Technical training.
Product information.

F12 Soft Top

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Technical Training
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BMW Service

General information

Symbols used

The following symbol / sign is used in this document to facilitate better comprehension and to draw attention to particularly important information:

Contains important safety guidance and information that is necessary for proper system functioning and which it is imperative to follow.

Information status and national-market versions

The BMW Group produces vehicles to meet the very highest standards of safety and quality. Changes in terms of environmental protection, customer benefits and design make it necessary to develop systems and components on a continuous basis. Consequently, this may result in differences between the content of this document and the vehicles available in the training course.

As a general principle, this document describes left-hand drive vehicles in the European version. Some controls or components are arranged differently in right-hand drive vehicles than those shown on the graphics in this document. Further discrepancies may arise from market-specific or country-specific equipment specifications.

Additional sources of information

Further information on the individual topics can be found in the following:

- Owner's Handbook
- Integrated Service Technical Application

Contact: conceptinfo@bmw.de

The information in the document is part of the BMW Group technical training course and is intended for its trainers and participants. Refer to the latest relevant BMW Group information systems for any changes/supplements to the technical data.

Information status: **November 2010**
VH-23/International Technical Training

F12 Soft Top

Contents

F12 Soft Top

1. Introduction

The F12 is the new BMW 6 Series Convertible. It uses a fully automatic, electro-hydraulic soft top and was introduced to the US market (just in time for Spring) in May of 2011.

As with the E64, the soft top of the F12 extends in the rear area into two side fins. This design enables the top edge of the soft top to be flattened towards the rear, which gives the car a coupe-like silhouette with a highly recognizable as a 6 Series when the soft top is closed.

BMW 6 Series Convertible

The soft top of the F12 is essentially based on that of the E64.

- The soft top is foam-backed with polyurethane, this provides excellent insulation against wind and driving noises.
- The heated, retractable rear window can be operated separately from the soft top.
- The soft top can be automatically operated with the soft top switch or with the integrated key in the lock cylinder of the driver's door.
  The F12 soft top to be opened and closed with the ID transmitter, and closed via the outside door handle electronics. This is made possible because all F12 vehicles are equipped with comfort access as standard equipment.
- It takes approximately 19 seconds for the soft top to open and approximately 22 seconds for it to close. With the side and rear windows being lowered or raised and the car being unlocked or locked while the soft top is being operated, it takes approximately 25 seconds for opening and approximately 26 seconds for closing.

Unlike the E64 convertible top, which was made by Edcha, the F12 soft top is manufactured instead by the Karmann company.

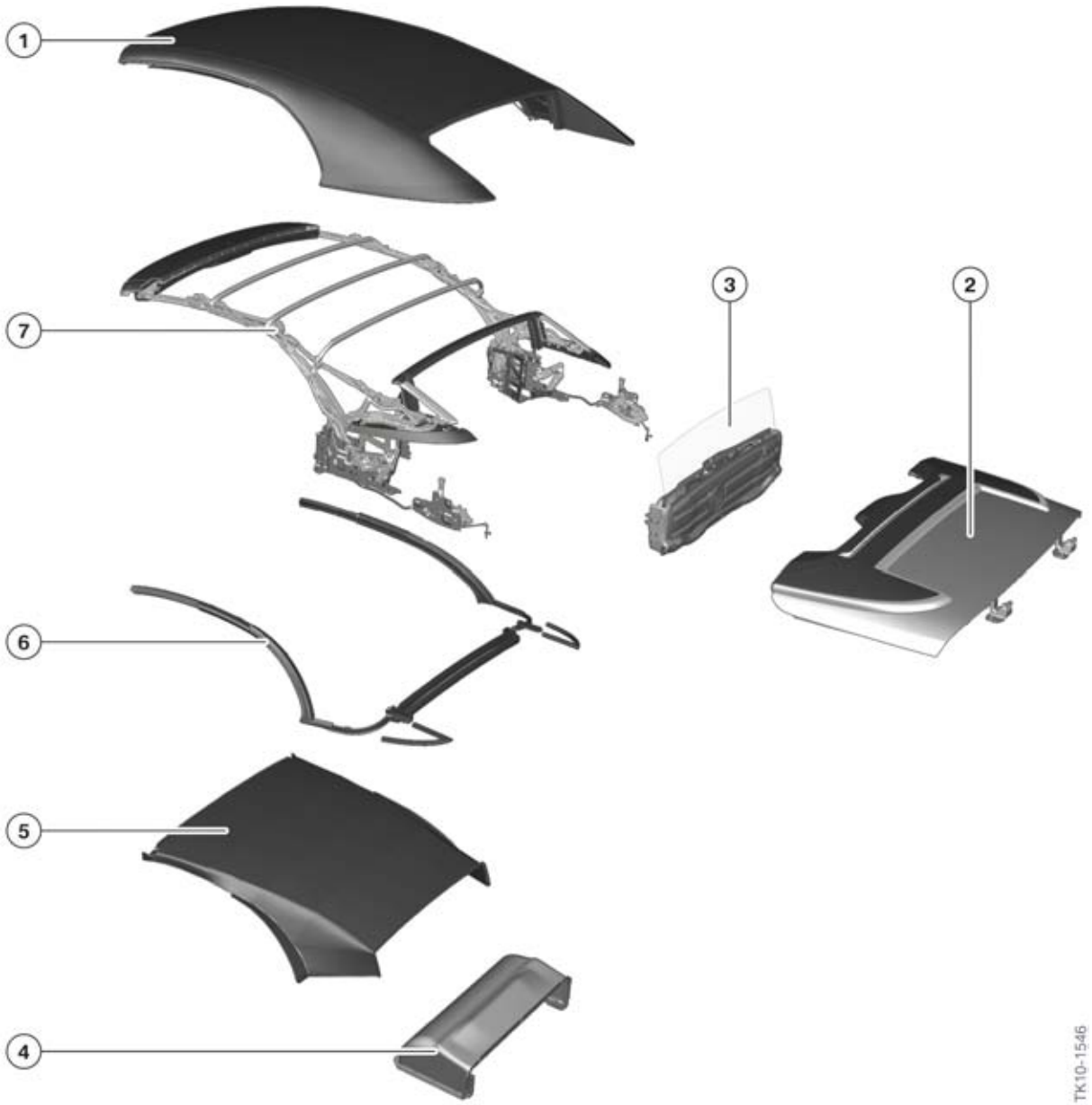
Special features

- The soft top can be ordered in two colors: black or beige. The headliner is always black.
- The soft top can be opened and closed while the car is being driven up to a speed of approximately 40 km/h / 25 mph.
  The soft top, once it has started moving, will be stopped at a speed exceeding approximately 50 km/h / 31 mph.

F12 Soft Top

2. System Components

2.1. Overview



F12 Design of soft top

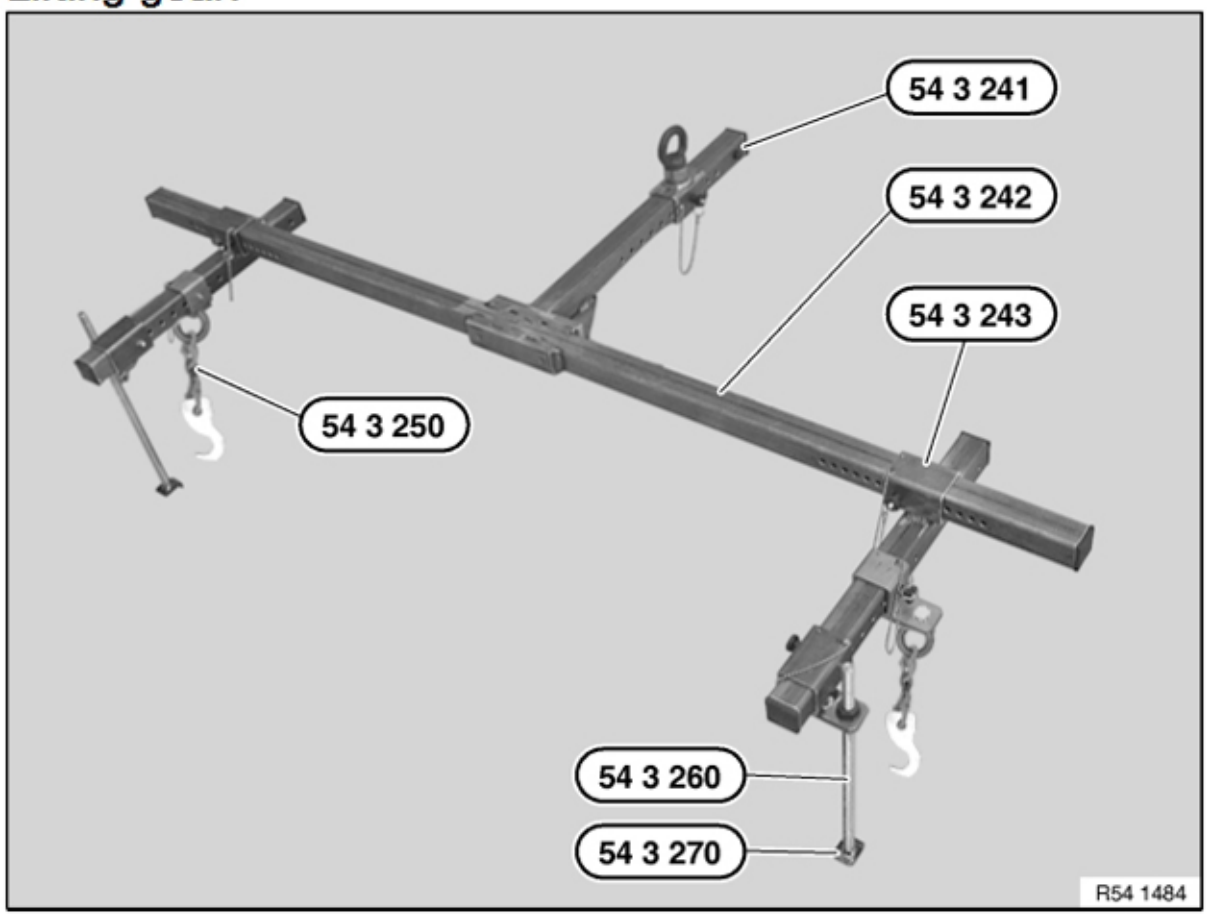
F12 Soft Top

2. System Components

Index	Explanation
1	Soft top cover
2	Soft top compartment lid
3	Rear window module
4	Variable soft top compartment
5	Headliner
6	Soft top seals
7	Soft top frame

The entire soft top weighs roughly 77 kg / 170 lbs. The following special tools are used to remove and install the soft top:

Lifting gear:



- 54 3 240, consists of 54 3 241, 242 and 243
- 54 3 250
- 54 3 260
- 54 3 270

F12 Soft Top

2. System Components

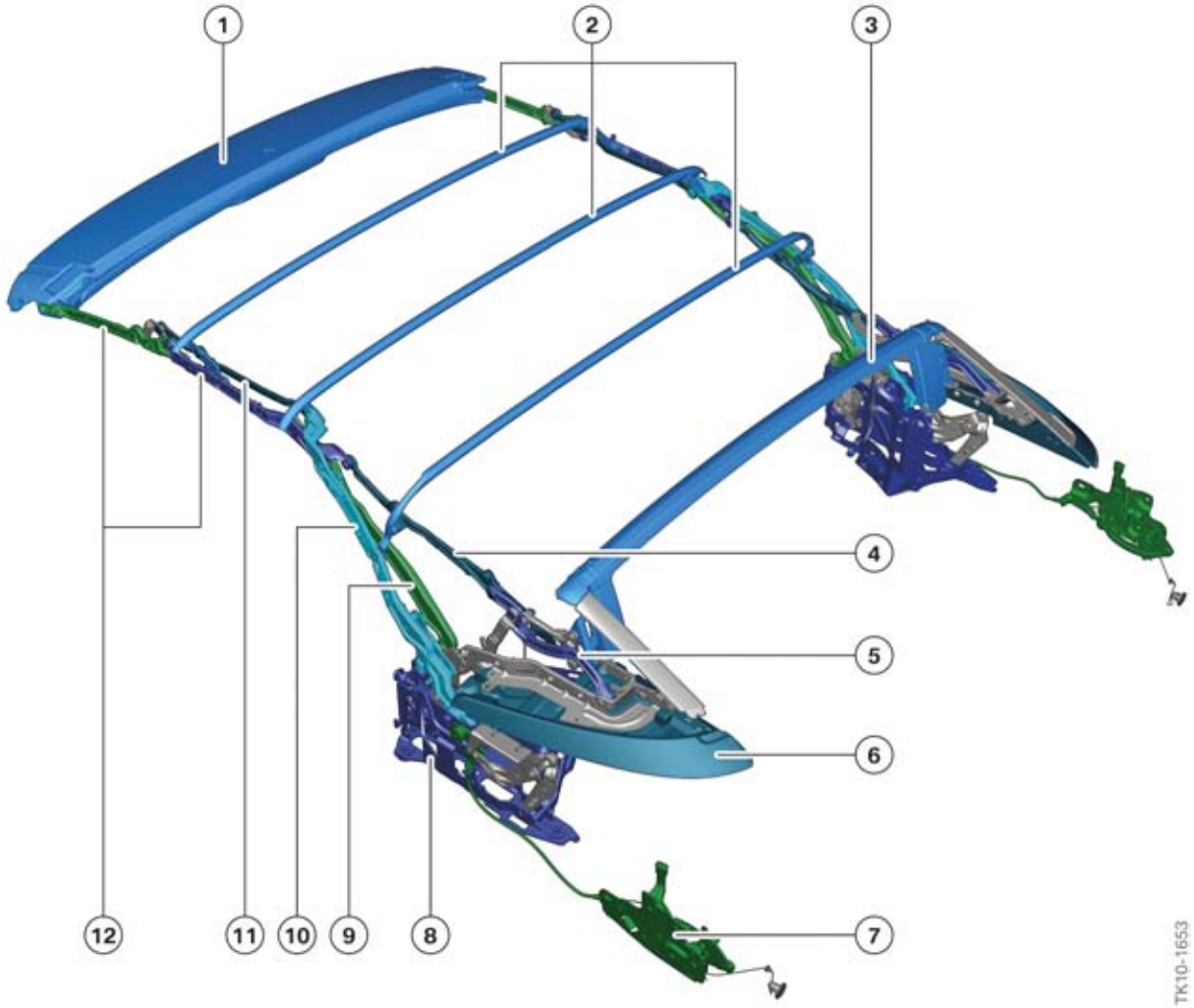
The headliner or soft top cover can be replaced separately.

The main soft top components are divided into mechanical, hydraulic and electrical components and are described in the following chapters.

2.2. Mechanical components

2.2.1. Soft top frame

The soft top frame is the framework to which the soft top cover, the headliner and the seals are mounted. The essential components of the soft top frame are illustrated in the graphic below.



F12 Design of soft top frame

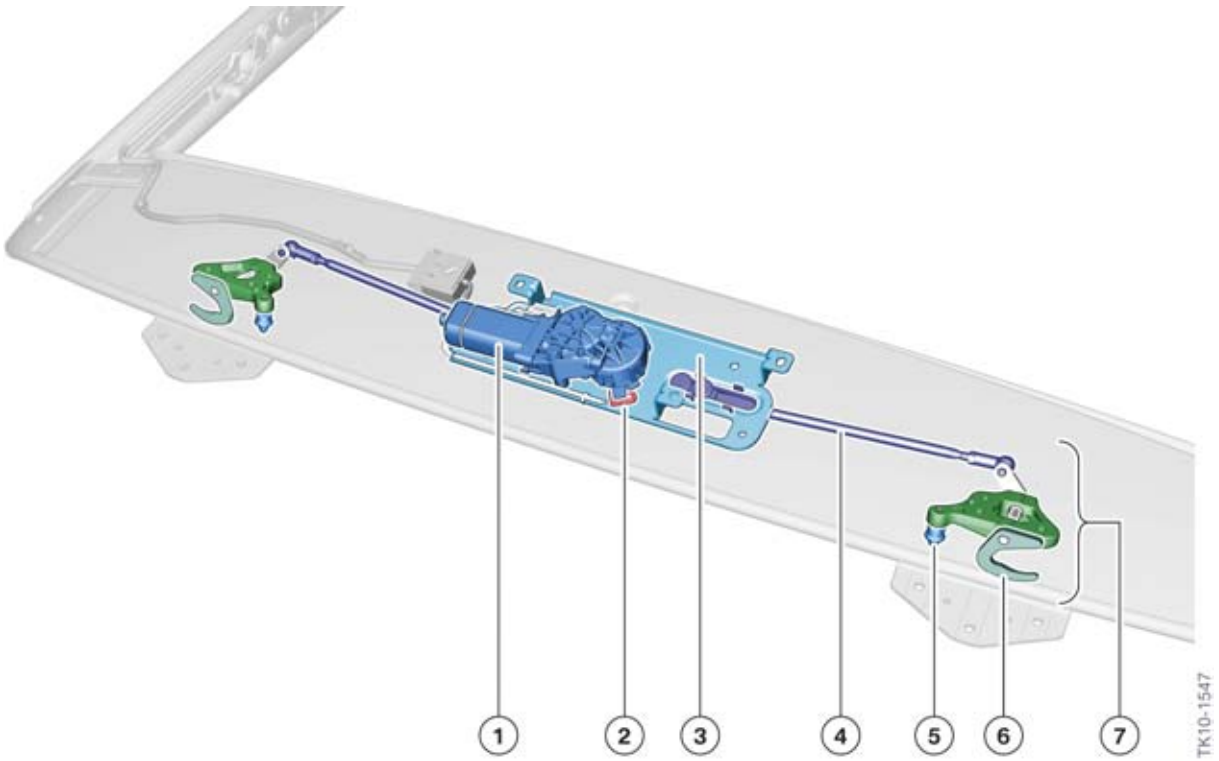
F12 Soft Top

2. System Components

Index	Explanation
1	Front soft top bow
2	Soft top bow
3	Rear soft top bow
4	Upper tension bar, left
5	Lower tension bar, left
6	Fin, left
7	Kinematic box, left (adjustment no longer necessary)
8	Soft top main bearing, left
9	Main link, left
10	Main pillar, left
11	Link, left
12	Roof link, left

The soft top frame is connected at the two main bearings to the bodyshell. To open and close the soft top, the main pillars and the fins are driven via a linkage by hydraulic cylinders. The soft top is locked on the cowl panel by the front soft top bow.

2.2.2. Cowl panel lock



F12 Design of cowl panel lock

F12 Soft Top
2. System Components

Index	Explanation
1	Soft top lock drive (electric motor for locking the retaining hooks with incremental sensor for position identification; gearing)
2	Hall-effect sensor, retaining hooks closed
3	Carrier plate
4	Pushrod, left
5	Guide pin, left
6	Retaining hook, left
7	Soft top latch, left

To lock and unlock the front soft top bow with the windshield frame, the retaining hooks are moved by an electric motor via the pushrods and the gearing.

A Hall-effect sensor on the carrier plate senses the locked position of the retaining hooks, all further positions are determined by means of an incremental sensor located in the electric motor.

The locking noises and the locking speed have been improved in the F12 when compared with the E64.

2.2.3. Soft top compartment lid

The F12 soft top compartment lid is made of SMC (Sheet Moulding Compound), a fiber-plastic composite.

F12 Soft top compartment lid

The F12 soft top compartment lid has been visibly enhanced with the addition of trim strips and a redesigned rear window assembly trim. The overall seal has also been improved by an optimized hinge connection design.

The enhanced rigidity of the SMC soft top compartment lid has made it possible to provide a more accurate fit between the soft top compartment lid and the body of the vehicle.

F12 Soft Top

2. System Components

The two locks of the soft top compartment lid are actuated by the kinematic box via a cable.

2.2.4. Variable soft top compartment

As with the E64, the luggage compartment capacity of the F12 can also be increased when the soft top is closed.

Moving the hinged panel of the variable soft top compartment into the upper position increases the luggage compartment capacity from 300 to 350 liters. Unlike the E64, the F12 uses a leaf spring design.

It is important to note that before the soft top can be opened, the hinged panel must be returned to the lower position.

The lower position of the hinged panel is monitored by a microswitch on the right side of the frame and forwarded to the soft top module.

F12 Components of variable soft top compartment

F12 Soft Top

2. System Components

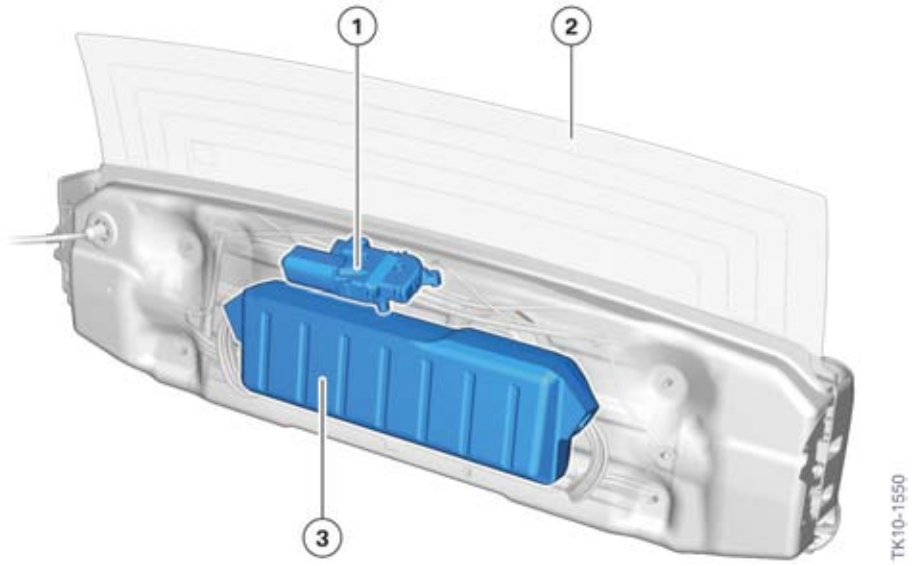
Index	Explanation
A	Hinged panel in lower position
B	Hinged panel in upper position
1	Hinged panel (with integrated handle recess)
2	Handle recess
3	Frame
4	Fabric hood
5	Leaf spring
6	Microswitch, soft top compartment

Special features

- Simple pulling and pushing function thanks to leaf spring design
- Weight was reduced by over 50 % compared with E64
- Manufacturing costs were reduced by 40 % compared with E64

2.2.5. Rear window module

The hydraulic unit for the F12 soft top is integrated in the rear window module.



F12 Rear window module

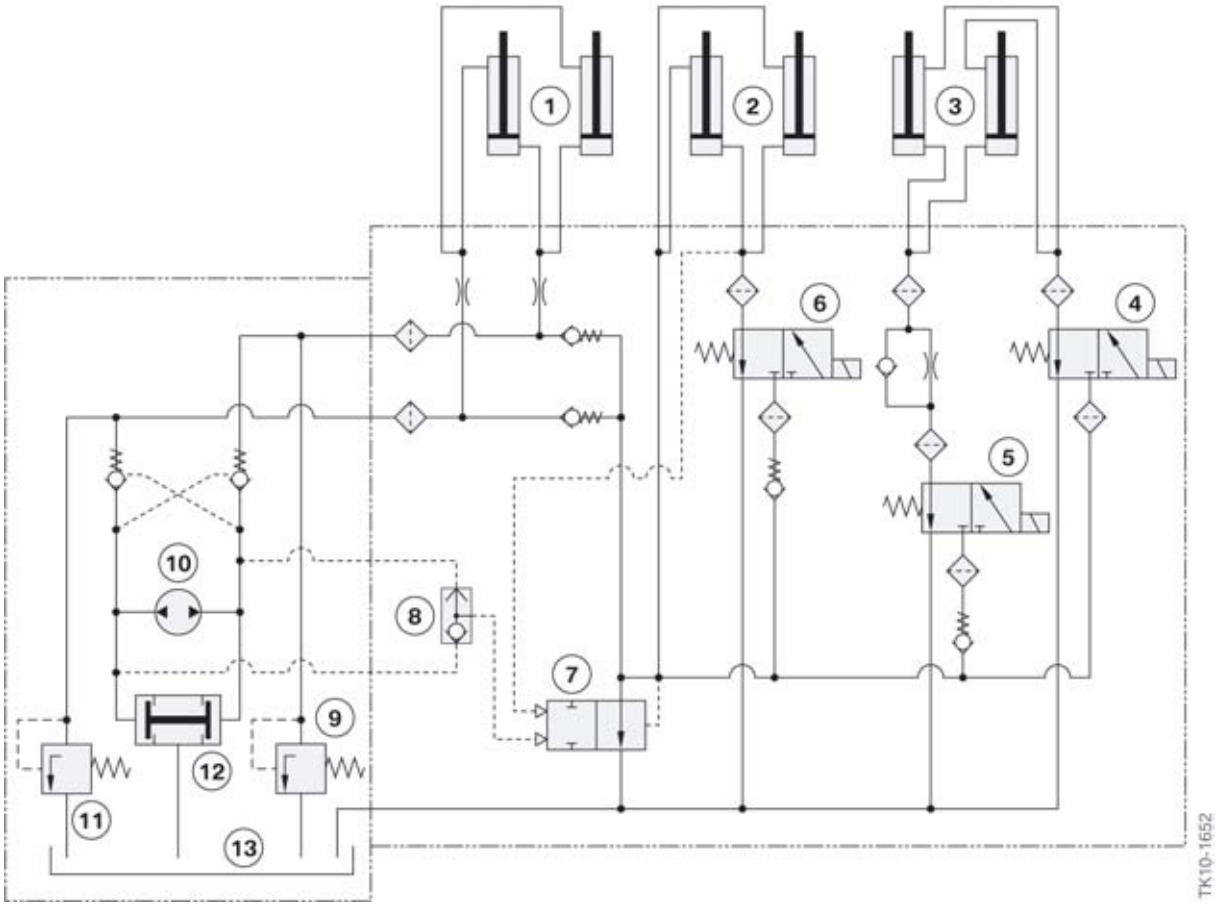
Index	Explanation
1	Rear window drive (electric motor with incremental sensor for position identification)
2	Rear window
3	Hydraulic unit

F12 Soft Top
2. System Components

The rear window can be replaced separately and the window module can be adjusted in the event of leaks in the rear window area.

2.3. Hydraulic components

2.3.1. System schematic, soft top hydraulics



F12 System schematic, soft top hydraulics

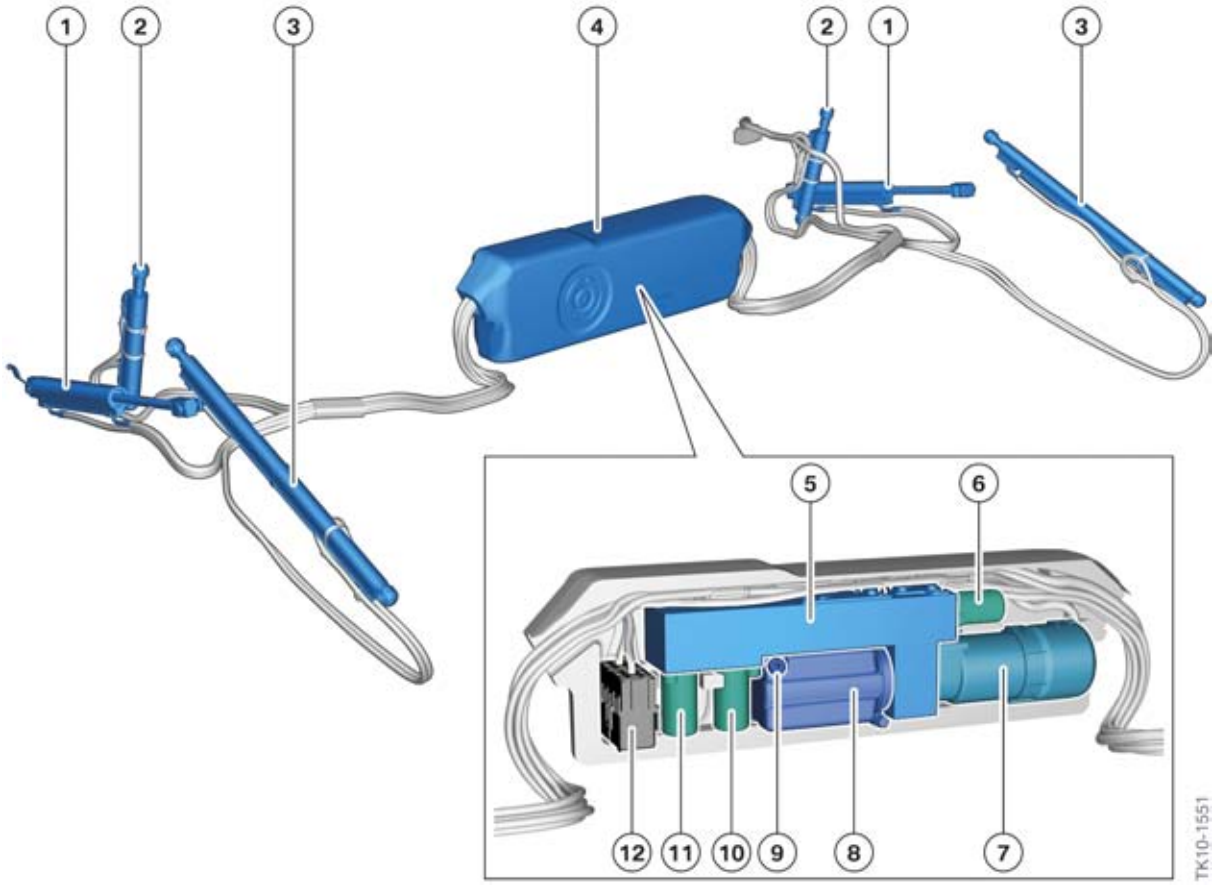
Index	Explanation
1	Hydraulic cylinders, main pillars
2	Hydraulic cylinders, soft top compartment lid
3	Hydraulic cylinders, fins
4	Changeover valve 2 (lower fins)
5	Changeover valve 3 (raise fins)
6	Changeover valve 1 (soft top compartment lid)
7	Changeover valve (system depressurized)
8	Double non-return valve

F12 Soft Top

2. System Components

Index	Explanation
9	Pressure-limiting valve
10	Hydraulic pump
11	Pressure-limiting valve
12	Two pressure control valve
13	Fluid reservoir

2.3.2. Layout and function



F12 Hydraulic soft top components

Index	Explanation
1	Hydraulic cylinder, main pillar
2	Hydraulic cylinder, fin
3	Hydraulic cylinder, soft top compartment lid
4	Hydraulic unit
5	Switching block
6	Solenoid valve for activating changeover valve 2 (lower fins)

F12 Soft Top
2. System Components

Index	Explanation
7	Drive unit (pump motor with hydraulic pump)
8	Fluid reservoir
9	Fluid filler plug
10	Solenoid valve for activating changeover valve 1 (soft top compartment lid)
11	Solenoid valve for activating changeover valve 3 (raise fins)
12	Relay for activating hydraulic pump motor (2x)

Six hydraulic cylinders (arranged in pairs) operate the soft top compartment lid, the fins and the main pillars. The hydraulic cylinders can be pressurized at the plunger and rod ends.

The direction in which the hydraulic cylinders for the main pillars are actuated is dependent on the direction in which the hydraulic pump rotates. The directions in which the hydraulic cylinders for the soft top compartment lid and the fins are actuated are dependent on the setting of the relevant changeover valves. When a hydraulic cylinder is pressurized at both ends, the pressure at the plunger end is dominant and the plunger rod extends.

In contrast to the E64, to save space, the entire hydraulic unit of the F12 is located inside the rear window module. The hydraulic fluid does not have to be changed. Service openings are provided in the rear window module and in the hydraulic unit for topping up hydraulic fluid, lost for example due to a leak. These openings are each sealed by a round cap. Hydraulic fluid may only be added up to the level mark on the fluid reservoir as seen below.

F12 Hydraulic fluid reservoir, service openings

The hydraulic system is automatically bled in the fluid reservoir.

If after a repair or emergency operation, there is high level noise while the soft top is being operated the soft top must be opened and closed several times in succession so that the air can be bled from the system.

The temperature of the hydraulic pump is determined by the soft top module by means of a virtual sensor. The hydraulic pump can run without interruption for roughly 8 minutes. The soft top can be operated again after the hydraulic system has cooled down.

The hydraulic pump's operating pressure is 190 to 200 bar. The system pressure is limited by two pressure-limiting valves to 190 bar.

The entire hydraulic system is depressurized if the soft top has been completely opened or closed.

If soft top operation is interrupted, the soft top compartment lid closes automatically after 8 to 10 minutes (when operated with the ID transmitter after approximately 30 seconds). Changeover valve 1 is alternately supplied with current (clocking).

2.3.3. Valve switching in the event of interrupted soft top operation

Opening direction

	Changeover valve 1	Changeover valve 2	Changeover valve 3
Raise fins		X	X
Open soft top compartment lid	X	X	X
Open soft top	X	X	X
Close soft top compartment lid	X		

Closing direction

	Changeover valve 1	Changeover valve 2	Changeover valve 3
Open soft top compartment lid	X		
Close soft top	X	X	X
Raise fins	X	X	X
Close soft top compartment lid	X	X	X
Lower fins		X	X

2.4. Electrical components

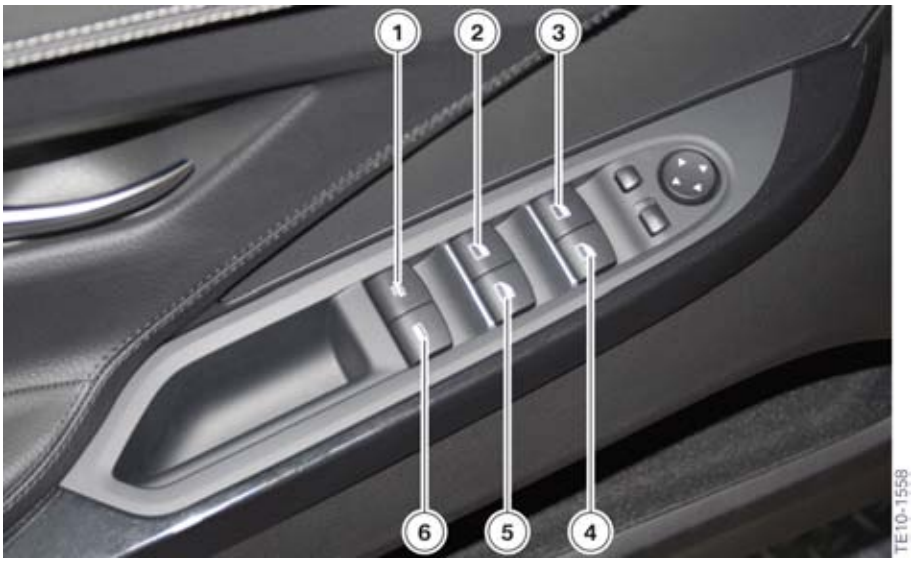
The following electrical components are involved in the operation of the soft top:

- Soft top module
- Soft top switch in the center console
- Driver's door switch pad with the power window switch for simultaneously opening/closing all four side windows and the rear window and the switch for operating the rear window
- Electric motor for locking the retaining hooks (with incremental sensor for position identification), protected by a 20 A fuse

F12 Soft Top
2. System Components

- Electric motor for hydraulic pump, protected by a 40 A fuse
- Electric motor for rear window (with incremental sensor for position identification), protected by a 30 A fuse
- Two relays for raising/lowering the rear window
- Two relays for activating the hydraulic pump motor
- Three solenoid valves for activating the changeover valves
- Two angle-of-rotation sensors for identifying the positions of the main pillars and fins
- One Hall-effect sensor for position identification - retaining hooks closed
- Two Hall-effect sensors for identifying when the soft top compartment lid is locked
- One Hall-effect sensor for position identification - soft top compartment lid open
- Two Hall-effect sensors of identifying dead center of soft top kinematics for the fins
- One Hall effect sensor for position identification - rear window fully lowered
- One microswitch for identifying when the hinged panel is in the lower position

2.4.1. Switches and control unit



F12 switch pad, driver's door

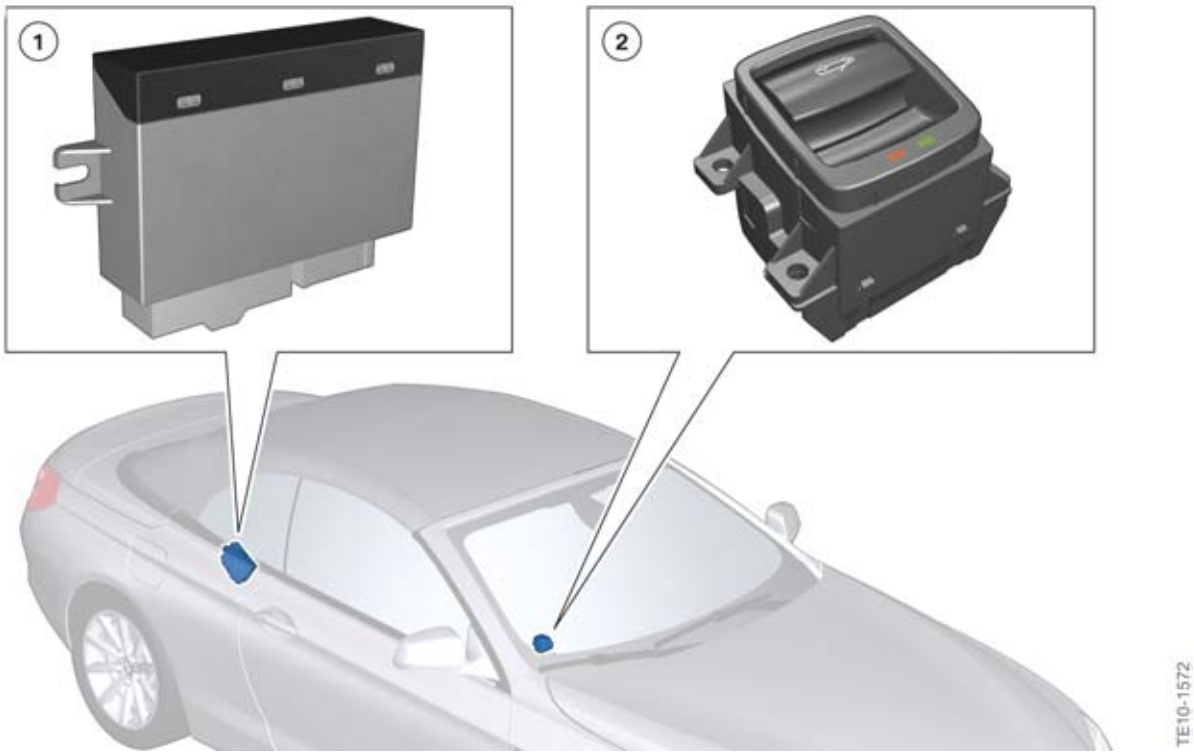
Index	Explanation
1	Power window switch for simultaneously opening/closing all four side windows and the rear window
2	Power window switch, rear left
3	Power window switch, front left
4	Power window switch, front right
5	Power window switch, rear right
6	Switch for operating the rear window

F12 Soft Top

2. System Components

Unlike in the E64, the rear side windows in the F12 are also fitted with an anti-trap mechanism. The rear window still does not have an anti-trap mechanism.

The four side windows and the rear window can be opened with the toll function. Only the four side windows can be closed with the toll function. The switch must be continuously operated in order to close the rear window.



F12 Soft top switch and soft top module

Index	Explanation
1	Soft top module
2	Soft top switch

The soft top switch is located in the center console behind the selector lever/gearshift lever. The operating principle is similar to that for the power window regulators.

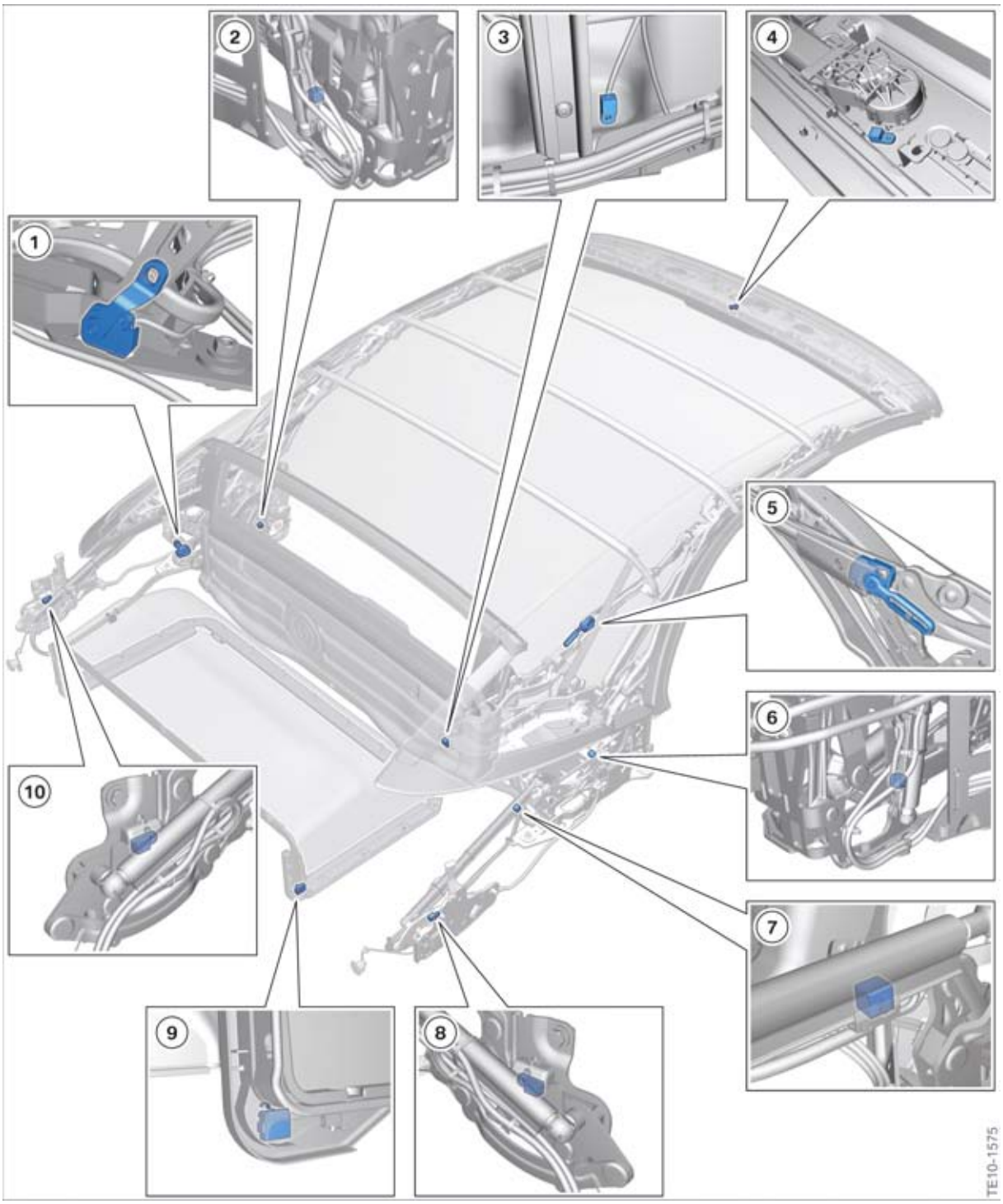
One green LED and one red LED are integrated in the soft top switch. The green LED is lit while the soft top is moving. When the red LED lights up, the soft top switch has been operated and one or more prerequisites for soft top operation have not been fulfilled (e.g. hinged panel of the variable soft top compartment not in the lower position). If the soft top switch is released while the soft top is being opened or closed, the movements are stopped and the red LED in the soft top switch lights up.

The soft top module (current version CVM 7) controls and monitors all the electrical functions of the electro-hydraulic soft top. The functions are similar to those of the electro-hydraulic soft top in the E64.

F12 Soft Top

2. System Components

2.4.2. Sensors



F12 Arrangement of soft top sensors

F12 Soft Top

2. System Components

Index	Explanation
1	Angle-of-rotation sensor for main pillar
2	Hall-effect sensor, dead center, fin control, left
3	Hall-effect sensor, rear window fully lowered
4	Hall-effect sensor, retaining hooks closed
5	Angle-of-rotation sensor for fin
6	Hall-effect sensor, dead center, fin control, right
7	Hall-effect sensor, soft top compartment lid open
8	Hall-effect sensor, soft top compartment lid closed, right
9	Microswitch, soft top compartment
10	Hall-effect sensor, soft top compartment lid closed, left

The sensors sense the component positions relevant to soft top operation and signal these positions to the soft top module.

The angle-of-rotation sensors sense the positions of the main pillars and the fins. They are designed as potentiometers. The output voltage of each potentiometer changes while the soft top is being operated. The voltage values are converted by the soft top module into angle values.

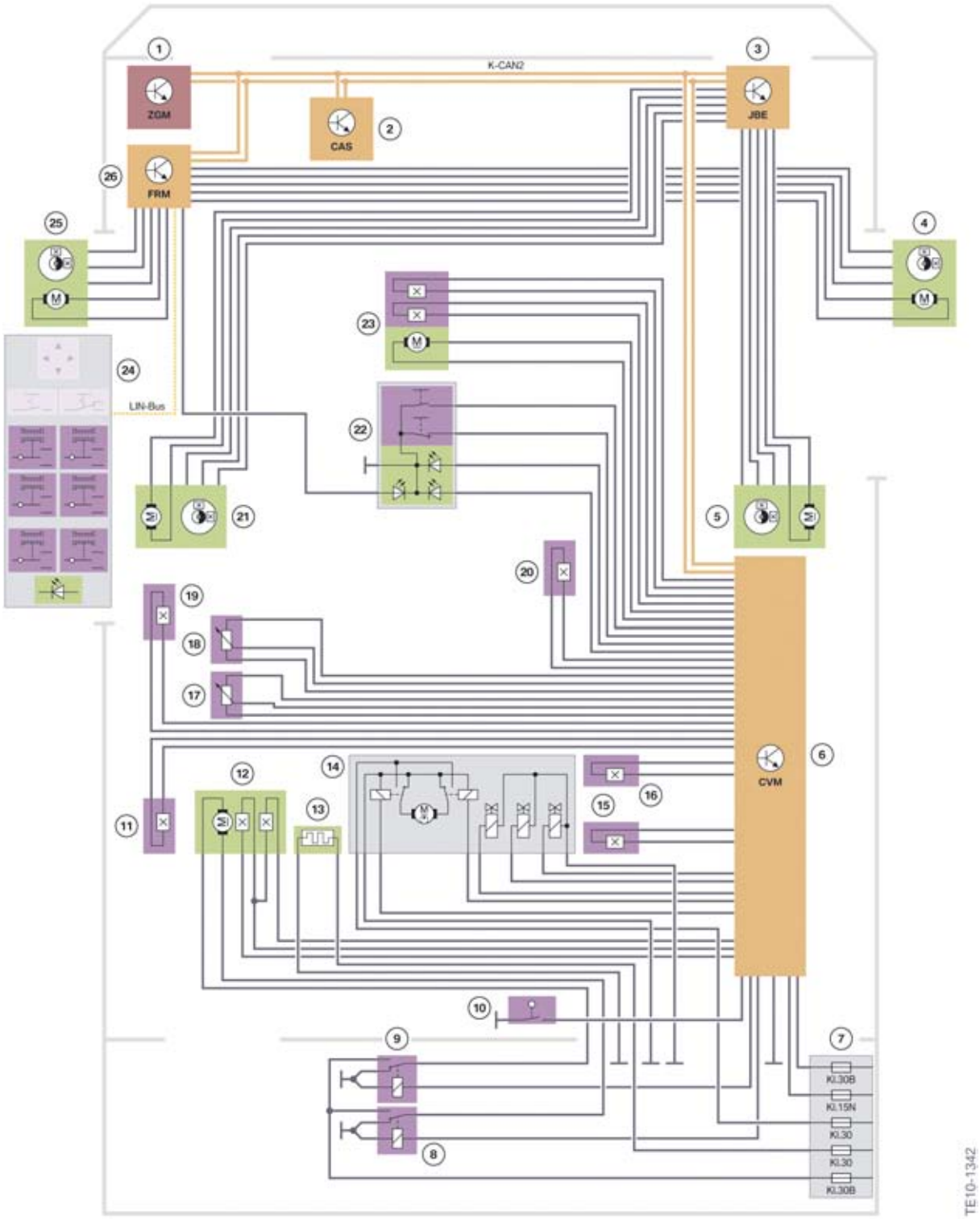
The Hall-effect sensors sense specific positions of the fins, rear window, retaining hooks and soft top compartment lid.

The soft top compartment microswitch uses a mechanical contact to sense the lower position of the hinged panel of the variable soft top compartment.

F12 Soft Top

2. System Components

2.4.3. System wiring diagram, soft top module



F12 System wiring diagram, soft top module

F12 Soft Top

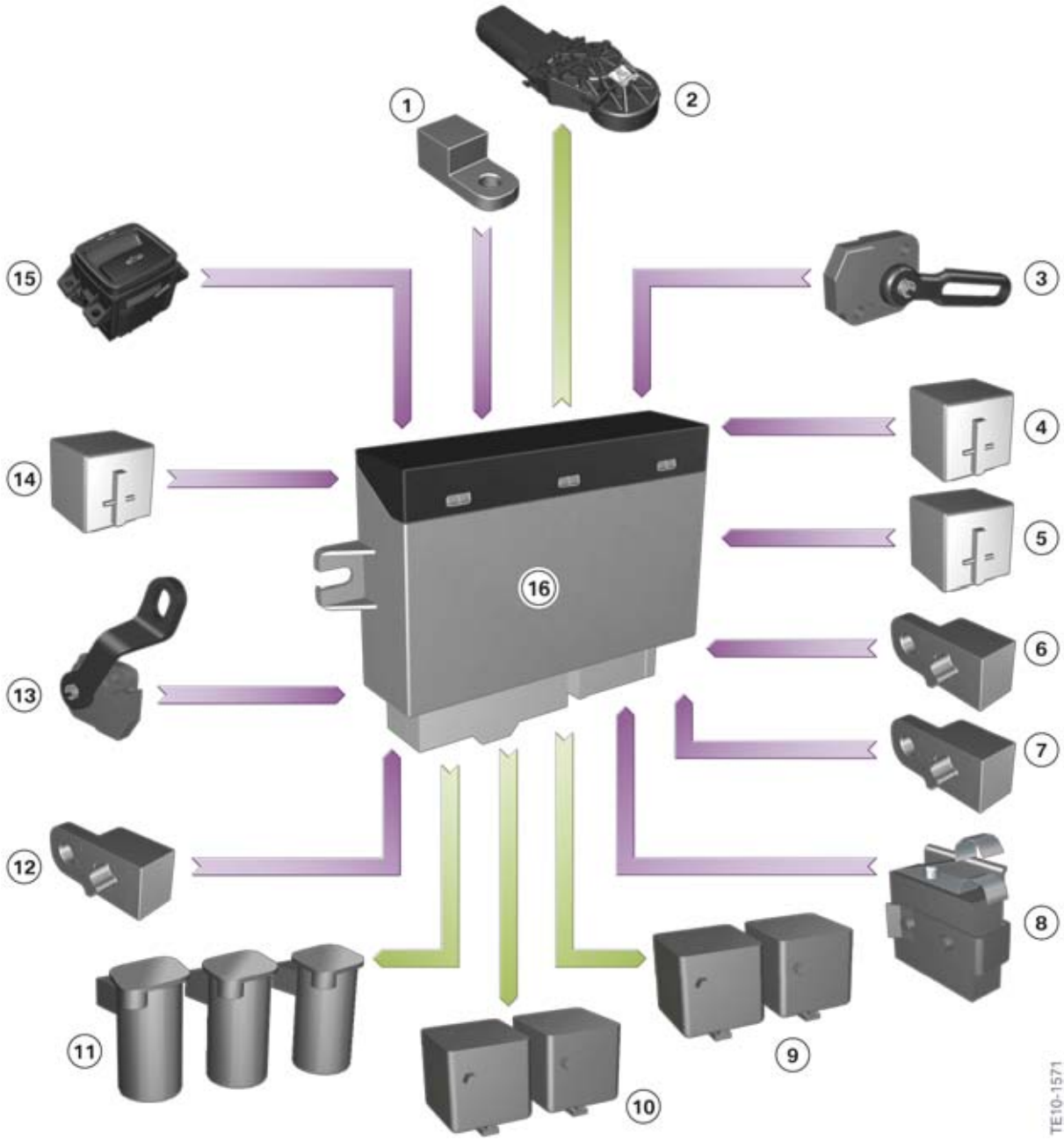
2. System Components

Index	Explanation
1	Central gateway module (ZGM)
2	Car Access System (CAS)
3	Junction box electronics (JBE)
4	Power window motor with indirect anti-trap mechanism, passenger side, front
5	Power window motor with indirect anti-trap mechanism, passenger side, rear
6	Soft top module (CVM)
7	Power distribution box, luggage compartment
8	Relay for raising rear window
9	Relay for lowering rear window
10	Microswitch, soft top compartment
11	Hall-effect sensor, dead center, fin control, left
12	Rear window drive (electric motor for rear window with incremental sensor for position identification and Hall-effect sensor - rear window fully lowered)
13	Heated rear window
14	Hydraulic unit
15	Hall-effect sensor, soft top compartment lid open
16	Hall-effect sensor, dead center, fin control, right
17	Angle-of-rotation sensor for fin
18	Angle-of-rotation sensor for main pillar
19	Hall-effect sensor, soft top compartment lid closed, left
20	Hall-effect sensor, soft top compartment lid closed, right
21	Power window motor with indirect anti-trap mechanism, driver's side, rear
22	Soft top switch
23	Soft top locking drive (electric motor, retaining hooks, with incremental sensor for position identification and Hall-effect sensor - retaining hooks closed)
24	Switch pad, driver's door
25	Power window motor with indirect anti-trap mechanism, driver's side, front
26	Footwell module (FRM)
KI.15N	Ignition (after-run)
KI.30	Terminal 30
KI.30B	Terminal 30 basic operation
LIN-Bus	Local interconnect network bus

F12 Soft Top

2. System Components

2.4.4. Inputs/outputs



F12 Inputs/outputs, soft top

Index	Explanation
1	Hall-effect sensor, retaining hooks closed
2	Soft top locking drive
3	Angle-of-rotation sensor for fin
4	Hall-effect sensor, dead center, fin control, right

F12 Soft Top

2. System Components

Index	Explanation
5	Hall-effect sensor, soft top compartment lid open
6	Hall-effect sensor, rear window fully lowered
7	Hall-effect sensor, soft top compartment lid closed, right
8	Microswitch, soft top compartment
9	Relay for raising/lowering rear window
10	Hydraulic pump relay
11	Solenoid valves for activating the changeover valves
12	Hall-effect sensor, soft top compartment lid closed, left
13	Angle-of-rotation sensor for main pillar
14	Hall-effect sensor, dead center, fin control, left
15	Soft top switch
16	Soft top module (CVM)

F12 Soft Top

3. Operation and Function

3.1. Soft top operation

For safety reasons, always observe the opening and closing actions of the soft top and make sure that nobody is trapped or injured by the mechanism.

3.1.1. Prerequisites

The following conditions must be satisfied before the soft top can be opened or closed:

- Hinged panel of the variable soft top compartment in the lower position
- Luggage compartment lid is closed
- Driving speed < 40 km/h / 25 mph
- Ambient temperature > –20 °C
- Terminal 15N activated (only for standard operation with the soft top switch)
- Power window regulators are initialized
- Battery voltage > 10.5 V
- Temperature of hydraulic pump not too high
  (The temperature of the hydraulic pump is recorded by the soft top module by means of a virtual sensor. The hydraulic pump can run without interruption for roughly 8 minutes. The soft top can be operated again after the hydraulic system has cooled down)
- Car is not in transport mode

If the soft top switch is operated and one of the conditions is not satisfied, the red LED in the soft top switch lights up and the opening or closing action is not started. In addition, a Check Control message is displayed in the instrument panel.

Do not operate the soft top when the rollover bars of the rollover protection system are extended!

Operating soft top when the rollover bars of the rollover protection system are extended will result in damage of the soft top.

3.1.2. Standard operation

The soft top is operated by the soft top switch located in the center console.

F12 Soft Top

3. Operation and Function

F12 Soft top switch

Index	Explanation
1	Green LED
2	Red LED
3	Switch

The operating principle of the soft top switch is similar to that for the power window regulators.

- Press soft top switch: soft top is opened
- Pull soft top switch: soft top is closed

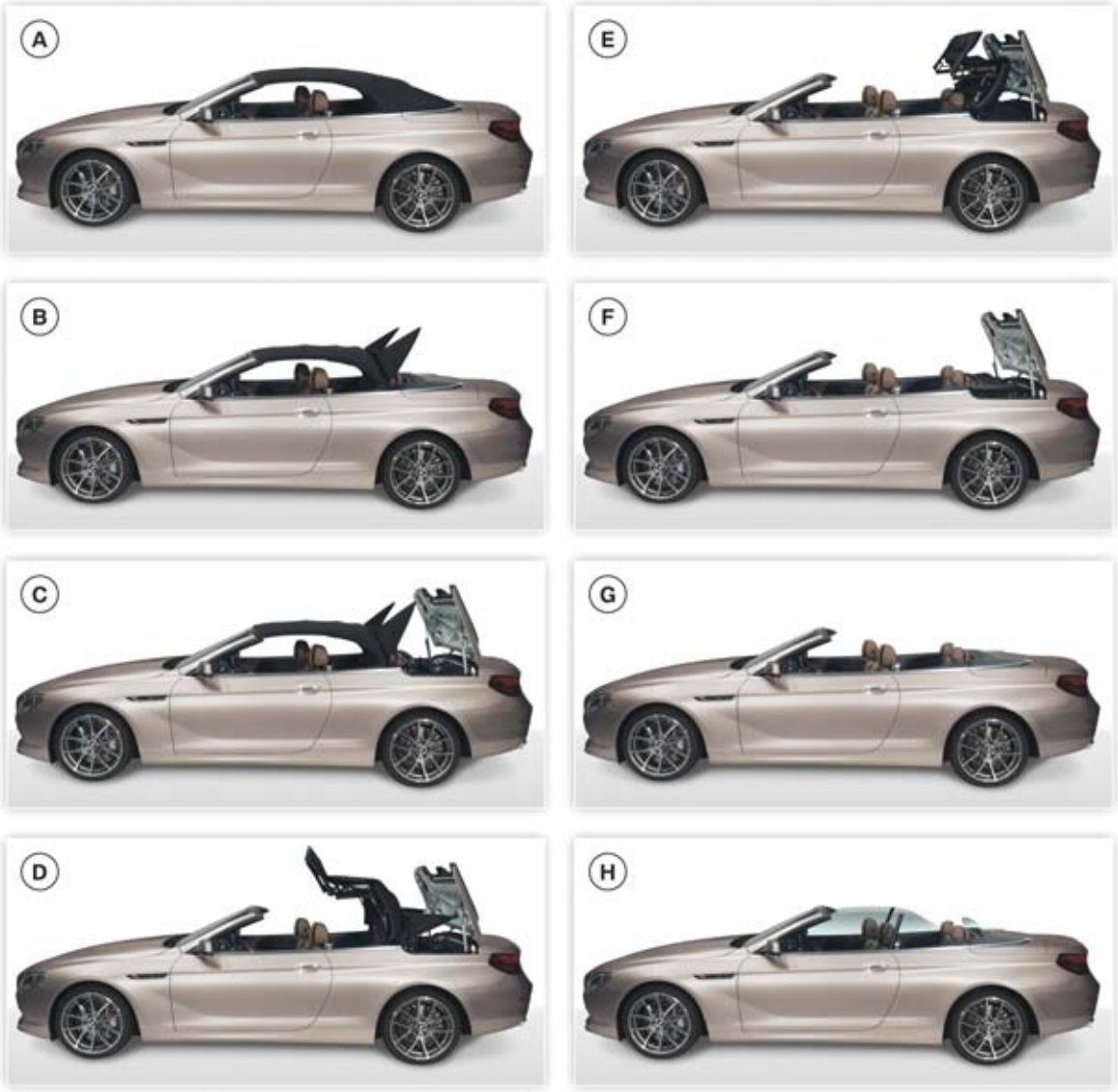
The green LED in the soft top switch is lit while the soft top is moving. If the soft top switch is released while the soft top is being opened or closed, the movements of the soft top or the side windows and the rear window are immediately interrupted. The red LED in the soft top switch then flashes and a Check Control message is displayed in the instrument panel. The movements are resumed when the soft top switch is operated again.

Sequence: Open soft top

When the soft top switch is pulled, the conditions for opening the soft top are verified by the soft top module. If all the conditions are satisfied, the soft top is opened.

F12 Soft Top

3. Operation and Function



F12 Open soft top

Index	Explanation
A	The side windows and the rear window are fully lowered
B	The fins are raised. Then the front soft top bow on the cowl panel is unlocked
C	The soft top compartment lid is unlocked and raised
D	The soft top is swung in the rearward direction
E	The soft top is swung further in the rearward direction and the fins are lowered
F	The soft top is stowed in the soft top compartment
G	The soft top compartment lid is closed and locked
H	The side windows and the rear window are fully raised[1]

F12 Soft Top

3. Operation and Function

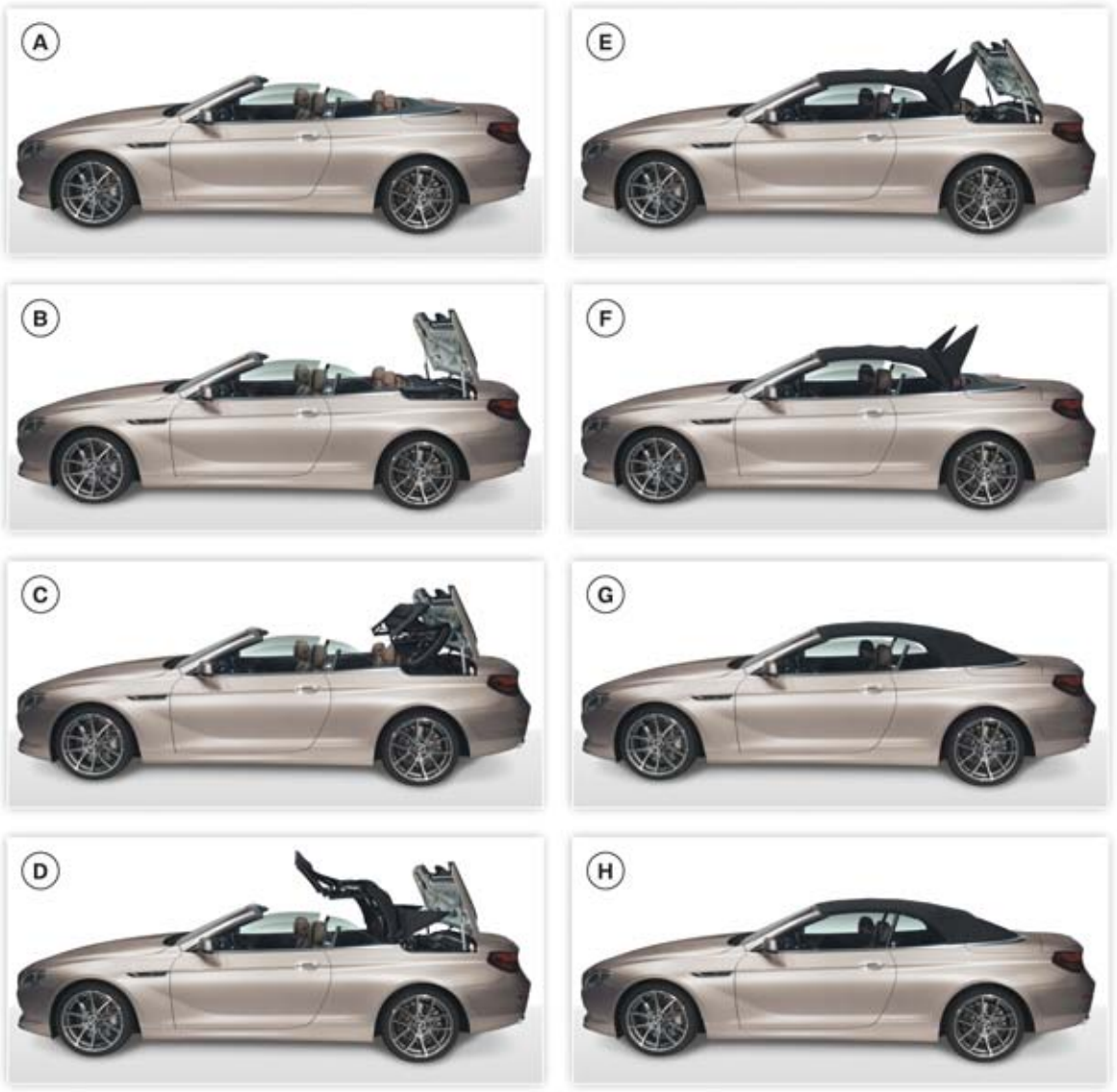
[1] If after the closing action the soft top switch remains operated for more than approx. 1.5 seconds or is operated again within approx. 1.5 seconds, the side windows and the rear window are closed.

When the soft top is open, the position of the raised rear window is slightly lower than when the soft top is closed. This helps to deflect air turbulence away from the passenger compartment more effectively.

Sequence: Close soft top

When the soft top switch is pressed, the conditions for closing the soft top are checked by the soft top module. If all the conditions are satisfied, the soft top is closed.

If the rear window is raised, it is fully lowered. If the side windows are raised, they are only slightly lowered.



F12 Close soft top

Index	Explanation
A	The rear window is fully lowered, the side windows are slightly lowered
B	The soft top compartment lid is unlocked and raised
C	The soft top is lifted out of the soft top compartment
D	The soft top is swung in the forward direction and the fins are raised
E	The front soft top bow settles on the cowl panel and the fins are raised further
F	The soft top compartment lid is closed and locked
G	The front soft top bow is locked on the cowl panel and the fins are lowered
H	The side windows and the rear window are fully raised (as long as the soft top switch is operated in the "Close" direction)

3.1.3. Convenience functions

The soft top can also be opened and closed from the outside via the lock barrel with the integrated key.

On all F12 vehicles the soft top to be opened and closed with the ID transmitter, and closed via the outside door handle electronics. This is possible since all F12 are equipped with comfort access.

The ignition does not have to be switched on for the soft top convenience functions to work. The ID transmitter must however be situated in the immediate vicinity of the car (approx. 1.5 m). Otherwise the same prerequisite as for standard operation apply.

F12 Soft Top

3. Operation and Function

Convenience opening and closing via ID transmitter or door lock

F12 ID transmitter and integrated mechanical spare key

To open or close the soft top with the ID transmitter, the Unlocking/Locking switch must be pressed and held down. The soft top is opened or closed after a period of approx. 1.5 seconds has elapsed. The opening or closing action is immediately interrupted when the Unlocking/Locking switch is released or the switch on a different ID transmitter is pressed.

The soft top can also be operated via the door lock. To this end, the in integrated key must be turned in the lock barrel of the driver's door in the open or close direction and held. The soft top opening or closing action is started after a period of approx. 1.5 seconds has elapsed. If the integrated key is released, the opening or closing action is immediately interrupted.

F12 Soft Top
3. Operation and Function

Convenience closing via outside door handle electronics

F12 Outside door handle

The sensitive surface of the outside door handle must be touched in order to close the soft top through Comfort Access. The soft top closing action is started after a period of approx. 1.5 seconds has elapsed. The sensitive surface must be constantly touched, otherwise the closing action will be immediately interrupted.

3.2. Rear window operation

The rear window of the F12 is heated and can be lowered and raised.

It is operated with the following controls:

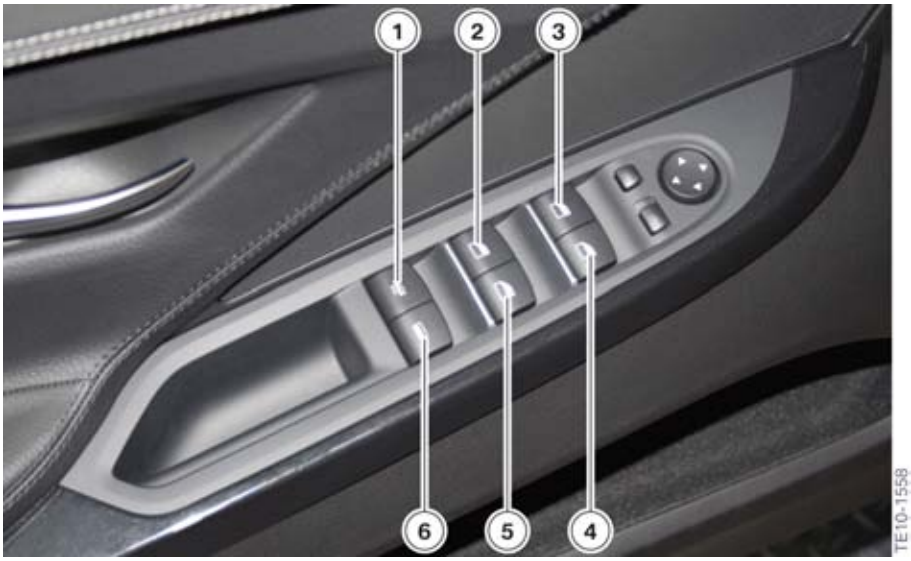
- the switch for operating the rear window in the driver's door switch pad
- the power window switch for simultaneously opening/closing all four side windows and the rear window in the driver's door switch pad
- the soft top switch, in conjunction with soft top operation

Opening and closing are only possible when the soft top is fully closed or opened.

The switch for the heated rear window is located in the control panel for the integrated automatic heating / air conditioning system (IHKA). An activated heated rear window is switched off when the rear window is fully lowered.

F12 Soft Top

3. Operation and Function



F12 switch pad, driver's door

Index	Explanation
1	Power window switch for simultaneously opening/closing all four side windows and the rear window
2	Power window switch, rear left
3	Power window switch, front left
4	Power window switch, front right
5	Power window switch, rear right
6	Switch for operating the rear window

F12 Soft Top

4. Information for Service

4.1. Check Control messages

In certain situations it will not be possible to open or close the soft top. A red LED lights up in the soft top switch in this event. In addition, one or more Check Control messages are displayed in the instrument panel and appear as plain text in the central information display.

The following table provides an overview of possible messages:

Check Control symbol	Check control message	Text in central information display
	Roof! Drive more slowly	Roof Speed for opening/closing the roof exceeded. Reduce speed and continue opening/closing.
	Luggage compartment separator	Luggage compartment separator Opening of roof is not possible. Move luggage compartment separator into required position, see owner's manual.
	Roof	Roof Opening/closing is temporarily not possible. Possible causes, see owner's manual.
	Roof Check lock!	Roof Control failed! If roof is securely locked, continued driving is possible. For information on checking the lock, see owner's manual. Have the vehicle checked by your BMW Service department.
	Roof	Roof Roof control failed. Manual opening/closing possible, see owner's manual.
	Roof not locked!	Roof Roof not locked! Fully open or close roof first, then continue driving. See owner's manual.

4.2. Emergency operation

The soft top can be manually operated in the event of a fault in the electro-hydraulic system.

F12 Soft Top

4. Information for Service

4.2.1. Tools

The tools for emergency operation of the soft top are located in the rear seat backrest filler piece.

F12 Tools for emergency operation of soft top

Index	Explanation
1	Rear window tool (hexagon socket screw key)
2	Soft top tool (hexagon socket screw key)
3	Adapter

4.2.2. Manually closing the soft top

⚠

Carry out the following operations with the doors open and the help of a second person, otherwise injuries may be suffered and the soft top may be damaged. Carry out the procedure carefully, in the prescribed order and without exerting excessive force.

To perform emergency operation of the soft top, refer to the repair instructions or the owner's manual!

F12 Soft Top

4. Information for Service

Before closing

F12 Unlocking the soft top compartment lid

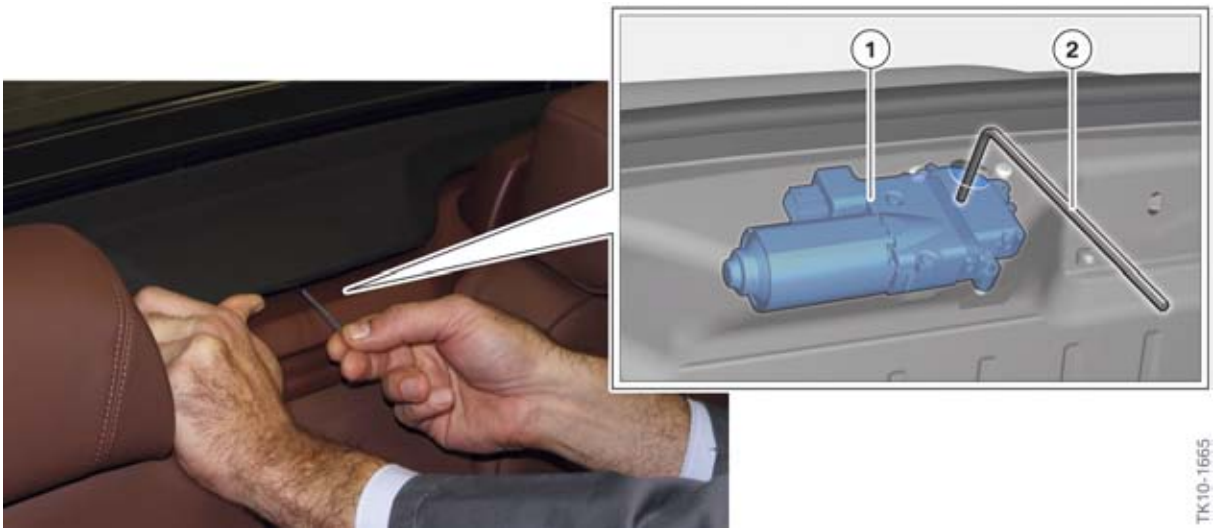
- Open the luggage compartment.
- Pull both protective caps out of the luggage compartment trim panel.
- Pull on the right protective cap and at the same time slightly lift the soft top compartment lid at front right (in front of the rear window).
- Proceed in the same way for the left side.
- Remove urgently needed objects from the luggage compartment and close the lid.
  Note: The soft top compartment lid remains unlocked after emergency operation of the soft top. The luggage compartment can now no longer be opened until the repair has been completed.
- Lower all the side windows and the rear window fully.
  If the rear window cannot be electrically operated, it must be manually lowered with the special tool.

Manually lowering the rear window

The spindle for lowering the rear window is located in front of the rear window, in the middle, under the soft top compartment lid.

F12 Soft Top

4. Information for Service



F12 Manually lowering the rear window

Index	Explanation
1	Rear window drive
2	Rear window tool

- Lift the plastic trim of the soft top compartment lid slightly and secure.
  Note: Do not damage the surfaces!
- Insert the rear window tool through the funnel-shaped opening into the spindle of the rear window drive motor. Turn the spindle in a clockwise direction until the rear window is fully lowered. Repeated use of the tool may be necessary, depending on the position of the rear window.

F12 Soft Top

4. Information for Service

Lifting out the soft top

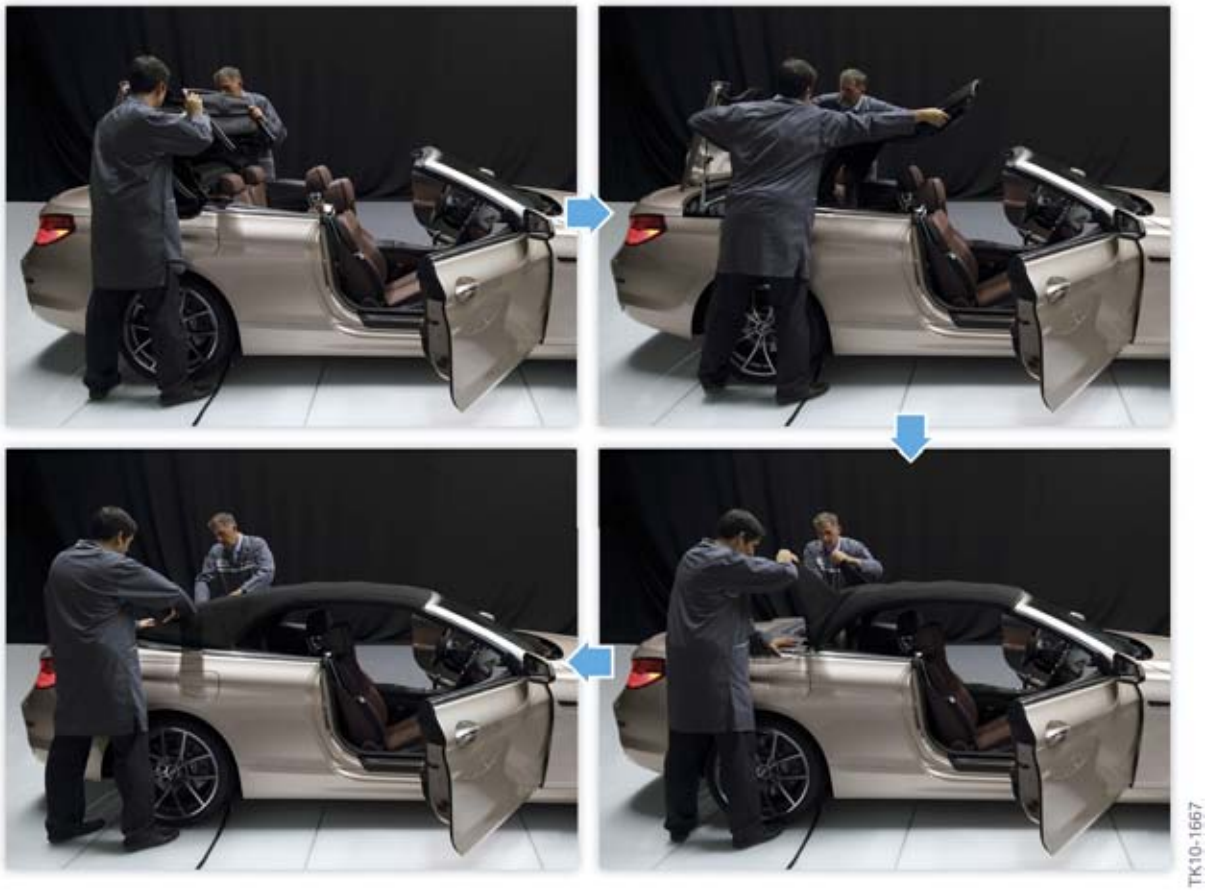
F12 Opening the soft top compartment lid and releasing the cowl panel lock

Index	Explanation
1	Soft top compartment lid
2	Soft top tool
3	Retaining hook (cowl panel lock)

- Swing the soft top compartment lid upwards on both sides as far as it will go and hold. If necessary, use special tool 54 3 120.
- Remove the small cover in the middle of the front soft top bow.
- Insert the soft top tool into the cowl panel lock and turn approximately half a turn in a clockwise direction to open the retaining hooks.
  Note: Do not damage the soft top fabric!

F12 Soft Top

4. Information for Service



F12 Lifting the soft top out of the soft top compartment, closing the soft top compartment lid

- On both sides of the car, grip the front corner of the soft top frame with one hand and grip the lower edge of the fin with the other hand.
  (At the same time hold the soft top compartment lid open, e.g. with your shoulder).
- Simultaneously lift out the front soft top bow and the fins on both sides and swing in the forward direction.
  Note: Make sure that the fins do not bang against other parts.
- Close the soft top compartment lid.
- Fold both fins down onto the soft top compartment lid.

F12 Soft Top

4. Information for Service

Locking the soft top

F12 Locking the soft top on the cowl panel

- Press the front soft top bow from the outside in the middle onto the windshield frame. At the same time, insert the soft top tool into the cowl panel lock and turn in an counterclockwise direction until the front soft top bow is locked with the windshield frame.
- Reinstall the small cover in the middle of the front soft top bow.

F12 Locking the fins

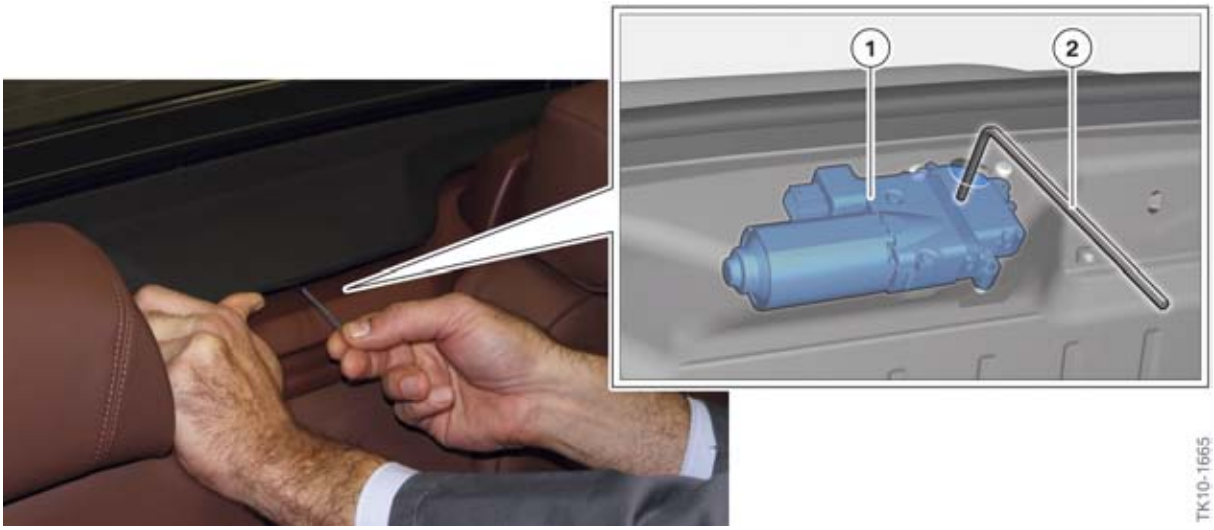
- Insert the long end of the soft top tool into the adapter.
- In the rear passenger compartment, raise the headliner and attach the adapter to the lever (marked in red) on the soft top mechanism.
- Press the fin downwards from the outside and at the same time pull the soft top tool upwards as far as it will go. This action presses and locks the fin onto the soft top compartment lid.
- Lock the other fin in the same manner.
- Electrically raise the rear window.
  If the rear window cannot be electrically operated, it can be raised manually using the special tool.

F12 Soft Top

4. Information for Service

Manually raising the rear window

The spindle for lowering the rear window is located in front of the rear window, in the middle under the soft top compartment lid.



F12 Manually raising the rear window

Index	Explanation
1	Rear window drive
2	Rear window tool

- Raise the trim on the soft top compartment lid slightly and secure.
  Note: Do not damage the surfaces!
- Insert the rear window tool through the funnel-shaped opening into the spindle. Turn the spindle in an counterclockwise direction until the rear window is fully raised. Repeated use of the tool may be necessary, depending on the position of the rear window.

4.2.3. Manually opening the soft top

⚠

Carry out the following operations with the doors open and the help of a second person, otherwise injuries may be suffered and the soft top may be damaged. Carry out the procedure carefully, in the prescribed order and without exerting excessive force.

To perform emergency operation of the soft top, refer to the repair instructions!

Before opening

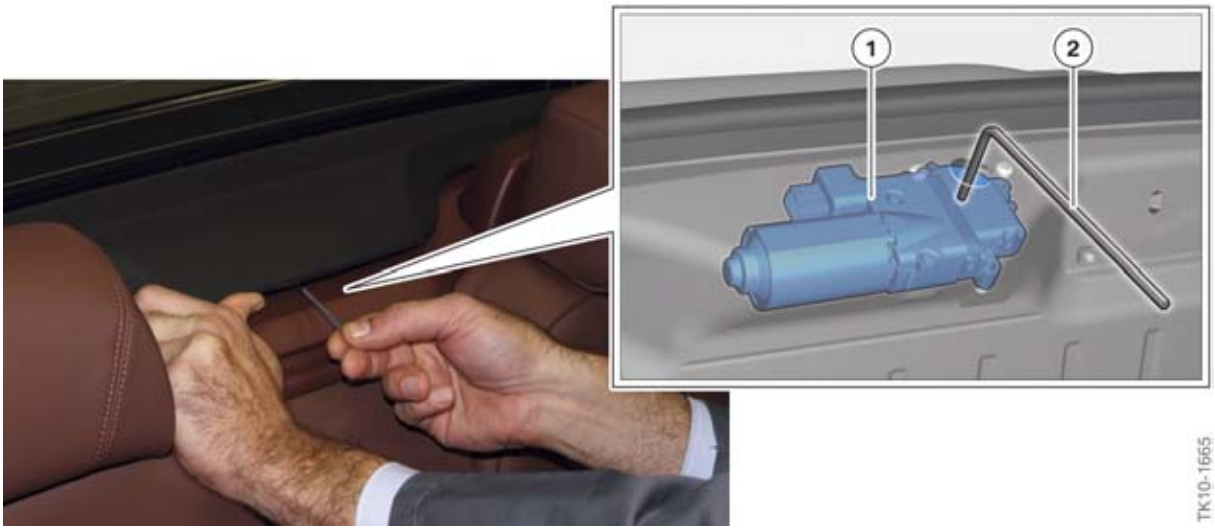
- Lower all the side windows and the rear window fully.
  If the rear window cannot be electrically operated, it must be manually lowered.

F12 Soft Top

4. Information for Service

Manually lowering the rear window

The spindle for lowering the rear window is located in front of the rear window, in the middle under the soft top compartment lid.



F12 Manually lowering the rear window

Index	Explanation
1	Rear window drive
2	Rear window tool

- Lift the trim on the soft top compartment lid slightly and secure.
  Note: Do not damage the surfaces!
- Insert the rear window tool through the funnel-shaped opening into the spindle. Turn the spindle in a clockwise direction until the rear window is fully lowered. Repeated use of the tool may be necessary, depending on the position of the rear window.

F12 Soft Top

4. Information for Service

Unlocking the soft top

F12 Unlocking the fins

- Open the luggage compartment (if the soft top was previously manually closed, the luggage compartment does **not** have to be opened).
- Insert the long end of the soft top tool into the adapter.
- In the rear passenger compartment, raise the headliner and attach the adapter to the lever (marked in red) on the soft top mechanism.
- Pull the soft top tool downwards, to unlock the fin.
- Unlock the other fin in the same manner.

F12 Unlocking the soft top on the cowl panel

- Remove the small cover in the middle of the front soft top bow.
- Insert the soft top tool into the cowl panel lock and turn in a clockwise direction until the front soft top bow is unlocked.

F12 Soft Top

4. Information for Service

Unlocking the soft top compartment lid

If the soft top was previously manually closed, the soft top compartment lid does not have to be unlocked.

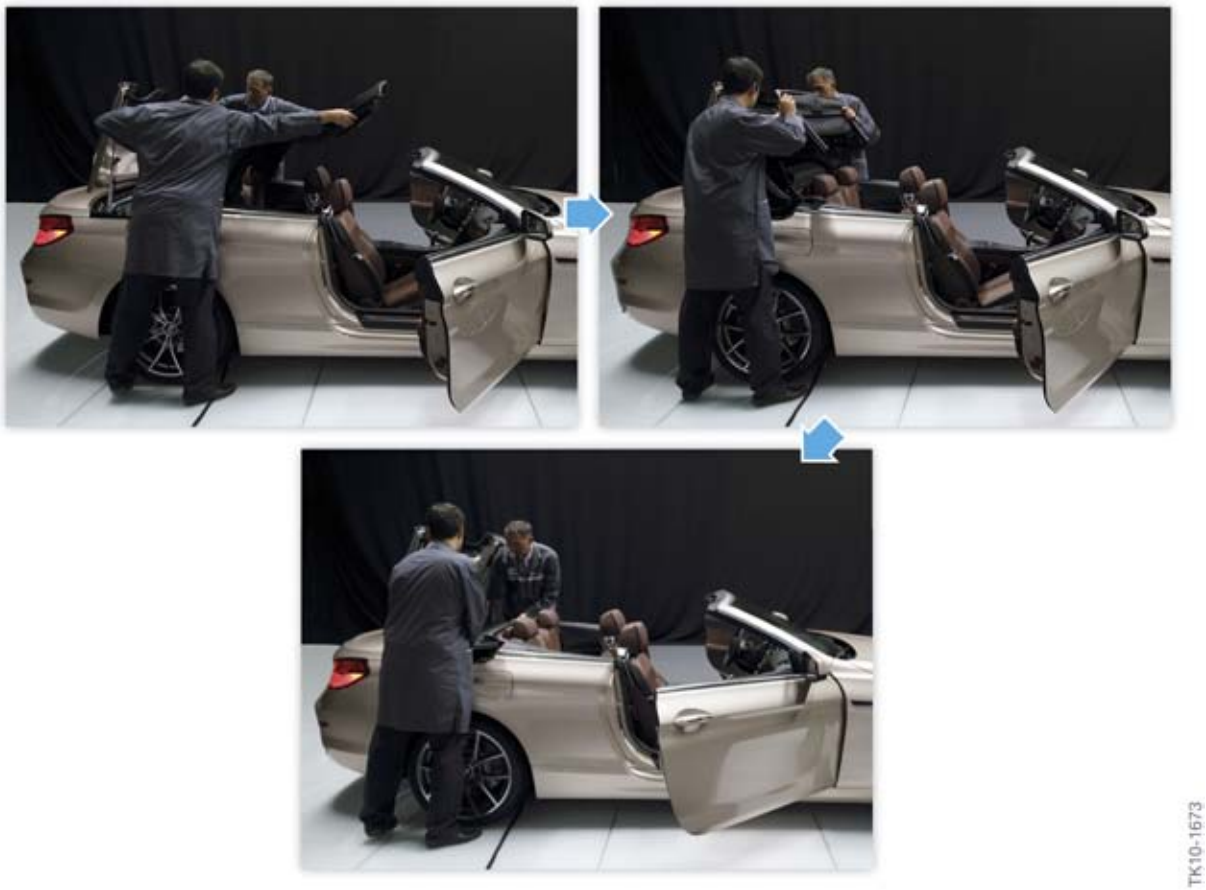
F12 Unlocking the soft top compartment lid

- On both sides of the car, grip the fins by the lower edge, and at the same time swing upwards and hold.
- Pull both protective caps out of the luggage compartment trim panel.
- Pull on the right protective cap and at the same time slightly lift the soft top compartment lid at front right, in front of the rear window.
- Proceed in the same way for the left side.
- Remove urgently needed objects from the luggage compartment and close the lid. Make sure that the soft top compartment lid and the trunk lid are not damaged.
  Note: The soft top compartment lid remains unlocked after emergency operation of the soft top. The luggage compartment can now no longer be opened until the repair has been completed.

F12 Soft Top

4. Information for Service

Stowing the soft top



F12 Stowing the soft top

- Swing the soft top compartment lid upwards on both sides as far as it will go and hold, use special tool 54 3 120 if necessary.
- On both sides of the car, grip the front corner of the soft top frame with one hand. Continue to hold the fins with the other hand.
- On both sides of the car, pull the front soft top bow in the rearward direction and at the same time continue holding the fins.
- Stow the soft top on both sides evenly in the soft top compartment.

F12 Soft Top
4. Information for Service

F12 Locking the cowl panel lock

Index	Explanation
1	Soft top compartment lid
2	Soft top tool
3	Retaining hook (cowl panel lock)

- Insert the soft top tool into the cowl panel lock and turn in an counterclockwise direction until the retaining hooks are retracted.
- Install the small cover in the middle of the front soft top bow.
- Close the soft top compartment lid.

⚠

Note: After emergency manual operation of the soft top, the soft top compartment lid is not locked and would open during driving. Only move the car at walking pace in this situation.

4.3. Adjusting the soft top

⚠

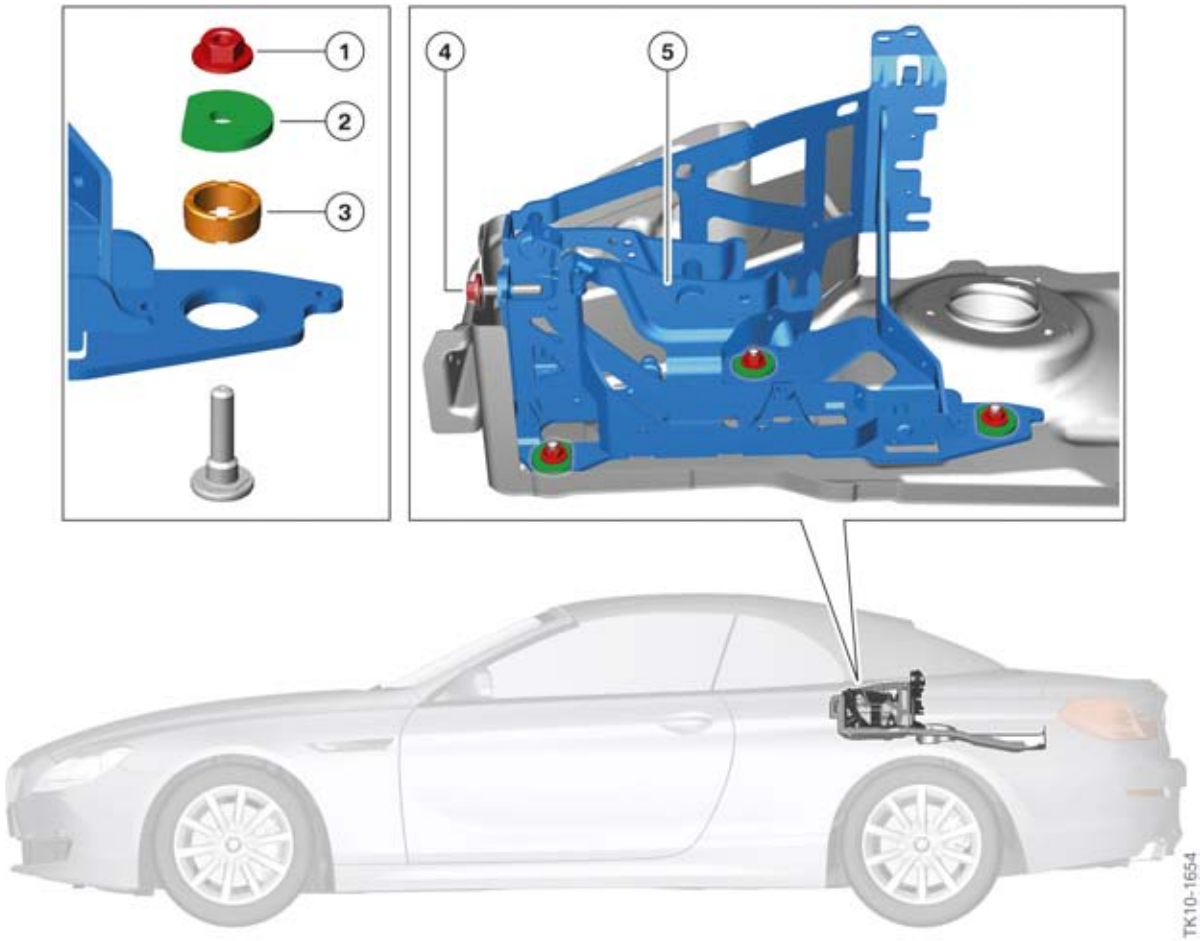
Always refer to the repair instructions adjust the soft top!

F12 Soft Top

4. Information for Service

The soft top can be adjusted in three directions: vertically, longitudinally and laterally.

Two soft top main bearing (brackets) connect the soft top to the bodyshell. These are secured by three lock nuts and one adjusting nut.



F12 Soft top adjustment

Index	Explanation
1	Lock nut
2	Washer
3	Banjo bolt
4	Adjusting nut
5	Soft top main bearing

To adjust the soft top, all the adjusting and lock nuts on the soft top main bearings must be released and the washers removed.

The soft top is vertically adjusted by turning the banjo bolts. The banjo bolts have external threads and can be turned in the main bearings with special tool 54 3 000. Turning clockwise raises the soft top, turning counterclockwise lowers the soft top.

F12 Soft Top
4. Information for Service

The elongated holes on the soft top main bearing allow the soft top to be longitudinally and laterally adjusted. In this way, the soft top can be adjusted in the horizontal direction around the threaded bolts.

The soft top setting made is secured by tightening down the adjusting nut. Brace the bolt in the process. Then fit the washers and tighten down all the lock nuts.

To finish, it is necessary to check the soft top adjustment in relation to the cowl panel. The guide pins on the left and right should drop in the middle into the guide bushes. If this is not possible, the entire soft top must be adjusted in the appropriate direction. After adjusting the soft top, it is also necessary to adjust the side windows as directed in the repair instructions.

Tips:

- To make it easier to adjust the soft top, it is useful before removing the soft top to mark the positions of the soft top main bearings on the body. After the repair is completed or when the soft top is replaced, the soft top main bearings can be aligned to the markings.
- If the soft top is being replaced: Before removing the soft top, measure the gap between the mounting plate and the soft top main bearing. Carry over these dimensions to the new soft top. In this way, the longitudinal adjustment of the soft top is roughly specified.
- If the soft top is being replaced: Measure the vertical adjustment of the banjo bolts and carry over to the new soft top.

4.4. Breaking in the soft top

The positions of the main pillars and fins are sensed by the two angle-of-rotation sensors and must be signalled to the soft top module.

The soft top must be broken in (taught) when:

- the soft top has been replaced
- a different soft top module control unit has been installed
- one or both angle-of-rotation sensors have been replaced

The soft top module is designed in such a way that it can also open and close the soft top in the non-taught state. However, the main pillars and fins are always subject to extended strain. The entire soft top operation is unharmonious, since other switching points are active.

Before the soft top module control unit is replaced, the rear window must be fully lowered (if necessary, manually lower the rear window). If an already taught soft top module control unit is to be installed in a different vehicle, it must be placed in a non-taught state by means of diagnosis prior to being removed.

In Service the ISTA diagnosis system can be used to read out the current status, whether the soft top module is taught and which values are stored.

As well as teaching by means of diagnosis, it is possible to teach the closed position by means of a switch combination. For this purpose, the soft top switch must be released after the soft top closing action within 5 seconds and then operated again for 30 seconds in the "Close" direction. The red and green LEDs in the soft top switch light up to indicate successful teaching, otherwise only the red LED lights up. No LED lights up if the soft top switch was operated too late or released too early.

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