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E70 Automatic Tailgate Lifting and Lowering

Initial Print Date: 11/07 Revision Date:

Subject **Page**

Automatic Tailgate Lifting and Lowering (HKL)

Model: E70

Production: From 11/2007 Production

OBJECTIVES

After completion of this module you will be able to:

- Explain the operation of the automatic tailgate lifting and lowering feature
- Identify the components used in the HKL system

Introduction

The automatic tailgate actuation function will be available on the E70 from 11/07. It will be available to order as option 316 and only concerns the upper tailgate section.

Automatic tailgate actuation improves vehicle access comfort in that the upper tailgate section is opened or closed automatically at the press of a button.

A spindle-driven system is fitted in the E70 for the first time to actuate the automatic opening or closing of the tailgate.

The features of automatic tailgate actuation are:

- Opening or closing of the tailgate at the press of a button
- Adjustable tailgate opening angle.

It is possible to select an opening angle for the tailgate in one of the menus in the Central Information Display using the controller.

This feature enables the customer to open the tailgate in low-ceiling garages, for example.

The tailgate is only opened to the angle set, thereby preventing it from striking the ceiling of the garage.

If the vehicle is equipped with Comfort Access (option 322), it is even possible to open the tailgate while the vehicle is locked. The tailgate can open automatically when the exterior tailgate push button is pressed. The only requirement being that a vehicle-specific ID transmitter must be present in the immediate vicinity of the rear end of the vehicle.

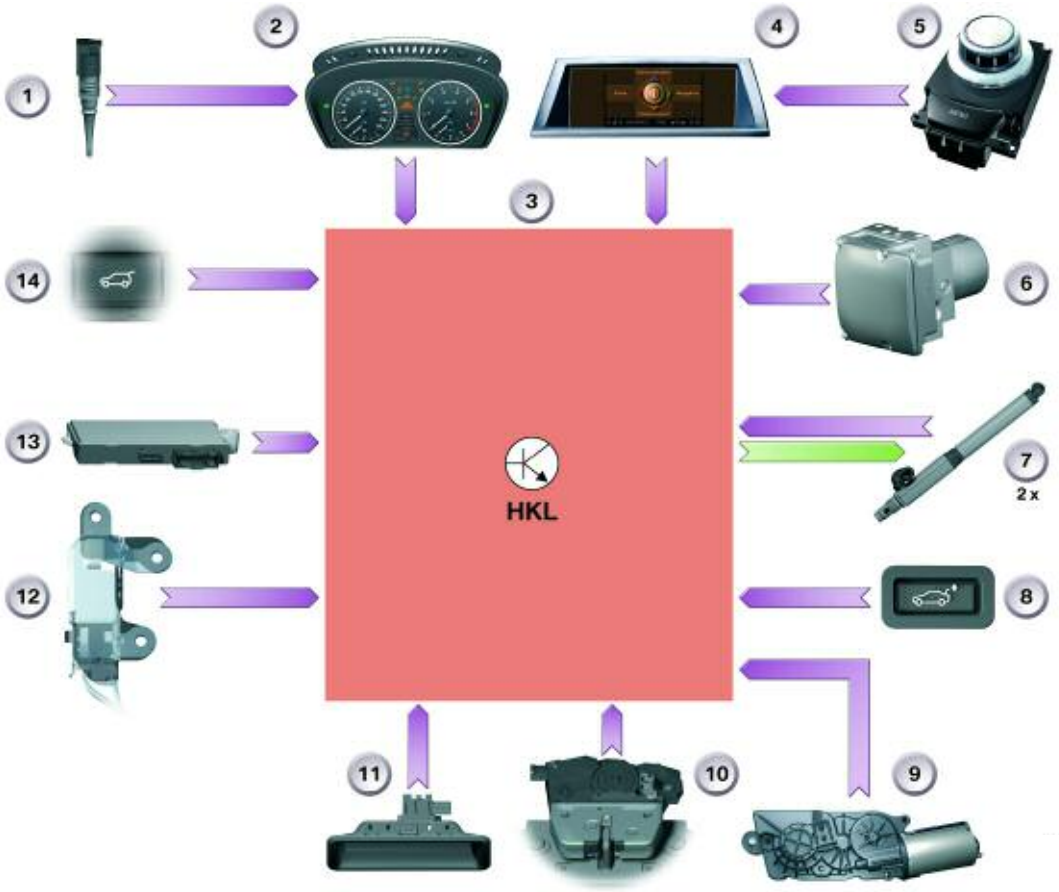
The automatic tailgate actuation function improves vehicle access comfort. The upper tailgate can be opened and closed automatically.

The features of automatic tailgate actuation are:

- Operation by button
- Adjustable opening angle

Systems Overview

Automatic Tailgate Actuation Input/Outputs



Index	Explanation	Index	Explanation
1	Outside temperature sensor	8	Interior tailgate push button
2	Instrument cluster	9	Automatic soft-close function drive
3	Automatic tailgate actuation control unit	10	Tailgate lock
4	Central Information Display	11	Exterior tailgate push button
5	Controller	12	Lower tailgate section microswitch
6	Dynamic Stability Control	13	Car Access System 3
7	Tailgate spindle drive	14	Interior tailgate push button

Note: Please refer to the diagram on the previous page for the comments below.

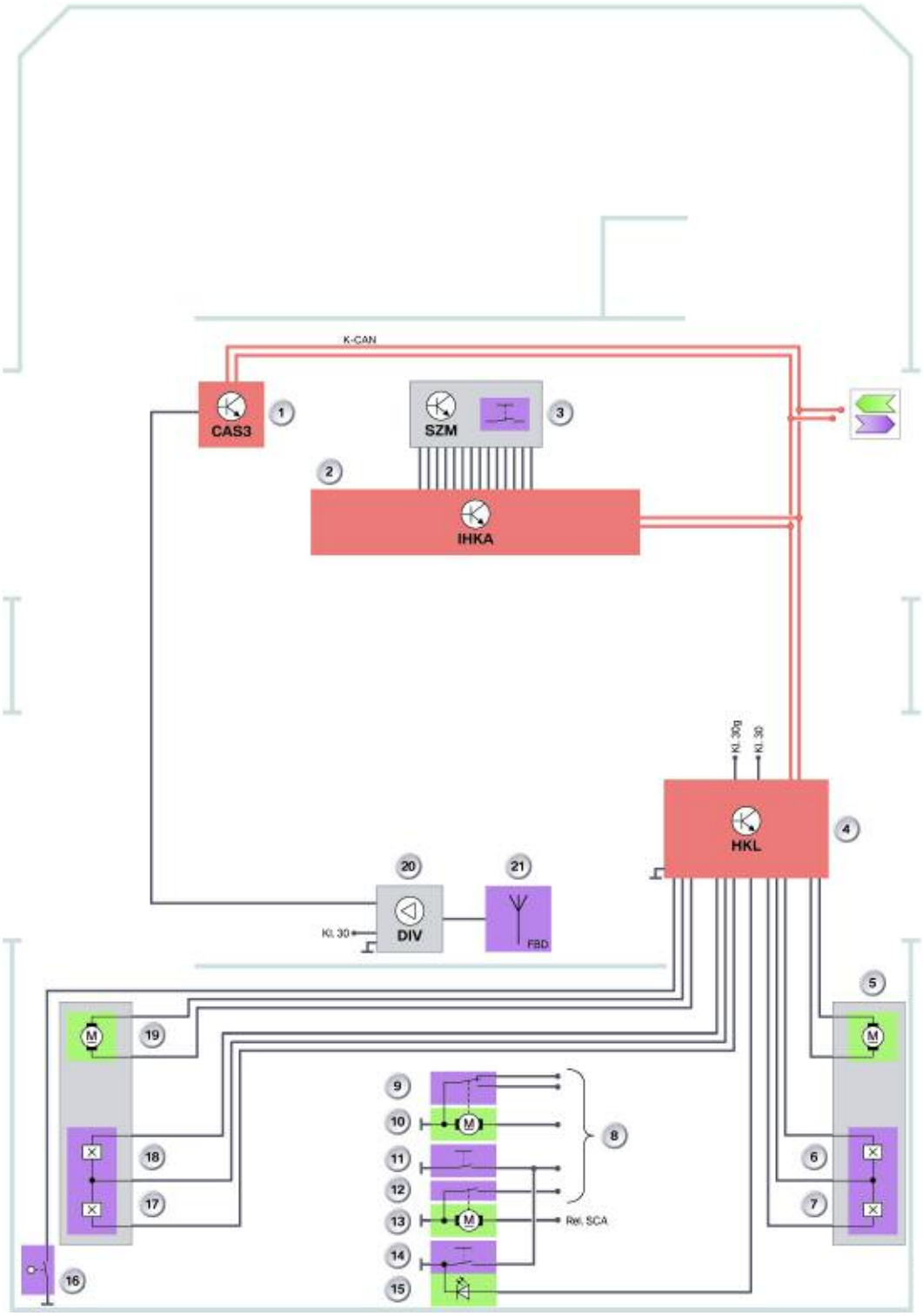
Tailgate lift control unit (3) controls and monitors the opening or closing of the tailgate.

The opening or closing of the tailgate can be triggered by the tailgate push buttons (8, 11, 14).

Controller (5) can be used to adjust the opening angle for the tailgate on the Central Information Display (4).

The signals from microswitch (12) and outside temperature sensor (1), and vehicle speed (6) are evaluated in the decision as to whether the tailgate may be opened or closed in response to a press of a button.

Automatic Tailgate Actuation System Circuit Diagram



Index	Explanation	Index	Explanation
1	Car Access System 3 CAS3	14	Interior tailgate push button
2	IHKA	15	Interior tailgate push button illumination
3	Tailgate push button in the SZM	16	Lower tailgate section contact
4	Tailgate lift HKL	17	Hall sensor, left
5	Spindle drive motor, right	18	Hall sensor, left
6	Hall sensor, right	19	Spindle drive motor, left
7	Hall sensor, right	20	Remote control receiver in diversity module
8	Connections to the junction- box ECU	21	Remote control aerial in the rear window
9	Tailgate contact	K-CAN	Body CAN
10	Upper tailgate lock motor	KL30	Terminal 30
11	Exterior tailgate push button	KL30g	Terminal 30 switched
12	Automatic soft-close drive contact	Rel SCA	Connection to the automatic soft close relay
13	Automatic soft-close tailgate		

The radio signal from the remote control is received by rear window aerial (21). The remote control receiver in diversity module (20) forwards the signal to Car Access System 3 (1). The Car Access System 3 is the master control unit for the central locking function.

Once the signal has been successfully verified, the Car Access System 3 issues a command to control the central locking in the tailgate.

The junction-box ECU executes the command to control the central locking in the tailgate. For the "automatic tailgate actuation" function, the junction-box ECU records the status of tailgate contact (9) and contact (12) of automatic soft-close function (13). The status of the contacts described is sent to tailgate lift (4) on the K-CAN. The status of these contacts is one of the criteria for the initiation of tailgate movement.

Sensors (5 to 7 and 17 to 19) monitor the movement of the tailgate. The tailgate lift is therefore able to reverse the movement of an obstructed tailgate, allowing the obstruction to be freed.

Contact (16) for the lower tailgate section sends status signals indicating "lower tailgate section open" or "lower tailgate section closed". If the lower tailgate section has not been closed correctly, the automatic tailgate actuation command is not executed.

K-CAN Signals at RAD2 (Boost CD) Control Unit			
In/Out	**Signal**	**Source**	**Function**
In	Tailgate contact status	Tailgate contact > junction- box ECU	Criterion for tailgate movement
In	Exterior tailgate push button status	Exterior tailgate push button > junction- box ECU	Requirement for tailgate movement
In	Interior tailgate push button	Interior tailgate push button > junction- box ECU	Requirement for tailgate movement
In	Outside temperature	Outside temperature sensor > instrument cluster	Value for the calculation of the spindle motors' thermal protection
In	Opening angle	Controller > Central Information Display	Opening angle input
In	Vehicle speed	Dynamic Stability Control > instrument cluster	Permit/deny control functions of the tailgate
Out	Lower tailgate section not closed	Lower tailgate section contact > tailgate lift	Display Check Control message

System Components

Control Units, Control Elements and Spindle Drives

Control Units

Tailgate Lift
The tailgate lift is fitted to the device holder inside the luggage compartment on the right hand side. The HKL controls and monitors the operation of the automatic tailgate actuation function.

The control logic module is connected to terminal 30g. The HKL is also connected to terminal 30 for the load current through the spindle drives.

In sleep mode, the HKL requires a certain amount of off-load current. With terminal 30g OFF, the HKL is no longer supplied with any off-load current.

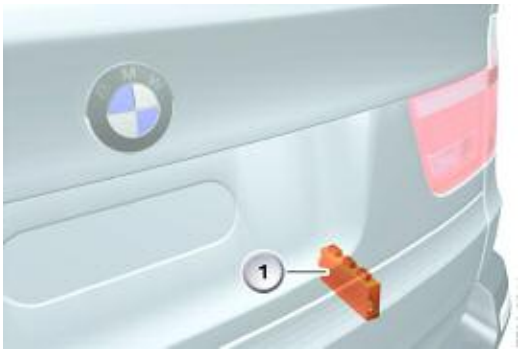
The tailgate lift operates at a voltage of between 9 V and 16 V. Outside this range, the functions may no longer be supported.

Car Access System 3
The Car Access System 3 is fitted on the left hand side next to the steering column. It is the master control unit for the central locking. It is therefore also responsible for having the tailgate unlocked.

Junction-box ECU JB
The junction-box ECU is connected inside the forward distribution box.

Note: The distribution box and the junction-box ECU are two separate components. This is an important point for the Service to note.

The central locking of the tailgate is controlled by a power output stage in the junction-box ECU. The automatic soft-close drive is supplied by a relay in the distribution box at the rear. The junction-box ECU controls the relay.



1. Tailgate Lift Installation Location

Control Elements

Exterior Tailgate push button
The tailgate push button switches to earth. The signal from the tailgate push button is recorded by the junction-box ECU. The junction-box ECU sends a tailgate push button status signal to the HKL on the K-CAN.

Interior Tailgate push button
The tailgate push button switches to ground. The signal from the tailgate push button is recorded by the junction-box ECU. The junction-box ECU sends a tailgate push button status signal to the HKL on the K-CAN.

The lighting of the tailgate push button is only supplied with power by the HKL in conjunction with the following conditions:

- Upper tailgate section open and
- Lower tailgate section closed
- Terminal 30g ON.

Remote Control Tailgate push button
The status of the tailgate push button on the remote control is evaluated by the electronics in the remote control.

The remote control sends an encrypted message to the vehicle by radio wave. The message reaches the remote control receiver via the aerial in the rear window. From there, the message is made available to the Car Access System 3.

The Car Access System 3 verifies the message. Once the message has been successfully verified, the Car Access System 3 sends out the request on the K-CAN.

ID Transmitter Tailgate push button
The ID transmitter has the same function as the remote control. For this reason, the description of the tailgate push button on the remote control logically applies here, too.

SZM Tailgate push button
The tailgate push button is resistance-coded. The status of the tailgate push button is evaluated by the air-conditioning control unit. The air-conditioning control unit issues the status on the K-CAN.

Spindle Drives

Each spindle drive comprises the following components:

- Spindle drive
- Drive motor
- Drive motor Hall sensor
- Spring
- Fixture of the spindle drive to the tailgate
- Fixture of the spindle drive to the body
- Ball bearing for the spindle drive

Note: A defective spindle drive must be replaced as a complete unit. The spindle drive is held together using an assembly aid to prevent it from coming apart under the force of its spring. Do not remove the assembly aid until the spindle drive has been fitted.

Contacts

The HKL requires the status of two contacts.

The contacts are:

- Tailgate contact
- Lower tailgate section contact

Tailgate Contact

The tailgate contact is switched to earth while the tailgate is not open. The status of the tailgate contact is evaluated and made available by the junction-box ECU.

Lower Tailgate Section Contact

The lower tailgate section contact is a microswitch. The microswitch is switched to earth. The status of the microswitch is evaluated by the HKL.

The HKL receives a high signal while the lower tailgate section is not open.

1 Lower tailgate section contact

Lower Tailgate Section Contact Installation Location

Principles of Operation

Tailgate Operating Points

The tailgate can be unlocked and opened or closed from various operating points. The operating points are the:

- Tailgate push button on the exterior of the tailgate.
- Tailgate push button on the interior of the tailgate (when the tailgate is open).
- Tailgate push button on the remote control; on the ID transmitter with Comfort Access.
- Tailgate push button in the passenger compartment on the center console switch cluster.

The automatic tailgate actuation function cannot be activated when the vehicle is in motion, only when the vehicle is stationary.

Automatic tailgate actuation is controlled and monitored by a control unit. This control unit has the designation tailgate lift HKL.

The HKL has an integrated "soft-opening" or "soft-closing" function. This means that the closing or opening speed is slowed shortly before the end stops are reached so that the tailgate moves softly into the respective end stop. The soft end stop is achieved by a change in the pulse width of the control voltage.

The tailgate moves quietly and smoothly. This gives the impression of a harmonious movement during the tailgate opening or closing procedure.

To achieve this, the speed of the tailgate movement is regulated by the HKL. Tailgate movement depends on whether the tailgate is covered with hoar frost or snow. If the weight of the snow is too heavy for the tailgate, no tailgate movement will take place.

The HKL receives signals on the K-CAN from the following control units:

- Integrated automatic heating and air conditioning system signal from the interior tailgate push button.
- Instrument cluster road speed signal.
- Car Access System 3
  - Authorization for control of the tailgate by remote control/ID transmitter or, more precisely, terminal status.
- Junction-box ECU
  - Signal from the exterior tailgate push button and the tailgate push button on the inside of the tailgate.
- Central Information Display
  - Signal with the opening angle set.

Operation by Tailgate Push Buttons

The tailgate can be opened, stopped or closed by pressing one of the tailgate push buttons. It is also possible to stop or resume the movement of the tailgate from any open position. Tapping a tailgate push button is sufficient input for the tailgate to continue to the respective end position (tailgate open or closed). The tailgate movement stops automatically as soon as the end position is reached.

Direction of Tailgate Movement

The tailgate's direction of movement changes with every second press of the interior or exterior tailgate push button. Initial state of tailgate closed:

- Button stroke > Open
- Button stroke > Stop
- Button stroke > Close
- Button stroke > Stop
- Button stroke > Open, etc.

Note: The tailgate push button in the center console switch cluster SZM can only be used to open or stop the tailgate.

Exterior Tailgate Push Button

The junction-box ECU evaluates the status of the tailgate push button.

Evaluation depends on whether or not the vehicle is in sleep mode. If the vehicle is in sleep mode, it will have to be woken first. Only then can the request be sent to the HKL on the K-CAN. The HKL triggers the appropriate request.

If the tailgate is closed, the tailgate is unlocked first, then the HKL triggers the opening of the tailgate. The tailgate is automatically opened fully or as far as the set opening angle.

1. Exterior Tailgate push button E70

Note: It is possible to set the opening angle as a percentage of the tailgate's total opening path. The setting can be selected in one of the menus in the Central Information Display using the controller.

Pressing the exterior tailgate push button during the tailgate opening procedure stops the movement of the tailgate. If the tailgate push button is now pressed once more, the tailgate will close again.

Pressing the tailgate push button once again stops the movement of the tailgate.

If the tailgate push button is pressed while the tailgate is closed, the tailgate opens until it is fully open.

Interior Tailgate Push Button

The interior tailgate push button is connected to the junction-box ECU in parallel with the exterior push button.

For this reason, the junction-box ECU does not distinguish between the two tailgate push buttons.

1. Interior tailgate push button E70

Remote Control/ID Transmitter Tailgate Push Buttons

If the complete vehicle is locked, it is possible to trigger an automatic opening of the tailgate by pressing the tailgate button with the tailgate symbol. Firstly, the tailgate is unlocked. Then the tailgate begins to open automatically.

The tailgate movement does not begin until the tailgate button has been released. The remote control/ID transmitter send a message indicating that the tailgate button has been released. From this message, it is possible for the tailgate push button stroke to be detected.

Automatic opening is initiated after the tailgate has unlocked. The tailgate is opened fully or until it reaches the set opening angle.

Note: The remote control cannot be used to close the tailgate for legal reasons.

Tailgate Push Button on the Center Console Switch Cluster

This tailgate push button can only be used to open the tailgate or stop its movement. It is possible for the tailgate to be stopped during either the opening or closing procedure.

The integrated automatic heating/air conditioning system issues requests to the HKL on the K-CAN.

1. Center Console Tailgate Push Button

Tailgate Push Button Priority

If more than one tailgate push button is pressed at the same time, the push button of the higher priority will always override the others.

Priority	Push Button
1	Tailgate interior
1	Tailgate exterior
2	Center console switch cluster
3	Remote control
4	Identification transmitter

If a request is issued by the tailgate push button in the center console switch cluster, this can be overridden by a request of higher rank. This means that a request from the interior or exterior tailgate push button would be carried out.

If a tailgate push button is defective in such a way that a request is repeatedly issued, the HKL will execute this request only the once.

Automatic Opening

The tailgate is opened or closed automatically when one of the tailgate push buttons is pressed. A basic prerequisite being that there must be no "inhibition condition" present. You will find a description of the inhibition conditions in the "Tailgate movement inhibition conditions" section of this Product Information.

Automatic Opening Procedure

The following procedure begins with a closed tailgate:

- Tailgate push button with tailgate symbol pressed briefly.
- Power supply switched to HKL and request to unlock the tailgate issued by the Car Access System 3.
- The junction-box ECU executes the unlocking of the tailgate. The automatic soft-close drive is controlled first to unlock the tailgate. The tailgate lock is controlled with a delay of approximately 200 ms.

  Since the tailgate is pressed against the body by the automatic soft-close feature (wedging of the tailgate), the tailgate would open jerkily and "spring out". For this reason, the automatic soft-close drive relieves the tailgate of stress before the tailgate lock is unlocked and the tailgate is opened.
- The tailgate contact status changes from closed to open.
- The HKL controls the spindle drives to open the tailgate.

The tailgate is opened fully or until it reaches the set opening angle. If one of the inhibition conditions becomes active during tailgate movement, this will stop further movement of the tailgate.

Tailgate Opening with Comfort Access

Vehicles equipped with the Comfort Access option also have a "keyless opening" tailgate function.

The junction-box ECU wakes a sleeping vehicle in response to a press of the exterior tailgate push button. The junction-box ECU sends the request on the K-CAN. Comfort Access receives the request and arranges for the ID transmitter to report to the vehicle.

Once the ID transmitter has been successfully verified by the Car Access System 3, the latter arranges for the tailgate to be unlocked. The junction-box ECU executes the unlocking procedure. As soon as the status of the tailgate contact changes, the junction-box ECU issues a notification on the K-CAN. In response, the HKL then executes the automatic opening procedure.

Automatic Closing

All tailgate push buttons are able to initiate automatic closing.

This is with the exception of the tailgate push button in the center console switch cluster. This tailgate push button cannot be used to start the automatic closing procedure.

Tailgate Closing with Comfort Access

Vehicles equipped with the Comfort Access option also have a "keyless closing" tailgate function.

The junction-box ECU wakes a sleeping vehicle in response to a press of the interior tailgate push button. The junction-box ECU sends the request on the K-CAN. Comfort Access receives the request and arranges for the ID transmitter to report to the vehicle.

Once the ID transmitter has been successfully verified by the Car Access System 3, it is possible for the automatic closing to be initiated.

In response, the HKL then executes the automatic closing procedure.

As soon as the status of the tailgate contact changes, the junction-box ECU issues a notification on the K-CAN. The HKL then knows that the closing process has ended.

During the closing procedure, Comfort Access checks whether an ID transmitter is present inside or outside the vehicle. If an ID transmitter is present in the luggage compartment, for example, the tailgate is reopened and an audible warning signal is output from the anti-theft alarm system.

Manual Opening and Closing

It is possible to open or close an open tailgate at any time in any vehicle idle mode situation.

Tailgate Lift Active
While terminal 30g is switched on, detection of manual tailgate movements is straight forward.

The HKL detects tailgate movement by means of Hall sensors located in the spindle drive motors. The HKL evaluates the pulses of the Hall sensors and stores the current position of the tailgate.

This position is used as the starting position for subsequent tailgate movement.

Tailgate Lift in Sleep Mode
The current position of the tailgate is stored in the HKL before the vehicle enters sleep mode.

Once the vehicle is in sleep mode, the HKL checks the Hall sensors on a cyclical basis.

The vehicle is woken if a tailgate movement is detected. The HKL is then switched on and detects the tailgate being moved by hand.

Terminal 30g OFF
If terminal 30g is switched off, the power supply to the spindle drives is switched off and so too are the Hall sensors. In this situation, therefore, manual tailgate movements can no longer be detected.

If the position of the tailgate has been altered manually, the stored value would no longer match the current value.

At the next request, the tailgate is always closed first. The HKL detects the lower end stop from the status of the tailgate contact.

This enables the current position of the tailgate to be compared with the stored starting position. The position of the tailgate is, in this way, newly referenced.

Note: If the tailgate movement is stopped before the lower end stop is reached, the tailgate will be opened the next time it is operated.

Since the position of the tailgate has not yet been referenced, the tailgate is only opened by as much it was previously closed.

Tailgate Movement Inhibition Conditions

The tailgate is not permitted to be operated in various situations. These situations include engine starting or driving or cases where there may be a risk of vehicle damage.

If tailgate operation needs to be inhibited while the tailgate is in motion, the movement that has commenced will continue through to the end. A closing tailgate is closed if the vehicle pulls away, for example.

The inhibition conditions are listed as follows:

Inhibition Conditions	Explanation/note
Vehicle speed Vmax > 3 km	The road speed signal is issued on the K-CAN by the instrument cluster. The tailgate can be set in motion in the presence of an invalid road speed signal.
Outside temperature < - 30 °C and + 80 °C >	The outside temperature signal is issued on the K-CAN by the instrument cluster. The tailgate can be set in motion in the presence of an invalid temperature signal.
On-board supply voltage < 9 V to 16 V >	In the event of undervoltage < 9 V or overvoltage > 16 V, the tailgate can no longer be set in motion.
Lower tailgate section not closed	The microswitch status is evaluated directly by the HKL. Cancellation if tailgate movement in progress, inhibition of tailgate operation.
Engine start (status "terminal 50 ON")	The signal is issued on the K-CAN by the Car Access System 3. Cancellation if tailgate movement in progress, inhibition of tailgate operation.

If the tailgate is reversing, the inhibition conditions are ignored and the tailgate movement is followed through to the end.

Additional Functions of the Tailgate Lift

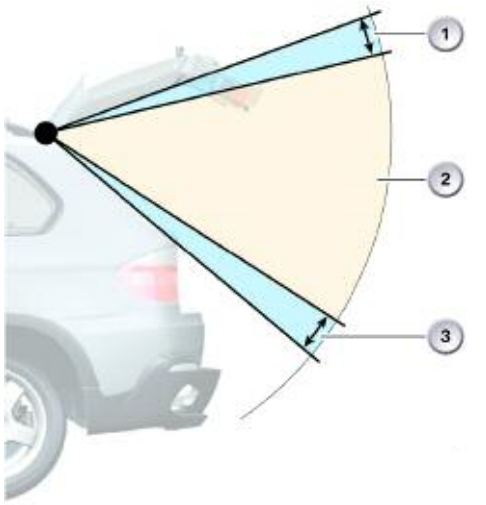
Position Detection

The spindle drives are each integrated with a motor. The motor contains two Hall sensors.

The Hall sensors are arranged with relative offset. This enables detection of the motor's direction of rotation. In addition, it is possible to draw conclusions as to the remaining path of the tailgate based on the Hall sensor pulses.

The complete movement range of the tailgate from "CLOSED" to "OPEN" is recorded during assembly in the works. The HKL therefore knows how many Hall sensor pulses were generated between the tailgate's lower and upper end stop.

The number of Hall sensor pulses corresponds to the tailgate's path. With this information, the HKL is able to determine the opening angle of the tailgate. The Hall sensor pulses are, for example, used to set the opening angle on the Central Information Display.



Index	Explanation
1	Upper Segment
2	Middle Range
3	Lowermost Segment

The path of the tailgate is subdivided into various segments. From the Hall sensor pulses, the HKL knows the segment in which the tailgate is positioned. If the tailgate is fully open, it is positioned within the range of the upper segment. From there, the tailgate is always moved in the closing direction.

If the tailgate is in the lower segment's range, i.e. closed, the tailgate is always moved in the opening direction.

The current position of the tailgate is stored by the HKL before it enters sleep mode. When the vehicle wakes up, the most recently stored position is used as the current position.

Obstruction Detection

Obstruction detection is active during the tailgate opening and closing procedure. An obstruction to tailgate movement during the opening procedure causes the tailgate to stop moving immediately. If the tailgate is obstructed in the closing direction, the HKL briefly controls the spindle drives in the opposite direction. If the tailgate remains obstructed, the HKL stops controlling the spindle drive motors.

There is no reversal of the direction of movement if the tailgate is obstructed as it opens or closes at the end stop.

Obstruction Detection Principle

The HKL evaluates the Hall sensor pulses in the spindle drive motors. The motor current is also recorded.

If the motor current increases and the Hall sensor pulses drop out, the HKL detects that the tailgate is being obstructed.

Note: Obstruction detection is deactivated during initialization of the tailgate lift. This allows the tailgate drives to be controlled with the maximum current available.

Repeat Interlock

The HKL is equipped with a repeat interlock to prevent the motors from overheating. The motor run-time is cumulated for the repeat interlock.

If the sum exceeds a maximum running time of 2 minutes, a new operation command will be rejected. An action that is already in progress always follows through to the end.

After a cooling phase of 6 minutes, it is possible for the motor to accrue a run-time of 2 minutes again.

The current motor run-time is stored by the HKL before it enters sleep mode.

The motor run-time of the repeat interlock is halved when the control unit is woken from sleep mode.

The repeat interlock is cleared in the event of a terminal 30 reset. This means that a motor run-time of 2 minutes is immediately available.

Setting the Opening Angle

The opening angle of the tailgate is adjustable to prevent the tailgate from striking a low garage ceiling when it opens automatically, for example. The menu for setting the opening angle can be called up on the Central Information Display using the controller.

The driver is able to set the opening angle of the tailgate to any one of five values between 50% and 100% of the maximum opening angle.

The setting can be changed by navigating to the "Tailgate" menu item at the end of this path on the Central Information Display: Settings" > "Central locking" > "Door locking":

Use the controller to select and confirm the opening angle.

Index	Explanation
1	Door Locking
2	Tailgate
3	Opening Angle

The HKL is informed of the set opening angle on the K-CAN by the Central Information Display.

The tailgate lift converts the value into the number of Hall sensor pulses from the spindle drive motors. With the information on the number of pulses, the tailgate lift is able to open the tailgate as far as the set opening angle. The HKL then stops controlling the spindle drives.

Note: The set opening angle value is stored in the HKL. This value would therefore be lost if the HKL were to be replaced and it would have to be reset.

Service Information

Teaching in the Tailgate End Stops

If the tailgate lift control unit has been replaced, a new teach-in procedure will be necessary for the upper end stop. To do this, the tailgate has to be moved until obstructed by the upper stop.

The obstruction of the tailgate, and thus the drop-out of the Hall sensor pulses, marks the point at which the tailgate has reached its maximum opening angle. From this point, a value of approximately 5% of the total opening angle is deducted. This will be the future opening angle of the tailgate. This point is also named the soft stop.

The soft stop prevents the tailgate from opening as far as the end stop and being damaged.

Note: The lower end stop is determined by the change in status of the tailgate lock's tailgate contact from open to closed. The junction-box ECU sends out the status of the tailgate contact on the K-CAN.

Spindle Drive Replacement

During the replacement of the spindle drive, it is necessary to disconnect the plug connections. To protect the control unit or the spindle drives, terminal 30g should be switched off beforehand.

If the HKL is woken in this situation, it checks whether the spindle drives are connected. If the spindle drives are in fact not connected, a fault code memory entry will be generated. In response to the fault code memory entry, the HKL prevents control of the spindle drives.

The automatic tailgate actuation function does not work, even if the spindle drives are connected now.

The HKL control unit must be allowed to enter sleep mode once more and terminal 30g switched off. The spindle drives are checked again the next time the control unit is woken. If the check is successful, the automatic tailgate actuation function is switched to active again.

The spindle drives are delivered under preload as a consequence of their spring force. Each spindle drive therefore has an assembly aid.

The assembly aid clamps the spindle drive together to prevent it from coming apart under the force of the spring. During replacement of a spindle drive, the assembly aid should not be removed until the new spindle drive has been fitted.

Note: The service information does not replace the current information available to Service, nor does it replace repair instructions.

Check Control Message

Check Control Message	Explanation	Central Information Display Message
	Lower tailgate section not engaged!	Lower tailgate section. Close the lower tailgate section correctly so that the upper tailgate can be closed by the tailgate lift.