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E70 Glovebox

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Glovebox

Model: E70

Production: From Start of Production

OBJECTIVES

After completion of this module you will be able to:

- Understand the operation of the E70 Glovebox
- Locate and identify E70 Glovebox components

Glovebox with Two Lids

A new feature in the E70 is a glovebox with a lid split into two sections. The two-section lid can be electrically unlocked at the touch of a button. After being unlocked, the lids are automatically opened by spring force.

Activation is triggered by a button. The button is located below the centre air vent in the instrument panel. To close, it is sufficient to press one lid only in the "CLOSED" direction. The other lid is automatically closed in the same process. The lids snap into place in the lock in the "CLOSED" end position.

Depending on the vehicle order, a CD changer or DVD changer can be installed in the glovebox.



| Index | Explanation |
|-------|-------------------------------|
| 1 | Button for unlocking glovebox |

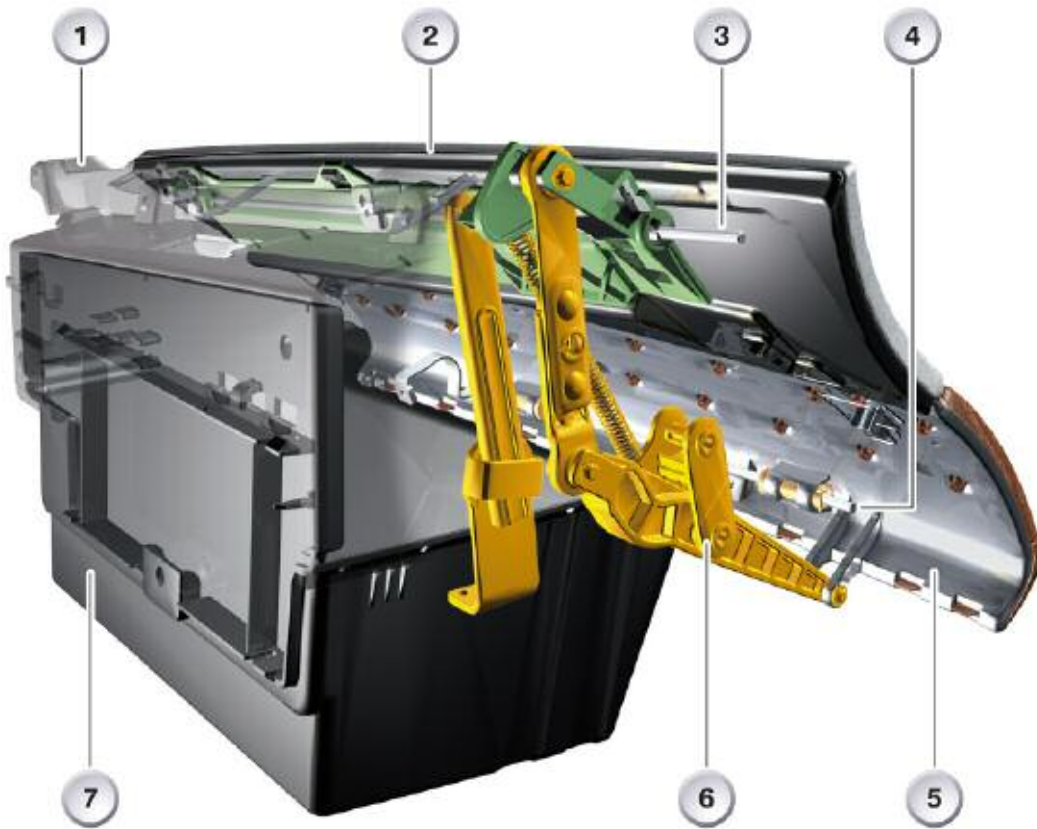
Closing and Opening Glovebox

The glovebox lids are closed by purely mechanical means. To close, it is sufficient to press only one of the lids closed. Opening is performed automatically and can be initiated by a button in the instrument panel.

Closing Glovebox by Hand

When one of the glovebox lids is pressed, the other lid is automatically closed in the process. The lids are mechanically interconnected by a kinematic assembly. Thus, one lid will always follow the movement of the other lid until the glovebox is fully closed and locked.

The glovebox can be closed by hand. However, pressing the button is enough to open the glovebox.



| Index | Explanation | Index | Explanation |
|-------|-------------------------|-------|------------------------|
| 1 | Upper glovebox housing | 5 | Bottom lid |
| 2 | Mounting plate, top lid | 6 | Kinematic assembly |
| 3 | Shaft, top lid | 7 | Lower glovebox housing |
| 4 | Shaft, bottom lid | | |

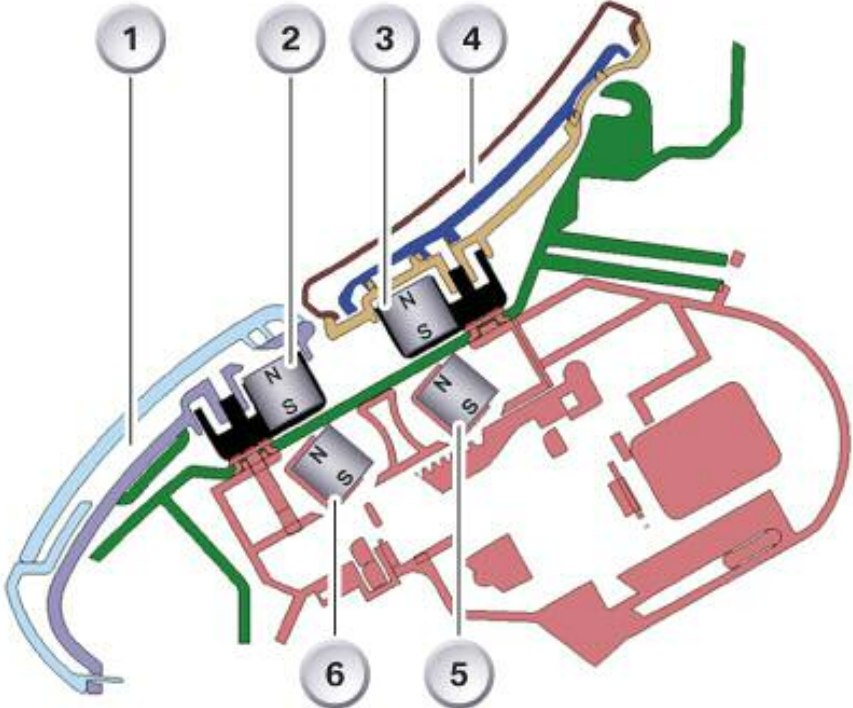
Magnets are located in the top and bottom lids and in the locking hooks. Closing of the lids is assisted down to the last millimeters by the integrated magnets.

When the glovebox lids come into the area of magnetic force, the magnets pull the lids into their end positions. The effect created by the magnets is also called the Soft Close effect.

The arrangement of the magnets (north and south pole 2, 3, 5 and 6) and the pivoted suspension lock the locking hooks in their end position automatically without the assistance of the electrical unlocking mechanisms.

In the "CLOSED" end position, the locking hooks snap into place and the glovebox is mechanically engaged.

Note: If the glovebox has not been fully closed and locked, it opens automatically. The glovebox must therefore be closed again so as to prevent an increased risk of injury caused by parts falling out in the event of an accident!

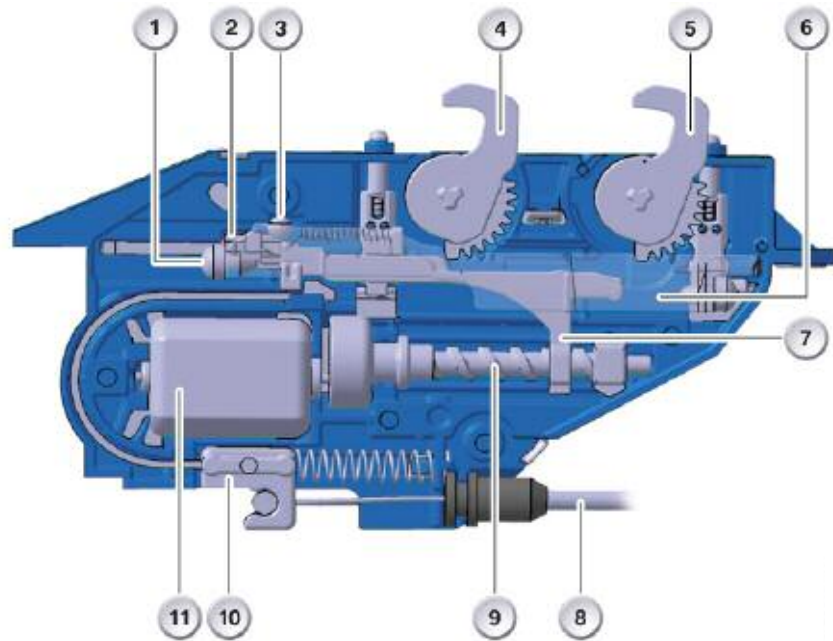


| Index | Explanation |
|-------|--------------------------------------|
| 1 | Bottom lid |
| 2 | Magnet in bottom lid |
| 3 | Magnet in top lid |
| 4 | Top lid |
| 5 | Magnet, locking hook for top lid |
| 6 | Magnet, locking hook for, bottom lid |

Monitoring of "CLOSED" End Position

Monitoring of the end position of the glovebox lids is necessary to ensure that the glovebox is fully closed and locked.

The end position of the lids in the "CLOSED" direction is recorded indirectly with infrared sensors. There are two infrared sensors in each lock. These infrared sensors detect the "CLOSED" position of the locking hooks.



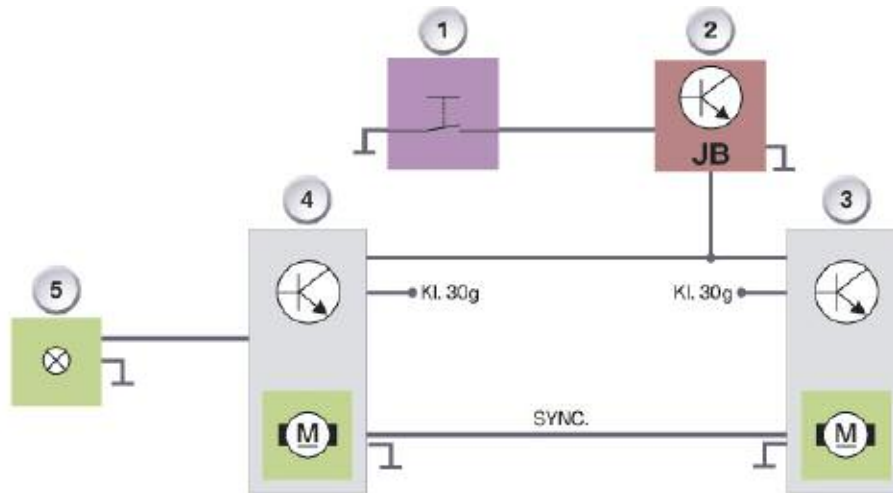
| Index | Explanation | Index | Explanation |
|-------|------------------------------|-------|--------------------------------------|
| 1 | Noise damper | 7 | Lower slide |
| 2 | Infrared sensors | 8 | Bowden cable for emergency unlocking |
| 3 | Mechanical interlock, (ball) | 9 | Drive shaft |
| 4 | Locking hook, top lid | 10 | Emergency unlocking |
| 5 | Locking hook, bottom lid | 11 | Unlocking drive |
| 6 | Upper slide | 12 | |

When the glovebox lids are closed, the locking hooks (4 and 5) are turned by magnetic force in the locking direction and engage. The slides (6 and 7) are displaced to the right by the rotational movement of the locking hooks. The movement is limited by the damper and at the same time noise is minimized at the stop.

The mechanical interlock (3) is pressed upwards by the lower slide and locks the locking hooks. On the lower slide (7) there is a "lug", which changes the status of the infrared sensors due to the movement of the lower slide.

The electronic circuit evaluates the change in status and detects whether the glovebox is fully closed.

Electrically Unlocking Glovebox



| Index | Explanation | Index | Explanation |
|-------|---|-------|----------------------|
| 1 | Button for unlocking glovebox | 5 | Glovebox light |
| 2 | Junction-box ECU (JB) | KL30g | Terminal 30g |
| 3 | Unlocking mechanism of glovebox on outside of vehicle | SYNC | Synchronization line |
| 4 | Unlocking mechanism of glovebox on inside of vehicle | | |

Unlocking of the glovebox is an autarkic function. Unlocking of the glovebox can be triggered as from "Terminal 30g ON".

When the button (1) is pressed, the junction box ECU (2) receives a low signal (approximately 0 V). The junction-box ECU now emits a pulse width modulated signal at the level of the vehicle system voltage. The unlocking mechanisms (3 and 4) of the glovebox receive this signal for approximately 100 ms.

Each unlocking mechanism features an electronic circuit, which controls and monitors the unlocking and locking processes.

Note: Unlocking requests are not executed when the glovebox is open.

The glovebox unlocking mechanisms cannot be diagnosed by means of the diagnosis system. If an unlocking mechanism is defective, the only option is to replace it completely.

The button for unlocking the glovebox can be diagnosed with a multimeter in accordance with the circuit diagram.

■ Over/Under-Voltage

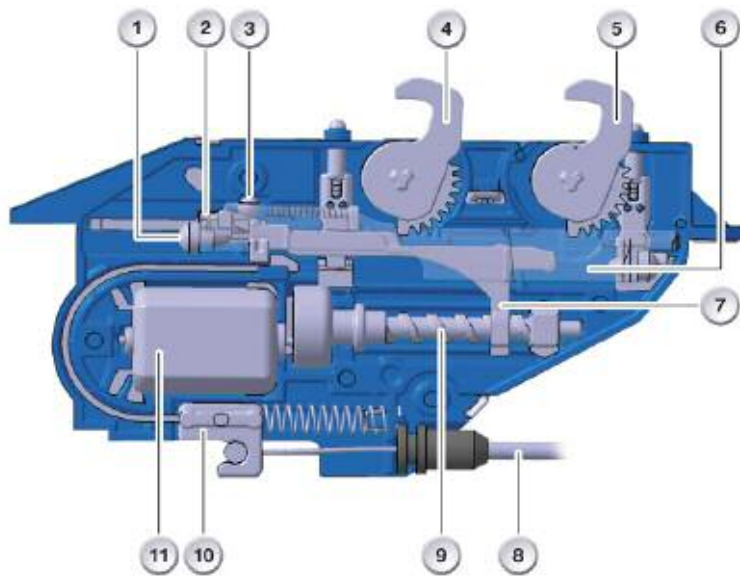
The glovebox unlocking mechanisms can be activated within a voltage range of 9 V to 16 V. Correct operation cannot be guaranteed outside this range.

Unlocking Sequence

The unlocking-mechanism electronic circuit recognizes when the junction-box ECU transmits the signal for unlocking. The unlocking drive (11) is activated once synchronization has been completed. The unlocking drive rotates the drive shaft (9).

The drive shaft moves the slide (7) in the "OPEN" direction. Initially the mechanical interlock is released by the slide.

The upper slide (6) is displaced up to the stop on the damper (1), thereby turning the locking hooks (4 and 5) in the "OPEN" position. The glovebox is unlocked and automatically opened. The two lids are opened by spring force up to the mechanical end stop.



| Index | Explanation | Index | Explanation |
|-------|--------------------------|-------|--------------------------------------|
| 1 | Noise damper | 7 | Lower slide |
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| 4 | Locking hook, top lid | 10 | Emergency unlocking |
| 5 | Locking hook, bottom lid | 11 | Unlocking drive |
| 6 | Upper slide | | |

The two unlocking mechanisms must be synchronized in order to achieve uniform unlocking. Both unlocking mechanisms are activated by the junction-box ECU. The unlocking mechanism which first receives the unlocking signal from the junction-box ECU starts the communication between the unlocking mechanisms.

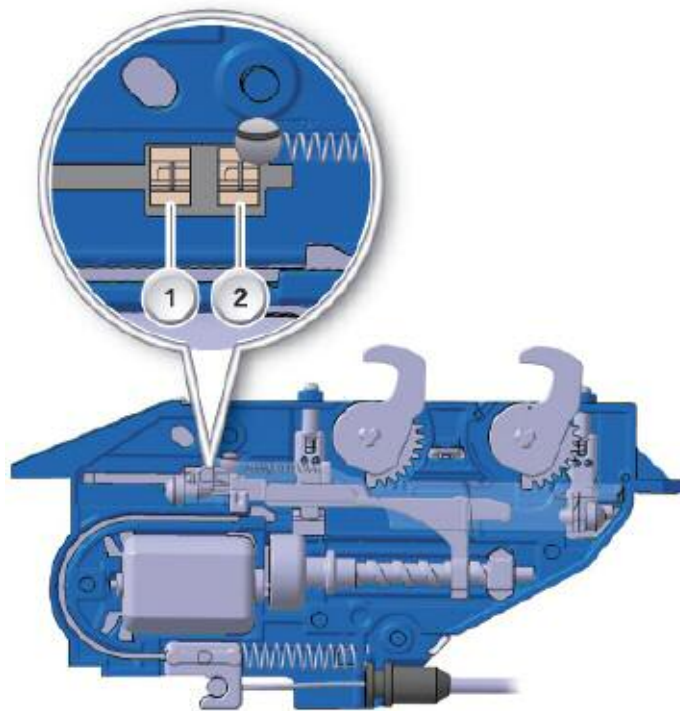
The unlocking mechanisms adapt their status and signal to each other their readiness for unlocking. The unlocking sequence is initiated when both unlocking mechanisms are ready.

Glovebox Light

Opening/closing the glovebox activates or deactivates the glovebox light respectively. Activation follows the Soft ON function and deactivation follows the Soft OFF function. The function is derived from the interior lights and is contained in the unlocking-mechanism electronic circuit.

The unlocking-mechanism electronic circuit evaluates the signal from the glovebox button. The glovebox light is switched on as soon as the signal from the junction-box ECU changes from low (approximately 0 V) to high (vehicle system voltage).

The signal from the infrared sensors (position detection of the locking hooks in the "CLOSED" direction) is used for switching off.



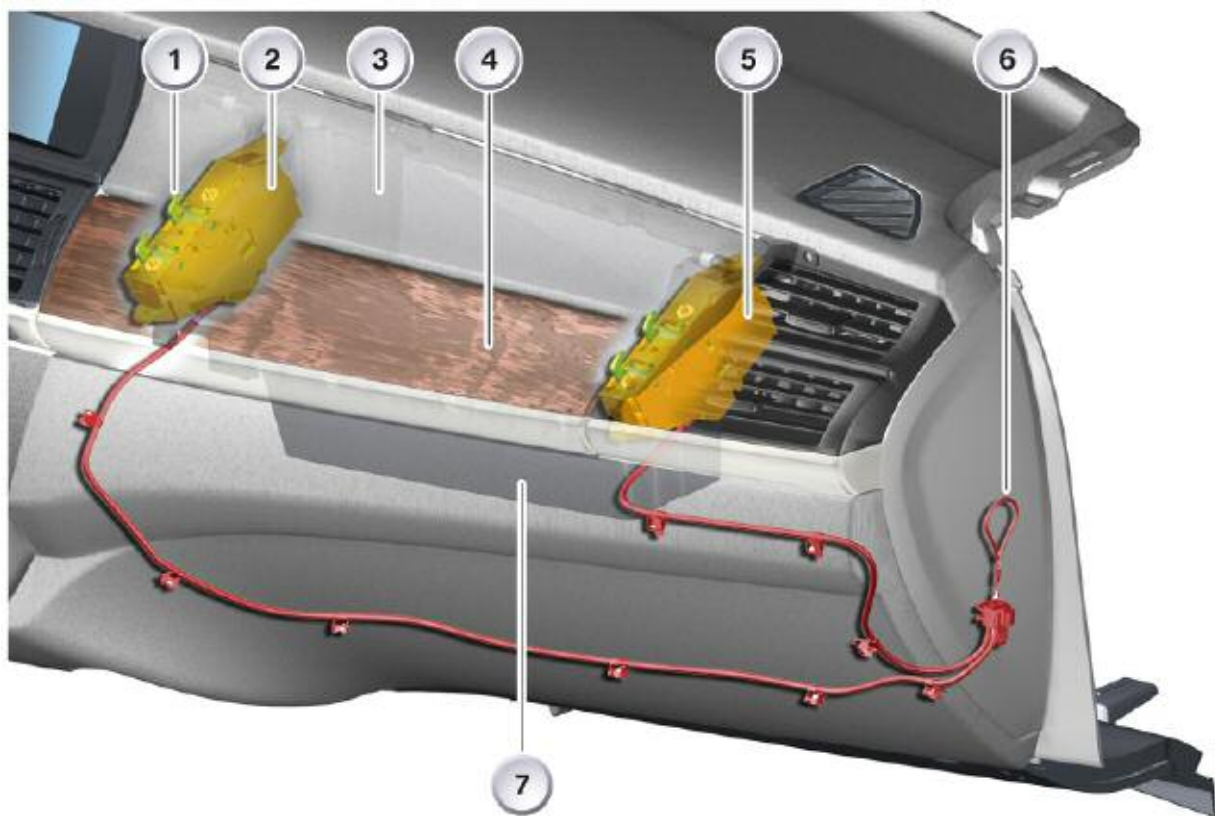
| Index | Explanation |
|-------|-------------------|
| 1 | Infrared sensor 1 |
| 2 | Infrared sensor 2 |

Emergency Unlocking of Glovebox

An emergency unlocking mechanism is provided so that the glovebox can be opened when the vehicle is de-energized or in the event of faulty unlocking mechanisms.

The emergency unlocking mechanism can be accessed from the front passenger's side. Only the instrument-panel cover needs to be opened here. Behind this cover is a loop, which, when pulled, unlocks and opens the glovebox.

The color of the system components shown here has been changed so that the emergency unlocking mechanism can be recognized more easily. Glovebox can be opened even when the vehicle is de-energized!



| Index | Explanation | Index | Explanation |
|-------|------------------------------------|-------|---|
| 1 | Locking hook, glovebox lid | 5 | Unlocking mechanism, front passenger side |
| 2 | Unlocking drive, middle of vehicle | 6 | Loop for emergency unlocking |
| 3 | Top glovebox lid | 7 | Glovebox housing |
| 4 | Bottom glovebox lid | | |

Unlocking Mechanisms

The glovebox has one unlocking mechanism each on the inside and the outside of the vehicle. The unlocking mechanisms are symmetrically designed (identical).

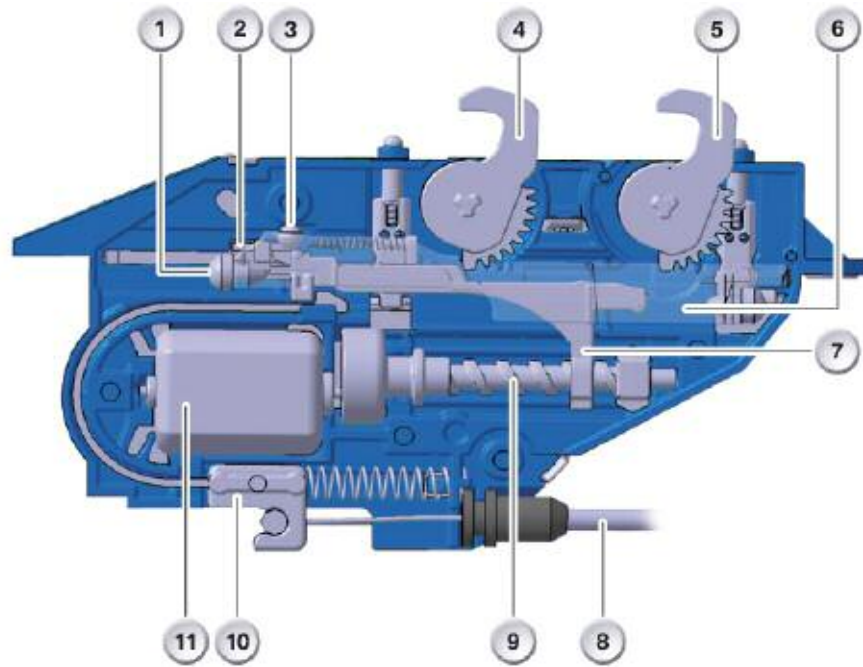
The advantage of this lies in the fact only one type of hardware and software is needed for glovebox unlocking.

The glovebox light is always connected to the unlocking mechanism inside the vehicle.

Symmetrical Design

The unlocking mechanisms contain among other things the following components:

- Unlocking drive
- Control electronics for the unlocking drive and glovebox light
- 2 infrared sensors (detection of glovebox "CLOSED")
- Mechanical interlock (ball) of locking hooks



| Index | Explanation | Index | Explanation |
|-------|--------------------------|-------|--------------------------------------|
| 1 | Noise damper | 7 | Lower slide |
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| 5 | Locking hook, bottom lid | 11 | Unlocking drive |
| 6 | Upper slide | | |

The control electronics is located on a printed-circuit board on the back of the unlocking mechanism. The connection of the unlocking drive (11) and the infrared sensors (2) are also integrated on the printed-circuit board.

The slide consists of two parts. The top part (6) is shown slightly transparent in the above graphic. This makes it easier to recognize the second part of the slide (7), which releases or locks the mechanical interlock (3).

Each unlocking mechanism has two locking hooks (4 and 5). One (4) is for the top lid, the other (5) for the bottom lid.

Triggered when the lug for the emergency unlocking mechanism is pulled. The bowden cable (8) transmits the pulling action. The emergency unlocking mechanism (10) pulls the lower slide back and thereby releases the mechanical interlock (3). In this way, both slides can be moved in the "OPEN" direction and the locking hooks are unlocked.

NOTES

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