

---

# Table of Contents

## F01 Central Locking System

<b>Subject</b>	<b>Page</b>
<b>Introduction</b> .....	<b>5</b>
Unlocking and Locking the Vehicle .....	5
<b>System Overview</b> .....	<b>7</b>
Input/output Central Locking .....	7
Central Locking System Circuit Diagram .....	8
<b>Functions</b> .....	<b>12</b>
Unlocking/locking the Vehicle .....	12
Functional Procedure .....	13
Unlocking .....	13
Locking .....	14
Central locking button .....	14
Center-lock Button .....	14
Mechanical Key/Spare Key .....	15
Driver's-door lock barrel .....	15
Trunk lock .....	15
Locking Button on Vehicle Doors .....	16
Car Access System 4 .....	16
Junction Box Electronics Module .....	16
Footwell Module .....	16
Unlocking the Trunk .....	17
ID transmitter .....	17
Exterior trunk button .....	17
Interior trunk button in the A-pillar .....	18
Closing the trunk .....	18
Special Functions .....	18
Automatic locking (personal profiles) .....	18
Unlocking after a crash .....	18
Selective unlocking .....	18
Central Locking Button .....	19
<b>System Components</b> .....	<b>20</b>
Components of the Central Locking System .....	20
Footwell Module .....	20
Car Access System 4 .....	20

---

<b>Subject</b>	<b>Page</b>
Junction Box Electronics Module .....	20
Controls .....	20
ID transmitter .....	21
Driver's-door lock barrel .....	22
Trunk locking barrel .....	22
Center-lock button .....	23
Central Locking Drive Units .....	23
Central locking drive units in the doors .....	23
Trunk central locking drive (trunk lock) .....	23
Automatic soft-close drive for the trunk .....	24
Fuel filler flap central locking drive .....	24
Manually releasing the fuel filler flap .....	24
Manually Unlocking the Trunk .....	25

**BLANK  
PAGE**

---

# Central Locking System

**Model: F01/F02**

**Production: From Start of Production**

# OBJECTIVES

After completion of this module you will be able to:

- Locate and identify components of the central locking system
- Understand the operation of the central locking system

# Introduction

## Unlocking and Locking the Vehicle

The central locking system makes it possible to unlock or lock the vehicle. It is fitted as standard equipment and relates to all vehicle doors, the fuel filler flap and the trunk.

The central locking can be operated via the following components:

- ID transmitter
- Driver's-door lock barrel (door lock)
- Central-lock button
- Trunk lock barrel
- Exterior trunk button
- Interior trunk button in the A-pillar
- Outside door handle \* (outside door handle electronics/Car Access System)
- Central locking button in the trunk lid \*.

\* Component of the Comfort Access option.

The central locking system in the F01/F02 is based on the central locking system as it is already known in, for instance, the E90 or E70. The function of the central locking system is basically divided between three control units.

The Car Access System has overall control. The Car Access System is aware of the statuses of the central locking system. Therefore it is the Car Access System which causes the unlocking, locking and central locking of the vehicle.

The junction box electronics module executes the request to unlock or lock the vehicle.

**Note: The Car Access System is now entering its fourth control-unit generation and contains the functions of its predecessor.**

**With Car Access System 4, Comfort Access functionality is now also integrated into this control unit. This means that, on the F01/F02 there is no separate control unit for Comfort Access.**

It is possible to unlock and lock the vehicle actively or passively.

- Active means that the vehicle can be opened after it has been unlocked by a press of the button on the ID transmitter. The vehicle can be locked by pressing the Lock button after the doors have been closed.

**Note: The vehicle can only be locked with the driver's door closed.**

---

Passive locking and unlocking requires the option Comfort Access.

- Passive means the vehicle is unlocked when the outer door handle is grasped, provided the ID transmitter is located within a radius of no more than approximately 1.5 meters from the vehicle. The locking function is triggered by pressing on the sensitive area on the outer door handle.

The trunk is fitted with the automatic soft-close function as standard. With the automatic soft-close function, it is sufficient to gently press the trunk into the trunk lock. As soon as the locking pawl reaches the pre-locking position, automatic soft-close fully closes the trunk. The locking pawl is then located in the main locking position.

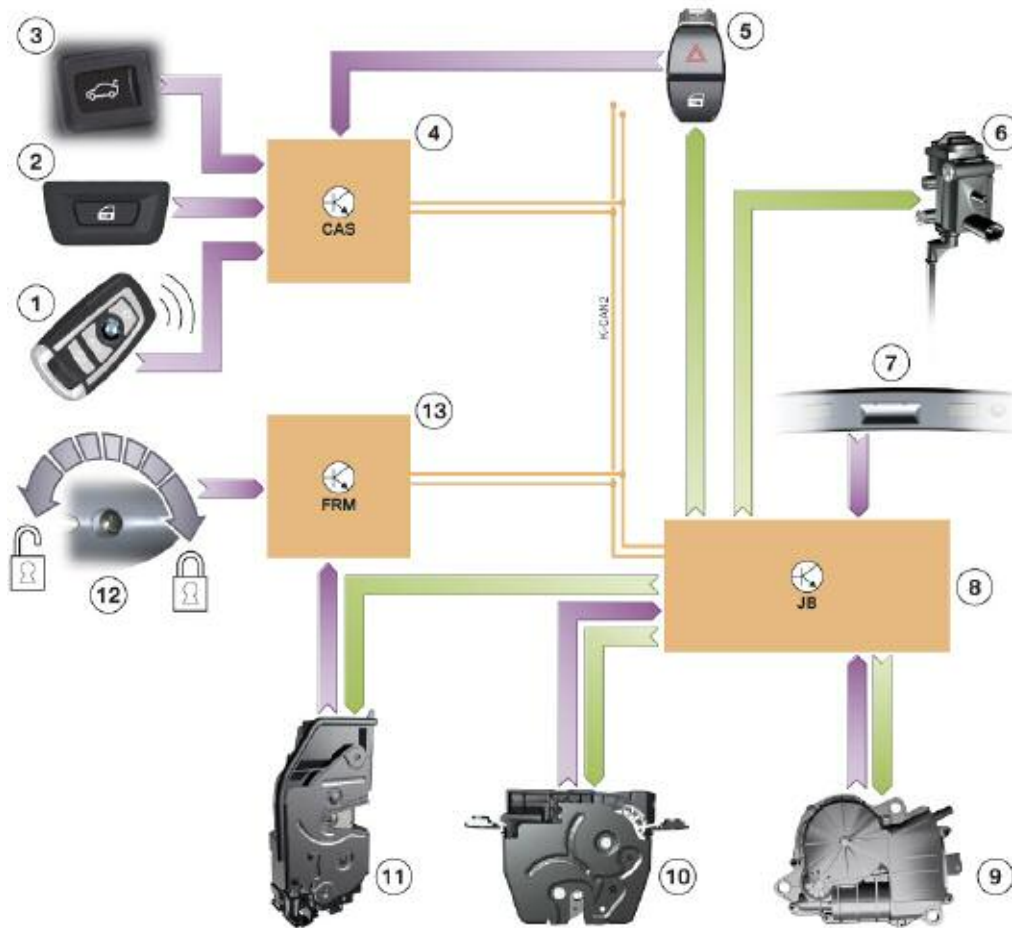
An alternative is automatic soft-close, the automatic soft-close function is available for all vehicle doors. When equipped with the automatic soft-close function, the vehicle door needs only to be gently pulled or pushed into the lock. The automatic soft-close function then completely closes the door.

The Car Access System (4) evaluates the signal from the ID transmitter (1) and requests the unlocking or locking of the vehicle. The junction box electronics module (8) executes the requests.

The lock barrel (12) in the driver's door is used for mechanically unlocking or locking the door. The footwell module (10) evaluates the movement (status of Hall sensors) of the lock barrel and the status of the door contacts.

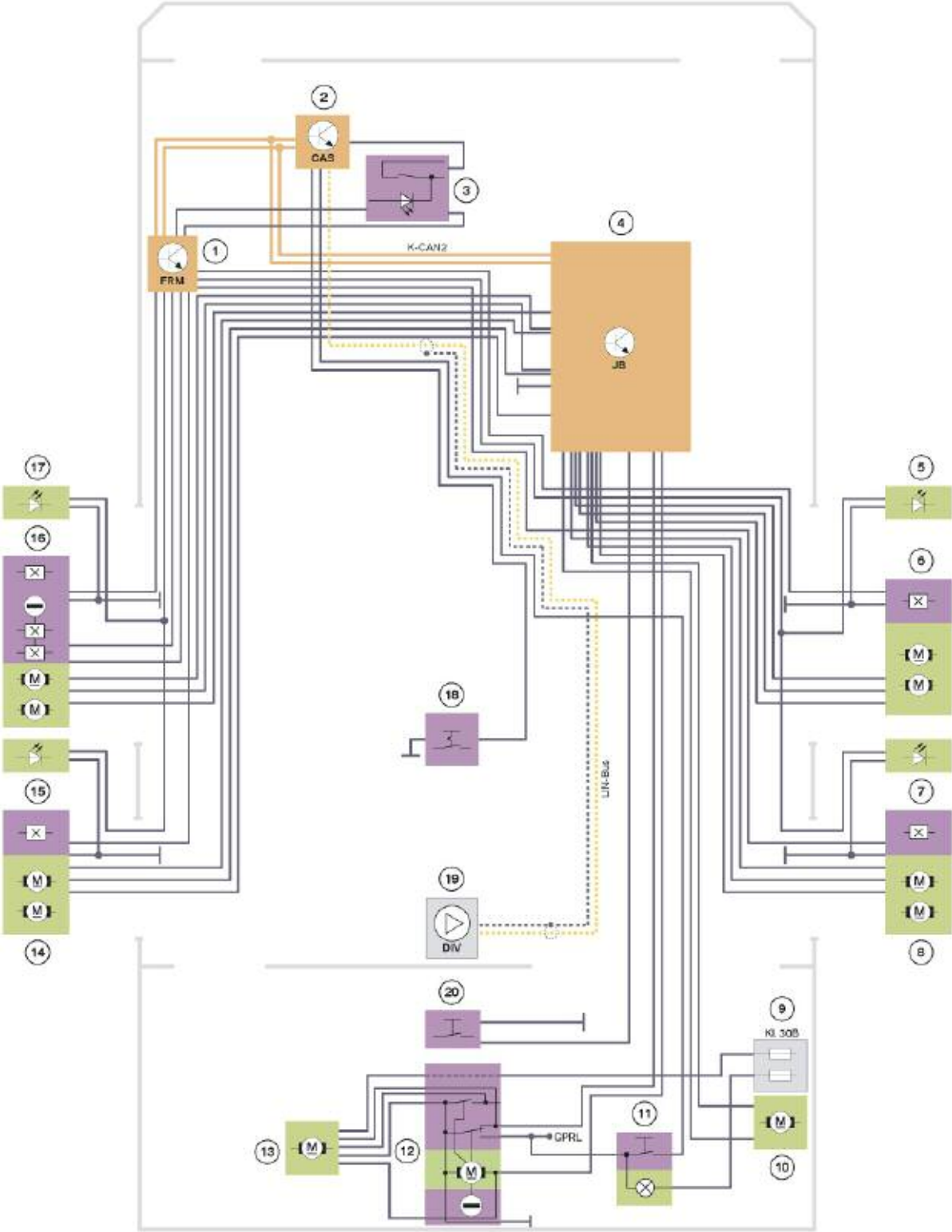
# System Overview

## Input/output Central Locking



Index	Explanation	Index	Explanation
1	ID transmitter	8	Junction box electronics module (JB)
2	Central locking button	9	Automatic soft-close drive in the trunk lock
3	Interior trunk button in the A-pillar	10	Trunk central locking system
4	Car Access System 4 (CAS 4)	11	Lock (4x) in vehicle doors
5	Center-lock button	12	Driver's-door lock barrel
6	Central locking, fuel filler flap	13	Footwell module (FRM)
7	Exterior trunk button	K-CAN2	Bodyshell CAN

# Central Locking System Circuit Diagram





Index	Explanation	Index	Explanation
1	Footwell module (FRM)	13	Automatic soft-close drive in the trunk lock
2	Car Access System (CAS)	14	Rear, driver's side central locking system
3	Center-lock button	15	Rear, driver's side illuminated entry system
4	Junction box electronics module (JB)	16	Hall sensors for lock barrel, door contact, driver's-door central locking system
5	Front-passenger-door illuminated entry system	17	Driver's-door illuminated entry system
6	Door contact, central locking, front passenger door	18	Valet switch
7	Rear, passenger-side illuminated entry system	19	Remote control receiver in diversity module
8	Door contact, central locking, rear passenger side	20	Exterior trunk button
9	Fuse in the luggage compartment power distribution box	K-CAN2	Bodyshell CAN2
10	Central locking, fuel filler flap	KI. 30B	Terminal 30, basic operation
11	Central locking button	LIN-Bus	Local Interconnect Network bus
12	Trunk lock central locking system	GPRL	Luggage compartment light



#### K-CAN signals at Car Access System 4

In/out	Information	Source/sink	Function
In	Crash signal	Crash sensor > Advanced Crash Safety Management	Unlock central locking in the event of a crash
In	Driving speed	Wheel-speed sensor > Integrated Chassis Management	Lock central locking from a defined driving speed
Out	Hall sensor status, driver's-door lock barrel	Driver's-door lock barrel > Footwell module	Comfort opening of vehicle
Out	Hall sensor status, driver's-door lock barrel	Driver's-door lock barrel >	Comfort closing of vehicle Footwell module

---

The radio signal from the ID transmitter is received by the rear window antenna. The remote control receiver integrated in the diversity module (19) forwards the signal to the Car Access System (2). After the signal has been successfully checked, the Car Access System issues a request for control of the central locking system. The Car Access System is the master control unit for the central locking system.

The junction box electronics module (4) executes the unlocking or locking of the vehicle.

The footwell module (1) evaluates the status of all door contacts (6, 8, 14 and 16). It communicates the current status on the K-CAN2. This means, for example, that the Car Access System is able to prevent locking when the driver's door is open.

The status of the center-lock button (3) is evaluated by the Car Access System and communicated over the K-CAN2. Depending on the status, the junction box electronics module activates central locking. The junction box electronics modules is also responsible for registering the status and activating central locking in the trunk.

The junction box electronics module is also responsible for controlling the fuel filler flap (10).

The footwell module evaluates the signals from the Hall sensors for the lock barrel (16) and makes this information available on the K-CAN2.

With this information, the Car Access System knows the status of the door lock in the driver's door. This is important if a request is issued to unlock or lock the vehicle using the ID transmitter, for example.

The central locking button is integrated in the underside of the trunk and is part of the Comfort Access option.

---

NOTES

PAGE

# Functions

## Unlocking/locking the Vehicle

The vehicle unlocking/locking procedure is initiated by the following system components:

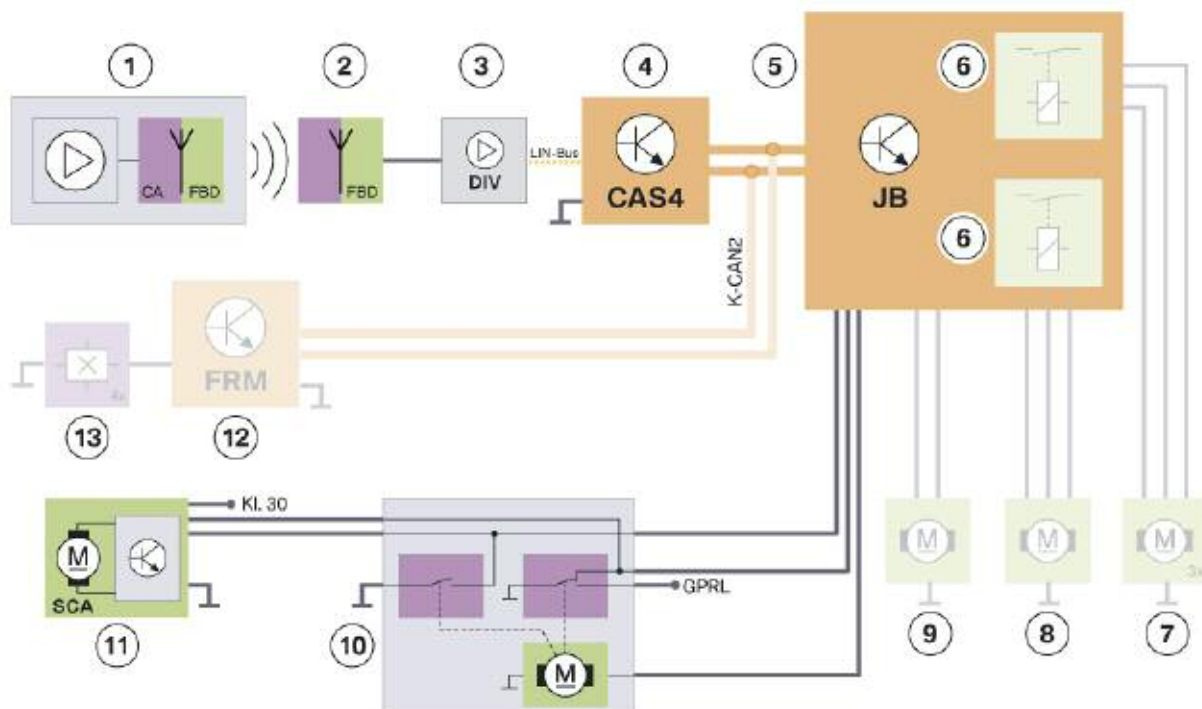
- ID transmitter
- Mechanical key/spare key
- Exterior trunk button (only unlocks the trunk)
- Central-lock button
- Interior trunk button on the A-pillar (only unlocks the trunk)
- Outside door handle \*
- Central locking button \* trunk.

\* Vehicle equipment for Comfort Access.

The central locking system activates the following system components:

- Central locking, driver's and front passenger door
- Central locking, rear doors
- Central locking, fuel tank
- Trunk central locking system (with automatic soft-close drive).

The following example shows the signal path when the trunk is unlocked.



Index	Explanation	Index	Explanation
1	ID transmitter	8	Central locking, driver's door
2	Rear window antenna	9	Central locking, fuel filler flap
3	Remote control receiver in diversity module	10	Trunk central locking system
4	Car Access System 4 (CAS 4)	11	Trunk automatic soft-close
5	Junction box electronics module (JB)	12	Footwell module
6	Relay for central locking	13	Door contacts
7	Central locking, front passenger door and rear doors		

## Functional Procedure

### ■ Unlocking

Pressing the Unlock button on the ID transmitter causes an encrypted remote control signal to be transmitted. The antenna in the rear window forwards the remote control signal to the diversity module. The diversity module remote control receiver demodulates, processes and then sends the signal to the Car Access System on the LIN bus.

If the vehicle is in sleep mode, the remote control receiver wakes up the Car Access System via the LIN bus for reduced-consumption operation. This allows the Car Access System to receive the request which was sent out by the ID transmitter. The ID transmitter has already been checked in the remote control receiver. If the result of the check is positive, the remote control receiver forwards the request via the LIN bus. If the request is authorized, the Car Access System wakes up the vehicle and causes the vehicle to unlock. The Car Access System thereby gives the junction box electronics module permission to unlock the central-locking drive.

The junction box electronics module then activates the relay and power output stages and triggers the unlocking of the vehicle.

**Note: The Car Access System is responsible for communication over the LIN bus. This means that the diversity module only passes on a LIN bus signal when instructed to do so by the Car Access System 4. This applies to vehicles not currently in sleep mode.**

---

## ■ Locking

The vehicle can only be locked once the footwell module has evaluated the door contacts and the Car Access System 4 has reported that the driver's door is closed.

The further signal progression for locking the vehicle corresponds analogously to the signal progression of the unlocking procedure.

During the vehicle locking process, all central locking drives are moved into the "Lock" position. The central-locking drives in the doors are additionally moved into the "centrally-locked" position. Following the central arrest procedure, the locking buttons in the doors are mechanically separated from the central locking drive system.

The vehicle can now no longer be unlocked using the locking buttons in the doors.

**Note: The trunk can either be locked manually or using automatic trunk actuation.**

## ■ Central locking button

The central locking button can be used to lock and centrally lock all vehicle doors.

The central locking button is located on the underside of the trunk and can therefore only be used with the trunk open.

Additional information is presented under the Central locking button section, which follows.

## Center-lock Button

The vehicle can be locked/unlocked with the center-lock button.

If the center-lock button is not being pressed, the junction box electronics module receives a high signal (battery voltage approximately 12 V). The high signal changes to a low signal (approximately 0 V) as soon as the center-lock button is pressed.

The junction box electronics module evaluates the change from the high signal to the low signal and locks/unlocks the vehicle.

In order for locking or unlocking to take place, the driver's door and front passenger door must be closed.

---

## **Mechanical Key/Spare Key**

The mechanical key/spare key is used to unlock/lock the driver's door. Should the ID transmitter fail, e.g. if the battery is flat, it is still possible to access or lock the vehicle.

### ■ **Driver's-door lock barrel**

The footwell module evaluates the Hall sensors for the lock barrel in the driver's door. The Car Access System 4 is informed of the change in status via the K-CAN2.

The Car Access System 4 enables the vehicle unlocking/locking procedure. The junction box electronics module triggers the unlocking/locking of the vehicle.

The normal procedure for unlocking or locking using the mechanical key occurs within a period of approximately 20 ms to 1 second. Evaluation of the lock barrel Hall sensors occurs within this period of time.

**Note: Turning the mechanical key in the driver's-door lock barrel too quickly or slowly, means that only the driver's door will be mechanically unlocked or locked. In such situations, the central locking system does not operate.**

### ■ **Trunk lock**

The trunk lock can be unlocked by using the mechanical key in the lock barrel, and then opened.

**Note: If the anti-theft alarm system is fitted, unlocking the trunk may trigger an alarm.**

To close the trunk, the trunk must be pushed into the trunk lock. As soon as the locking pawl reaches the pre-locking position, automatic soft-close begins and closes the trunk.

**Note: In the F01, the trunk lock is pulled closed via an automatic soft-close drive. Slamming the trunk closes the trunk so quickly that automatic soft-close is not activated.**

---

## Locking Button on Vehicle Doors

All four doors can be mechanically locked separately with the locking button.

The inside door handle of the door to be unlocked must be pulled twice before the door will unlock.

However, the junction box electronics module does not activate central locking.

If the vehicle is centrally locked, the locking knobs are mechanically disconnected from the lock. It is thus no longer possible to unlock the vehicle either via the locking knobs or by pulling twice on the door handle. On vehicles with an anti-theft alarm system, this also activates the system.

## Car Access System 4

As soon as the Car Access System 4 receives the signal from the remote control receiver, it checks whether the ID transmitter is valid and belongs to the vehicle. Only if the check is successful will the Car Access System 4 forward the request to the central locking.

The check, also referred to as authentication, takes a few milliseconds. As the master control unit of the central locking system, the Car Access System 4 grants authorization for control of the central locking system.

The junction box electronics module receives the enable via the K-CAN2.

## Junction Box Electronics Module

The junction box electronics module is the trunk central locking system is activated slave control unit which unlocks/locks the directly via a power output stage. entire vehicle. The unlocking/locking relays are located in the junction box electronics module. The following relays are activated:

- Relay for unlocking/locking central locking
  - Driver's door.
- Relay for unlocking/locking central locking
  - Rear doors
  - Front passenger door
  - Fuel filler flap.

## Footwell Module

The footwell module monitors the Hall The request to lock the vehicle, for example, is sensors of the door contacts. Opening or not executed while the driver's door is open. closing a door causes a change in status of the door contact in question to occur.

The junction box electronics module receives the current status of the door contacts from the footwell module via the K-CAN2. The junction box electronics module passes the status of the door contacts on to the Car Access System 4.



---

## Unlocking the Trunk

The trunk can be unlocked via the ID transmitter and the exterior or interior trunk button, and then opened.

### ■ ID transmitter

The ID transmitter is used to trigger the unlocking of the trunk by means of a brief (approximately 500 ms) press on the trunk symbol button.

The junction box electronics module executes the unlocking of the trunk.

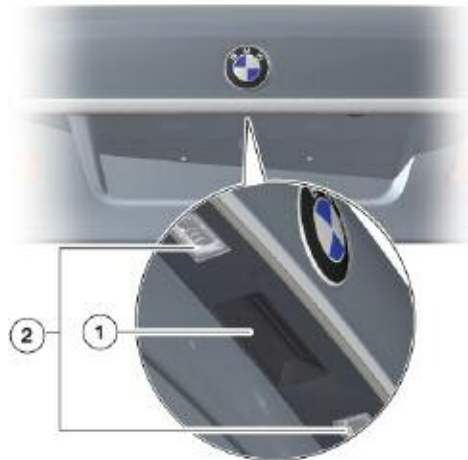
The motor in the trunk lock is activated via the power output stage in the junction box electronics module.

**Note: If the vehicle is fitted with the automatic trunk actuation option, the trunk symbol button must be pressed and held for longer than 1.2 seconds.**

### ■ Exterior trunk button

As soon as the vehicle is unlocked, the trunk can be opened with the exterior trunk button in the trunk. The button switches to ground when the exterior trunk button is pressed.

The button is monitored by the junction box electronics. When the signal of the button changes to low, the trunk is unlocked and can be opened.



Index	Explanation	Index	Explanation
1	Exterior trunk button	2	License plate light

---

### ■ Interior trunk button in the A-pillar

As soon as the vehicle is unlocked, the trunk can be unlocked and opened by pressing the interior trunk button.

The button is integrated into the A-pillar and switches to ground.

The Car Access System evaluates the button and sends the signal for the junction box electronics module over the K-CAN2. The junction box electronics module evaluates the message and triggers the trunk to unlock.

### ■ Closing the trunk

Gently pressing the trunk into the trunk lock triggers the automatic soft-close drive.

A microswitch in the trunk lock is activated by the locking pawl being located in the pre-locking position. The drive electronics for automatic soft-close assess the change in status as a starting signal.

The drive then pulls the rotary striker closed via a Bowden cable. As soon as the locking pawl engages in the main locking position, the automatic soft-close drive is stopped.

**Note: The automatic soft-close drive serves to ensure that the trunk closes both safely and securely.**

## Special Functions

### ■ Automatic locking (personal profiles)

At speeds in excess of 16 km/h (10 mph), the vehicle locks automatically. The speed signal is supplied by the Integrated Chassis Management.

The vehicle is unlocked in connection with Comfort Access as soon as terminal 15 is switched off.

**Note: Various functions of the central locking system can be individually customized using “personal profiles”. Refer to the Owner’s Handbook for further information.**

### ■ Unlocking after a crash

A locked central locking system is unlocked as soon as the Car Access System 4 receives a crash message from the advanced crash safety management.

After this crash message is received, the central locking controls are blocked.

The controls are only enabled again after Advanced Safety Crash Management (ASCM) stops sending the crash message or if, after 10 seconds, the crash message is no longer received.

### ■ Selective unlocking

With corresponding coding, the vehicle can also be unlocked selectively. In this case, initially the driver’s door is unlocked. The rest of the vehicle is unlocked in response to a renewed unlock request.

## Central Locking Button

A new function for the central locking system is the ability to activate central locking from the trunk.



The central locking button is located on the underside of the trunk. Whether or not the button is present depends on which equipment is installed on the vehicle.

Pressing the central locking button locks and centrally locks all vehicle doors.

**Note: The central locking button is only accessible with the trunk open.**

The button status is evaluated by the Car Access System. If the vehicle is in sleep mode, it must first be woken up.

The Car Access System recognizes that the central locking button has been pressed and locks and centrally locks the car as appropriate.

Option	Central locking button	
Comfort Access (CA)	Central locking button	
Automatic Trunk Actuation (HKL)	Button for HKL actuation is located next to central locking button	

# System Components

## Components of the Central Locking System

### Footwell Module

The footwell module is installed at the left-hand A-pillar. It evaluates the status of the door contacts and reads in the Hall sensor signals of the lock barrel in the driver's door and transfers the information via the K-CAN2 to the junction box electronics module or Car Access System 4.

### Car Access System 4

The Car Access System 4 is installed on the right, above the steering column. It assumes the master function for the central locking system. The Car Access System 4 has the exclusive system authorization and is simply supported by the other control units.

The Car Access System 4 also registers the status of the center lock button. The Car Access System 4 activates central locking, depending on the status of the central locking system. Briefly pressing the center lock button triggers the vehicle to lock or unlock.

The Car Access System evaluates the status of the interior trunk button on the A-pillar and the central locking button on the trunk.

### Junction Box Electronics Module

The junction box electronics module is plugged into the front power distribution box.

**Note: The power distribution box and the junction box electronics module are two separate components. This must be borne in mind when performing service work.**

The junction box electronics module contains the relays for activating the central locking drive units.

The trunk central locking is activated via a power output stage in the junction box electronics module.

The status of the exterior trunk button is read by the junction box electronics module and this information is passed on to the Car Access System 4.

The automatic soft-close drive and the remote control receiver are supplied with power by the rear power distribution box.

### Controls

The central locking can be operated from the following controls (among others):

- ID transmitter
- Driver's-door/trunk lock barrel

- Central locking button
- Interior trunk button in the A-pillar
- Central locking button.

### ■ ID transmitter

Each vehicle is supplied with a purse key/ spare key and two ID transmitters. The adapter for the spare key is located in the glove compartment.

**Note: Up to eight ID transmitters can be used in conjunction with the Comfort Access function. Four ID transmitters can be used for personal profiles.**

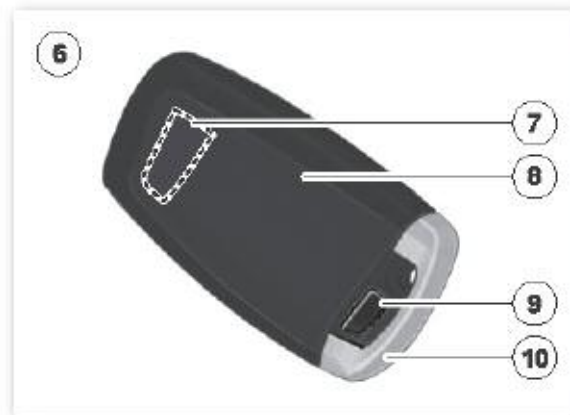
The ID transmitter has one button for locking and one for unlocking the vehicle. There is a separate button for unlocking the trunk. Pressing the trunk symbol button triggers automatic closing/opening of the trunk. Automatic closing requires the automatic trunk actuation option.

The ID transmitter contains a battery which lasts up to four years.

The mechanical key is located in the ID transmitter.

**Note: The passenger airbag can also be deactivated/activated with the mechanical key.**

#### F01/F02 ID transmitter



Index	Explanation	Index	Explanation
1	ID transmitter top view	6	ID transmitter rear view
2	Unlock/comfort open	7	Transponder coil area
3	Lock/comfort close	8	Battery compartment
4	Button for OPEN trunk	9	Button for mechanical key
5	Button for vehicle search function	10	Mechanical key

The ID transmitter has a 512 MB data memory. The following data can be stored in the ID transmitter:

Data	Explanation
km reading (mileage)	Current km reading of vehicle
VIN	
Key number	Number of the ID transmitter
Fault code memory entries	Which displays fault code memory entries and associates them with possible PuMAs
NAVI-DVD version	Data status of navigation DVD
Engine oil	Information on topping up or draining the engine oil, e.g. in the case of overfilling
Battery condition	Battery charge status
Integration stages	Integration stage that left the factory, integration stage last programmed or currently available integration stage.

**Note: The remote control receiver is integrated in the antenna diversity facility and passes the remote control signal to the Car Access System 4 via the LIN bus.**

#### ■ Driver's-door lock barrel

The lock barrel is connected mechanically via a linkage to the door lock. Hall sensors for the lock barrel are integrated in the door lock.

The footwell module evaluates the signals from the Hall sensors for locking/unlocking purposes.

#### ■ Trunk locking barrel

The lock barrel is connected mechanically via a Bowden cable to the trunk lock. Turning the spare key in the lock barrel opens the trunk lock.

**Note: If the vehicle is fitted with an anti-theft alarm system, this causes an alarm to be triggered. 1 Center lock button 2 Center lock button**

### ■ Center-lock button

The center-lock button is installed between the center of the outlets in the dashboard. The center-lock button forms one unit together with the hazard warning lights button.

### F01/F02 button unit



Index	Explanation	Index	Explanation
1	Hazard warning flasher button	2	Central locking button

**Note: The center lock button can also be operated when the vehicle is locked. However, opening the vehicle door will trigger an alarm from the anti-theft alarm system.**

### Central Locking Drive Units

A central locking drive unit consists of an electric drive unit and the unlocking/locking mechanism.

#### ■ Central locking drive units in the doors

The central locking drive units in the doors are equipped with two motors to facilitate the unlocking/locking and central arrest functions of the vehicle.

Central arrest means that the locking button in the doors is separated mechanically from the central locking drive unit.

As a result, the vehicle cannot be opened by pulling the locking button.

The Hall sensor for the door contact is additionally integrated in the central locking drive unit.

#### ■ Trunk central locking drive (trunk lock)

The central locking drive for the trunk is equipped with a motor for unlocking.

The central locking drive contains two microswitches which are actuated by the locking pawl. If the locking pawl is in the pre-locking position, the status of the microswitch changes from a high signal to a low signal. The electronics in the automatic soft-close drive register the status and activate the drive. As soon as the locking pawl engages in the main locking position, the drive stops.

---

**Note: The junction box electronics module evaluates the status of the microswitch. The junction box electronics module sends the status via the K-CAN2. This applies to vehicles with automatic trunk actuation. The trunk lift requires this information so that it can start at the right time, and not cause damage to the trunk lock.**

The second microswitch is used to switch on the luggage compartment lighting. The change in the status of the microswitch which occurs when the trunk is opened or closed is also used to monitor the trunk for the purposes of the anti-theft alarm system.

■ **Automatic soft-close drive for the trunk**

The automatic soft-close drive is connected to the trunk lock with a Bowden cable. This has the benefit that the drive can be fitted regardless of the available installation space. The drive is connected to terminal 30B. The fuse is located in the rear power distribution box. An electronics module is integrated into the automatic soft-close drive which is used to monitor its proper functioning.

Closing the trunk places the rotary striker in the trunk lock in the pre-locking position. To this end, a microswitch is located in the trunk lock which changes status when the lock is actuated.

The electronics module in the automatic soft-close drive evaluates this change in status and triggers the drive to switch on. The automatic soft-close drive is actuated until the rotary striker is located in the main locking position. Once this has occurred, the microswitch changes status again and the drive is switched off.

**Note: The drive and the trunk lock can be replaced individually.**

■ **Fuel filler flap central locking drive**

The central locking drive is equipped with a motor for unlocking/locking.

■ **Manually releasing the fuel filler flap**

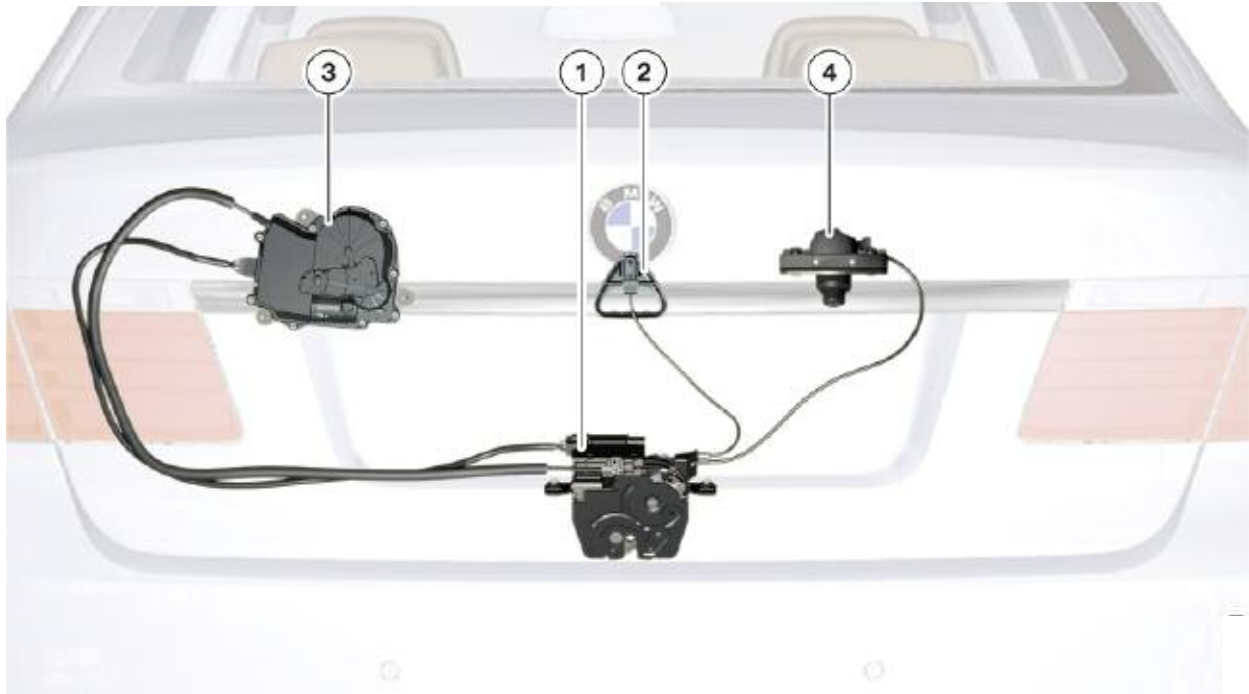
The fuel filler flap can be released manually in the event of an electrical defect. The release mechanism is located in the luggage compartment, on the right-hand side.



## Manually Unlocking the Trunk

The US variant of the F01/F02 has an emergency trunk release mechanism. This makes it possible to open the trunk manually from inside the luggage compartment.

### F01/F02 emergency trunk release mechanism



Index	Explanation	Index	Explanation
1	Trunk lock	3	Automatic soft-close drive
2	Handle for the emergency release	4	Trunk lock barrel mechanism

Pulling on the handle (item no. 2) unlocks the trunk lock. The pulling motion on the handle is transferred to the trunk lock by a Bowden cable, causing the trunk lock to unlock.