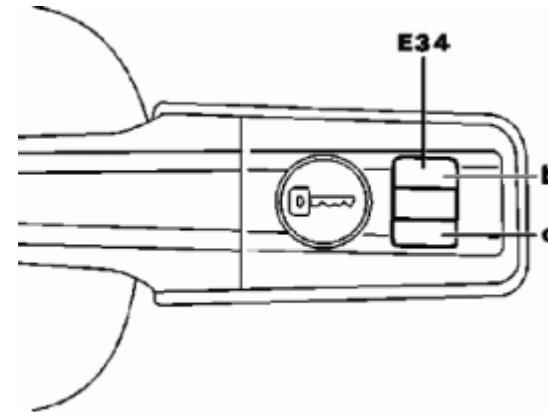
Function indicator (IRCL)



The driver's door handle contains only red and green signal lamps, no receiver unit (not ).

The lock cylinder is plugged with a cap, which can be removed as required to get into the vehicle passenger compartment when the remote control batteries are run down.

- b Red signal lamp
- c Green signal lamp

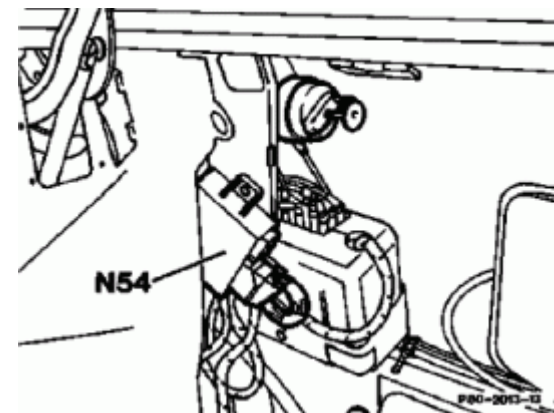


P80.30-0259-01

Infrared remote central locking control module (N54) up to 11/94, , up to 08/95.

The control module is fixed to the reinforcement on the right of the luggage compartment. The electrical connection is equipped with an aid for connecting and disconnecting. For removal press the locking catch and pull up the plug on the cable side.

When replacing the control module or the remote control, it is essential to specify the locking system number, since both parts are matched to each other

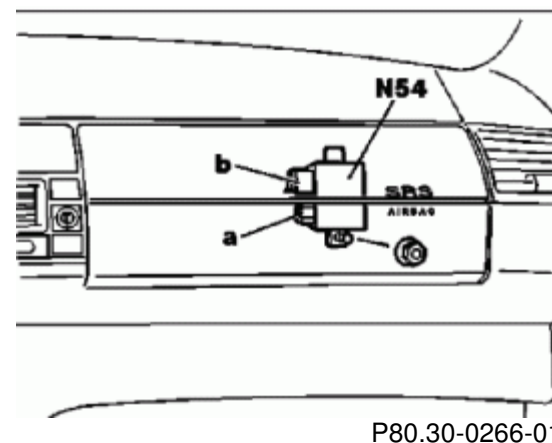


P80-2013-13

Infrared remote central locking control module (N54) as of 12/94, , as of 09/95

The control module is located behind the passenger airbag. The 12-pin electrical connection (a) is equipped with an aid for connecting and disconnecting. To disconnect press in the catch and swivel the strap away. The 2-pin electrical connection (b) is secured with a retainer. To disconnect press the catch and push the retainer to the side. When replacing the control module or the remote control always indicate the locking system number,

because the two parts are matched to one another.



E. Stage 1a immobilizer as of 01/94 to 11/94, p to 08/95 (USA)

The IRCL control module (N54) is equipped with an electronic output (pin 26) for control of the starter lockout relay (K38) for the immobilizer function (interruption of starter circuit) as of 12/93 to 11/94.

If the vehicle is unlocked with the remote control key at one of the three control points, the immobilizer output is switched through to ground, after the ignition is switched on the starter lockout relay (K38) pulls in allowing the vehicle to be started.

If the vehicle is locked at one of the three control points with the remote control key, the ground for the starter lockout relay (K38) is interrupted via the immobilizer output preventing the vehicle from being started.

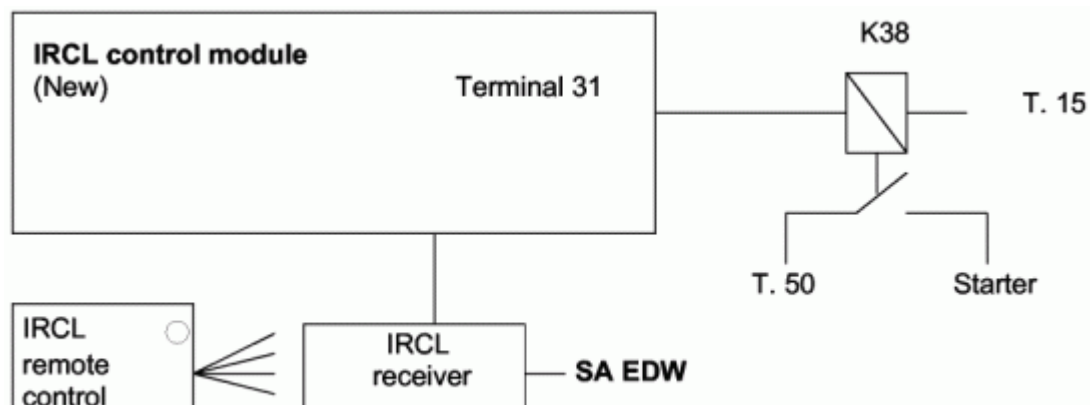
Notes

If the vehicle is unlocked with the mechanical key it cannot be started (except (USA)).

See diagnosis manual for testing of the immobilizer output.

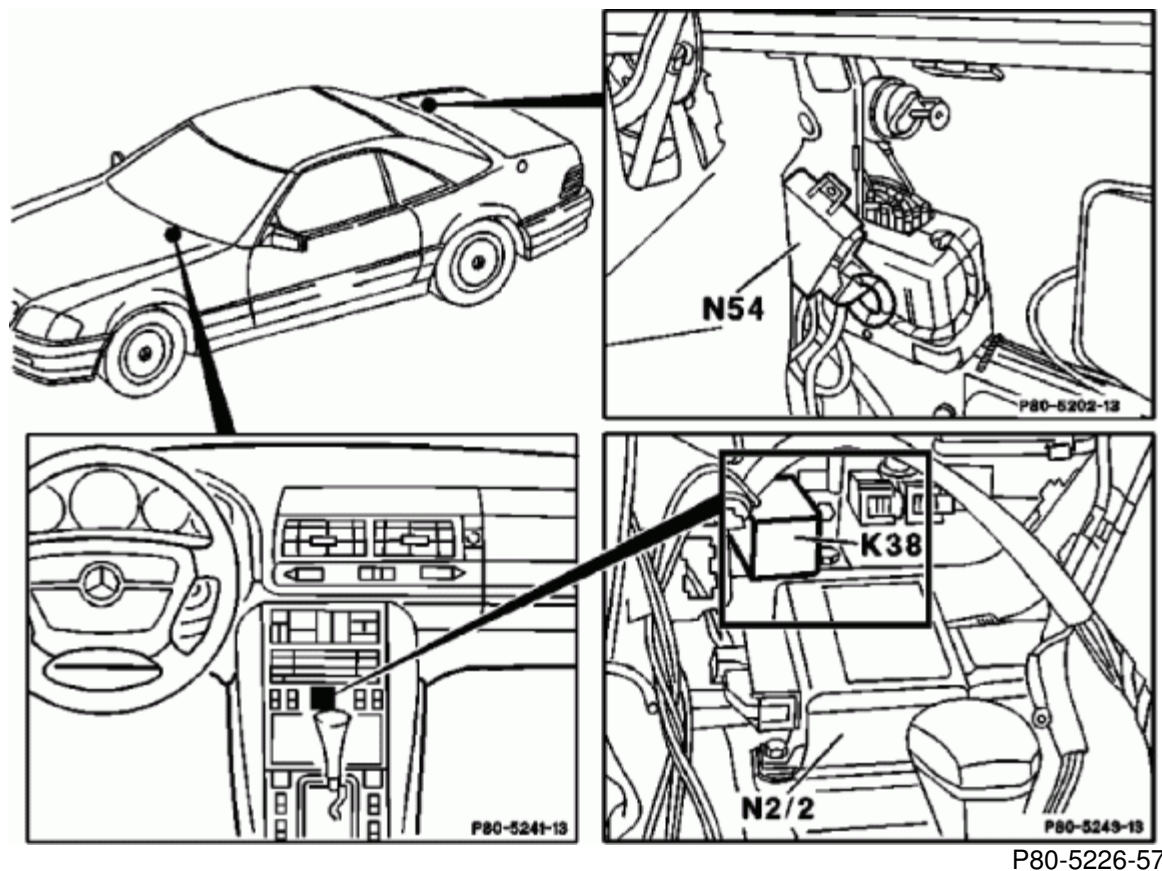
On vehicles as of 01/94 - 12/94 without IRCL the starter lockout relay (K38) is controlled via the central locking pump (M14, M14/1).

Stage 1a immobilizer



IRCL = Infrared remote central locking

Location of components, stage 1a immobilizer



K38 Starter lockout relay

N54 Infrared remote central locking control module

F. Stage 2 drive authorization system as of 12/94, ^{USA} as of 09/95

The infrared remote control module interacts with the engine control module for implementation of the stage 2 drive authorization system. The system inhibits the engine control when the vehicle has been locked with the infrared remote control. The starter can turn, however, the engine will not start. Various drive authorization systems are used to match the engine control module in the vehicle

(IRCL version). Two versions are used. An IRCL version with CAN connection and a version with pulse width modulation connection to the engine control module.

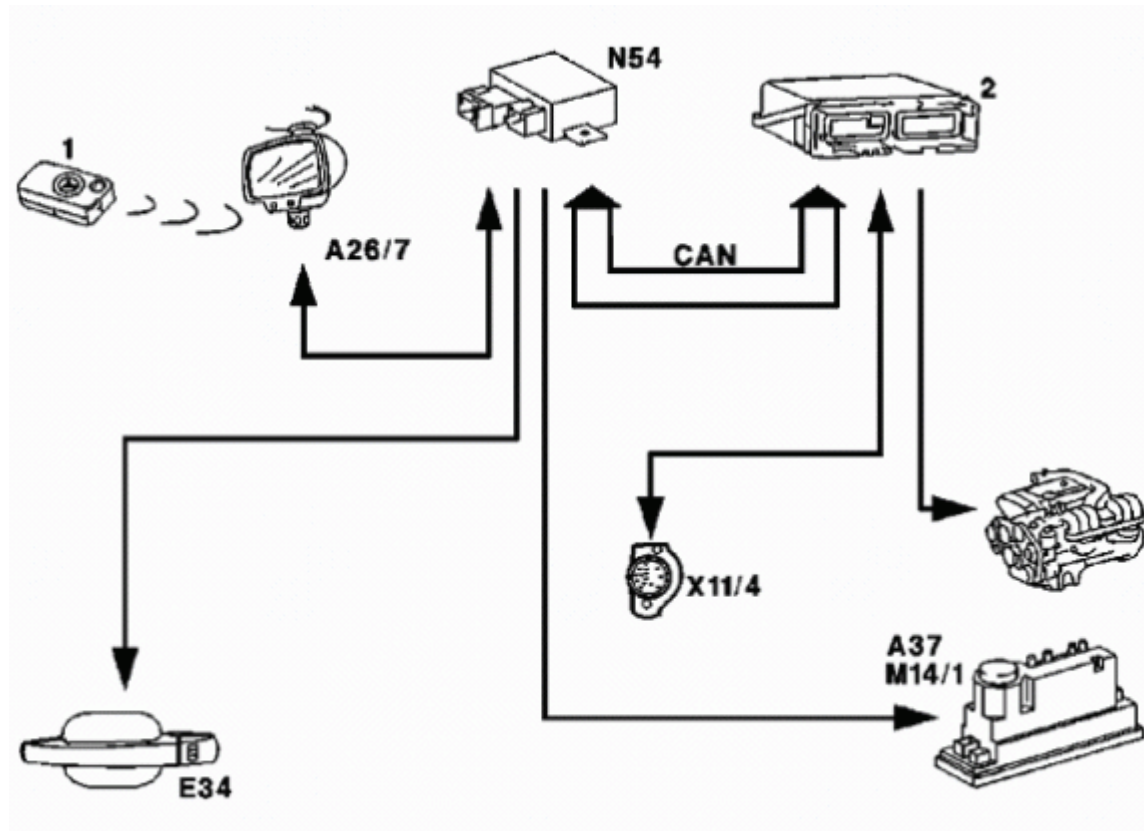
The drive authorization system and ATA can be activated and deactivated only with the IRCL. Opening and closing the vehicle with the mechanical key has no effect on the drive authorization system and ATA.

(USA): All systems can still be operated with the IRCL and key).

The IRCL control module and engine control module are permanently assigned to one another via the CAN bus by an identification code. This identification code cannot be erased. For this reason it is not possible to use an IRCL control module or engine control module from another vehicle for testing.

Interlinkage of components as of 12/94, (USA) as of 09/95

Connection between IRCL control module and engine control module via CAN

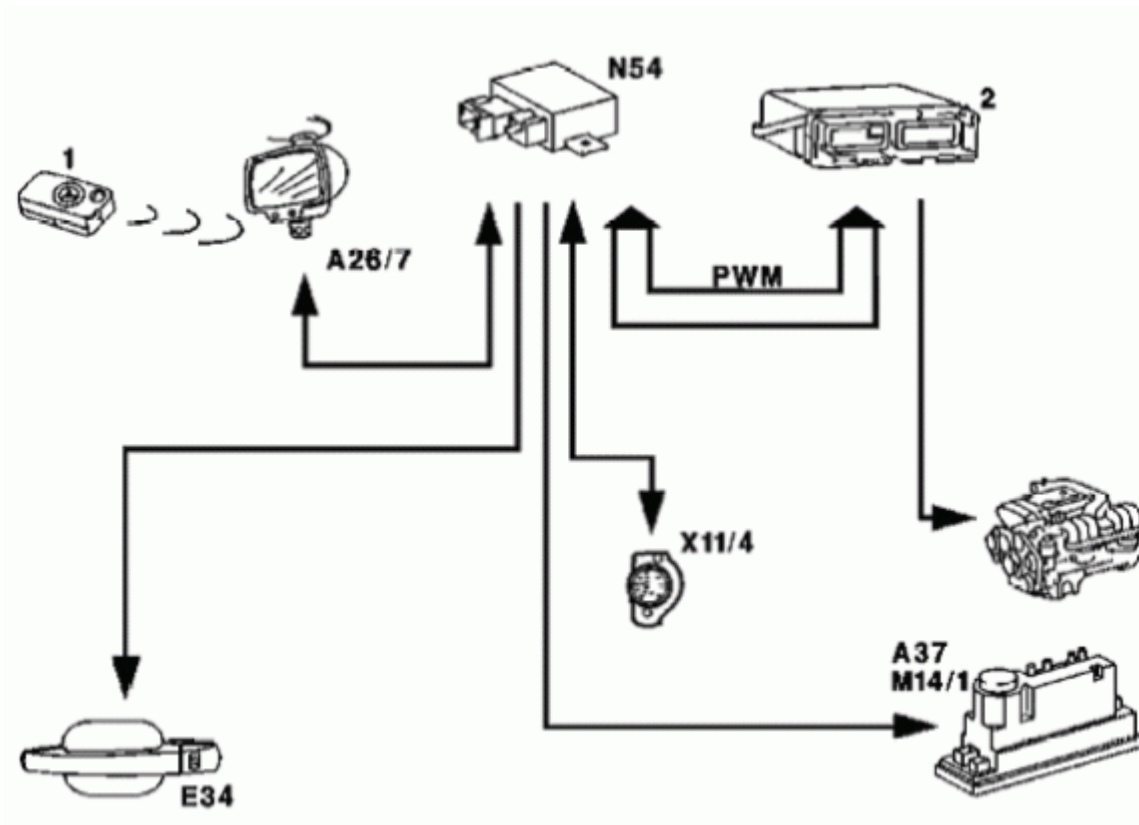


P80.30-0243-06

| | | | |
|-------|---|-----|---|
| A26/7 | Infrared remote central locking receiver unit, interior | N54 | Infrared remote central locking control module (IRCL) |
|-------|---|-----|---|

| | | | |
|-------|--|-------|-----------------------------|
| | mirror | | |
| CAN | Controller Area Network | X11/4 | Data link connector |
| E34 | Function indicator (IRCL), (except USA, Japan) | 1 | Infrared remote control key |
| M14/1 | Supply pump, central locking (CL) | 2 | Engine control module |

Connection, IRCL control module/engine control module via pulse width modulation



P80.30-0244-06

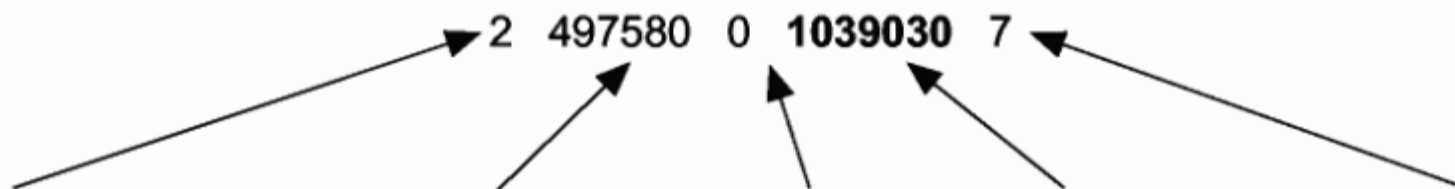
| | | | |
|-------|--|-------|-----------------------------|
| A26/7 | Infrared remote central locking receiver unit, interior mirror | PWM | Pulse width modulation |
| E34 | Function indicator (IRCL), (except USA, Japan) | X11/4 | Data link connector |
| N54 | Infrared remote central locking control module (IRCL) | 1 | Infrared remote control key |
| M14/1 | Supply pump, central locking (CL) | 2 | Engine control module |

Replacement of infrared remote central locking components (vehicles with stage 2 drive authorization system)



The infrared remote central locking control module and engine control module are permanently assigned to one another with an identification code. For this reason the infrared portion of the locking system number must remain in the vehicle for the entire vehicle service life. This means that it is only possible to change the mechanical portion of the locking system number as well as the check digit.

Locking system number format



| | | | | |
|--|--|---|--|---------------------------|
| 1 st digit Locking system 1 → 2 channels in key 2 → 4 channels in key | 2nd - 7th digit Mechanical portion of locking system number | 8 th digit Supplier 0, 1 → Huf 8, 9 → Ymos | 9th-15th digit Infrared portion of locking system number | 16th digit Check digit |
|--|--|---|--|---------------------------|

This means that when a remote control key or mechanical key is lost:

- The IRCL portion of the locking system number remains unchanged › lost keys can be invalidated by desynchronization of the control module or by inhibiting the associated remote control key revocably or irrevocably (only on specific request of customer).
- Changing mechanical portion of locking system number › install mechanical locks with new locking system number all around. A

sticker with the 8-digit locking system number indicating the VIN must also be sent to department VP/MAM2, Mercedes-Benz AG; D-70322 Stuttgart.

This means that when the IRCL control module is defective:

- The IRCL portion of the locking system number remains unchanged › install new control module with same locking system number.

This means that when one of the mechanical lock components is defective:

- The locking system number is maintained › replace lock component using the same locking system number.

Inhibiting infrared remote control keys revocably or irrevocably (vehicles with stage 2 drive authorization system)

As of introduction of the IRCL control modules with part no. 210 820 27 26 / 28 26 as of approx. 09/95 the infrared remote control keys can be inhibited revocably with the hand-held tester. Certain infrared remote control keys can be inhibited with the hand-held tester with menu guidance. Certain remote control keys can be revocably inhibited and reenabled with the hand-held tester module

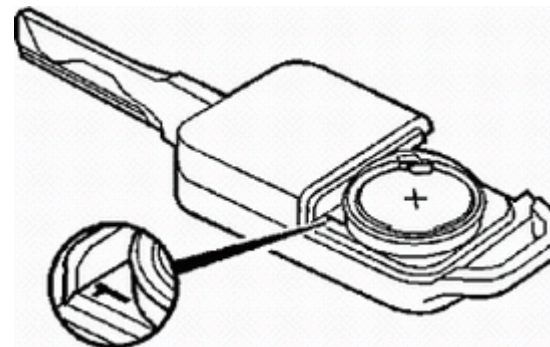
06/95.

As of introduction of the stage 2 drive authorization system infrared remote control keys can be inhibited irrevocably with the hand-held tester. Certain remote control keys can be inhibited with the hand-held tester with menu guidance.

A certain remote control key should be inhibited irrevocably only when the key in question has been lost and this is requested specifically by the customer.

All vehicles are shipped from the factory with remote control keys "1" and "2". The spare infrared remote control key supplied as of approx. 05/95 will be assigned the number "3". Moreover, any sequentially numbered remote control keys purchased later must be taken into consideration. The remote control keys still present can be recognized on the basis of the numbers embossed on the remote control key housing. Remove the battery compartment cover on the remote control key to read off the identification numbers.

The number of the lost remote control key to be inhibited can be determined in this manner.



P80.30-0249-01